

PRE-DESIGN INVESTIGATION REPORT

WORK ASSIGNMENT D009803-34

ARTCO INDUSTRIAL LAUNDRIES
SITE NO. 828102
CITY OF ROCHESTER, MONROE COUNTY, NY

Prepared for:
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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DIVISION OF ENVIRONMENTAL REMEDIATION

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FINAL PRE-DESIGN INVESTIGATION REPORT
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MONROE COUNTY, NEW YORK

PREPARED FOR:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
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REMEDIAL BUREAU E
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LIST OF ACRONYMS AND ABBREVIATIONS

1,1,1-TCA	1,1,1-trichloroethane
AECOM	AECOM USA, Inc.
AFES	Agency For Empowerment & Support, LLC
Amsl	above mean sea level
Artco	Former Artco Industrial Laundries
BCP	Brownfield Cleanup Program
bgs	below ground surface
BSR	Barnes/Stevens Redevelopment LLC
BTEX	benzene, toluene, ethylbenzene, xylenes
CD	compact disc
COC	chain-of-custody
CVOC	chlorinated volatile organic compound
DCE	dichloroethene
DUSR	Data Usability Summary Report
EDV	Environmental Data Validation, Inc.
EMI	electromagnetic induction
(ft/ft)	feet per foot
GPR	ground penetrating radar
HDPE	high density polyethylene
HDR	Henningson, Durham & Richardson, Inc.
Hertz	Hz
HUD	Housing and Urban Development
ID	inside diameter
IDW	investigation derived waste
Inc.	Incorporated
IRM	Interim Remedial Measure
ISCO	In-situ chemical oxidation
ISMP	Interim Site Management Plan
megahertz	MHz
mg/kg	milligrams per kilogram (parts per million)
NAPL	non-aqueous phase liquid
NAVD	North American Vertical Datum
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OD	outside diameter
ORP	oxidation/reduction potential
PAHs	polynuclear (or polycyclic) aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCE	perchloroethene, aka tetrachloroethene or tetrachloroethylene or perchloroethylene
PDI	Pre-Design Investigation
PDIR	Pre-Design Investigation Report
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
PID	photoionization detector
ppb	parts per billion

ppm	parts per million
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RDWP	Remedial Design Work Plan
RI	Remedial Investigation
ROD	Record of Decision
RQD	rock-quality designation
SCGs	standards, criteria and guidance
SCOs	soil cleanup objectives
SVE	soil vapor extraction
SVI	soil vapor intrusion
SVOC	semi-volatile organic compound
TAL	target analyte list
TCE	trichloroethene, aka trichloroethylene
TCL	target compound list
TOC	total organic carbon
TOGS	Technical and Operational Guidance Series
µg/kg	micrograms per kilogram (parts per billion)
µg/L	micrograms per liter (parts per billion)
URS	URS Corporation (acquired by AECOM)
USEPA	United States Environmental Protection Agency
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
WA	Work Assignment

1.0 INTRODUCTION

This Pre-Design Investigation Report (PDIR) presents the data generated from the Pre-Design Investigation (PDI) activities conducted from January 2020 to April 2021 at the Artco Industrial Laundries Site (Artco), Site No. 828102 (Site) located in the City of Rochester, New York (Figure 1-1). This document describes activities performed during this PDI as proposed in the approved Remedial Design Work Plan (RDWP, URS Corporation, January 2020), compares the PDI data against applicable criteria, and recommends additional activities to address remedial actions in accordance with the Record of Decision (ROD [New York State Department of Environmental Conservation (NYSDEC), March 2017]. The PDI was coordinated by AECOM USA, Inc. (AECOM - formerly URS Corporation).

1.1 Purpose and Scope of Report

The purpose of the PDI was to collect additional subsurface information within the building near the former dry cleaning machine/source area, collect an additional round or groundwater samples, assess evaluate the results of the PDI in combination with previous investigation results, and develop the remedial design in accordance with the ROD. The scope and components of the Site remediation were identified in the March 2017 ROD. They comprise: 1) active construction to remediate the Site; and 2) engineering and institutional controls to protect the public and the environment after construction is completed. This PDIR presents the results of information gathered as part of the PDI, as well as relevant data obtained during previous investigations.

1.2 Site History

The site and adjoining properties have long been an area of commercial and industrial development since the early 1900's. The site property was previously developed with former structures dating back to the 1800's. The area, including the site parcel, was part of a former rail yard from the early 1900's through the 1960's. Redevelopment as the Artco facility occurred in the late 1960's to early 1970's. Artco purchased the Site from the Office of Housing & Urban Development (HUD) in 1969 and construction of the current facility building began shortly thereafter. Operations started at the facility in the fall of 1972. Artco operated an industrial laundry service at the site between approximately 1972 and 1999 and operations included a dry-cleaning process that used tetrachloroethene (PCE) as a solvent. It is this use that appears to have led to the PCE contamination at the site. According to site personnel interviewed for previous investigations, there was a dry-cleaning machine that used PCE on the property since the facility opened in 1972 until cessation of PCE use in 1999. Past reports indicate the machine had always been at the same location at the eastern interior of the building. In January 1999, the facility started using a dry-cleaning unit that used non-toxic, non-chlorinated chemicals in the cleaning process. Subsequent site occupants

never used PCE at the site. Environmental testing performed in the early 1990's, prior to and during construction of an adjacent building, indicated that PCE was present in the soil and groundwater.

In 1999, the NYSDEC conducted an investigation which indicated that the dry-cleaning operation at Artco was an apparent source of the PCE. In 2000, Artco entered the Voluntary Cleanup Program (VCP). Elevated levels of PCE were detected in the soil underneath the building and in 2004 a soil vapor extraction (SVE) system was installed as an interim remedial measure (IRM) to treat contaminated soil. Additional sampling indicated that groundwater contaminated with PCE appeared to be migrating off-site to the north, west and east. IRM work plans were submitted to the NYSDEC in August 2002 and August 2003 for implementation of a soil vapor extraction (SVE) system in an area of elevated PCE concentrations in soil proximate to the former dry cleaning machine location. The SVE system was subsequently installed in February 2004. Operation of the system commenced in March 2004 with routine sampling of influent and effluent air concentrations to determine progress of soil remediation (via the vapor extraction) and conformance with air discharge criteria agreed to with the NYSDEC. Operation of the system ceased in April 2006 when the Voluntary Cleanup Agreement (VCA) was ultimately terminated. Overall, it was found that the system was marginally effective in reducing soil contamination; however, groundwater contamination remained at levels that posed a significant threat to public health and the environment (per NYSDEC designation).

Between 2005 and 2006, two separate entities acquired the Site. The first was Kram Knarf, LLC which attempted to bring the Site into the NYSDEC Brownfield Cleanup Program (BCP), however that application was denied due to Kram Knarf's unwillingness to continue investigation and remedial efforts at the Site, and the existing VCA was terminated in 2006. Barnes/Stevens Redevelopment LLC (BSR) subsequently acquired the property and successfully entered it into the BCP in 2007. BSR submitted a Remedial Investigation Work Plan on August 8, 2007, which was approved by the NYSDEC with modifications on October 12, 2007. Based on results of the investigation, the NYSDEC requested that an IRM be implemented to address the vapor intrusion concerns for the Site building. BSR submitted an IRM work plan in December 2008, which was approved with modifications on 27 March 2009. The IRM work plan included proposed installation of a sub-slab depressurization system (SSD) for the Site building, which utilized the existing SVE infrastructure for sub-slab suction. After a delay in implementing Site work, the NYSDEC ultimately terminated the BSR Brownfield Cleanup Agreement (BCA) in August 2009.

In May 2009, in parallel with the BCP investigation conducted by BSR, Henningson, Durham & Richardson, Inc. (HDR) conducted an off-site investigation on behalf of the NYSDEC of areas surrounding the Site consisting of well installation and sampling and a vapor intrusion structures sampling (HDR report dated February 2010). Additional sources of CVOCs were not identified, and HDR concluded that

significant impact to adjacent properties related to soil vapor intrusion was not occurring or anticipated in the future. The HDR investigation confirmed downgradient migration of CVOCs in groundwater into shallow bedrock, with likely pathways being trenches cut through the bedrock beneath West Main Street to accommodate subsurface utility lines.

In October 2009, the Site was listed in the New York State Registry of Inactive Hazardous Waste Disposal Sites as a class "2 site. After termination of the BCA with BSR was issued, title to the property was acquired by Agency For Empowerment & Support, LLC (AFES), and it entered as a Respondent into an Order on Consent ("Consent Order") with the NYSDEC to address an IRM and remaining remedial investigation of the Site. AFES signed the Consent Order on 14 September 2010. An IRM work plan for installation of a sub-slab depressurization (SSD) system was submitted in accordance with the Consent Order. The revised IRM work plan was submitted on 27 March 2011 and approved by the NYSDEC on 31 March 2011. The system was installed and began operation in October 2011. An Interim Site Management Plan (ISMP) dated April 2012, was approved by the NYSDEC and describes the procedures required for operation, monitoring, and maintenance of the SSD system, as well as reporting requirements. In May 2018, AFES terminated the Order due to a lack of financial resources.

1.2.1 Site Location and Description

The Site is approximately 1.8 acres in size. The main Site feature is an approximately 54,500 square foot unoccupied building. The rest of the Site is mostly paved with some grass and landscaped areas immediately north and west of the building. The Site is generally flat. The overburden soils generally consist of a layer of fill materials varying in thickness from 4 to 8 feet underlain generally by silty fine sand. Groundwater at the site is present in the overburden at a depth of approximately 7 feet below ground surface (bgs). Bedrock (Penfield Dolostone, DeCew Dolostone and Rochester Shale units) is present at approximately 11 to 12 feet bgs. Groundwater from the Site generally flows to the west and northwest but is variable with low horizontal hydraulic gradients. Groundwater flow direction appears to be influenced by underground utilities, the depth interval evaluated, and seasonality.

1.3 Overall Nature and Extent of Contamination Summary

Based on investigations conducted to date, the primary contaminants of concern at the Site include PCE and associated chlorinated breakdown compounds such as trichloroethene (TCE) cis-1,2-dichloroethene (DCE), and vinyl chloride. As discussed below, these contaminants have impacted the environmental media of soil, groundwater, bedrock, and soil vapor.

1.3.1 Soil

Subsurface soil contamination associated with the dry cleaning operation is present underneath the building with the highest concentrations located under the eastern section of the building where the dry cleaning equipment was formerly located. In the source area under the building, maximum soil contaminant concentrations and the applicable 6 NYCRR Part 375 Protection of Groundwater soil cleanup objectives (SCO), are provided below for PCE, TCE, and cis-1,2-DCE (note that for these compounds, the Protection of Groundwater SCO is the same as the Unrestricted Use SCO).

- PCE was detected at concentrations up to 26,000 parts per million (ppm), which significantly exceeds the SCO of 1.3 ppm, and indicates the potential presence of non-aqueous phase liquid (NAPL).
- TCE was detected at concentrations up to 110 ppm which significantly exceeds the SCO of 0.47 ppm.
- Cis-1,2-DCE was detected at concentrations up to 18 ppm which significantly exceeds the SCO of 0.25 ppm.

Subsurface soil impacts exceeding Unrestricted Use SCOs appear to extend approximately 10 feet off-site to the east. This off-site area is paved and has subsurface utilities. A summary of historical soil analytical results is presented in Appendix A. An interpretation of the impacts in soil as presented in the Feasibility Study (Haley & Aldrich of New York, April 2016) is shown in Figure 1-2.

1.3.2 Groundwater

Groundwater is present at a depth of 7 to 8 feet in overburden and bedrock is fully saturated. No confining units were identified within the overburden and bedrock to depths investigated. Previous investigations targeted shallow bedrock (approximately 15 to 25 feet bgs), intermediate bedrock (approximately 25 to 35 feet bgs) and deep bedrock (approximately 35 to 50 feet bgs). The soil contamination has resulted in significant groundwater contamination, as PCE and associated chlorinated degradation products were detected in the on-site groundwater both under the building and outside the building footprint at concentrations significantly above groundwater standards, criteria and guidance (SCG), which is 5 parts per billion (ppb) for the identified chlorinated contaminants (except vinyl chloride at 2 ppb). In the source area overburden under the east side of building, PCE groundwater concentrations in the overburden ranged from 500 ppb to 160,000 ppb. Outside the source area, the highest concentrations under the building were detected at the northwestern portion of the building where PCE concentrations ranged from 4,000 ppb to 111,000 ppb. The higher concentrations indicate the potential presence of NAPL in the groundwater under the building.

Outside the building footprint, contaminant concentrations in the overburden groundwater decrease significantly, but the groundwater in the shallow and intermediate bedrock (to about 35 feet below ground) is significantly impacted. The highest bedrock groundwater concentrations were detected outside the northeast corner of the building where PCE was detected at concentrations up to 35,000 ppb. Off-site, the highest groundwater concentrations were detected north of the Site under West Main Street and just north of West Main Street in the shallow bedrock (to about 25 feet below ground) where PCE concentrations ranged from about 3,600 ppb to 14,400 ppb. These results indicate the potential for NAPL to be migrating with groundwater beyond the footprint of the building.

PCE degradation products TCE, cis-1,2-DCE, and vinyl chloride have also been detected in overburden and bedrock groundwater at concentrations exceeding groundwater SCGs. Groundwater impacts appear to extend about 250 feet off-site to the north and west and to depths of approximately 45 feet below ground. Previous investigation results (Haley & Aldrich of New York, February 2015) suggest that PCE has diffused into the bedrock matrix. It is expected that this PCE will act as a long-term source of groundwater contamination as the PCE will continue to slowly diffuse back into the groundwater over time. A summary of historical groundwater analytical results is presented in Appendix A. Interpreted impacts on groundwater are shown in Figures 1-3A through 1-3D.

1.3.3 Soil Vapor and Indoor Air

The soil and groundwater contamination at the Site has resulted in on-site soil vapor contamination. In 2011, a sub-slab depressurization system (a system that removes soil vapor/air beneath the building) was installed at the on-site building to prevent the migration, and inhalation potential of the chlorinated solvent contamination.

An off-site vapor intrusion investigation was conducted by the NYSDEC (Department) in 2009. Soil vapor intrusion samples were collected from three adjacent off-site structures. Levels of PCE were found to be within background levels typically observed in commercial buildings. The results indicated that no additional actions were needed to address potential off-site exposures associated with soil vapor intrusion.

1.4 Summary of the Selected Remedy: Artco Industrial Laundries

The NYSDEC issued the ROD for the Site in March 2017 (NYSDEC, March 2017). The elements of the selected remedy for the Site as presented in the ROD are as follows:

1. Remedial Design

A remedial design program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques will be implemented to the extent feasible in the design, implementation, and site management of the remedy as per DER-31. The major green remediation components are as follows:

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling, and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic, and social goals; and
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development.

2. Cover System

A site cover currently exists in areas not occupied by buildings and will be maintained to allow for commercial use of the Site. Any site redevelopment will maintain the existing site cover. The site cover may include paved surface parking areas, sidewalks or soil where the upper one foot of exposed surface soil meets the applicable SCOs for commercial use. Any fill material brought to the Site will meet the requirements for the identified site use as set forth in 6NYCRR Part 375-6.7(d).

3. In-Situ Chemical Oxidation

In-situ chemical oxidation (ISCO) will be implemented to treat chlorinated volatile organic compounds (VOCs) in groundwater. A chemical oxidant will be injected into the subsurface to destroy the contaminants in an approximately 4,000 square foot area located in the northeastern portion of the Site where total chlorinated VOC concentration exceed approximately 14,000 ppb at the site perimeter which is the limit of efficacy for the enhanced bioremediation element discussed in Paragraph 4. Once the chlorinated VOC concentrations are below 14,000 ppb, the same areas will be treated as part of the enhanced bioremediation element discussed in Paragraph 4. The chemical oxidant will be injected via two sets of injection wells screened from approximately 10 to 25 feet bgs (shallow bedrock) and approximately

20 to 30 feet bgs (intermediate bedrock). The remedial design will also evaluate implementing ISCO in the source area under the building as pre-treatment prior to implementing the enhanced bioremediation element discussed in Paragraph 4. The method and depth of injection will be determined during the remedial design.

4. Enhanced Bioremediation

In-situ enhanced biodegradation will be employed to treat contaminants in groundwater in the source area under the building and at the downgradient site boundary as depicted on Figure 1-4. The biological breakdown of contaminants through anaerobic reductive dechlorination will be enhanced by injecting liquid activated carbon and electron donor reagents into the overburden in the source area under the building and in the overburden, shallow bedrock, and intermediate bedrock near the downgradient site boundary to control contaminant migration and promote microbe growth via injection wells screened from approximately 3 to 35 feet depending on location.

5. Institutional Control

Imposition of an institutional control in the form of an environmental easement for the controlled property which will:

- require the remedial party or Site owner to complete and submit to the Department a periodic certification of institutional and engineering controls in accordance with Part 375-1.8 (h)(3);
- allow the use and development of the controlled property for low occupancy, industrial use as defined by Part 375-1.8(g), although land use is subject to local zoning laws;
- restrict the use of groundwater as a source of potable or process water, without necessary water quality treatment as determined by the New York State Department of Health (NYSDOH) or Monroe County Department of Health; and
- require compliance with the Department approved Site Management Plan.

6. Site Management Plan

A Site Management Plan is required, which includes the following:

1. An Institutional and Engineering Control Plan that identifies all use restrictions and engineering controls for the Site and details the steps and media-specific requirements necessary to ensure the following institutional and/or engineering controls remain in place and effective:

Institutional Controls: The Environmental Easement discussed in Paragraph 5 above.

Engineering Controls: The cover system discussed in Paragraph 2 and the sub-slab depressurization system Interim Remedial Measure.

This plan includes, but may not be limited to:

- an Excavation Plan which details the provisions for management of future excavations in areas of remaining contamination;
- a provision for further investigation and remediation should large scale redevelopment occur, if any of the existing structures are demolished, or if the subsurface is otherwise made accessible. The nature and extent of contamination in areas where access was previously limited or unavailable will be immediately and thoroughly investigated pursuant to a plan approved by the Department. Based on the investigation results and the Department determination of the need for a remedy, a Remedial Action Work Plan (RAWP) will be developed for the final remedy for the Site, including removal and/or treatment of any source areas to the extent feasible. Citizen Participation Plan (CPP) activities will continue through this process. Any necessary remediation will be completed prior to, or in association with, redevelopment. This includes all overburden and bedrock located under the existing on-site building;
- a provision for removal or treatment of the source area located under the existing on-site building if and when the building is demolished or becomes vacant;
- descriptions of the provisions of the environmental easement including any land use and/or groundwater water use restrictions;
- a provision that should a building foundation or building slab be removed in the future, a cover system consistent with that described in Paragraph 2 above will be placed in any areas where the upper 1 foot of exposed surface soil exceeds the applicable SCOs;
- a provision for evaluation of the potential for soil vapor intrusion for any new buildings developed on the site and in off-site areas of contamination, including provision for implementing actions recommended to address exposures related to soil vapor intrusion;
- provisions for the management and inspection of the identified engineering controls;
- maintaining Site access controls and Department notification; and
- the steps necessary for the periodic reviews and certification of the institutional and/or engineering controls.

2. A Monitoring Plan to assess the performance and effectiveness of the remedy. The plan includes, but may not be limited to:

- monitoring of groundwater, soil vapor, sub-slab soil vapor, and indoor air to assess the performance and effectiveness of the remedy

- a schedule of monitoring and frequency of submittals to the Department; and
- monitoring for vapor intrusion any buildings as may be required by the Institutional and Engineering Control Plan discussed above.

3. An Operation and Maintenance (O&M) Plan to ensure continued operation, maintenance, inspection, and reporting of any mechanical or physical components of the active vapor mitigation systems. The plan includes, but may not be limited to:

- procedures for operating and maintaining the systems; and
- compliance inspection of the systems to ensure proper O&M as well as providing the data for any necessary reporting.

Based on the results of PDIR, areas requiring remediation and quantities listed above in this section have been revised in the appropriate portions of this PDIR to include the new information.

2.0 PRE-DESIGN INVESTIGATION

AECOM and our subcontractor team completed the PDI that refined remedial extents and requirements and generated data to support the development of a remedial plan for submittal to the NYSDEC. All activities were supervised by AECOM personnel. The following work elements were performed as part of the PDI between January 16, 2020, and April 8, 2021:

- Geophysical Survey and Utility Markout and Vac-Tron Clearance;
- Soil Probe Sampling and Soil Vapor Screening;
- Advancement of Direct-push Soil Borings and Soil Sampling;
- Installation of Overburden and Bedrock Monitoring Wells;
- Monitoring Well Development;
- Collection of Water Levels/Product Thickness;
- Collection of Groundwater Samples;
- Investigation Derived Waste (IDW) Handling; and
- Completed an engineering survey to refine the Site base map and establish the sampling locations.

Proposed PDI locations are shown in Figures 2-1 and 2-2. Table 2-1 provides the sample analytical program. The work was performed in accordance with the RDWP (Appendix B), unless specified below. Field notes generated during this PDI are included in Appendix C.

2.1 Geophysical Survey and Utility Markout and Vac-Tron Clearance

AECOM provided oversight for a geophysical survey performed by Pegasus Environmental Co. to identify underground obstructions and utilities beneath the building slab (Figures 2-1 and 2-2).

All soil boring and monitoring well locations were cleared for subsurface utilities by conducting a geophysical survey/utility mark out via ground penetrating radar methods. The purpose of the geophysical utility clearance was to screen for and identify the presence of underground utilities and structures in areas where proposed soil borings and monitoring wells will be installed. A sufficient area around each location was cleared to allow room for offsets, if needed. Anomalies were marked and identified with spray paint as they were located and were recorded in the field notes.

2.2 Soil Probe Sampling and Soil Vapor Screening

AECOM established a 10-foot by 10-foot grid inside the eastern portion of Artco building where the former dry-cleaning equipment was located (Figure 2-1). The grid covered approximately 6,000 square feet (50 feet by 120 feet) with a total of 78 grid nodes. At 68 grid nodes, a photoionization detector (PID)

reading was measured by using a hammer drill with a nominal 2-inch bit to drill a probe hole, and inserting the tubing connected to the PID probe into the hole. The PID readings are provided on Figure 2-3. Soil sample locations were selected based on the elevated PID readings. Soil samples were collected by AECOM personnel using JMC© soil samplers (a hand-driven soil samplers). Soil samples were collected from 26 boring locations (Figure 2-4) and analyzed for target compound list (TCL) VOCs. At six of the locations the samples were analyzed for full TCL/and/or target analyte list (TAL) parameters to provide additional information on other potential contaminants as required by the Department and as listed in Table 2-1. Screening data can be found in the field notes in Appendix C, and boring logs can be found in Appendix D and E. A soil boring summary is provided in Table 2-2. Spoils were drummed for off-site disposal and the borings were backfilled with cement grout to the concrete surface.

2.3 Direct-Push Soil Borings and Soil Sampling

Direct-push soil borings were advanced at 12 locations as shown on Figure 2-4 by Nothnagle Drilling, Inc. Soil samples were collected as follows:

- Each boring location was cleared to a minimum depth of 5 feet bgs using hand tools.
- Fifteen soil samples were collected at 12 locations that had the highest PID readings. Sample depths ranged from 4 feet to 12.5 feet bgs. All samples were analyzed for TCL VOCs.
- One soil sample was analyzed for full TCL/TAL parameters and three samples were analyzed for per- and polyfluoroalkyl substances (PFAS).

Table 2-2 contains a boring summary. Boring logs can be found in Appendix E.

2.4 Installation of Two Overburden and Four Bedrock Monitoring Wells

Drilling and monitoring well installation services were provided by Nothnagle Drilling, Inc. Separate borings for the two overburden wells (Figure 2-4) were advanced to the bedrock surface using 4 1/4-inch inside diameter (ID) hollow stem augers (HSAs) while continuously collecting soil samples using a split-spoon sampler.

The borings for the four bedrock wells (Figure 2-4) were advanced to the bedrock surface using 6 1/4-inch ID HSAs while continuously collecting soil samples using a split-spoon sampler. Upon reaching the bedrock surface, the augers were removed, and a temporary 6-inch diameter casing was installed. A 5 7/8-inch diameter rotary bit was then used to drill 3- to 5-foot long rock socket. A 4-inch diameter permanent steel casing was then set into the rock socket and grouted with a cement grout. The grout was allowed to cure for at least 24 hours. After the grout has cured, the boring was continuously cored to the target depth bgs using an HQ core barrel.

All soil samples were visually described and classified, inspected for signs of contamination, and screened with a PID for the presence of organic vapors by the AECOM supervising geologist. The bedrock cores were visually described by the onsite AECOM geologist and included a calculation of the rock-quality designation (RQD). A rock coring summary is provided in Table 2-3. Soil cuttings and drilling water were contained in DOT approved 55-gallon drums. Rock cores were contained in rock core boxes.

Soil samples were collected at boring locations MW-13OB, MW-13S, MW-13I, MW-14I and MW-14S from the depth with the highest PID reading. Samples were collected from depths of 7 feet to 11 feet bgs and analyzed for TCL VOCs. One sample was analyzed for the full TCL/TAL parameters and two samples were analyzed for PFAS.

The two overburden monitoring were constructed using continuous wrap #10 slot stainless-steel screen attached to Schedule 40 PVC riser.

The four bedrock wells were constructed with a 15-foot length of 2-inch ID #10 slot stainless steel continuous wrap screen. A 2-inch ID by 2-foot stainless steel sump was placed beneath the screen. A 2-inch ID, Schedule 40 PVC riser connected the screen to the ground surface. All wells were completed with flush-mount curb boxes. A summary of new and existing well construction details are provided in Table 2-4. Boring logs and well construction logs can be found in Appendix E and F, respectively.

2.5 Monitoring Well Development

The new monitoring wells were developed by AECOM after installation using surge and pump methods until the water quality parameters (i.e., temperature, pH, dissolved-oxygen, conductivity, turbidity, and oxidation-reduction potential) stabilized or 105 gallons were removed, whichever was less. Well development logs can be found in Appendix G

2.6 Water Levels/ Non-Aqueous Phase Liquids

AECOM collected a comprehensive round of water levels in all accessible monitoring wells on February 2, 2021 and checked for NAPL with an interface probe. None of the existing or newly installed monitoring wells showed evidence of NAPL in this round of measurements. However, during well installation, staining was observed at a depth of approximately 8 to 9 feet bgs in MW-13OB with elevated PID readings as high as 8,011 ppm; and black staining was observed at 8.8 to 9 feet bgs in MW-14S with elevated PID readings as high as 4,250 ppm. Water level measurement and elevations can be found in Table 2-5. Groundwater elevation contours for overburden, shallow, intermediate and deep bedrock wells are shown in Figures 2-5 through 2-8.

2.7 Groundwater Sample Collection

AECOM collected groundwater samples from 48 of 59 new and existing monitoring wells using low-flow sampling procedures during the period of February 3 - 11, 2021. The 11 monitoring wells in the Main Street right-of-way could not be sampled until a traffic diversion permit was obtained and traffic control set-up. After permits were issued by the City of Rochester, traffic control was provided by US Traffic Control, Inc. and two wells in Main Street (MN-8D and MN-9D) were sampled on April 8, 2021; the remaining nine wells in the street (MN-7S, MN-7I, MN-7D, MN-8S, MN-8I, MN-9OB, MN-9S, MN-9I, and MW-9) could not be sampled because they were filled with sediment or damaged beyond use.

Groundwater samples were analyzed for VOCs. Five samples were analyzed for full TCL/TAL parameters. Three samples were also analyzed for low level 1,4-dioxane by Method 8270 selected ion monitoring (SIM) and PFAS. Purge logs can be found in Appendix H.

2.8 Investigation-Derived Waste Management

Investigation-derived waste (IDW), including development, purge and decontamination water and soil spoils from borings, was drummed for disposal. Drums were categorized and removed from the Site after analytical results from the environmental sampling are received from the laboratory. Copies of the waste manifests for the IDW are included in Appendix I.

2.9 Site Survey

A survey was completed that included boring locations, MH inverts, other environmental sample locations, edges of the pavement, erosional features, key grade changes, and other notable features. The survey tied into the existing site survey and basemap.

3.0 STUDY AREA GEOLOGY

This section discusses the physical and hydrogeological characteristics of the study area.

3.1 Geology and Hydrogeology

The hydrogeology and geology at the Site were characterized as part of previous investigations and further refined as part of the PDI. Information obtained from other studies conducted near the Site and from various literature sources also were used to help characterize the hydrogeology. The following subsections summarize the regional and site-specific geology and hydrogeology.

3.1.1 Geology

3.1.1.1 Regional Geology

The City of Rochester is situated in the Erie-Ontario Lowlands physiographic province of New York State (Broughton, et al. 1966). The province is characterized by low plains with little relief. In the Ontario lowland south of Lake Ontario, two escarpments occur which correspond to the underlying Onondaga Limestone and Lockport Dolomite bedrock units.

The overburden deposits in the region have been mapped largely as glacial till, which consists of a well-graded mixture of clay, silt, sand, and gravel (USGS1985). In the region, it varies in thickness from a few feet to more than 100 feet.

Beneath the overburden deposits at the Site are the Penfield Dolostone of the lower portion of the Lockport Formation, DeCew Dolostone and underlying Rochester Shale bedrock units. These rocks are Silurian in age, strike east-west, and dip gently to the south at approximately 1 degree or 40 to 50 feet per mile (Rickard, L. et al. - New York State Museum and Science Service 1970). The dip of the rocks follow the structural trend of a homocline affecting the Paleozoic basement rocks across western and southern New York State. In general, dip increases from west to east across western and central New York. Bedrock joints are common in the Lockport Formation and are a result of structural stresses during the late Paleozoic Appalachian deformation (Zenger 1965). In the Rochester area, bedrock outcrops along the Erie Barge Canal are characterized by occasional near vertical joints and horizontal bedding planes.

As part of field investigations performed by H&A in 1994, bedrock fractures were mapped in the Lyell Avenue/Lee Street vicinity. H&A mapped 35 linear features from aerial photographs. Fractures within the nearby Erie Canal range in orientation from ranged from N34W to N70W, N36E to N70E, and N27W to N28E.

3.1.1.2 Site Geology

The stratigraphic sequence at the Site includes the following units from the surface down:

- miscellaneous heterogenous fill;
- unconsolidated natural silty sand and gravel; and
- bedrock.

Overburden thickness ranges from approximately 9 to 13 feet (Figure 3-1). The bedrock consists of the Penfield Dolostone and DeCew Dolostone Member of the lower Lockport Formation and Rochester Shale Formations. The Rochester Shale Formation bedrock is divided in the Rochester area into the Gates Dolomite and Rochester Shale of the Rochester Shale Formation. The Rochester Shale is further divided into the Burleigh Hill Member and Lewiston Members (USGS 1995). The rock units also vary in thickness in the region, and in general, the Lockport Formation is approximately 29 to 39 feet and the Rochester Formation is reportedly approximately 90 feet thick.

Overburden

The overburden material at and near the Site consists of heterogeneous fill materials approximately 4 to 8 feet deep. Fill is characterized as a mixture of fine to coarse sand, silt, clay, and anthropogenic materials including ash, brick and miscellaneous construction and demolition debris. Boring logs illustrating the stratigraphic sequence in borings advanced as part of the PDI are presented in Appendix E.

Bedrock

Information obtained from the well borings were used to determine the depth to bedrock and prepare a bedrock surface map (Figure 3-2). The bedrock surface slopes gently toward west at the Site.

Lockport Formation

The Penfield and DeCew Members are part of the lower Lockport Formation. The Penfield Member is characterized as a medium gray to light gray, medium grained and thin to medium bedded quartzose dolomite. Laminations, carbonaceous partings, cross-stratification are common. Vugs containing dolomite, sphalerite, gypsum and selenite are found in these cavities. The DeCew Member is characterized as hard, medium to dark gray, thin to medium bedded, fine-grained dolomite. The thickness of the DeCew is reported to be approximately 10 to 15 feet near the Site. It outcrops in the nearby Erie Barge Canal east of the site. It is classified as a siliceous dolomite (Zenger 1965). Small vugs containing gypsum and dolomite were sporadically identified in portions of the cored sequence. The contact between the Penfield and DeCew Members could not be distinguished from the rock cores. RQDs from the rock cores are presented in Table 2-3.

Rochester Shale Formation

The Gates Member lies beneath the DeCew Member of the Lockport Formation. Because of its shaly character, it is considered a part of the Rochester Shale Formation. It is regarded as a transitional unit between the overlying Lockport Dolomite and underlying finer, less dolomitic shales of the Rochester Formation (Zenger 1965). The contact between the Gates and DeCew is difficult to discern from rock cores. The Gates Member is reported to be 18 to 20 feet thick along the nearby Erie Canal, and is characterized as dark-gray, fine-grained, medium hard, thin bedded argillaceous and siliceous dolomite (Zenger 1965).

Argillaceous partings are interbedded throughout the unit. Small vugs containing gypsum and dolomite are reported to be present within the rock sequence as well. The rocks beneath it are considered as Rochester shale which are characterized as thin to medium bedded, dark gray to black, medium hard to medium soft, argillaceous shale and dolomitic shale. In general, bedding planes and fractures decrease with increasing depth and RQDs measured during coring operations and summarized in Table 2-3 reflect this observation.

3.1.2 Hydrogeology

The primary hydrogeologic unit identified at the Site is the unconfined water-table aquifer present in both the overburden and bedrock. No confining unit was identified thus no barrier exists between the overburden and bedrock groundwater zones.

Groundwater in the bedrock flows through primarily secondary porosity features in the rock including faults, joints, solution cavities, and bedding planes. Figures 2-5 through 2-8 depict the potentiometric surfaces of the overburden, shallow bedrock, shallow and intermediate bedrock, and deep bedrock on February 5, 2021. The potentiometric surface in the overburden ranges from approximately 505.7 feet above mean sea level (amsl) along the eastern side of the Site to approximately 504 feet amsl along the western side of the Site. The horizontal hydraulic gradient in the overburden is approximately 0.014 feet per foot (ft/ft).

Historical bedrock groundwater elevation data suggested flow locally toward the north or west, with likely influences on localized direction of groundwater resulting from subsurface utilities that intercept bedrock. Subsurface utilities are located beneath West Main Street, including a sewer main which is incised into bedrock approximately five feet and generally slopes deeper into rock from east to west (Haley & Aldrich, February 2015). Figures 2-6 through 2-8 depict the variability of groundwater flow in the shallow, intermediate, and deep portions of the bedrock.

Hydraulic Conductivities

Hydraulic conductivity of bedrock monitoring wells was estimated by conducting slug tests during previous investigations as shown in Table 3-1. Vertical hydraulic gradient calculations are provided in Table 3-2. A wide range of hydraulic conductivities were estimated from the slug tests. This is indicative of the aquifer's heterogeneity and anisotropic nature of the fractured bedrock. The hydraulic conductivities ranged from 8.1×10^{-3} cm/sec in MW-23 to 9.15×10^{-6} cm/sec in MW-18. The range of hydraulic conductivities is likely representative of the aquifer on the whole. Vertical hydraulic gradients are downward between overburden and bedrock, and between shallow bedrock and deeper bedrock as indicated in Table 3-2.

4.0 SAMPLE ANALYSES

NYSDEC Analytical Service Protocol Category B data packages were provided by the laboratory and included reporting forms and raw data necessary to evaluate and verify the reported analytical results.

AECOM and Environmental Data Validation Inc. (EDV, Inc.), an AECOM subcontractor, performed data validation and prepared Data Usability Summary Reports (DUSRs) following the guidelines provided by USEPA Region II and the NYSDEC Division of Environmental Remediation DER-10 Technical Guidance for Site Investigation and Remediation, Appendix 2B - Guidance for Data Deliverables and the Development of Data Usability Summary Reports, May 2010.

The complete validated analytical results are presented in the DUSRs in Appendix J. Form I's are provided in the DUSRs and include the reporting limit for each non-detected compound.

4.1 Standards, Guidance, and Criteria

4.1.1 Soil

SCOs presented in New York Codes, Rules and Regulations Title 6 (6 NYCRR) Part 375 are considered appropriate for this Site.

Part 375 Unrestricted Use SCOs are considered to assist in the development of a remedial alternative capable of achieving unrestricted future use, as required by DER-10 Section 4.4 (b) 3 ii. The Unrestricted Use SCOs are used to evaluate soil analytical data for samples collected from the public rights-of-way (e.g., sidewalks). For on-site comparison purposes, Protection of Groundwater and Commercial Use criteria are used.

4.1.2 Groundwater

The SCGs for groundwater are the 6 NYCRR Part 703 Class GA standards. In the absence of a standard, guidance values presented in NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, June 1998 (including subsequent revisions) were used. These are collectively referred to as TOGS 1.1.1 in the tables and figures These groundwater SCGs are included on the groundwater analytical tables presented below. The SCGs for PFAS and 1,4-dioxane in groundwater are NYSDEC's Proposed Guidance Values - Raw Water Source, Human Health.

4.2 Analytical Results

4.2.1 Emerging Contaminants

Four soil and three groundwater samples were analyzed for 1,4-dioxane, and five soil and three groundwater samples were analyzed PFAS compounds. The soil and groundwater analytical results are presented in Tables 4-1 and 4-2, respectively. 1,4-Dioxane was not detected in any of the soil samples. PFAS' were detected in the soil samples; however, all concentrations are below Protection of Groundwater and Commercial Use SCGs.

1,4-Dioxane exceeded human health SCGs [0.35 micrograms per liter (µg/L)] in two of the three groundwater samples (0.57 µg/L and 0.91 µg/L). PFAS' were detected in the groundwater samples; however, all concentrations are below human health SCGs. Results for emerging contaminants were previously documented in a separate submittal to the Department.

4.2.2 Soil Vapor Analytical Results

4.2.2.1 Total Volatile Organic Vapor Screening

A PID was used to measure organic vapors in samples collected from the 68 boreholes. As shown in Figure 2-3, the highest PID readings were at location 40N 40E where a PID measurement of 16,000 ppm was recorded. The next highest reading was 341 ppm at 40N 50E followed by 182 ppm at 20N 50E.

4.2.3 Soil Analytical Results

Soil analytical results are presented in Table 4-3 and 4-4 and Figure 4-1 (shallow) and Figure 4-2 (deep). Total chlorinated VOC (CVOC) results are shown in Figure 4-3. Results exceeding SCOs are indicated with a circle and/or a rectangle outline, respectively.

PCE exceeded the Commercial Use SCO [150 milligrams per kilogram (mg/kg)] at the following locations:

- 10N 30E (0.7-2.1 feet bgs);
- 30N 40E (0.5-1.3 feet bgs);
- 40N 40E (0.7-2.1 feet bgs);
- 40N 50E (0.5-2.2 feet bgs);
- 80N 35E (4-5 feet bgs, 9 feet bgs and 11-12 feet bgs); and
- MW-14S (8.5-9 feet bgs).

The highest concentration of PCE were as follows:

- 80N 35E 11-12 feet bgs (7,400 mg/kg);

- MW-14S 8.5-9 feet bgs (2,000 mg/kg);
- 10N 30E 0.7-2.1 feet bgs (820 mg/kg); and
- 40N 50E 0.5-2.2 feet bgs (640 mg/kg).

No other VOCs exceeded Commercial Use limits.

PCE in a majority of the samples exceeded the Protection of Groundwater SCO (1.3 mg/kg). Other VOCs exceeding Protection of Groundwater SCOs included cis-1,2-DCE, trans-1,2-DCE, and TCE.

4.2.3.1 Non-VOC Analytical Results

In the six soil samples, the semivolatile organic compounds (SVOCs) detected were primarily polynuclear aromatic hydrocarbons (PAHs) and phthalates were detected. PAHs exceeded Commercial Use and Protection of Groundwater SCOs at locations 20N 10E 0.5-1.8 feet bgs and 80N 35E 4-5 feet bgs. At location MW-14S 10-11 feet bgs, only Protection of Groundwater SCOs were exceeded for two PAHs, benzo(a)anthracene and chrysene. Total PAHs exceeded 500 ppm at 80N 35E. Several pesticides and metals were also detected but did not exceed SCOs.

4.2.4 Groundwater Analytical Results

4.2.4.1 Chlorinated Compounds

In February and April 2021, groundwater samples were collected from 50 new and existing monitoring wells in the Site area. A summary of the detected VOC in the overburden, shallow bedrock, intermediate bedrock and deep bedrock groundwater samples is presented in Tables 4-5 through 4-8, respectively. Results exceeding TOGS criteria are indicated with a circle.

The locations of detected compounds that have exceeded their respective criteria in the overburden, shallow bedrock, intermediate bedrock and deep bedrock wells are shown on Figures 4-4 through 4-7, respectively. The results are summarized below.

4.2.4.1.1 Overburden Groundwater Analytical Results

PCE was detected in five of the 10 overburden monitoring wells sampled, with concentrations at those five locations exceeding the groundwater criterion of 5 µg/L (Table 4-5). Concentrations ranged from 0.84 µg/L to 56,000 µg/L (Figure 4-4). The highest concentration of PCE was detected at MW-13OB, followed by MW-15OB (1,400 µg/L) and MW-101 (1,300 µg/L).

TCE was detected in five of the 10 overburden monitoring wells sampled, with concentrations at those five locations exceeding the groundwater criterion of 5 µg/L. Concentrations ranged from 11 µg/L to 9,400 µg/L. The highest concentration of TCE was at DEC-13OB.

Cis-1,2-DCE was detected in four of the 10 overburden monitoring wells sampled, with concentrations at those four locations exceeding the groundwater criterion of 5 µg/L. Cis-1,2-DCE detections ranged from 8.5 µg/L to 6,500 µg/L, with the highest concentration detected at MW-13OB.

4.2.4.1.2 Shallow Bedrock Groundwater Sampling Results

PCE was detected in 10 of the 19 shallow bedrock monitoring wells sampled, with eight locations having PCE concentrations exceeding the groundwater criterion (Table 4-6). Concentrations ranged from 0.55 µg/L to 82,000 µg/L (Figure 4-5). The highest PCE concentration was detected at BMW-104S, followed by MW-15 (27,000 µg/L), MW-13S (16,000 µg/L), and MW-14S (14,000 µg/L).

TCE was detected in 10 of the 19 shallow bedrock monitoring wells sampled, with eight locations having TCE concentrations exceeding the groundwater criterion. Concentrations ranged from 0.65 µg/L to 20,000 µg/L. The highest concentration of TCE was found at BMW-104S followed by MW-14S (1,800 µg/L) and MW-13S (900 µg/L).

Cis-1,2-DCE was detected in 14 of the 19 shallow bedrock monitoring wells sampled, with 13 locations having cis-1,2-DCE concentrations exceeding the groundwater criterion. Cis-1,2-DCE detections ranged from 3.3 µg/L to 8,900 µg/L, with the highest concentration detected at BMW-04S followed by MW-14S (1,900 µg/L) and MW-15 (880 µg/L).

Vinyl chloride was detected in eight of the 19 shallow bedrock monitoring wells sampled, with eight locations having vinyl chloride concentrations exceeding the groundwater criterion of 2 µg/L. The range of vinyl chloride detections exceeding groundwater criteria varied from 2.7 µg/L to 45 µg/L, with the highest concentration detected at MW-14.

Other non-chlorinated contaminants detected above criteria included benzene (BMW-103S, 3.4 µg/L) and methylene chloride (BMW-104S, 1,100 µg/L).

4.2.4.1.3 Intermediate Bedrock Groundwater Sampling Results

PCE was detected in seven of the 10 intermediate bedrock monitoring wells sampled, with five locations having PCE concentrations exceeding the groundwater criterion (Table 4-7). Concentrations ranged from 0.50 µg/L to 8,700 µg/L (Figure 4-6). The highest concentration was detected at MW-13I, followed by BMW-104I (3,100 µg/L), MW-14I (2,300 µg/L) and MN-4I (2,100 µg/L).

TCE was detected in six of the 10 intermediate bedrock monitoring wells sampled, with five locations having TCE concentrations exceeding the groundwater criterion. Concentrations ranged from 0.98 µg/L to 1,300 µg/L. The highest concentration of TCE was found at BMW-104I followed by MW-13I (730 µg/L).

Cis-1,2-DCE was detected in seven of the 10 intermediate bedrock monitoring wells sampled, with six locations having cis-1,2-DCE concentrations exceeding the groundwater criterion. Cis-1,2-DCE detections ranged from 2.8 µg/L to 1,600 µg/L, with the highest concentration at BMW-104I followed by MW-6I (1,300 µg/L) and MW-14I (1,200 µg/L).

Vinyl chloride was detected in five of the 10 intermediate bedrock monitoring wells sampled, with five locations having vinyl chloride concentrations exceeding the groundwater criterion. Vinyl chloride detections exceeding groundwater criteria ranged from 8.7 µg/L to 55 µg/L, with the highest concentration detected at MW-14I.

Other non-chlorinated contaminants detected above criteria included benzene (BMW-5I, 3.4 µg/L) and methylene chloride (BMW-104I, 19 µg/L).

4.2.4.1.4 Deep Bedrock Groundwater Sampling Results

PCE was detected in one of the 11 deep bedrock monitoring wells sampled and did not exceed groundwater criterion (Table 4-8).

No PCE degradation products were detected in the deep bedrock monitoring wells. Other non-chlorinated contaminants detected above criteria included acetone (BMW-102D 80 µg/l), ethylbenzene (BMW-102D, 3.4 µg/L and MN-1D, 5.4 µg/L) and xylene (BMW-102D, 22 µg/L and MN-1D 32 µg/L).

4.2.4.1.5 Other Non-VOC Contaminants

Groundwater samples from one overburden, three shallow bedrock, and one intermediate bedrock well were analyzed for SVOCs, pesticides, herbicides, PCBs, and metals and cyanide(Table 4-9).All groundwater samples exceeded SCGs for iron, magnesium, and sodium. Manganese exceeded the SCG only in overburden well MW-13OB. There were no other exceedances in the groundwater samples.

5.0 SUMMARY AND RECOMMENDATIONS

5.1 Summary

The Site is approximately 1.8 acres in size. The main Site feature is an approximately 54,500 square foot occupied building. The rest of the Site is mostly paved with some grass and landscaped areas immediately north and west of the building. The surface topography is generally flat and the setting is urban. Operations started at the facility in the fall of 1972 and included a dry-cleaning process that used PCE as a solvent. Past reports indicate the dry cleaning machine had always been at the same location at the eastern interior of the building.

5.1.1 Field Activities

PDI field activities included a geophysical survey, soil sampling within the source area to further characterize impacted soils, installation of two overburden monitoring wells, two shallow bedrock monitoring wells, and two intermediate bedrock monitoring wells at locations heavily impacted with CVOCs, groundwater sampling in the newly installed and existing monitoring wells, and a site survey to locate and map field data.

5.1.2 Geology and Hydrogeology

The stratigraphic sequence at the Site includes heterogenous fill materials to a depth of approximately 8 feet bgs, overlying approximately 4 to 5 feet of generally natural deposits of silty sand and gravel down to the bedrock surface. The bedrock consists of the Penfield and DeCew Dolostone units of the lower Lockport Formation and underlying Gates Dolostone and Rochester Shale of the Rochester Shale Formation. The contacts between the rock units was not readily distinguishable, which is demonstrated through the review of the rock cores obtained during the PDI. Bedrock was found to be very competent, with RQDs ranging from the 60's in the upper portion, to as high as 100 at depth.

Groundwater occurs under unconfined conditions in both the overburden materials and bedrock. Groundwater flow in the overburden is generally toward the west with a low horizontal hydraulic gradient of approximately 0.014 ft/ft. Groundwater in the bedrock flows through secondary porosity features including faults, joints, solution cavities, and bedding planes. Historical bedrock groundwater elevation data suggested flow locally toward the north and west, with likely influences on localized direction of groundwater resulting from subsurface utilities that intercept bedrock along West Main Street.

5.1.3 Soil Analytical Results

CVOCs were detected in numerous soil samples with only PCE concentrations exceeding Commercial Use SCOs. PCE concentrations ranged from 0.012 mg/kg to 7,400 mg/kg with the highest

concentration in the area of the former location of the dry cleaning machine. CVOCs exceeding Protection of Groundwater SCOs included PCE, cis-1,2-DCE, trans-1,2-DCE, and TCE.

5.1.4 Groundwater Analytical Results

CVOCs were detected in numerous groundwater samples at concentrations exceeding Class GA groundwater SCGs. PCE concentrations ranged from 0.5 µg/L to 82,000 µg/L with the highest concentration occurring in the shallow bedrock zone at well BMW-104S located on the north side of the building. The next highest PCE concentrations were found in the overburden groundwater at well MW-13OB located just north on the dry cleaning machine. Concentrations in the intermediate bedrock zone were significantly lower than in the overburden and shallow bedrock zones. The deep bedrock zone had minimal PCE contamination, with the only detection being at well BMW-02D, located west of the building.

5.2 Conclusions

The PDI confirmed that past operations associated with dry cleaning in the building impacted overburden materials, and groundwater in the overburden and shallow and intermediate bedrock.

The horizontal and vertical extent of the impacts in soil is situated near the former dry cleaning machine and extends generally northward approximately 60 feet, southward approximately 40 feet, and approximately 40 feet westward from the eastern wall of the building. Within the unsaturated portion of the overburden, the highest soil vapor (PID readings) occurred near the footprint of the former dry cleaning machine. Within the saturated portion of the overburden, the highest PID readings were occurred near the former dry cleaning machine and overburden/bedrock interface north of the dry cleaning machine. No NAPL was found in overburden during the February 2, 2021, groundwater elevation collection event. However, observations from the soil borings show concentrations of PCE in soil at some locations are at/near solubility of PCE indicating NAPL could be present; in addition, black staining was observed during drilling in the overburden at MW-14S.

The horizontal and vertical extent of groundwater was delineated. Overburden groundwater impacts are generally co-located with the extent of soil contamination as discussed above. Bedrock groundwater contamination was found to be generally similar to results obtained as part of previous investigations. Shallow bedrock groundwater impacts are also generally co-located with overburden soil and overburden groundwater contamination. Within the shallow bedrock, the highest concentrations of chlorinated VOCs were found beneath the eastern portion of the building extending to the sidewalk area just north of the building, and beneath the northwest corner of the building. Chlorinated VOC concentrations rapidly decrease in concentration east, west, north and south of the building footprint. Within the intermediate bedrock, the highest concentrations of chlorinated VOCs were found near the former dry

cleaning machine and contamination extends into the sidewalk area north of the building. Deep bedrock groundwater was not impacted with chlorinated VOCs around the building footprint.

5.3 Recommendations

The following recommendations are offered for consideration by the Department.

- Implement the Site remedy as outlined in the ROD and further evaluated by AECOM as documented in the Technical Memorandum dated March 2022.
- Implement the remediation in a phased approach. The first phase would include:
    1. the installation of overburden, shallow bedrock and intermediate bedrock wells in the source area;
    2. installation of shallow bedrock wells in the hot spot area located north of the building; and
    3. installation of shallow bedrock wells in the hot spot area located around well MW-15 off the northwest corner of the building.

Implementation of ISCO in all three areas (Figure 5-2) by using persulfate as the oxidant. Persulfate is recommended as the oxidant for ISCO to allow enhanced bioremediation as described in the ROD using PlumeStop to be considered for the second phase of remediation, if this second phase proves to be necessary. ISCO treatment details (percent persulfate solution, injection volumes, injection schedule, etc.) will be explained in the Remedial Design Work Plan.

6.0 REFERENCES

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.

TABLES

TABLE 2-1
ARTCO INDUSTRIAL LAUNDRIES, SITE No. 828102
NYSDEC WA D009803-34
SAMPLE ANALYTICAL PROGRAM

Analytical Methods*	Samples	QC						Total No of Samples
		Field Dup	MS	MSD	Equipment/ Rinse Blank	Field Blank	Trip Blank	
Soils								
Soil Probes (Hand sampled)								
TCL Volatiles + 10 TICs by 8260C	25	1	1	1	0	0	0	28
TCL Semivolatiles, including 1,4-dioxane + 20 TICs by 8270D	2	1	1	1	0	0	0	5
TCL Pesticides by 8081A	2	1	1	1	0	0	0	5
TCL PCBs by 8082A	2	1	1	1	0	0	0	5
Chlorinated Herbicides by 8151A	2	1	1	1	0	0	0	5
TAL Metals by 6010C	2	1	1	1	0	0	0	5
Mercury by 7471A	2	1	1	1	0	0	0	5
Cyanide by 9012A	2	1	1	1	0	0	0	5
PFASs by EPA Method 537 modified	2	1	1	1	1	1	0	7
Soil Vapor Survey								
TCL Volatiles by TO-15	6	1	0	0	0	0	0	7
Direct Push Soils								
TCL Volatiles + 10 TICs by 8260C	10	1	1	1	0	0	0	13
TCL Semivolatiles, including 1,4-dioxane + 20 TICs by 8270D	1	1	1	1	0	0	0	4
TCL Pesticides by 8081A	1	1	1	1	0	0	0	4
TCL PCBs by 8082A	1	1	1	1	0	0	0	4
TAL Metals by 6010C	1	1	1	1	0	0	0	4
Mercury by 7471A	1	1	1	1	0	0	0	4
Cyanide by 9012A	1	1	1	1	0	0	0	4
PFASs by EPA Method 537 modified	1	1	1	1	1	1	0	6
Drill Rig Soils								
TCL Volatiles + 10 TICs by 8260C	4	0	0	0	0	0	0	4
TCL Semivolatiles, including 1,4-dioxane + 20 TICs by 8270D	1	0	0	0	0	0	0	1
TCL Pesticides by 8081A	1	0	0	0	0	0	0	1
TCL PCBs by 8082A	1	0	0	0	0	0	0	1
TAL Metals by 6010C	1	0	0	0	0	0	0	1
Mercury by 7471A	1	0	0	0	0	0	0	1
Cyanide by 9012A	1	0	0	0	0	0	0	1
PFASs by EPA Method 537 modified	1	0	0	0	1	1	0	3
Groundwaters								
TCL Volatiles + 10 TICs by 8260C	48	3	1	1	0	0	1	54
TCL Semivolatiles + 20 TICs by 8270D	5	1	1	1	0	0	0	8
TCL Pesticides by 8081A	5	1	1	1	0	0	0	8
TCL PCBs by 8082A	5	1	1	1	0	0	0	8
TAL Metals by 6010C	5	1	1	1	0	0	0	8
Mercury by 7470A	5	1	1	1	0	0	0	8
Cyanide by 9010B	5	1	1	1	0	0	0	8
1,4-dioxane by 8270D SIM	5	1	1	1	0	0	0	8
PFASs by EPA Method 537 modified	5	1	1	1	1	1	0	10
NAPL*								
TCL Volatiles + 10 TICs by 8260C	1	0	0	0	0	0	0	1
TCL Semivolatiles + 20 TICs by 8270D	1	0	0	0	0	0	0	1
TCL PCBs by 8082A	1	0	0	0	0	0	0	1
Fuel Fingerprint by 310-13	1	0	0	0	0	0	0	1
Flashpoint by 1010	1	0	0	0	0	0	0	1
Density	1	0	0	0	0	0	0	1
Waste Characterization								
Full TCLP	2	0	0	0	0	0	0	2
Ignitability	2	0	0	0	0	0	0	2
Corrosivity	2	0	0	0	0	0	0	2
Reactivity	2	0	0	0	0	0	0	2

DNAPL/LNAPL - Dense/light non-aqueous phase liquid
MS - Matrix Spike
MSD - Matrix Spike Duplicate
PCBs - Polychlorinated biphenyls
PFASs - Per- and polyfluoroalkyl substances
SIM - Selected Ion Monitoring
TAL - Target Analyte List
TCL - Target compound List
TCLP - Toxicity Characteristics Leaching Procedure
TICs - Tentatively Identified Compounds

* If LNAPL, analyze for VOCs and density. IF DNAPL analyze for all parameters.

TABLE 2-2
BORING SUMMARY
FORMER ARTCO INDUSTRIAL LAUNDRIES SITE

Boring ID	Shallow Soil Probe	Direct Push Boring	PID Range (ppm)	Staining	NAPL	Comment/ Impact
0N 20E	X		0.6 to 52.5	None	None	
10N 30E	X		35.7 to 318	Yes @ 12-36"	None	
10N 36E		X	0.0 to 96.0	None	None	
20N 10E	X		0.0 to 26.3	None	None	
20N 50E	X		2.5 to 182.7	None	None	
25N 50E		X	0.0 to 7.8	None	None	
30N 20E	X		0.3 to 2.5	None	None	
30N 40E	X		3.9 to 68.7	Yes @ 12-36"	None	
40N 10E	X		0.0 to 38.1	None	None	
40N 30E	X		0.5 to 47	Yes @ 12-36"	None	
40N 40E	X	X	0 to 15000	None	None	
40N 50E	X	X	0.0 to 341.2	None	None	
42N 20E		X	0.1 to 16.7	None	None	
50N 50E	X		1.8 to 73.6	Yes @ 13-36"	None	
60N 10E	X		0.0 to 12.8	None	None	
60N 40E	X	X	1.3 to 568.1	Yes @ 10'	Possible @ 10-11'	Strong Odor @ 8.25'
60N 50E	X		0.2 to 3.2	None	None	
70N 20E	X	X	0.2 to 55.8	Yes @ 9-36" & 7-8'	None	
70N 40E	X		1.5 to 566.7	None	None	
70N 50E	X		4.1 to 65.8	Yes @ 13-36"	None	
80N 30E	X		5.0 to 62.5	None	None	
80N 35E		X	0.0 to 6825	None	None	Strong Odor @ 8-12'
80N 40E	X		2.7 to 109.1	None	None	
90N 10E	X	X	0.0 to 188.6	None	None	
90N 50E	X	X	0.0 to 22.5	Yes @ 8-36"	None	
100N 20E	X		0.3 to 12.9	None	None	
100N 35E		X	0.7 to 17.6	None	None	
100N 40E	X		2.9 to 119.8	None	None	
110N 20E		X	0.0 to 8.1	None	None	
110N 30E	X		0.0 to 27.9	None	None	
110N 50E	X		1.7 to 52.8	None	None	
MW-13OB		X	5.8 to 8011	Possible @ 2-3' & 9-9.5'	None	Well screen 1.8-11.8'.
MW-13S		X	2.2 to 222.8 (Out of Core Hole)	None	None	Well screen 16.9-31.9'. Sump 31.9 to 33.9'.
MW-13I		X	3.2 to 29.9	None	None	Well screen 34-49'. Sump 49 to 51".
MW-14S		X	1.5 to 4250	Yes @ 8.8-9'	Yes @ 8.8-9'	Well screen 14.9-29.9'. Sump 29.9 to 31.9'.
MW-14I		X	2.5 to 420 (Out of Core Hole)	None	None	Well screen 32-47'. Sump 47 to 49'.
MW-15OB		X	0.0 to 38.6	Possible @ 9.8-10'	None	Well screen 2-12'.

Note: All boring are located inside site building.

TABLE 2-3
ROCK CORING SUMMARY
FORMER ARTCO INDUSTRIAL LAUNDRIES SITE

Boring ID	Core Run	Run Depth (ft bgs)	REC (%)	RQD (%)	PID Range (ppm)	Comment/ Impact
MW-13S	R1	17-22	87	62	0.0 to 0.0	no sheen on return water
	R2	22-27	93	72	0.0 to 0.0	no sheen on return water
	R3	27-32	100	88	37 core hole.	no sheen on return water
	R4	32-34	100	92	222.8 core hole.	no sheen on return water
MW-13I	R1	17-22	98	67	0.0 to 0.0	no sheen on return water
	R2	22-27	95	82	0.0 to 0.0	no sheen on return water
	R3	27-32	100	88	0.0 to 0.0	no sheen on return water
	R4	32-37	100	90	0.0 to 0.0	no sheen on return water
	R5	37-42	92	75	0.0 to 0.0	no sheen on return water
	R6	42-47	100	87	0.0 to 0.0	no sheen on return water
	R7	47-51	100	92	0.0 to 0.0	no sheen on return water
MW-14S	R1	17-27	100	73	0.0 to 0.0	no sheen on return water
	R2	27-34	100	73	0.0 to 0.0	~600-gallon water loss. No sheen on return water.
MW-14I	R1	17-22	93	67	14.9 core hole.	no sheen on return water
	R2	22-27	98	77	0.0 to 0.0	no sheen on return water
	R3	27-32	93	85	0.0 to 0.0	no sheen on return water
	R4	32-37	98	78	420 core hole.	no sheen on return water
	R5	37-42	93	73	0.0 to 0.0	no sheen on return water
	R6	42-46	100	100	0.0 to 0.0	no sheen on return water
	R7	46-49	92	81	0.0 to 0.0	no sheen on return water

Note: All boring are located inside site building.

TABLE 2-4
SUMMARY OF WELL CONSTRUCTION DETAILS
ARTCO INDUSTRIAL LAUNDRIES SITE

Well ID	Interval	Investigation Phase	Location (Onsite/ Offsite)	Depth to Bedrock/ Refusal[1]	Screen (feet)[1]			Elevation (feet msl)[2]				
					Top	Bottom	Length	Surface	Top of Riser	Bedrock	Screen Top	Screen Bottom
MW-1	Overburden	Rochester 1993	Offsite	11.6	6.0	12.7	6.7	511.87	511.46	500.27	505.87	499.17
MW-2	Overburden	Rochester 1993	Offsite	9.2	6.0	12.7	6.7	514.34	514.02	505.14	508.34	501.64
MW-3	Overburden	Rochester 1993	Offsite	9.2	6.0	12.7	6.7	513.76	513.48	504.56	507.76	501.06
MW-4	Overburden	Rochester 1993	Offsite	9.1	6.0	12.7	6.7	514.40	515.08	505.30	508.40	501.7
MW-4R	Shallow Bedrock	H&A 2001	Offsite	10.5	12.5	26.0	13.5	514.60	514.22	504.10	502.10	488.6
MW-5	Overburden	NYSDEC 1998	Offsite	8.5	3.5	8.5	5.0	513.88	513.41	505.38	510.38	505.38
MW-6	Overburden	NYSDEC 1998	Onsite	11.5	6.5	11.5	5.0	514.77	514.48	503.27	508.27	503.27
MW-7[3]	*Overburden*	*NYSDEC 1998*	*Onsite*	*11.5*	*6.5*	*11.5*	*5.0*	*514.47*	*514.18*	*502.97*	*507.97*	*502.97*
MW-8A[3]	*Overburden*	*NYSDEC 1998*	*Offsite*	*10.5*	*5.5*	*10.5*	*5.0*	*512.02*	*511.27*	*501.52*	*506.52*	*501.52*
MW-9[5]	*Overburden*	*NYSDEC 1998*	*Offsite*	*10.0*	*5.0*	*10.0*	*5.0*	*513.79*	*513.04*	*503.79*	*508.79*	*503.79*
MW-10[3]	*Overburden*	*NYSDEC 1998*	*Onsite*	*11.0*	*6.0*	*11.0*	*5.0*	*514.34*	*513.69*	*503.34*	*508.34*	*503.34*
MW-11	Shallow Bedrock	H&A 2001	Offsite	9.0	11.0	25.5	14.5	513.72	513.17	504.72	502.72	488.22
MW-12	Shallow Bedrock	H&A 2001	Onsite	11.2	12.2	25.2	13.0	512.36	512.27	501.16	500.16	487.16
MW-13	Shallow Bedrock	H&A 2001	Offsite	12.0	15.0	24.5	9.5	512.02	511.68	500.02	497.02	487.52
MW-14	Shallow Bedrock	H&A 2001	Offsite	12.3	14.3	24.0	9.7	512.82	512.50	500.52	498.52	488.82
MW-15	Shallow Bedrock	H&A 2001	Onsite	10.9	13.0	25.4	12.4	513.52	514.83	502.62	500.52	488.12
SB-5[4]	N/A	NYSDEC 1998	Onsite	11.0	N/A	N/A	N/A	514.34	N/A	503.34	N/A	N/A
SB-6[4]	N/A	NYSDEC 1998	Onsite	11.0	N/A	N/A	N/A	514.34	N/A	503.34	N/A	N/A
SB-7[4]	N/A	NYSDEC 1998	Onsite	10.5	N/A	N/A	N/A	514.34	N/A	503.84	N/A	N/A
SB-8[4]	N/A	NYSDEC 1998	Onsite	10.5	N/A	N/A	N/A	514.34	N/A	503.84	N/A	N/A
SB-9	Overburden	H&A 2001	Onsite	11.0	5.5	10.5	5.0	513.81	513.78	502.81	508.31	503.31
SB-10	Overburden	H&A 2001	Onsite	10.5	5.5	10.3	4.8	512.36	512.05	501.86	506.86	502.06
SB-11	Overburden	H&A 2001	Offsite	12.6	7.0	12.0	5.0	512.86	512.56	500.26	505.86	500.86
SB-12	Overburden	H&A 2001	Onsite	11.0	5.0	10.0	5.0	513.53	513.38	502.53	508.53	503.53
SB-13	Overburden	H&A 2001	Onsite	13.0	7.5	12.5	5.0	514.34	514.19	501.34	506.84	501.84
SB-14	Overburden	H&A 2001	Onsite	13.0	7.0	12.0	5.0	514.34	514.18	501.34	507.34	502.34
SVE-1	Overburden	H&A SVE System	Onsite	N/A	3.0	11.4	8.4	514.34	514.14	N/A	511.34	502.95
MN-1D	Deep Bedrock	NYSDEC 2009	Offsite	13.0	44.8	49.8	5.0	511.98	514.14	498.98	467.18	462.18
MN-1I	Intermediate Bedrock	NYSDEC 2009	Offsite	13.0	25.0	30.0	5.0	511.98	514.23	498.98	486.98	481.98
MN-1S	Shallow Bedrock	NYSDEC 2009	Offsite	13.0	15.0	20.0	5.0	511.98	514.26	498.98	496.98	491.98
MN-2S	Overburden	NYSDEC 2009	Offsite	12.5	8.5	13.5	5.0	512.08	514.31	499.58	503.58	498.58
MN-2D	Deep Bedrock	NYSDEC 2009	Offsite	12.5	41.0	46.0	5.0	512.08	514.12	499.58	471.08	466.08
MN-2I	Shallow Bedrock	NYSDEC 2009	Offsite	12.5	17.0	22.0	5.0	512.08	514.23	499.58	495.08	490.08
MN-3S	Overburden	NYSDEC 2009	Offsite	13.0	9.0	14.0	5.0	513.41	515.51	500.41	504.41	499.41
MN-3D	Deep Bedrock	NYSDEC 2009	Offsite	13.0	38.0	43.0	5.0	513.54	515.54	500.54	475.54	470.54
MN-3I	Shallow Bedrock	NYSDEC 2009	Offsite	13.0	16.0	21.0	5.0	513.54	515.73	500.54	497.54	492.54

TABLE 2-4
SUMMARY OF WELL CONSTRUCTION DETAILS
ARTCO INDUSTRIAL LAUNDRIES SITE

Well ID	Interval	Investigation Phase	Location (Onsite/ Offsite)	Depth to Bedrock/ Refusal[1]	Screen (feet)[1]			Elevation (feet msl)[2]				
					Top	Bottom	Length	Surface	Top of Riser	Bedrock	Screen Top	Screen Bottom
MN-4OB	Overburden	NYSDEC 2009	Onsite	11.0	6.0	11.0	5.0	512.85	512.64	501.85	506.85	501.85
MN-4D	Deep Bedrock	NYSDEC 2009	Onsite	11.0	39.3	44.3	5.0	512.88	512.49	501.88	473.58	468.58
MN-4I	Intermediate Bedrock	NYSDEC 2009	Onsite	11.0	28.0	33.0	5.0	512.88	512.60	501.88	484.88	479.88
MN-4S	Shallow Bedrock	NYSDEC 2009	Onsite	11.0	17.0	22.0	5.0	512.88	512.69	501.88	495.88	490.88
MN-5OB	Overburden	NYSDEC 2009	Onsite	12.4	7.0	12.0	5.0	511.89	511.60	499.49	503.89	499.89
MN-5D	Deep Bedrock	NYSDEC 2009	Onsite	12.4	37.5	45.5	8.0	512.12	511.67	499.72	474.62	466.62
MN-5I	Intermediate Bedrock	NYSDEC 2009	Onsite	12.4	27.0	32.0	5.0	512.12	511.78	499.72	485.12	480.12
MN-5S	Shallow Bedrock	NYSDEC 2009	Onsite	12.4	16.0	21.0	5.0	512.12	511.86	499.72	496.12	491.12
MN-6OB	Overburden	NYSDEC 2009	Offsite	9.5	4.5	9.5	5.0	515.50	517.81	506.00	511.00	506.00
MN-6D	Deep Bedrock	NYSDEC 2009	Offsite	9.5	40.0	45.0	5.0	515.39	517.02	505.89	475.39	470.39
MN-6I	Intermediate Bedrock	NYSDEC 2009	Offsite	9.5	23.0	28.0	5.0	515.39	517.24	505.89	492.39	487.39
MN-6S	Shallow Bedrock	NYSDEC 2009	Offsite	9.5	11.0	16.0	5.0	515.39	517.43	505.89	504.39	499.39
MN-7D[5]	*Deep Bedrock*	*NYSDEC 2009*	*Offsite*	*11.0*	*40.0*	*45.0*	*5.0*	*513.32*	*512.95*	*502.32*	*473.32*	*468.32*
MN-7I[5]	*Intermediate Bedrock*	*NYSDEC 2009*	*Offsite*	*11.0*	*27.0*	*35.0*	*8.0*	*513.32*	*513.05*	*502.32*	*486.32*	*478.32*
MN-7S[5]	*Shallow Bedrock*	*NYSDEC 2009*	*Offsite*	*11.0*	*17.0*	*22.0*	*5.0*	*513.32*	*513.12*	*502.32*	*496.32*	*491.32*
MN-8D	Deep Bedrock	NYSDEC 2009	Offsite	12.0	40.0	45.0	5.0	514.41	514.19	502.41	474.41	469.41
MN-8I[5]	*Intermediate Bedrock*	*NYSDEC 2009*	*Offsite*	*12.0*	*27.0*	*32.0*	*5.0*	*514.41*	*514.21*	*502.41*	*487.41*	*482.41*
MN-8S[5]	*Shallow Bedrock*	*NYSDEC 2009*	*Offsite*	*12.0*	*15.0*	*20.0*	*5.0*	*514.41*	*514.22*	*502.41*	*499.41*	*494.41*
MN-9OB[5]	*Overburden*	*NYSDEC 2009*	*Offsite*	*9.5*	*4.5*	*14.0*	*9.5*	*512.79*	*512.57*	*503.29*	*508.29*	*498.79*
MN-9D	Deep Bedrock	NYSDEC 2009	Offsite	9.5	40.0	45.0	5.0	512.78	512.24	503.28	472.78	467.78
MN-9I[5]	*Intermediate Bedrock*	*NYSDEC 2009*	*Offsite*	*9.5*	*22.0*	*27.0*	*5.0*	*512.78*	*512.32*	*503.28*	*490.78*	*485.78*
MN-9S[5]	*Shallow Bedrock*	*NYSDEC 2009*	*Offsite*	*9.5*	*12.5*	*17.5*	*5.0*	*512.78*	*512.43*	*503.28*	*500.28*	*495.28*
MN-10D	Deep Bedrock	NYSDEC 2009	Offsite	11.0	42.6	47.6	5.0	512.05	511.75	501.05	469.45	464.45
MN-10I	Intermediate Bedrock	NYSDEC 2009	Offsite	11.0	26.0	31.0	5.0	512.05	511.71	501.05	486.05	481.05
MN-10S	Shallow Bedrock	NYSDEC 2009	Offsite	11.0	15.0	20.0	5.0	512.05	511.72	501.05	497.05	492.05
MN-11D	Deep Bedrock	NYSDEC 2009	Offsite	10.0	40.0	45.0	5.0	514.21	513.88	504.21	474.21	469.21
MN-11I	Intermediate Bedrock	NYSDEC 2009	Offsite	10.0	29.0	34.0	5.0	514.21	513.94	504.21	485.21	480.21
MN-11S	Shallow Bedrock	NYSDEC 2009	Offsite	10.0	16.0	21.0	5.0	514.21	513.94	504.21	498.21	493.21
MN-12OB	Overburden	NYSDEC 2009	Offsite	8.0	3.0	11.0	8.0	514.67	514.42	506.67	511.67	503.67
MN-12D	Deep Bedrock	NYSDEC 2009	Offsite	8.0	40.0	45.0	5.0	514.73	514.44	506.73	474.73	469.73
MN-12I	Intermediate Bedrock	NYSDEC 2009	Offsite	8.0	29.0	34.0	5.0	514.73	514.46	506.73	485.73	480.73
MN-12S	Shallow Bedrock	NYSDEC 2009	Offsite	8.0	13.0	18.0	5.0	514.73	514.45	506.73	501.73	496.73
MW-101	Overburden	H&A 2013	Onsite	10.3	3.6	10.6	7.0	512.82	512.21	502.52	509.22	502.22
BMW-102S	Shallow Bedrock	H&A 2013	Offsite	12.8	15.5	20.5	5.0	512.91	512.50	500.11	497.41	492.41
BMW-102I	Intermediate Bedrock	H&A 2013	Offsite	12.8	27.0	32.0	5.0	513.08	512.64	500.28	486.08	481.08
BMW-102D	Deep Bedrock	H&A 2013	Offsite	12.8	40.0	45.0	5.0	513.20	512.70	500.40	473.20	468.20

TABLE 2-4
SUMMARY OF WELL CONSTRUCTION DETAILS
ARTCO INDUSTRIAL LAUNDRIES SITE

Well ID	Interval	Investigation Phase	Location (Onsite/ Offsite)	Depth to Bedrock/ Refusal[1]	Screen (feet)[1]			Elevation (feet msl)[2]				
					Top	Bottom	Length	Surface	Top of Riser	Bedrock	Screen Top	Screen Bottom
BMW-103S	Shallow Bedrock	H&A 2013	Offsite	13.1	16.0	26.0	10.0	514.98	514.56	501.88	498.98	488.98
BMW-104S	Shallow Bedrock	H&A 2013	Onsite	10.5	14.0	19.0	5.0	514.44	514.04	503.94	500.44	495.44
BMW-104I	Intermediate Bedrock	H&A 2013	Onsite	10.5	25.0	30.0	5.0	514.43	513.96	503.93	489.43	484.43
MW-13OB	Overburden	AECOM 2020	Onsite	11.8	1.8	11.8	10.0	514.36	514.17	502.56	512.56	502.56
MW-13S	Shallow Bedrock	AECOM 2020	Onsite	12.0	16.9	31.9	15.0	514.38	514.06	502.38	497.48	482.48
MW-13I	Intermediate Bedrock	AECOM 2020	Onsite	12.0	34.0	49.0	15.0	514.36	514.00	502.36	480.36	465.36
MW-14S	Shallow Bedrock	AECOM 2020	Onsite	11.8	14.9	29.9	15.0	514.39	514.17	502.59	499.49	484.49
MW-14I	Intermediate Bedrock	AECOM 2020	Onsite	11.8	32.0	47.0	15.0	514.38	514.10	502.58	482.38	467.38
MW-15OB	Overburden	AECOM 2020	Onsite	12.0	2.0	12.0	10.0	514.44	514.21	502.44	512.44	502.44

Notes:
1. Depths measured from ground surface.
2. Elevations reference North American Vertical Datum of 1988 (NAVD88).
3. MW-7, MW-8, and MW-10 could not be located prior to the 2013 groundwater sampling events and are considered lost.
4. Soil borings SB-5, SB-6, SB-7, and SB-8 were utilized as temporary groundwater monitoring points.
5. Wells damaged beyond repair (i.e., well cap buried in sediment, well blocked above top of screen, etc.).

TABLE 2-5
GROUNDWATER ELEVATION MEASUREMENTS
ARTCO INDUSTRIAL LAUNDRIES

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
BMW-102D	1150413.230	1404725.141	513.2	512.7	512.7	D	2/2/2021 0000	28.44	484.26	0.00		
BMW-102I	1150410.982	1404719.829	513.08	512.64	512.64	I	2/2/2021 0000	28.48	484.16	0.00		
BMW-102S	1150409.473	1404715.309	512.91	512.5	512.5	S	2/2/2021 0000	13.78	498.72	0.00		
BMW-103S	1150375.269	1404561.713	514.98	514.56	514.56	S	2/2/2021 0000	15.54	499.02	0.00		
BMW-104I	1150509.633	1404962.355	514.43	513.96	513.96	I	2/2/2021 0000	29.01	484.95	0.00		
BMW-104S	1150506.666	1404957.852	514.44	514.04	514.04	S	2/2/2021 0000	14.27	499.77	0.00		
MN- 1D	1150151.192	1404570.421	0	514.14	514.14	D	2/2/2021 0000	31.26	482.88	0.00		
MN- 1I	1150151.189	1404570.154	0	514.23	514.23	I	2/2/2021 0000	29.91	484.32	0.00		
MN- 1S	1150151.557	1404570.416	0	514.26	514.26	S	2/2/2021 0000	13.76	500.50	0.00		
MN- 2D	1150149.433	1404671.322	0	514.12	514.12	D	2/2/2021 0000	31.21	482.91	0.00		
MN- 2I	1150149.403	1404668.653	0	514.23	514.23	S	2/2/2021 0000	13.81	500.42	0.00		
MN- 2S	1150149.798	1404671.317	0	514.31	514.31	OB	2/2/2021 0000	10.28	504.03	0.00		
MN- 3D	1150246.223	1404561.058	0	515.54	515.54	D	2/2/2021 0000	32.60	482.94	0.00		

NM - No Measurement

Geologic Zone:
D Bedrock Aquifer

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

TABLE 2-5
GROUNDWATER ELEVATION MEASUREMENTS
ARTCO INDUSTRIAL LAUNDRIES

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MN- 3I	1150246.226	1404561.325	0	515.73	515.73	S	2/2/2021 0000	15.28	500.45	0.00		
MN- 3S	1150246.588	1404561.054	0	515.51	515.51	OB	2/2/2021 0000	12.15	503.36	0.00		
MN- 4D	1150156.209	1405102.789	0	512.49	512.49	D	2/2/2021 0000	29.98	482.51	0.00		
MN- 4I	1150156.206	1405102.523	0	512.6	512.6	I	2/2/2021 0000	28.65	483.95	0.00		
MN- 4S	1150155.841	1405102.527	0	512.69	512.69	S	2/2/2021 0000	12.59	500.10	0.00		
MN- 5D	1150146.884	1404925.688	0	511.67	511.67	D	2/2/2021 0000	28.91	482.76	0.00		
MN- 5I	1150146.882	1404925.421	0	511.78	511.78	I	2/2/2021 0000	27.73	484.05	0.00		
MN- 5S	1150154.535	1404925.333	0	511.86	511.86	S	2/2/2021 0000	11.51	500.35	0.00		
MN- 6D	1150717.782	1405090.199	515.5	517.02	517.02	D	2/2/2021 0000	34.28	482.74	0.00		
MN- 6I	1150717.779	1405089.932	515.5	517.24	517.24	I	2/2/2021 0000	28.27	488.97	0.00		
MN- 6OB	1150721.427	1405090.157	515.5	517.81	517.81	OB	2/2/2021 0000	10.57	507.24	0.00		
MN- 6S	1150721.424	1405089.890	515.5	517.43	517.43	S	2/2/2021 0000	15.05	502.38	0.00		

NM - No Measurement

Geologic Zone:
D Bedrock Aquifer

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

TABLE 2-5
GROUNDWATER ELEVATION MEASUREMENTS
ARTCO INDUSTRIAL LAUNDRIES

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MN-11D	1150866.122	1404898.215	0	513.88	513.88	D	2/2/2021 0000	32.03	481.85	0.00		
MN-11I	1150866.125	1404898.482	0	513.94	513.94	I	2/2/2021 0000	26.22	487.72	0.00		
MN-11S	1150866.486	1404898.211	0	513.94	513.94	S	2/2/2021 0000	16.89	497.05	0.00		
MN-12D	1150738.259	1404968.803	0	514.44	514.44	D	2/2/2021 0000	32.59	481.85	0.00		
MN-12I	1150738.256	1404968.536	0	514.46	514.46	I	2/2/2021 0000	28.08	486.38	0.00		
MN-12S	1150738.620	1404968.532	0	514.45	514.45	S	2/2/2021 0000	10.05	504.40	0.00		
MW- 1	1150151.653	1404801.267	0	511.46	511.46	OB	2/2/2021 0000	7.99	503.47	0.00		
MW- 2	1150458.667	1404999.769	514.34	514.02	514.02	OB	2/2/2021 0000	8.64	505.38	0.00		
MW- 3	1150536.061	1405136.855	513.76	513.48	513.48	OB	2/2/2021 0000	4.45	509.03	0.00		
MW- 6	1150285.888	1404999.885	514.95	514.48	514.48	OB	2/2/2021 0000	7.69	506.79	0.00		
MW- 9	1150584.463	1404971.37	513.79	513.04	513.04	OB	2/2/2021 0000	8.33	504.71	0.00		
MW-101	1150335.951	1404820.235	512.82	512.21	512.21	OB	2/2/2021 0000	8.22	503.99	0.00		
MW-11	1150583.709	1404905.727	513.72	513.17	513.17	S	2/2/2021 0000	11.67	501.50	0.00		

NM - No Measurement

Geologic Zone:
D Bedrock Aquifer

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

TABLE 2-5
GROUNDWATER ELEVATION MEASUREMENTS
ARTCO INDUSTRIAL LAUNDRIES

Location ID / Type	Northing	Easting	Ground Elevation (ft)	Casing Elevation (ft)	Meas.point (Riser)Elev.(ft)	Geol. Zone	Date / Time	Depth to Water (ft)	Water Elev. (ft)	Product Thick. (ft)	Corrected Water Elev. (ft)	Remark
MW-12	1150251.244	1404903.406	512.36	512.27	512.27	S	2/2/2021 0000	10.86	501.41	0.00		
MW-13	1150326.903	1404762.427	512.02	511.68	511.68	S	2/2/2021 0000	11.48	500.20	0.00		
MW-13I	1150351.681	1404966.682	514.356	513.995	513.995	I	2/2/2021 0000	30.37	483.63	0.00		
MW-13OB	1150361.506	1404966.431	514.363	514.167	514.167	OB	2/2/2021 0000	8.51	505.66	0.00		
MW-13S	1150345.851	1404966.591	514.384	514.056	514.056	S	2/2/2021 0000	14.91	499.15	0.00		
MW-14	1150366.374	1404676.039	512.82	512.5	512.5	S	2/2/2021 0000	12.22	500.28	0.00		
MW-14I	1150377.552	1404957.001	514.381	514.096	514.096	I	2/2/2021 0000	30.45	483.65	0.00		
MW-14S	1150383.196	1404956.473	514.385	514.137	514.137	S	2/2/2021 0000	14.81	499.33	0.00		
MW-15	1150442.868	1404830.217	513.52	514.83	514.83	S	2/2/2021 0000	13.07	501.76	0.00		
MW-15OB	1150334.087	1404965.233	514.436	514.212	514.212	OB	2/2/2021 0000	8.49	505.72	0.00		
SB- 9	1150248.811	1405072.369	513.81	513.78	513.78	OB	2/2/2021 0000	6.78	507.00	0.00		
SB-10	1150251.266	1404905.274	512.36	512.05	512.05	OB	2/2/2021 0000	7.02	505.03	0.00		

NM - No Measurement

Geologic Zone:
D Bedrock Aquifer

The value noted in the column labeled Specific Gravity is an assumed value for free product, if found.

TABLE 3-1
SUMMARY OF HYDRAULIC CONDUCTIVITY TESTING RESULTS
ARTCO INDUSTRIAL LAUNDRIES SITE #828102

Well Name	Type	Reference Elevation (ft msl)	Well Screen Interval (ft toc)	Measured Well Depth (ft toc)	Static Depth to Water (ft toc)	Static Water Elevation (ft msl)	Water Column (ft)	Estimated Hydraulic Conductivity (cm/sec)	Date	Notes
MW-101[A]	Overburden	512.21	3.1 - 10.1	9.82	8.29	503.92	1.53	2.3×10^{-3}	November 2013	Well screen completed in sand with gravel (unsaturated) and silt with gravel.
BMW-102S[A]	Bedrock	512.50	15.0 - 20.0	20.00	13.00	499.50	7.00	4.1×10^{-3}		Well screen completed in hard, slightly weathered Decew Dolostone, weathered zones noted at 18.1 and 18.8 ft bgs, RQD 81%.
BMW-102I[A]	Bedrock	512.64	26.5 - 31.5	--	28.72	483.92	2.78	1.2×10^{-4}		Well screen completed in hard, fresh Decew Dolostone, RQD 88%.
BMW-102D[A]	Bedrock	512.70	39.5 - 44.5	--	39.38	473.32	5.12	3.0×10^{-4}		Well screen completed in hard, fresh Decew Dolostone, RQD 82%.
BMW-103S[A]	Bedrock	514.56	15.5 - 25.5	25.40	14.54	500.02	10.86	2.0×10^{-3}		Well screen completed in hard, fresh Decew Dolostone, weathered zone noted at 22.4 ft bgs, RQD 61% and 86%.
BMW-104S[A]	Bedrock	514.04	13.5 - 18.5	18.50	14.30	499.74	4.20	9.5×10^{-4}		Well screen completed in hard, fresh Decew Dolostone, RQD 98%. Well development indicated very low permeability.
BMW-104I[A]	Bedrock	513.96	24.5 - 29.5	29.40	28.78	485.18	0.62	Not measured - inadequate water column		Well screen completed in hard, fresh Decew Dolostone, RQD 84%. Well development indicated very low permeability.
MW-1[B]	Bedrock	511.46	6.0 - 12.7	12.70	8.40	503.06	4.30	7.1×10^{-6}	September 1993	
MW-2[B]	Bedrock	514.02	6.0 - 12.7	12.70	7.05	506.97	5.65	5.6×10^{-6}		
MW-3[B]	Bedrock	513.48	6.0 - 12.7	12.70	6.40	507.08	6.30	5.4×10^{-7}		
MW-4[B]	Bedrock	515.08	6.0 - 12.7	12.70	6.15	508.93	6.55	2.7×10^{-6}		
MW-4R[C]	Bedrock	514.22	12.5 - 26.0	26.00	13.72	500.50	12.28	1×10^{-3}	February 2001	
MW-11[C]	Bedrock	513.17	11.0 - 25.5	25.50	16.00	497.17	9.50	1×10^{-5} at 11-18 ft, 4×10^{-4} at 18-25.5 ft		
MW-12[C]	Bedrock	512.27	12.2 - 25.2	25.20	11.98	500.29	13.22	0 at 14.2-19.2 ft		Interval of 19.2-25.2 ft was not tested because there was no significant change in the quality of rock from this interval.
MW-13[C]	Bedrock	511.68	15.0 - 24.5	24.50	11.87	499.81	12.63	1×10^{-3} at 17-22 ft, 1×10^{-3} at 19.2-24.5 ft, 2×10^{-4} at 22.0-24.5 ft		Flow zone is likely present in the 17.0-19.2 ft interval.
MW-14[C]	Bedrock	512.50	14.3 - 24.0	24.00	12.42	500.08	11.58	1×10^{-3} at 14.3-19.3 ft, 8×10^{-4} at 21.3-24.0 ft		
MW-15[C]	Bedrock	514.83	13.0 - 25.4	25.40	13.78	501.05	11.62	1×10^{-4} at 13.0-18.0 ft, 5×10^{-4} at 18.9-25.4 ft		

NOTES:

1. Elevation data in (ft msl) reference North American Vertical Datum 1988 (NAVD88) Geoid 03.
2. Abbreviations:
   ft msl: feet above mean sea level. ft toc: feet below top of casing. ft bgs: feet below ground surface. cm/sec: centimeters per second.

A: Depth to water measurements and permeability testing completed by Haley & Aldrich of New York on 14 and 15 November 2013.
Hydraulic conductivity values were calculated using Bower-Rice Method, calculated values based on best fit match to recovery curve.

B: Source: "Summary of Rising Head Test Results", ca. 1993; Wells installed by Seeler Associates, September 1993.

C: Source: Revised Report on Voluntary Cleanup Agreement Investigations, Haley & Aldrich of New York, April 2003.

TABLE 3-2
VERTICAL HYDRAULIC GRADIENT CALCULATIONS
ARTCO INDUSTRIAL LAUNDRIES

Well Clusters	Well ID	Date	Measuring Point Reference Elevation (ft amsl)	Depth to Water (ft)	Groundwater Elevation (ft amsl)	Screen Setting (feet bgs)	Ground Elevation (ft amsl)	Midpoint of Screen Elevation (ft amsl)	Separation/ Gradient Reference	Vertical Separation (ft)	Vertical Gradient (ft/ft) 2/2/2021	Vertical Flow Direction
Well Cluster MN-1S/ 1I/ 1D	MN-1S	2/2/2021	514.26	13.76	500.50	15.00 to 20.00	511.98	494.48	Between MN-1S & MN-1I	10.00	**1.6180**	**Down**
	MN-1I	2/2/2021	514.23	29.91	484.32	25.00 to 30.00	511.98	484.48	Between MN-1I & MN-1D	19.80	**0.0727**	**Down**
	MN-1D	2/2/2021	514.14	31.26	482.88	44.80 to 49.80	511.98	464.68	Between MN-1S & MN-1D	29.80	**0.5913**	**Down**
Well Cluster MN-2S/ 2I/ 2D	MN-2S	2/2/2021	514.31	10.28	504.03	8.50 to 13.50	512.08	501.08	Between MN-2S & MN-2I	8.50	**0.4247**	**Down**
	MN-2I	2/2/2021	514.23	13.81	500.42	17.00 to 22.00	512.08	492.58	Between MN-2I & MN-2D	24.00	**0.7296**	**Down**
	MN-2D	2/2/2021	514.12	31.21	482.91	41.00 to 46.00	512.08	468.58	Between MN-2S & MN-2D	32.50	**0.6498**	**Down**
Well Cluster MN-3S/ 3I/ 3D	MN-3S	2/2/2021	515.51	12.15	503.36	9.00 to 14.00	513.41	501.91	Between MN-3S & MN-3I	6.87	**0.4236**	**Down**
	MN-3I	2/2/2021	515.73	15.28	500.45	16.00 to 21.00	513.54	495.04	Between MN-3I & MN-3D	22.00	**0.7959**	**Down**
	MN-3D	2/2/2021	515.54	32.60	482.94	38.00 to 43.00	513.54	473.04	Between MN-3S & MN-3D	28.87	**0.7073**	**Down**
Well Cluster MN-4S/ 4I/ 4D	MN-4S	2/2/2021	512.69	12.59	500.10	17.00 to 22.00	512.88	493.38	Between MN-4S & MN-4I	11.00	**1.4682**	**Down**
	MN-4I	2/2/2021	512.60	28.65	483.95	28.00 to 33.00	512.88	482.38	Between MN-4I & MN-4D	11.30	**0.2407**	**Down**
	MN-4D	2/2/2021	512.49	31.26	481.23	39.30 to 44.30	512.88	471.08	Between MN-4S & MN-4D	22.30	**0.8462**	**Down**
Well Cluster MN-5S/ 5I/ 5D	MN-5S	2/2/2021	511.86	11.51	500.35	16.00 to 21.00	512.12	493.62	Between MN-5S & MN-5I	11.00	**1.4818**	**Down**
	MN-5I	2/2/2021	511.78	27.73	484.05	27.00 to 32.00	512.12	482.62	Between MN-5I & MN-5D	12.00	**0.1075**	**Down**
	MN-5D	2/2/2021	511.67	28.91	482.76	37.50 to 45.50	512.12	470.62	Between MN-5S & MN-5D	23.00	**0.7648**	**Down**
Well Cluster MN-11S/ 11I/ 11D	MN-11S	2/2/2021	513.94	16.89	497.05	16.00 to 21.00	514.21	495.71	Between MN-11S & MN-11I	13.00	**0.7177**	**Down**
	MN-11I	2/2/2021	513.94	26.22	487.72	29.00 to 34.00	514.21	482.71	Between MN-11I & MN-11D	11.00	**0.5336**	**Down**
	MN-11D	2/2/2021	513.88	32.03	481.85	40.00 to 45.00	514.21	471.71	Between MN-11S & MN-11D	24.00	**0.6333**	**Down**
Well Cluster MN-12S/ 12I/ 12D	MN-12S	2/2/2021	512.69	12.59	500.10	17.00 to 22.00	512.88	493.38	Between MN-12S & MN-12I	11.00	**1.4682**	**Down**
	MN-12I	2/2/2021	512.60	28.65	483.95	28.00 to 33.00	512.88	482.38	Between MN-12I & MN-12D	11.30	**0.2407**	**Down**
	MN-12D	2/2/2021	512.49	31.26	481.23	39.30 to 44.30	512.88	471.08	Between MN-12S & MN-12D	22.30	**0.8462**	**Down**
Well Cluster MW-13OB/ 13S/ 13I	MW-13OB	2/2/2021	514.17	8.51	505.66	1.80 to 11.80	514.36	507.56	Between MW-13OB & MW-13S	17.58	**0.3704**	**Down**
	MW-13S	2/2/2021	514.06	14.91	499.15	16.90 to 31.90	514.38	489.98	Between MW-13S & MW-13I	17.12	**0.9066**	**Down**
	MW-13I	2/2/2021	514.00	30.37	483.63	34.00 to 49.00	514.36	472.86	Between MW-13OB & MW-13I	34.70	**0.6349**	**Down**
Well Cluster MW-14S/ 14I	MW-14S	2/2/2021	514.14	14.81	499.33	14.90 to 29.90	514.39	491.99	Between MW-14S & MW-14I	17.11	**0.9165**	**Down**
	MW-14I	2/2/2021	514.10	30.45	483.65	32.00 to 47.00	514.38	474.88				

amsl - elevation in feet above mean sea level

TABLE 4-1
SUMMARY OF DECTECTED EMERGING CONTAMINANTS IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				20N 10E	40N 40E	42N 20E	42N 20E	60N 40E
Sample ID				20N 10E SOIL	40N 40E	42N 20E 11.5-12.3	DUP-200212-1	60N 40E SOIL
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				0.5-1.8	14.0-16.0	11.5-12.3	11.5-12.3	0.5-1.8
Date Sampled				01/24/20	02/11/20	02/12/20	02/12/20	01/24/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**				Field Duplicate (1-1)	
Semivolatile Organic Compounds								
1,4-Dioxane	MG/KG	0.1	130	1.2 U	NA	NA	NA	0.060 U
Per- and Polyfluoroalkyl Substances								
Perfluorobutanesulfonic acid (PFBS)	UG/KG	-	-	NA	0.026 J	0.029 U	0.028 U	NA
Perfluorobutanoic acid (PFBA)	UG/KG	-	-	NA	0.030 U	0.24 U	0.23 U	NA
Perfluorodecane sulfonate (PFDS)	UG/KG	-	-	NA	0.31 J	0.046 U	0.044 U	NA
Perfluorodecanoic acid (PFDA)	UG/KG	-	-	NA	0.16 J	0.026 U	0.025 U	NA
Perfluorododecanoic acid (PFDoA)	UG/KG	-	-	NA	0.071 U	0.079 U	0.076 U	NA
Perfluoroheptanesulfonic acid (PFHpS)	UG/KG	-	-	NA	0.037 U	0.041 U	0.040 U	NA
Perfluoroheptanoic acid (PFHpA)	UG/KG	-	-	NA	0.075 J	0.034 U	0.033 U	NA
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	-	-	NA	0.35 J	0.037 U	0.035 U	NA
Perfluorohexanoic acid (PFHxA)	UG/KG	-	-	NA	0.044 U	0.049 U	0.047 U	NA
Perfluorononanoic acid (PFNA)	UG/KG	-	-	NA	0.070 J	0.042 U	0.041 U	NA
Perfluorooctane sulfonamide (PFOSA)	UG/KG	-	-	NA	0.32 J	0.097 U	0.093 U	NA
Perfluorooctanesulfonic acid (PFOS)	UG/KG	3.7	440	NA	2.0 J	0.24 U	0.23 J	NA
Perfluorooctanoic acid (PFOA)	UG/KG	1.1	500	NA	0.60 J	0.10 U	0.097 U	NA
Perfluoropentanoic acid (PFPeA)	UG/KG	-	-	NA	0.081 U	0.091 U	0.087 U	NA
Perfluorotetradecanoic acid (PFTeA)	UG/KG	-	-	NA	0.057 U	0.064 U	0.061 U	NA
Perfluorotridecanoic acid (PFTriA)	UG/KG	-	-	NA	0.054 U	0.060 U	0.058 U	NA
Perfluoroundecanoic acid (PFUnA)	UG/KG	-	-	NA	0.038 U	0.042 U	0.041 U	NA
1H,1H,2H,2H-Perfluorooctanesulfonic acid	UG/KG	-	-	NA	0.16 U	0.18 U	0.17 U	NA
1H,1H,2H,2H-Perfluorodecanesulfonic acid	UG/KG	-	-	NA	0.26 U	0.29 U	0.28 U	NA
N-Ethyl perfluorooctanesulfonamidoacet	UG/KG	-	-	NA	0.86 J	0.44 U	0.42 U	NA
N-Methyl perfluorooctanesulfonamidoacet	UG/KG	-	-	NA	3.1 J	0.46 U	0.44 U	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

U - Not detected. J - The reported concentration is an estimated value.

NA - Not analyzed

Detection Limits shown are MDL

TABLE 4-1
SUMMARY OF DECTECTED EMERGING CONTAMINANTS IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				80N 35E	80N 35E	80N 35E	MW-130B	MW-14S
Sample ID				80N35E 4-5	FD-200212-2	80N 35E 9	MW-13OB 7.5-8.5	FD-20200416-1
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				4.0-5.0	4.0-5.0	9.0-9.0	7.5-8.5	10.0-11.0
Date Sampled				02/12/20	02/12/20	02/12/20	04/15/20	04/16/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**		Field Duplicate (1-1)			Field Duplicate (1-1)
Semivolatile Organic Compounds								
1,4-Dioxane	MG/KG	0.1	130	12 U	12 U	NA	NA	NA
Per- and Polyfluoroalkyl Substances								
Perfluorobutanesulfonic acid (PFBS)	UG/KG	-	-	NA	NA	0.037 J	0.030 U	0.035 U
Perfluorobutanoic acid (PFBA)	UG/KG	-	-	NA	NA	0.22 U	0.24 U	0.28 U
Perfluorodecane sulfonate (PFDS)	UG/KG	-	-	NA	NA	0.044 U	0.046 U	0.054 U
Perfluorodecanoic acid (PFDA)	UG/KG	-	-	NA	NA	0.025 U	0.026 U	0.031 U
Perfluorododecanoic acid (PFDoA)	UG/KG	-	-	NA	NA	0.075 U	0.079 U	0.094 U
Perfluoroheptanesulfonic acid (PFHpS)	UG/KG	-	-	NA	NA	0.039 U	0.041 U	0.049 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	-	-	NA	NA	0.032 U	0.034 U	0.040 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	-	-	NA	NA	0.084 J	0.037 U	0.043 U
Perfluorohexanoic acid (PFHxA)	UG/KG	-	-	NA	NA	0.059 J	0.051 J	0.059 U
Perfluorononanoic acid (PFNA)	UG/KG	-	-	NA	NA	0.040 U	0.043 U	0.050 U
Perfluorooctane sulfonamide (PFOSA)	UG/KG	-	-	NA	NA	0.092 U	0.097 U	0.11 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	3.7	440	NA	NA	0.82	0.59 U	0.28 U
Perfluorooctanoic acid (PFOA)	UG/KG	1.1	500	NA	NA	0.096 U	0.10 U	0.12 U
Perfluoropentanoic acid (PFPeA)	UG/KG	-	-	NA	NA	0.086 U	0.091 U	0.11 U
Perfluorotetradecanoic acid (PFTeA)	UG/KG	-	-	NA	NA	0.060 U	0.064 U	0.075 U
Perfluorotridecanoic acid (PFTriA)	UG/KG	-	-	NA	NA	0.057 U	0.060 U	0.071 U
Perfluoroundecanoic acid (PFUnA)	UG/KG	-	-	NA	NA	0.040 U	0.043 U	0.050 U
1H,1H,2H,2H-Perfluorooctanesulfonic acid	UG/KG	-	-	NA	NA	0.17 U	0.18 U	0.21 U
1H,1H,2H,2H-Perfluorodecanesulfonic acid	UG/KG	-	-	NA	NA	0.28 U	0.30 U	0.35 U
N-Ethyl perfluorooctanesulfonamidoacet	UG/KG	-	-	NA	NA	0.41 U	0.44 U	0.52 U
N-Methyl perfluorooctanesulfonamidoacet	UG/KG	-	-	NA	NA	0.44 U	0.46 U	0.54 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

U - Not detected. J - The reported concentration is an estimated value.

NA - Not analyzed.

Detection Limits shown are MDL

TABLE 4-1
SUMMARY OF DECTECTED EMERGING CONTAMINANTS IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				MW-14S
Sample ID				MW-14S 10-11
Matrix				Soil
Depth Interval (ft)				10.0-11.0
Date Sampled				04/16/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	
Semivolatile Organic Compounds				
1,4-Dioxane	MG/KG	0.1	130	0.063 U
Per- and Polyfluoroalkyl Substances				
Perfluorobutanesulfonic acid (PFBS)	UG/KG	-	-	0.032 U
Perfluorobutanoic acid (PFBA)	UG/KG	-	-	0.25 U
Perfluorodecane sulfonate (PFDS)	UG/KG	-	-	0.050 U
Perfluorodecanoic acid (PFDA)	UG/KG	-	-	0.028 U
Perfluorododecanoic acid (PFDoA)	UG/KG	-	-	0.085 U
Perfluoroheptanesulfonic acid (PFHpS)	UG/KG	-	-	0.045 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	-	-	0.037 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	-	-	0.25 U
Perfluorohexanoic acid (PFHxA)	UG/KG	-	-	0.053 U
Perfluorononanoic acid (PFNA)	UG/KG	-	-	0.046 U
Perfluorooctane sulfonamide (PFOSA)	UG/KG	-	-	0.10 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	3.7	440	0.25 U
Perfluorooctanoic acid (PFOA)	UG/KG	1.1	500	0.11 U
Perfluoropentanoic acid (PFPeA)	UG/KG	-	-	0.14 J
Perfluorotetradecanoic acid (PFTeA)	UG/KG	-	-	0.069 U
Perfluorotridecanoic acid (PFTriA)	UG/KG	-	-	0.065 U
Perfluoroundecanoic acid (PFUnA)	UG/KG	-	-	0.046 U
1H,1H,2H,2H-Perfluorooctanesulfonic acid	UG/KG	-	-	0.19 U
1H,1H,2H,2H-Perfluorodecanesulfonic acid	UG/KG	-	-	0.32 U
N-Ethyl perfluorooctanesulfonamidoacet	UG/KG	-	-	0.47 U
N-Methyl perfluorooctanesulfonamidoacet	UG/KG	-	-	0.50 U

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

U - Not detected. J - The reported concentration is an estimated value.

NA - Not analyzed.

Detection Limits shown are MDL

TABLE 4-2
SUMMARY OF DECTECTED EMERGING CONTAMINANTS IN GROUNDWATER SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 5S	MN- 5S	MN- 6S	MW-13
Sample ID			FD-20210204-1	MN- 5S	MN- 6S	MW-13
Matrix			Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-
Date Sampled			02/04/21	02/04/21	02/04/21	02/04/21
Parameter	**Units**	**Criteria***	Field Duplicate (1-1)			
Semivolatile Organic Compounds						
1,4-Dioxane	UG/L	0.35	0.90 J	0.91 J	0.10 UJ	0.57 J
Per- and Polyfluoroalkyl Substances						
Perfluorobutanesulfonic acid (PFBS)	NG/L	-	0.39 J	0.43 J	1.4 J	1.3 J
Perfluorobutanoic acid (PFBA)	NG/L	-	12	12	15	16
Perfluorodecane sulfonate (PFDS)	NG/L	-	0.29 U	0.30 U	0.31 U	0.30 U
Perfluorodecanoic acid (PFDA)	NG/L	-	0.28 U	0.29 U	0.30 U	0.29 U
Perfluorododecanoic acid (PFDoA)	NG/L	-	0.50 U	0.51 U	0.53 U	0.51 U
Perfluoroheptanesulfonic acid (PFHpS)	NG/L	-	0.17 U	0.18 U	0.18 U	0.18 U
Perfluoroheptanoic acid (PFHpA)	NG/L	-	0.50 J	0.55 J	2.8	2.2
Perfluorohexanesulfonic acid (PFHxS)	NG/L	-	0.52 U	0.53 U	1.1 J	0.53 U
Perfluorohexanoic acid (PFHxA)	NG/L	-	3.0	3.1	3.4	11
Perfluorononanoic acid (PFNA)	NG/L	-	0.25 U	0.25 U	0.26 U	0.25 U
Perfluorooctane sulfonamide (PFOSA)	NG/L	-	0.90 U	0.91 U	0.95 U	0.91 U
Perfluorooctanesulfonic acid (PFOS)	NG/L	2.7	0.50 U	0.50 U	2.7 J	0.85 J
Perfluorooctanoic acid (PFOA)	NG/L	6.7	0.78 U	0.79 U	6.4	1.3 J
Perfluoropentanoic acid (PFPeA)	NG/L	-	5.9	6.1	3.8	18
Perfluorotetradecanoic acid (PFTeA)	NG/L	-	0.67 U	0.68 U	0.71 U	0.67 U
Perfluorotridecanoic acid (PFTriA)	NG/L	-	1.2 U	1.2 U	1.3 U	1.2 U
Perfluoroundecanoic acid (PFUnA)	NG/L	-	1.0 U	1.0 U	1.1 U	1.0 U
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2)	NG/L	-	2.3 U	2.3 U	2.4 U	2.3 U
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2)	NG/L	-	0.42 U	0.43 U	0.45 U	0.42 U
N-Ethyl perfluorooctanesulfonamidoacetic acid	NG/L	-	1.2 U	1.2 U	1.3 U	1.2 U
N-Methyl perfluorooctanesulfonamidoacetic acid	NG/L	-	1.1 U	1.1 U	1.2 U	1.1 U

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

U - Not detected. J - The reported concentration is an estimated value.

Detection Limits shown are MDL

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[MATRIX] = 'WG' AND ([PRCCODE] = 'PFC' OR [PARNAME] = '1,4-Dioxane

TABLE 4-3
SUMMAY OF DETECTED VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				0N 20E	10N 30E	10N 36E	20N 10E	20N 50E
Sample ID				0N 20E SOIL	10N 30E SOIL	10N36E 7	20N 10E SOIL	20N 50E SOIL
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				0.5-1.5	0.7-2.1	7.0-7.0	0.5-1.8	0.5-2.1
Date Sampled				01/24/20	01/23/20	02/11/20	01/24/20	01/23/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,2-Dichloroethene (cis)	MG/KG	500	0.25				0.011	
1,2-Dichloroethene (trans)	MG/KG	500	0.19				0.0011 J	
Acetone	MG/KG	500	0.05			0.0064 J		
Chloroform	MG/KG	350	0.37					
Isopropylbenzene (Cumene)	MG/KG	-	2.3 CP-51					
Methyl acetate	MG/KG	-	-					
Methylcyclohexane	MG/KG	-	-					
Methylene chloride	MG/KG	500	0.05					
Tetrachloroethene	MG/KG	150	1.3	48 D	820	0.063	0.074	94
Trichloroethene	MG/KG	200	0.47	0.57			0.0039 J	2.8
Total Chlorinated VOCs	MG/KG	-	-	48.57	820	0.063	0.09	96.8
Total Volatile Organic Compounds	MG/KG	-	-	48.57	820	0.0694	0.09	96.8

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-3
SUMMAY OF DETECTED VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				25N 50E	30N 20E	30N 40E	40N 10E	40N 30E
Sample ID				25N50E 8.5	30N 20E SOIL	30N 50E SOIL	40N 10E	40N 30E SOIL
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				8.5-8.5	0.5-1.8	0.5-1.3	0.5-1.5	0.5-2.3
Date Sampled				02/12/20	01/24/20	01/23/20	01/24/20	01/24/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,2-Dichloroethene (cis)	MG/KG	500	0.25	0.014	0.25		0.034 J	0.27
1,2-Dichloroethene (trans)	MG/KG	500	0.19		0.10 J			
Acetone	MG/KG	500	0.05					
Chloroform	MG/KG	350	0.37	0.00051 J				
Isopropylbenzene (Cumene)	MG/KG	-	2.3 CP-51					
Methyl acetate	MG/KG	-	-					0.38 J
Methylcyclohexane	MG/KG	-	-					
Methylene chloride	MG/KG	500	0.05					
Tetrachloroethene	MG/KG	150	1.3	1.2	14	180	1.9	21
Trichloroethene	MG/KG	200	0.47	0.021	0.46	5.2 J	0.10 J	0.61
Total Chlorinated VOCs	MG/KG	-	-	1.23551	14.81	185.2	2.034	21.88
Total Volatile Organic Compounds	MG/KG	-	-	1.23551	14.81	185.2	2.034	22.26

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-3
SUMMAY OF DETECTED VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				40N 40E	40N 40E	40N 50E	40N 50E	42N 20E
Sample ID				40N 40E	40N40E 13	40N 50E SOIL	40N50E 12	42N 20E 11.5-12.3
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				0.7-2.1	13.0-13.0	0.5-2.2	12.0-12.0	11.5-12.3
Date Sampled				01/24/20	02/11/20	01/23/20	02/11/20	02/12/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,2-Dichloroethene (cis)	MG/KG	500	0.25	1.6 J		4.9 J		
1,2-Dichloroethene (trans)	MG/KG	500	0.19					
Acetone	MG/KG	500	0.05		0.0085 J			
Chloroform	MG/KG	350	0.37					
Isopropylbenzene (Cumene)	MG/KG	-	2.3 CP-51					
Methyl acetate	MG/KG	-	-					
Methylcyclohexane	MG/KG	-	-					
Methylene chloride	MG/KG	500	0.05					
Tetrachloroethene	MG/KG	150	1.3	450 D	0.16	640	0.2	0.077
Trichloroethene	MG/KG	200	0.47	4.3		11 J	0.0018 J	
Total Chlorinated VOCs	MG/KG	-	-	455.9	0.16	655.9	0.2018	0.077
Total Volatile Organic Compounds	MG/KG	-	-	455.9	0.1685	655.9	0.2018	0.077

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-3
SUMMAY OF DETECTED VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				50N 50E	60N 10E	60N 40E	60N 40E	60N 40E
Sample ID				50N 50E SOIL	60N 10E SOIL	60N 40E SOIL	60N40E 8.5-9	60N40E 10-11
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				0.5-1.8	0.5-2.0	0.5-1.8	8.5-9.0	10.0-11.0
Date Sampled				01/24/20	01/24/20	01/24/20	02/13/20	02/13/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,2-Dichloroethene (cis)	MG/KG	500	0.25	0.54	0.43	2.1		0.16 J
1,2-Dichloroethene (trans)	MG/KG	500	0.19		0.034 J			
Acetone	MG/KG	500	0.05					
Chloroform	MG/KG	350	0.37					
Isopropylbenzene (Cumene)	MG/KG	-	2.3 CP-51					0.98
Methyl acetate	MG/KG	-	-	0.64 J	0.24 J			
Methylcyclohexane	MG/KG	-	-					
Methylene chloride	MG/KG	500	0.05					
Tetrachloroethene	MG/KG	150	1.3	79 D	4.3	100	11	24
Trichloroethene	MG/KG	200	0.47	1.2	0.078 J	2.0		1.1
Total Chlorinated VOCs	MG/KG	-	-	80.74	4.842	104.1	11	25.26
Total Volatile Organic Compounds	MG/KG	-	-	81.38	5.082	104.1	11	26.24

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-3
SUMMAY OF DETECTED VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				60N 50E	70N 20E	70N 20E	70N 20E	70N 40E
Sample ID				60N 50E SOIL	70N 20E	70N 20E	70N20E 12-12.5	70N 40E SOIL
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				0.5-2.2	0.5-1.8	0.5-1.8	12.0-12.5	0.7-1.3
Date Sampled				01/24/20	01/24/20	01/24/20	02/12/20	01/23/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,2-Dichloroethene (cis)	MG/KG	500	0.25	0.25	2.8	1.7	0.0014 J	0.094 J
1,2-Dichloroethene (trans)	MG/KG	500	0.19		0.42	0.28		
Acetone	MG/KG	500	0.05					
Chloroform	MG/KG	350	0.37					
Isopropylbenzene (Cumene)	MG/KG	-	2.3 CP-51					
Methyl acetate	MG/KG	-	-	0.18 J	0.91 J	0.60		
Methylcyclohexane	MG/KG	-	-					
Methylene chloride	MG/KG	500	0.05					
Tetrachloroethene	MG/KG	150	1.3	5.2	15	15 D	1.4	9.6
Trichloroethene	MG/KG	200	0.47	0.21	0.52	0.35	0.009	
Total Chlorinated VOCs	MG/KG	-	-	5.66	18.74	17.33	1.4104	9.694
Total Volatile Organic Compounds	MG/KG	-	-	5.84	19.65	17.93	1.4104	9.694

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-3
SUMMAY OF DETECTED VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				70N 50E	80N 30E	80N 35E	80N 35E	80N 35E
Sample ID				70N 50E	80N 30E SOIL	80N35E 4-5	FD-200212-2	80N35E 9
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				0.5-1.8	0.7-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled				01/24/20	01/23/20	02/12/20	02/12/20	02/12/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**				Field Duplicate (1-1)	
Volatile Organic Compounds								
1,2-Dichloroethene (cis)	MG/KG	500	0.25	0.12	0.53	0.014	0.015	
1,2-Dichloroethene (trans)	MG/KG	500	0.19					
Acetone	MG/KG	500	0.05			0.0068 J		
Chloroform	MG/KG	350	0.37			0.00097 J	0.0011 J	
Isopropylbenzene (Cumene)	MG/KG	-	2.3 CP-51					
Methyl acetate	MG/KG	-	-					
Methylcyclohexane	MG/KG	-	-					
Methylene chloride	MG/KG	500	0.05					
Tetrachloroethene	MG/KG	150	1.3	8.4	48 D	200	190	170
Trichloroethene	MG/KG	200	0.47	0.14	0.75	0.021	0.021	
Total Chlorinated VOCs	MG/KG	-	-	8.66	49.28	200.03597	190.0371	170
Total Volatile Organic Compounds	MG/KG	-	-	8.66	49.28	200.04277	190.0371	170

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-3
SUMMAY OF DETECTED VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				80N 35E	80N 40E	90N 10E	90N 10E	90N 50E
Sample ID				80N35E 11-12	80N 40E SOIL	90N 10E SOIL	90N16E 6-6.5	90N 50E SOIL
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				11.0-12.0	0.7-1.3	0.5-1.3	6.0-6.5	0.5-1.8
Date Sampled				02/12/20	01/23/20	01/24/20	02/13/20	01/24/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,2-Dichloroethene (cis)	MG/KG	500	0.25			0.051 J		0.85
1,2-Dichloroethene (trans)	MG/KG	500	0.19					
Acetone	MG/KG	500	0.05					
Chloroform	MG/KG	350	0.37					
Isopropylbenzene (Cumene)	MG/KG	-	2.3 CP-51					
Methyl acetate	MG/KG	-	-					
Methylcyclohexane	MG/KG	-	-					
Methylene chloride	MG/KG	500	0.05					
Tetrachloroethene	MG/KG	150	1.3	7,400	0.024	5.2	0.16	37 D
Trichloroethene	MG/KG	200	0.47			0.12		0.97
Total Chlorinated VOCs	MG/KG	-	-	7,400	0.024	5.371	0.16	38.82
Total Volatile Organic Compounds	MG/KG	-	-	7,400	0.024	5.371	0.16	38.82

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-3
SUMMAY OF DETECTED VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				90N 50E	100N 20E	100N 35E	100N 40E	110N 20E
Sample ID				90N50E 5	100N 20E SOIL	100N35E 7-7.5	100N 40E SOIL	110N20E 10-10.5
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				5.0-5.0	0.5-2.3	7.0-7.5	0.7-1.2	10.0-10.5
Date Sampled				02/12/20	01/24/20	02/13/20	01/23/20	02/13/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,2-Dichloroethene (cis)	MG/KG	500	0.25					0.012
1,2-Dichloroethene (trans)	MG/KG	500	0.19					
Acetone	MG/KG	500	0.05					
Chloroform	MG/KG	350	0.37					
Isopropylbenzene (Cumene)	MG/KG	-	2.3 CP-51					
Methyl acetate	MG/KG	-	-					
Methylcyclohexane	MG/KG	-	-		0.056 J			
Methylene chloride	MG/KG	500	0.05	0.0032 J				
Tetrachloroethene	MG/KG	150	1.3	0.012	6.0	0.047	0.031	0.44
Trichloroethene	MG/KG	200	0.47		0.047 J			0.0095
Total Chlorinated VOCs	MG/KG	-	-	0.0152	6.047	0.047	0.031	0.4615
Total Volatile Organic Compounds	MG/KG	-	-	0.0152	6.103	0.047	0.031	0.4615

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

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Only Detected Results Reported.

TABLE 4-3
SUMMAY OF DETECTED VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				110N 30E	110N 50E	MW-13I	MW-13OB	MW-13S
Sample ID				110N 30E SOIL	110N 50E SOIL	MW-13I 7-7.5	MW-13OB 7.5-8.5	MW-13S 7.5-8.5
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				0.5-1.9	0.5-2.2	7.0-7.5	7.5-8.5	7.5-8.5
Date Sampled				01/24/20	01/24/20	04/20/20	04/15/20	04/20/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Volatile Organic Compounds								
1,2-Dichloroethene (cis)	MG/KG	500	0.25		0.046 J			
1,2-Dichloroethene (trans)	MG/KG	500	0.19					
Acetone	MG/KG	500	0.05					
Chloroform	MG/KG	350	0.37					
Isopropylbenzene (Cumene)	MG/KG	-	2.3 CP-51					
Methyl acetate	MG/KG	-	-	0.34 J				
Methylcyclohexane	MG/KG	-	-					
Methylene chloride	MG/KG	500	0.05					
Tetrachloroethene	MG/KG	150	1.3	9.7	3.9	31	0.48	0.89
Trichloroethene	MG/KG	200	0.47	0.13	0.093 J	0.46 J		
Total Chlorinated VOCs	MG/KG	-	-	9.83	4.039	31.46	0.48	0.89
Total Volatile Organic Compounds	MG/KG	-	-	10.17	4.039	31.46	0.48	0.89

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-3
SUMMAY OF DETECTED VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				MW-14I	MW-14S	MW-14S
Sample ID				MW-14I 8-8.5	MW-14S 8.5-9.0	MW-14S 10-11
Matrix				Soil	Soil	Soil
Depth Interval (ft)				8.0-8.5	8.5-9.0	10.0-11.0
Date Sampled				04/16/20	04/16/20	04/16/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**			
Volatile Organic Compounds						
1,2-Dichloroethene (cis)	MG/KG	500	0.25			
1,2-Dichloroethene (trans)	MG/KG	500	0.19			
Acetone	MG/KG	500	0.05			
Chloroform	MG/KG	350	0.37			
Isopropylbenzene (Cumene)	MG/KG	-	2.3 CP-51			
Methyl acetate	MG/KG	-	-	0.37 J		
Methylcyclohexane	MG/KG	-	-			
Methylene chloride	MG/KG	500	0.05			
Tetrachloroethene	MG/KG	150	1.3	1.8	2,000	90
Trichloroethene	MG/KG	200	0.47			
Total Chlorinated VOCs	MG/KG	-	-	1.8	2,000	90
Total Volatile Organic Compounds	MG/KG	-	-	2.17	2,000	90

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

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Only Detected Results Reported.

TABLE 4-4
SUMMAY OF DETECTED NON-VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				20N 10E	40N 30E	60N 10E	60N 40E	80N 35E
Sample ID				20N 10E SOIL	40N 30E SOIL	60N 10E SOIL	60N 40E SOIL	80N35E 4-5
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				0.5-1.8	0.5-2.3	0.5-2.0	0.5-1.8	4.0-5.0
Date Sampled				01/24/20	01/24/20	01/24/20	01/24/20	02/12/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Semivolatile Organic Compounds								
1,1-Biphenyl	MG/KG	-	-	0.60 J	NA	NA		
2-Methylnaphthalene	MG/KG	-	36.4 CP-51	2.0 J	NA	NA		
Acenaphthene	MG/KG	500	98	5.7	NA	NA		8.4 J
Acenaphthylene	MG/KG	500	107	1.1 J	NA	NA		13 J
Anthracene	MG/KG	500	1000	19	NA	NA		34 J
Benzo(a)anthracene	MG/KG	5.6	1	39	NA	NA		140 J
Benzo(a)pyrene	MG/KG	1	22	33	NA	NA		140
Benzo(b)fluoranthene	MG/KG	5.6	1.7	37	NA	NA	0.11 J	160
Benzo(g,h,i)perylene	MG/KG	500	1000	22	NA	NA	0.084 J	97
Benzo(k)fluoranthene	MG/KG	56	1.7	18	NA	NA		80
bis(2-Ethylhexyl)phthalate	MG/KG	-	435 CP-51		NA	NA	0.13 J	
Butylbenzylphthalate	MG/KG	-	122 CP-51		NA	NA	0.14 J	
Carbazole	MG/KG	-	-	10	NA	NA		12 J
Chrysene	MG/KG	56	1	37	NA	NA		160
Dibenz(a,h)anthracene	MG/KG	0.56	1000	7.3	NA	NA		32 J
Dibenzofuran	MG/KG	350	210	4.2	NA	NA		
Di-n-butylphthalate	MG/KG	-	8.1 CP-51		NA	NA	0.058 J	
Fluoranthene	MG/KG	500	1000	80	NA	NA	0.040 J	260
Fluorene	MG/KG	500	386	7.2	NA	NA		11 J
Indeno(1,2,3-cd)pyrene	MG/KG	5.6	8.2	21	NA	NA	0.066 J	85
Naphthalene	MG/KG	500	12	3.4 J	NA	NA		
Phenanthrene	MG/KG	500	1000	74	NA	NA		150 J
Pyrene	MG/KG	500	1000	68	NA	NA	0.039 J	260
Total Polynuclear Aromatic Hydrocarbons	MG/KG	-	-	474.7	NA	NA	0.339	1,630.4

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

NA - Not analyzed.

Only Detected Results Reported.

TABLE 4-4
SUMMAY OF DETECTED NON-VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				20N 10E	40N 30E	60N 10E	60N 40E	80N 35E
Sample ID				20N 10E SOIL	40N 30E SOIL	60N 10E SOIL	60N 40E SOIL	80N35E 4-5
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				0.5-1.8	0.5-2.3	0.5-2.0	0.5-1.8	4.0-5.0
Date Sampled				01/24/20	01/24/20	01/24/20	01/24/20	02/12/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Pesticide Organic Compounds								
4,4'-DDT	MG/KG	47	136		NA		NA	0.036 J
alpha-BHC	MG/KG	3.4	0.02		NA		NA	0.0078 J
delta-BHC	MG/KG	500	0.25		NA	0.0074 J	NA	
Endrin	MG/KG	89	0.06	0.011 J	NA		NA	
Endrin aldehyde	MG/KG	-	-	0.12 J	NA		NA	
Endrin ketone	MG/KG	-	-		NA		NA	0.042 J
Methoxychlor	MG/KG	-	900 CP-51		NA		NA	
Metals								
Aluminum	MG/KG	-	-	NA	8,320	NA	5,590	8,150
Antimony	MG/KG	-	-	NA	1.6 J	NA	1.1 J	1.3 J
Arsenic	MG/KG	16	16	NA	5.2	NA	4.2	8.8
Barium	MG/KG	400	820	NA	82.7	NA	67.2 J	86.8
Beryllium	MG/KG	590	47	NA	0.42	NA	0.27	0.43
Cadmium	MG/KG	9.3	7.5	NA	0.23	NA	0.18 J	0.44
Calcium	MG/KG	-	-	NA	64,700	NA	37,600 J	20,300
Chromium	MG/KG	1500	NS	NA	13.6	NA	7.8	12.2
Cobalt	MG/KG	-	-	NA	4.8	NA	3.6	4
Copper	MG/KG	270	1720	NA	23.3	NA	37.1 J	31.8
Iron	MG/KG	-	-	NA	13,000	NA	9,330 J	13,000
Lead	MG/KG	1000	450	NA	91.7	NA	120 J	133
Magnesium	MG/KG	-	-	NA	17,500	NA	12,300	6,670
Manganese	MG/KG	10000	2000	NA	395	NA	350 J	324
Mercury	MG/KG	2.8	0.73	NA	0.15	NA	0.37	0.49
Nickel	MG/KG	310	130	NA	14.2	NA	10.5	11.1

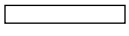
Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.



Concentration Exceeds Criteria (1)



Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

NA - Not analyzed.

Only Detected Results Reported.

TABLE 4-4
SUMMAY OF DETECTED NON-VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				20N 10E	40N 30E	60N 10E	60N 40E	80N 35E
Sample ID				20N 10E SOIL	40N 30E SOIL	60N 10E SOIL	60N 40E SOIL	80N35E 4-5
Matrix				Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)				0.5-1.8	0.5-2.3	0.5-2.0	0.5-1.8	4.0-5.0
Date Sampled				01/24/20	01/24/20	01/24/20	01/24/20	02/12/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**					
Metals								
Potassium	MG/KG	-	-	NA	1,910	NA	1,510	1,690
Selenium	MG/KG	1500	4	NA		NA		
Silver	MG/KG	1500	8.3	NA		NA	0.23 J	
Sodium	MG/KG	-	-	NA	283	NA	360 J	257
Thallium	MG/KG	-	-	NA		NA		0.58 J
Vanadium	MG/KG	-	-	NA	18.6	NA	11.6	17.3
Zinc	MG/KG	10000	2480	NA	72.6	NA	78.0 J	167

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

NA - Not analyzed.

Only Detected Results Reported.

TABLE 4-4
SUMMAY OF DETECTED NON-VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				80N 35E	MW-14S
Sample ID				FD-200212-2	MW-14S 10-11
Matrix				Soil	Soil
Depth Interval (ft)				4.0-5.0	10.0-11.0
Date Sampled				02/12/20	04/16/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	Field Duplicate (1-1)	
Semivolatile Organic Compounds					
1,1-Biphenyl	MG/KG	-	-		0.051 J
2-Methylnaphthalene	MG/KG	-	36.4 CP-51		0.12 J
Acenaphthene	MG/KG	500	98	20 J	0.14 J
Acenaphthylene	MG/KG	500	107	17 J	0.065 J
Anthracene	MG/KG	500	1000	70 J	0.5
Benzo(a)anthracene	MG/KG	5.6	1	220 J	1.3
Benzo(a)pyrene	MG/KG	1	22	190	0.89
Benzo(b)fluoranthene	MG/KG	5.6	1.7	240	1.1
Benzo(g,h,i)perylene	MG/KG	500	1000	120	0.56
Benzo(k)fluoranthene	MG/KG	56	1.7	84	0.6
bis(2-Ethylhexyl)phthalate	MG/KG	-	435 CP-51		2.2
Butylbenzylphthalate	MG/KG	-	122 CP-51		0.43
Carbazole	MG/KG	-	-	19 J	
Chrysene	MG/KG	56	1	210	1.2
Dibenz(a,h)anthracene	MG/KG	0.56	1000	38	0.23
Dibenzofuran	MG/KG	350	210	14 J	0.19
Di-n-butylphthalate	MG/KG	-	8.1 CP-51		0.14 J
Fluoranthene	MG/KG	500	1000	370	2.7
Fluorene	MG/KG	500	386	32 J	0.26
Indeno(1,2,3-cd)pyrene	MG/KG	5.6	8.2	110	0.51
Naphthalene	MG/KG	500	12	7.7 J	
Phenanthrene	MG/KG	500	1000	300 J	2.8
Pyrene	MG/KG	500	1000	390	2.3
Total Polynuclear Aromatic Hydrocarbons	MG/KG	-	-	2,418.7	15.275

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

NA - Not analyzed.

Only Detected Results Reported.

TABLE 4-4
SUMMAY OF DETECTED NON-VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				80N 35E	MW-14S
Sample ID				FD-200212-2	MW-14S 10-11
Matrix				Soil	Soil
Depth Interval (ft)				4.0-5.0	10.0-11.0
Date Sampled				02/12/20	04/16/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	Field Duplicate (1-1)	
Pesticide Organic Compounds					
4,4'-DDT	MG/KG	47	136	0.069 J	0.0071 J
alpha-BHC	MG/KG	3.4	0.02	0.016 J	
delta-BHC	MG/KG	500	0.25		
Endrin	MG/KG	89	0.06		
Endrin aldehyde	MG/KG	-	-		0.027
Endrin ketone	MG/KG	-	-	0.11 J	0.013 JN
Methoxychlor	MG/KG	-	900 CP-51		0.017 J
Metals					
Aluminum	MG/KG	-	-	7,190	3,140
Antimony	MG/KG	-	-	1.1 J	
Arsenic	MG/KG	16	16	8.7	1.6 J
Barium	MG/KG	400	820	75.2	16.4
Beryllium	MG/KG	590	47	0.43	0.14 J
Cadmium	MG/KG	9.3	7.5	0.48	0.039 J
Calcium	MG/KG	-	-	20,900	30,800
Chromium	MG/KG	1500	NS	11.4	5.0
Cobalt	MG/KG	-	-	3.8	2.5
Copper	MG/KG	270	1720	31	4.6
Iron	MG/KG	-	-	11,500	6,870
Lead	MG/KG	1000	450	143	3.0
Magnesium	MG/KG	-	-	6,390	7,260
Manganese	MG/KG	10000	2000	265	295
Mercury	MG/KG	2.8	0.73	0.43	
Nickel	MG/KG	310	130	9.7	5.2 J

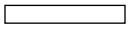
Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.



Concentration Exceeds Criteria (1)



Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

NA - Not analyzed.

Only Detected Results Reported.

TABLE 4-4
SUMMAY OF DETECTED NON-VOCs IN SOIL SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID				80N 35E	MW-14S
Sample ID				FD-200212-2	MW-14S 10-11
Matrix				Soil	Soil
Depth Interval (ft)				4.0-5.0	10.0-11.0
Date Sampled				02/12/20	04/16/20
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	Field Duplicate (1-1)	
Metals					
Potassium	MG/KG	-	-	1,330	934
Selenium	MG/KG	1500	4	0.68 J	
Silver	MG/KG	1500	8.3	0.21 J	
Sodium	MG/KG	-	-	208	183
Thallium	MG/KG	-	-	0.87 J	
Vanadium	MG/KG	-	-	15.6	9.8
Zinc	MG/KG	10000	2480	178	12.3

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Commercial, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria (1)

Concentration Exceeds Criteria (2)

Empty cell - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

NA - Not analyzed.

Only Detected Results Reported.

TABLE 4-5
SUMMARY OF DETECTED VOCs IN OVERBURDEN GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 2S	MN- 3S	MN- 6OB	MW- 1	MW- 2
Sample ID			MN- 2S	MN- 3S	MN- 6OB	MW- 1	MW- 2
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/10/21	02/10/21	02/04/21	02/09/21	02/03/21
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,2-Dichloroethene (cis)	UG/L	5					8.5
1,2-Dichloroethene (trans)	UG/L	5					
Chloroform	UG/L	7				0.72 J	
Methylene chloride	UG/L	5					
Tetrachloroethene	UG/L	5				0.84 J	17
Trichloroethene	UG/L	5					11
Total Chlorinated VOCs	UG/L	-	ND	ND	ND	1.56	36.5
Total Volatile Organic Compounds	UG/L	-	ND	ND	ND	1.56	36.5

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: Overburden Wells
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([LOCID] LIKE "*OB' OR [LOCID] = 'MN- 2S' OR [LOCID] = 'MN- 3S' OR [LOCID] = 'MW- 1' OR [LOCID] = 'MW- 2' OR [LOCID] = 'MW- 3' OR [LOCID] = 'MW- 4' OR [LOCID] = 'MW- 5' OR [LOCID] = 'MW- 6' OR [LOCID] = 'MW- 7' OR [LOCID] = 'MW- 8' OR [LOCID] = 'MW- 9' OR [LOCID] = 'MW-10' OR [LOCID] = 'MW-101') AND [LOGDATE] >= #1/23/2020# AND [MATRIX] = 'WG' AND

TABLE 4-5
SUMMARY OF DETECTED VOCs IN OVERBURDEN GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 3	MW- 6	MW-101	MW-13OB	MW-15OB
Sample ID			MW- 3	MW- 6	MW-101	MW-130B	MW-150B
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/05/21	02/05/21	02/09/21	02/11/21	02/11/21
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,2-Dichloroethene (cis)	UG/L	5		41	100	6,500	
1,2-Dichloroethene (trans)	UG/L	5		0.98 J			
Chloroform	UG/L	7					
Methylene chloride	UG/L	5	3.5 J				
Tetrachloroethene	UG/L	5		80	1,300	56,000	1,400
Trichloroethene	UG/L	5		11	51	9,400	36
Total Chlorinated VOCs	UG/L	-	3.5	132.98	1,451	71,900	1,436
Total Volatile Organic Compounds	UG/L	-	3.5	132.98	1,451	71,900	1,436

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: Overburden Wells
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([LOCID] LIKE "*OB' OR [LOCID] = 'MN- 2S' OR [LOCID] = 'MN- 3S' OR [LOCID] = 'MW- 1' OR [LOCID] = 'MW- 2' OR [LOCID] = 'MW- 3' OR [LOCID] = 'MW- 4' OR [LOCID] = 'MW- 5' OR [LOCID] = 'MW- 6' OR [LOCID] = 'MW- 7' OR [LOCID] = 'MW- 8' OR [LOCID] = 'MW- 9' OR [LOCID] = 'MW-10' OR [LOCID] = 'MW-101') AND [LOGDATE] >= #1/23/2020# AND [MATRIX] = 'WG' AND

TABLE 4-6
SUMMARY OF DETECTED VOCs IN SHALLOW BEDROCK GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			BMW-102S	BMW-103S	BMW-104S	MN- 1S	MN- 2I
Sample ID			BMW-102S	BMW-103S	BMW-104S	MN- 1S	MN- 2I
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/08/21	02/08/21	02/03/21	02/10/21	02/10/21
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1-Dichloroethane	UG/L	5					
1,2-Dichloroethene (cis)	UG/L	5	330	240	8,900		5.2
Benzene	UG/L	1		3.4 J			
Cyclohexane	UG/L	-		2.0 J			
Methyl tert-butyl ether	UG/L	10					
Methylene chloride	UG/L	5			1,100 J		
Tetrachloroethene	UG/L	5	3,400		82,000		
Trichloroethene	UG/L	5	470		20,000		
Vinyl chloride	UG/L	2		7.3			
Total Chlorinated VOCs	UG/L	-	4,200	247.3	112,000	ND	5.2
Total Volatile Organic Compounds	UG/L	-	4,200	252.7	112,000	ND	5.2

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: Shallow Wells
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[MATRIX] = 'WG' AND [LOGDATE] >= #1/23/2020# AND [PRCCODE] = 'VOA' AND ([LOCID] LIKE '*S' OR [LOCID] = 'MN- 2I' OR [LOCID] = 'MN- 3I' OR [LOCID] = 'MW- 4R' OR [LOCID] = 'MW-11' OR [LOCID] = 'MW-12' OR [LOCID] = 'MW-13' OR [LOCID] = 'MW-14' OR [LOCID] = 'MW-15') AND NOT ([LOCID] = 'MN- 2S' OR [LOCID] = 'MN- 3S')

TABLE 4-6
SUMMARY OF DETECTED VOCs IN SHALLOW BEDROCK GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 3I	MN- 4S	MN- 5S	MN- 5S	MN- 6S
Sample ID			MN- 3I	MN- 4S	FD-20210204-1	MN- 5S	MN- 6S
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/10/21	02/10/21	02/04/21	02/04/21	02/04/21
Parameter	Units	Criteria*			Field Duplicate (1-1)		
Volatile Organic Compounds							
1,1-Dichloroethane	UG/L	5		2.7	4.3	4.3	
1,2-Dichloroethene (cis)	UG/L	5	3.3	8.3	17	16	
Benzene	UG/L	1					
Cyclohexane	UG/L	-					
Methyl tert-butyl ether	UG/L	10		2.4	2.3	2.1	
Methylene chloride	UG/L	5					
Tetrachloroethene	UG/L	5			1.1	1.1	
Trichloroethene	UG/L	5			0.65 J	0.70 J	
Vinyl chloride	UG/L	2	2.7	5.9	8.1	8.2	
Total Chlorinated VOCs	UG/L	-	6	16.9	31.15	30.3	ND
Total Volatile Organic Compounds	UG/L	-	6	19.3	33.45	32.4	ND

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-6
SUMMARY OF DETECTED VOCs IN SHALLOW BEDROCK GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN-11S	MN-11S	MN-12S	MN-12S	MW- 4R
Sample ID			FD - 20210203-2	MN-11S	FD-20210203-1	MN-12S	MW- 4R
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/03/21	02/03/21	02/03/21	02/03/21	02/05/21
Parameter	**Units**	**Criteria***	Field Duplicate (1-1)		Field Duplicate (1-1)		
Volatile Organic Compounds							
1,1-Dichloroethane	UG/L	5					
1,2-Dichloroethene (cis)	UG/L	5					
Benzene	UG/L	1					
Cyclohexane	UG/L	-					
Methyl tert-butyl ether	UG/L	10				0.16 J	
Methylene chloride	UG/L	5					3.1 J
Tetrachloroethene	UG/L	5					
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2					
Total Chlorinated VOCs	UG/L	-	ND	ND	ND	ND	3.1
Total Volatile Organic Compounds	UG/L	-	ND	ND	ND	0.16	3.1

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-6
SUMMARY OF DETECTED VOCs IN SHALLOW BEDROCK GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-11	MW-12	MW-13	MW-13S	MW-14
Sample ID			MW-11	MW-12	MW-13	MW-13S	MW-14
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/03/21	02/09/21	02/04/21	02/11/21	02/08/21
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1-Dichloroethane	UG/L	5					2.2
1,2-Dichloroethene (cis)	UG/L	5	84	14	12	520	61
Benzene	UG/L	1					
Cyclohexane	UG/L	-					0.30 J
Methyl tert-butyl ether	UG/L	10	0.90 J	0.76 J	1.6 J		
Methylene chloride	UG/L	5			3.6 J		
Tetrachloroethene	UG/L	5	140	66	410	16,000	0.55 J
Trichloroethene	UG/L	5	70	18	17	900	0.99 J
Vinyl chloride	UG/L	2	5.6	2.8	9.6		45
Total Chlorinated VOCs	UG/L	-	299.6	100.8	452.2	17,420	109.74
Total Volatile Organic Compounds	UG/L	-	300.5	101.56	453.8	17,420	110.04

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: Shallow Wells
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[MATRIX] = 'WG' AND [LOGDATE] >= #1/23/2020# AND [PRCCODE] = 'VOA' AND ([LOCID] LIKE '*S' OR [LOCID] = 'MN- 2I' OR [LOCID] = 'MN- 3I' OR [LOCID] = 'MW- 4R' OR [LOCID] = 'MW-11' OR [LOCID] = 'MW-12' OR [LOCID] = 'MW-13' OR [LOCID] = 'MW-14' OR [LOCID] = 'MW-15') AND NOT ([LOCID] = 'MN- 2S' OR [LOCID] = 'MN- 3S')

TABLE 4-6
SUMMARY OF DETECTED VOCs IN SHALLOW BEDROCK GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-14S	MW-15
Sample ID			MW-14S	MW-15
Matrix			Groundwater	Groundwater
Depth Interval (ft)			-	-
Date Sampled			02/11/21	02/08/21
Parameter	**Units**	**Criteria***		
Volatile Organic Compounds				
1,1-Dichloroethane	UG/L	5		
1,2-Dichloroethene (cis)	UG/L	5	1,900	880 J
Benzene	UG/L	1		
Cyclohexane	UG/L	-		
Methyl tert-butyl ether	UG/L	10		
Methylene chloride	UG/L	5		
Tetrachloroethene	UG/L	5	14,000	27,000
Trichloroethene	UG/L	5	1,800	880 J
Vinyl chloride	UG/L	2		
Total Chlorinated VOCs	UG/L	-	17,700	28,760
Total Volatile Organic Compounds	UG/L	-	17,700	28,760

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-7
SUMMARY OF DETECTED VOCs IN INTERMEDIATE BEDROCK GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			BMW-102I	BMW-104I	MN- 1I	MN- 4I	MN- 5I
Sample ID			BMW-102I	BMW-104I	MN- 1I	MN- 4I	MN- 5I
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/08/21	02/03/21	02/10/21	02/10/21	02/10/21
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1-Dichloroethene	UG/L	5					0.54 J
1,2-Dichloroethene (cis)	UG/L	5		1,600	2.8	280	270 D
1,2-Dichloroethene (trans)	UG/L	5					1.1
Acetone	UG/L	50					
Benzene	UG/L	1			0.54 J		5.3
Carbon disulfide	UG/L	60	0.19 J			11 J	
Methyl tert-butyl ether	UG/L	10					0.22 J
Methylene chloride	UG/L	5		19 J			
Tetrachloroethene	UG/L	5	0.50 J	3,100		2,100	1.1
Trichloroethene	UG/L	5		1,300		280	0.98 J
Vinyl chloride	UG/L	2		49	8.7		26
Total Chlorinated VOCs	UG/L	-	0.5	6,068	11.5	2,660	299.72
Total Volatile Organic Compounds	UG/L	-	0.69	6,068	12.04	2,671	305.24

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: Intermediate Wells
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[MATRIX] = 'WG' AND [LOGDATE] >= #1/23/2020# AND [PRCCODE] = 'VOA' AND [LOCID] LIKE '*I' AND NOT ([LOCID] = 'MN- 2I' OR [LOCID] = 'MN- 3I')

TABLE 4-7
SUMMARY OF DETECTED VOCs IN INTERMEDIATE BEDROCK GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 6I	MN-11I	MN-12I	MW-13I	MW-14I
Sample ID			MN- 6I	MN-11I	MN-12I	MW-13I	MW-14I
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/04/21	02/03/21	02/03/21	02/11/21	02/11/21
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1-Dichloroethene	UG/L	5					
1,2-Dichloroethene (cis)	UG/L	5	1,300			600	1,200
1,2-Dichloroethene (trans)	UG/L	5					
Acetone	UG/L	50			5.3 J		
Benzene	UG/L	1					
Carbon disulfide	UG/L	60					
Methyl tert-butyl ether	UG/L	10					
Methylene chloride	UG/L	5					
Tetrachloroethene	UG/L	5	160			8,700	2,300
Trichloroethene	UG/L	5	280			730	470
Vinyl chloride	UG/L	2	27				85
Total Chlorinated VOCs	UG/L	-	1,767	ND	ND	10,030	4,055
Total Volatile Organic Compounds	UG/L	-	1,767	ND	5.3	10,030	4,055

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-8
SUMMARY OF DETECTED VOCs IN DEEP BEDROCK GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			BMW-102D	MN- 1D	MN- 2D	MN- 3D	MN- 4D
Sample ID			BMW-102D	MN- 1D	MN- 2D	MN- 3D	MN- 4D
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/08/21	02/09/21	02/09/21	02/09/21	02/10/21
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Acetone	UG/L	50	80	4.3 J			
Benzene	UG/L	1		0.58 J			
Carbon disulfide	UG/L	60	13	4.5			0.63 J
Cyclohexane	UG/L	-	11	19			
Ethylbenzene	UG/L	5	5.3	5.4			
Isopropylbenzene (Cumene)	UG/L	5		0.84 J			
Methyl ethyl ketone (2-Butanone)	UG/L	50	8.5 J				
Methylcyclohexane	UG/L	-	23	16			
Tetrachloroethene	UG/L	5	3.0				
Toluene	UG/L	5	1.8 J	4.3			
Xylene (total)	UG/L	5	22	32			
Total Chlorinated VOCs	UG/L	-	3	ND	ND	ND	ND
Total Volatile Organic Compounds	UG/L	-	167.6	86.92	ND	ND	0.63

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

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[MATRIX] = 'WG' AND [LOGDATE] >= #1/23/2020# AND [PRCCODE] = 'VOA' AND [LOCID] LIKE '*D'

TABLE 4-8
SUMMARY OF DETECTED VOCs IN DEEP BEDROCK GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 5D	MN- 6D	MN- 8D	MN- 9D	MN-11D
Sample ID			MN- 5D	MN- 6D	MN-8D	MN-9D	MN-11D
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/10/21	02/04/21	04/08/21	04/08/21	02/05/21
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Acetone	UG/L	50					
Benzene	UG/L	1					
Carbon disulfide	UG/L	60	0.81 J	1.0			0.48 J
Cyclohexane	UG/L	-					
Ethylbenzene	UG/L	5					
Isopropylbenzene (Cumene)	UG/L	5					
Methyl ethyl ketone (2-Butanone)	UG/L	50					
Methylcyclohexane	UG/L	-					
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5					
Xylene (total)	UG/L	5					
Total Chlorinated VOCs	UG/L	-	ND	ND	ND	ND	ND
Total Volatile Organic Compounds	UG/L	-	0.81	1	ND	ND	0.48

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-8
SUMMARY OF DETECTED VOCs IN DEEP BEDROCK GROUNDWATER
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN-12D
Sample ID			MN-12D
Matrix			Groundwater
Depth Interval (ft)			-
Date Sampled			02/05/21
Parameter	**Units**	**Criteria***	
Volatile Organic Compounds			
Acetone	UG/L	50	
Benzene	UG/L	1	
Carbon disulfide	UG/L	60	1.0
Cyclohexane	UG/L	-	
Ethylbenzene	UG/L	5	
Isopropylbenzene (Cumene)	UG/L	5	
Methyl ethyl ketone (2-Butanone)	UG/L	50	
Methylcyclohexane	UG/L	-	
Tetrachloroethene	UG/L	5	
Toluene	UG/L	5	
Xylene (total)	UG/L	5	
Total Chlorinated VOCs	UG/L	-	ND
Total Volatile Organic Compounds	UG/L	-	1

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-9
SUMMAY OF DETECTED NON-VOCs IN GROUNDWATER SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 5S	MN- 5S	MW-13	MW-13I	MW-13OB
Sample ID			FD-20210204-1	MN- 5S	MW-13	MW-13I	MW-130B
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			02/04/21	02/04/21	02/04/21	02/11/21	02/11/21
Parameter	**Units**	**Criteria***	Field Duplicate (1-1)				
Semivolatile Organic Compounds							
Butylbenzylphthalate	UG/L	50					4.7 J
Diethylphthalate	UG/L	50					0.80 J
Di-n-butylphthalate	UG/L	50					3.2 J
Fluoranthene	UG/L	50					0.45 J
Naphthalene	UG/L	10					3.4 J
Phenanthrene	UG/L	50					0.73 J
Total Polynuclear Aromatic Hydrocarbons	UG/L	-	ND	ND	ND	ND	4.58
Pesticide Organic Compounds							
4,4'-DDT	UG/L	0.2				0.011 J	
Endrin aldehyde	UG/L	5					0.41
Metals							
Aluminum	UG/L	-				450	
Barium	UG/L	1000	69	68	74	140	130
Calcium	UG/L	-	164,000	162,000	158,000	176,000	125,000
Chromium	UG/L	50			1.1 J	2.5 J	
Copper	UG/L	200				4.4 J	
Iron	UG/L	300	1,400	1,400	1,700	3,800	1,700
Magnesium	UG/L	35000	51,800	51,300	45,100	53,200	38,800
Manganese	UG/L	300	130	130	290	150	1,100
Nickel	UG/L	100				4 J	1.6 J
Potassium	UG/L	-	10,700	10,600	15,700	32,400	96,000
Sodium	UG/L	20000	127,000	127,000	109,000	851,000	281,000
Zinc	UG/L	2000				7.8 J	
Miscellaneous Parameters							
Cyanide	UG/L	200	6.5 J	7.8 J	5.4 J		

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

TABLE 4-9
SUMMAY OF DETECTED NON-VOCs IN GROUNDWATER SAMPLES
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-14S
Sample ID			MW-14S
Matrix			Groundwater
Depth Interval (ft)			-
Date Sampled			02/11/21
Parameter	**Units**	**Criteria***	
Semivolatile Organic Compounds			
Butylbenzylphthalate	UG/L	50	1.1 J
Diethylphthalate	UG/L	50	
Di-n-butylphthalate	UG/L	50	
Fluoranthene	UG/L	50	
Naphthalene	UG/L	10	
Phenanthrene	UG/L	50	0.73 J
Total Polynuclear Aromatic Hydrocarbons	UG/L	-	0.73
Pesticide Organic Compounds			
4,4'-DDT	UG/L	0.2	
Endrin aldehyde	UG/L	5	0.027 J
Metals			
Aluminum	UG/L	-	
Barium	UG/L	1000	120
Calcium	UG/L	-	140,000
Chromium	UG/L	50	
Copper	UG/L	200	
Iron	UG/L	300	1,800
Magnesium	UG/L	35000	45,000
Manganese	UG/L	300	260
Nickel	UG/L	100	
Potassium	UG/L	-	37,000
Sodium	UG/L	20000	576,000
Zinc	UG/L	2000	2.9 J
Miscellaneous Parameters			
Cyanide	UG/L	200	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

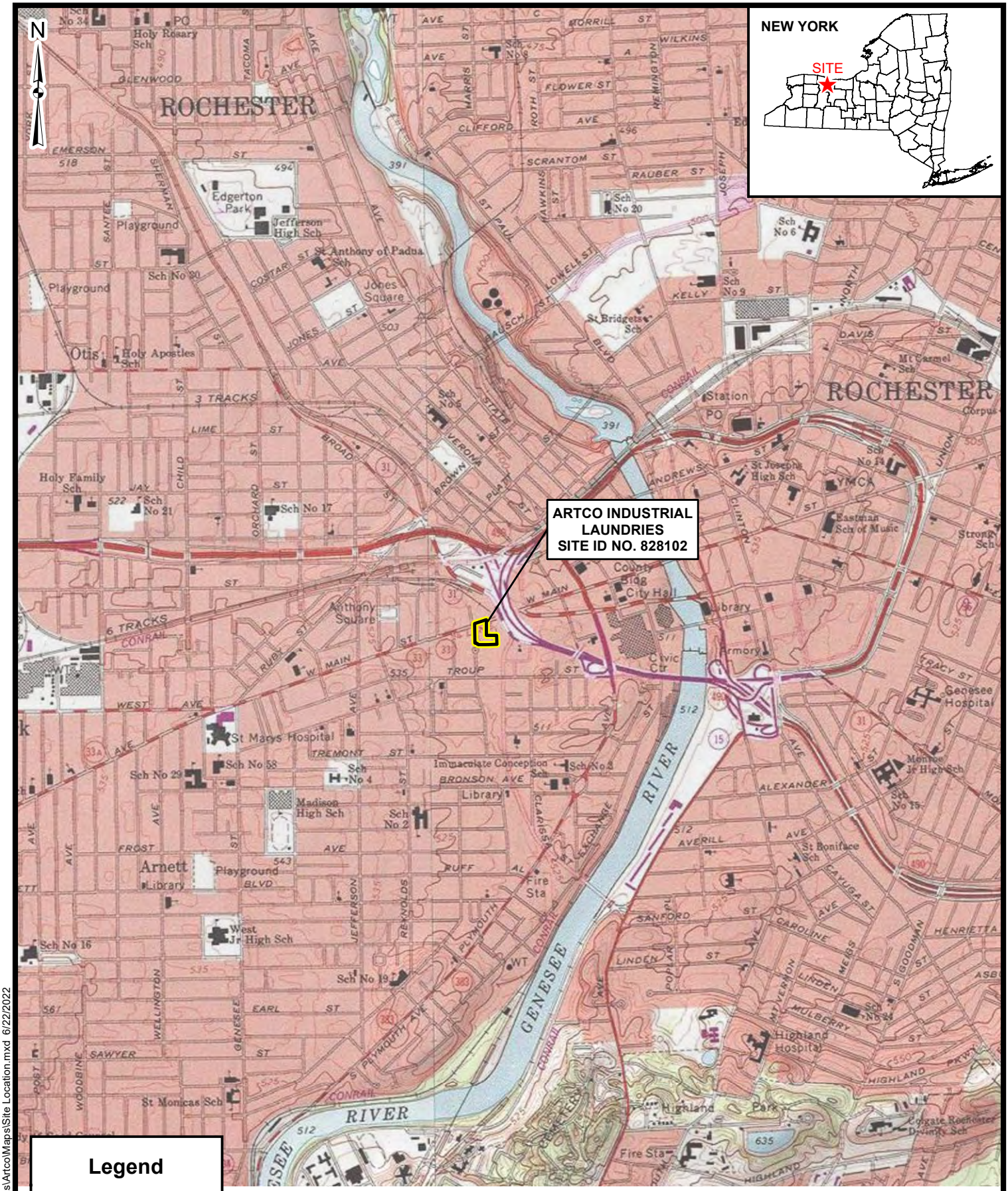
Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

Empty cell or ND - Not detected. J - The reported concentration is an estimated value. D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

FIGURES

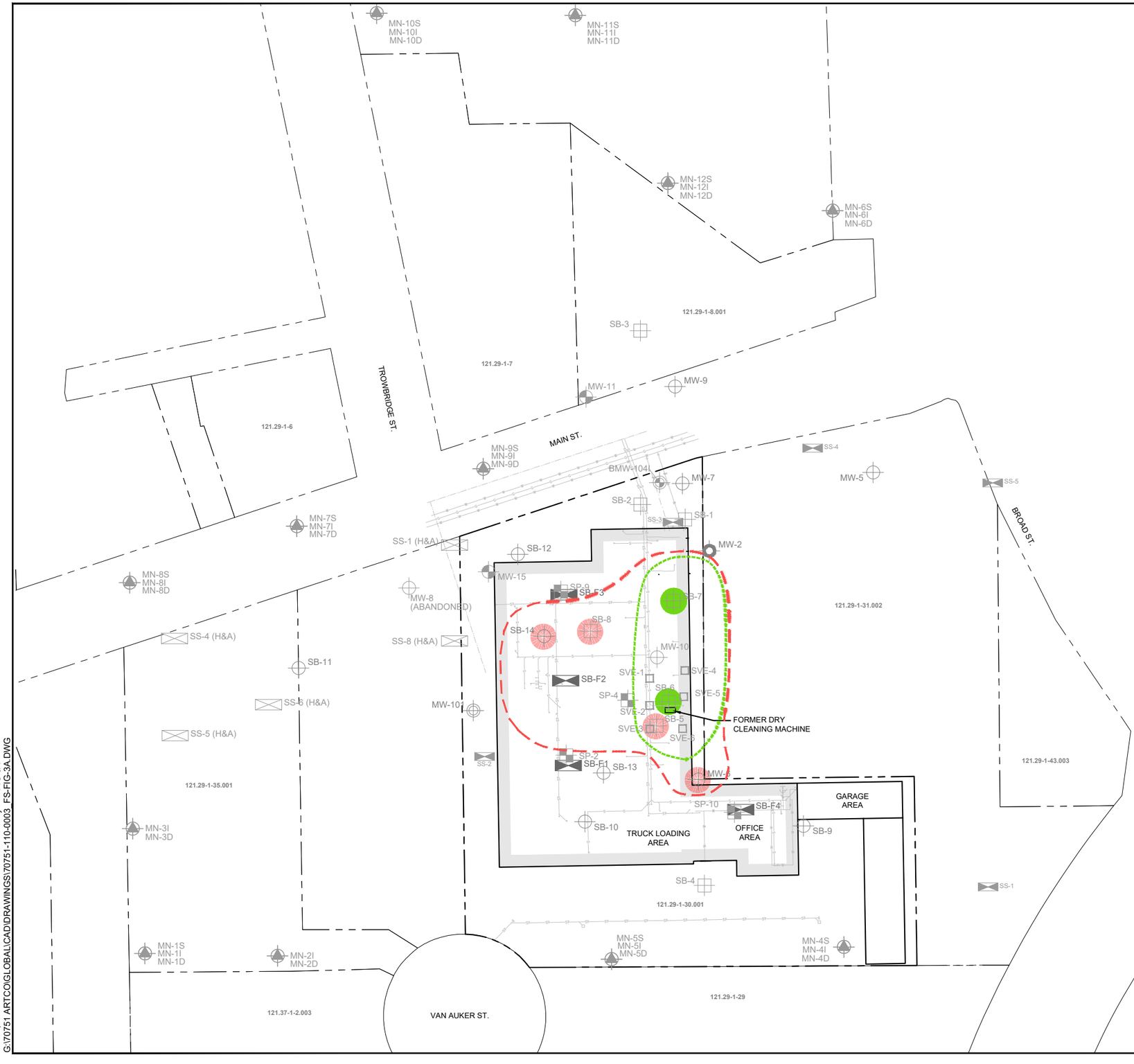


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AECOM

ARTCO INDUSTRIAL LAUNDRIES (SITE ID NO. 828102)
NYSDEC WORK ASSIGNMENT NO. D007622-59
CITY OF ROCHESTER, MONROE COUNTY, NEW YORK
SITE LOCATION

FIGURE 1-1



LEGEND

- PROPERTY LINE
- SITE PROPERTY LINE
- 121.29-1-30.001 PARCEL NUMBER
- EXISTING BUILDING
- SANITARY SEWER
- STORM SEWER
- COMBINED SEWERS
- GAS PIPING
- WATER PIPING
- FIRE LINE
- WELL CLUSTER - VARIOUS INTERVALS (NYSDEC, 2009)
- BEDROCK WELL (HALEY & ALDRICH, 2001)
- BEDROCK WELL (HALEY & ALDRICH, 2013)
- OVERBURDEN WELL (HALEY & ALDRICH, 2001 AND NYSDEC, 1998)
- OVERBURDEN WELL (HALEY & ALDRICH, 2013)
- BEDROCK/OVERBURDEN INTERVAL WELL (SEELER, ENV., 1993)
- OVERBURDEN SOIL BORING (NYDEC, 1998)
- OVERBURDEN SOIL BORING (HALEY & ALDRICH, 2011)
- SOIL VAPOR EXTRACTION WELL
- SURFACE SOIL SAMPLE (HALEY & ALDRICH 2001)
- SURFACE SOIL SAMPLE (NYDEC 1998)
- FILL MATERIAL; TARGET CHLORINATED VOLATILE ORGANIC COMPOUND OF CONCERN (TCVOC) > COMMERCIAL USE SCOs
- FILL MATERIAL; TARGET CHLORINATED VOLATILE ORGANIC COMPOUND OF CONCERN (TCVOC) > UNRESTRICTED USE SCOs AND PROTECTION OF GROUNDWATER SCOs
- 9,377 SF EXTENT OF FILL MATERIAL IMPACTS; TCVOCs > COMMERCIAL SCOs
- 24,024 SF EXTENT OF FILL MATERIAL IMPACTS; TCVOCs > UNRESTRICTED USE SCOs

NOTES

1. HISTORIC DATA FROM PREVIOUS EXPLORATION AND SAMPLE LOCATIONS SHOWN (SOURCE AND INSTALLATION DATE IN LEGEND).
2. UTILITY LOCATION AND PROPERTY BOUNDARY INFORMATION ADOPTED FROM MONROE COUNTY GIS SERVICES DIVISION.

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SCALE IN FEET

AECOM

FORMER ARTCO INDUSTRIAL LAUNDRIES, INC.
331-337 WEST MAIN STREET
ROCHESTER, NEW YORK

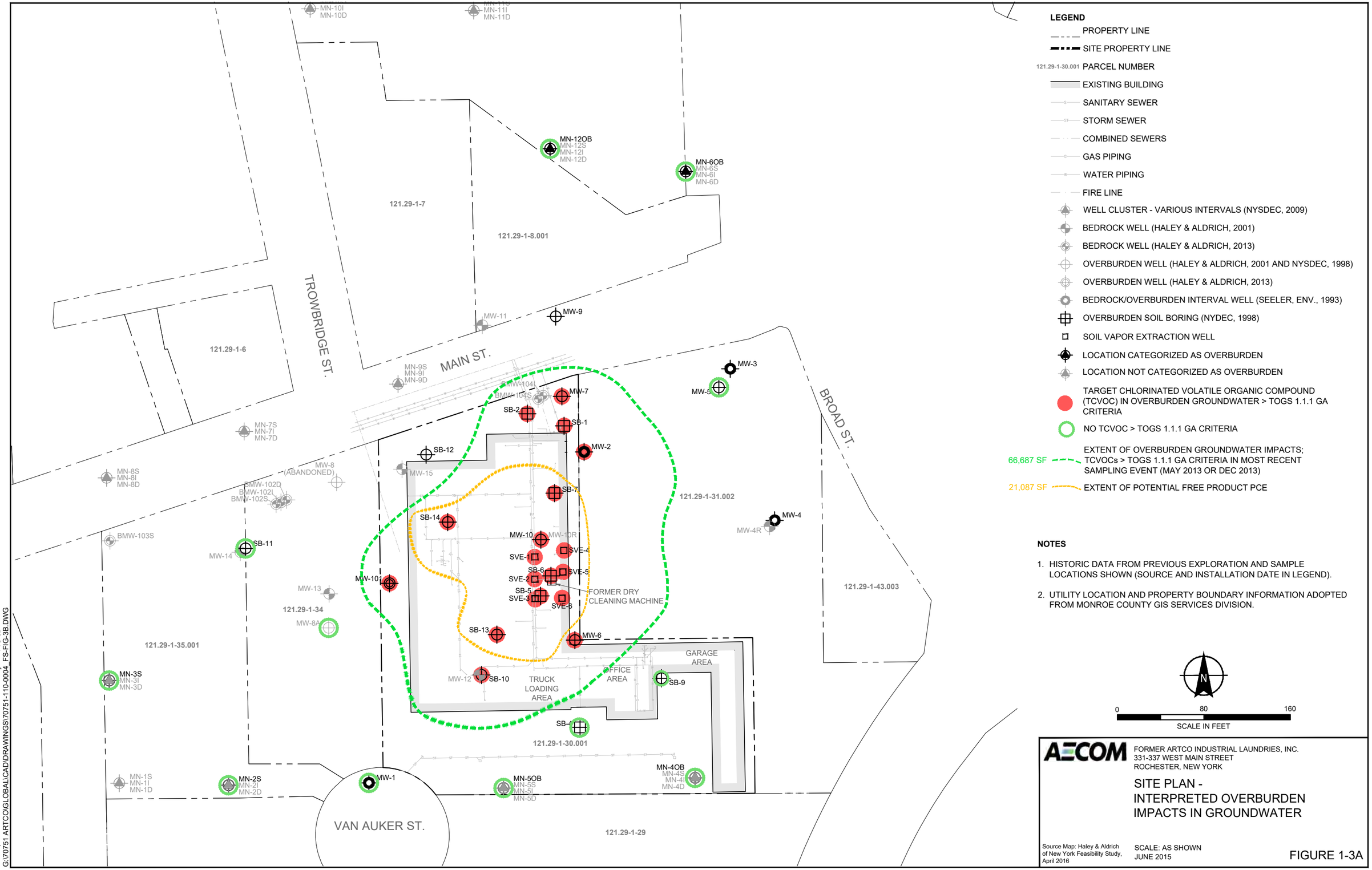
SITE PLAN - INTERPRETED OVERBURDEN IMPACTS IN SOIL

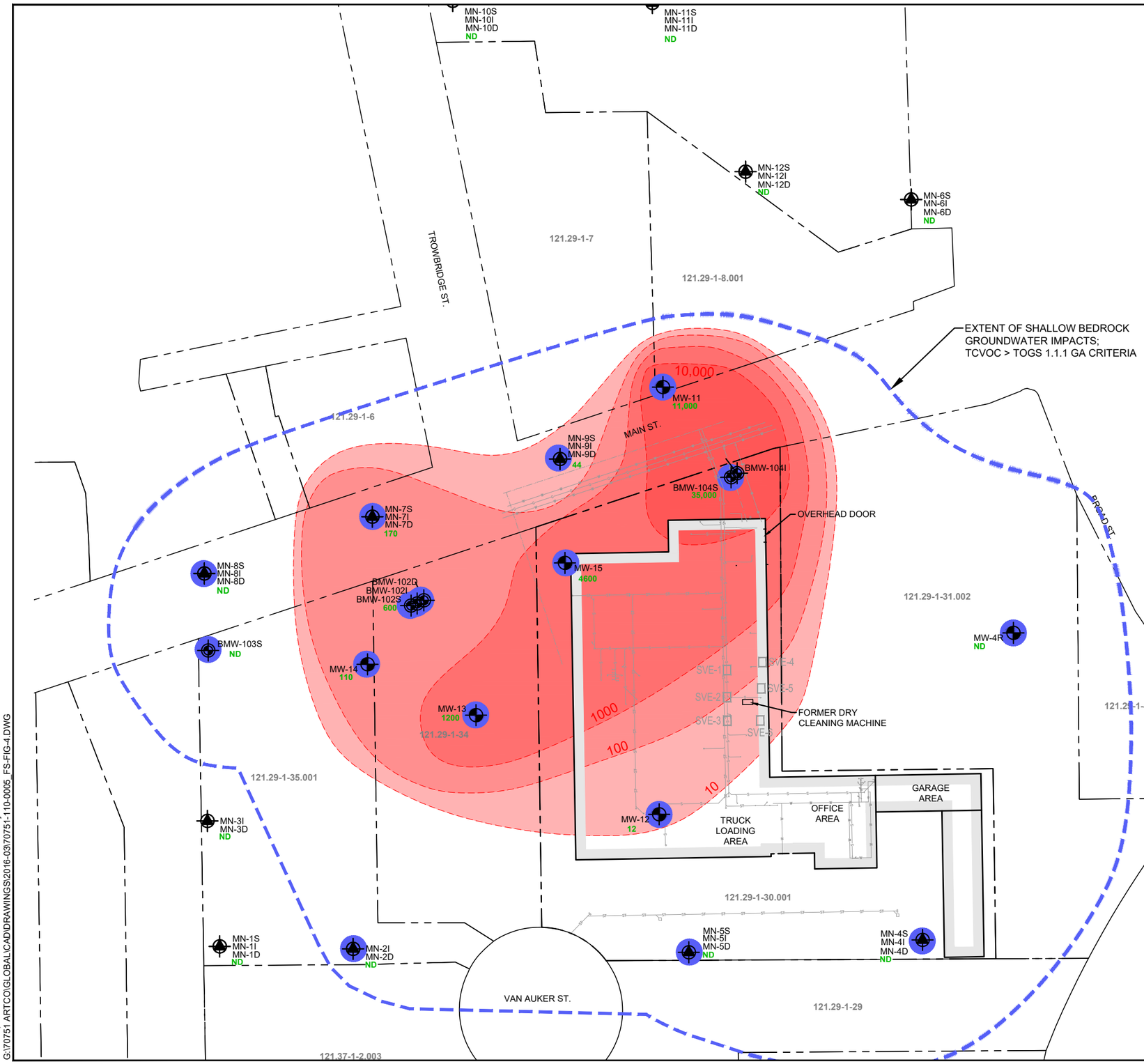
Source Map: Haley & Aldrich of New York Feasibility Study, April 2016

SCALE: AS SHOWN
JUNE 2015

FIGURE 1-2

LIBBY, PAT
Printed: 6/12/2015 11:18 AM Layout: FIG 3A
G:\70751 ARTCO\GLOBAL\CAD\DRAWINGS\70751-110-0003_FS-FIG-3A.DWG


MN-10I
MN-10D
MN-11I
MN-11D
MN-12OB
MN-12S
MN-12I
MN-12D
MN-6OB
MN-6S
MN-6I
MN-6D
121.29-1-7
121.29-1-8.001
121.29-1-6
TROWBRIDGE ST.
MAIN ST.
BROAD ST.
MW-11
MW-9
MN-9S
MN-9I
MN-9D
MW-104I
MW-104S
MW-7
SB-2
SB-1
MW-2
MW-3
MW-5
SB-12
MW-15
MW-8
(ABANDONED)
MN-8S
MN-8I
MN-8D
BMW-102D
BMW-102I
BMW-102S
SB-7
121.29-1-31.002
MW-4
MW-4R
SB-14
MW-10
MW-10R
SVE-4
SVE-1
SB-6
SVE-5
SVE-2
SB-5
SVE-3
SVE-6
FORMER DRY
CLEANING MACHINE
MW-101
BMW-103S
SB-11
MW-14
MW-13
121.29-1-34
MW-8A
121.29-1-43.003
121.29-1-35.001
SB-13
MW-6
GARAGE
AREA
OFFICE
AREA
SB-9
MW-12
SB-10
TRUCK
LOADING
AREA
SB-4
121.29-1-30.001
MN-3S
MN-3I
MN-3D
MN-7S
MN-7I
MN-7D
MN-1S
MN-1I
MN-1D
MN-2S
MN-2I
MN-2D
MW-1
MN-5OB
MN-5S
MN-5I
MN-5D
MN-4OB
MN-4S
MN-4I
MN-4D
VAN AUKER ST.
121.29-1-29
LEGEND
PROPERTY LINE
SITE PROPERTY LINE
121.29-1-30.001 PARCEL NUMBER
EXISTING BUILDING
SANITARY SEWER
STORM SEWER
COMBINED SEWERS
GAS PIPING
WATER PIPING
FIRE LINE
WELL CLUSTER - VARIOUS INTERVALS (NYSDEC, 2009)
BEDROCK WELL (HALEY & ALDRICH, 2001)
BEDROCK WELL (HALEY & ALDRICH, 2013)
OVERBURDEN WELL (HALEY & ALDRICH, 2001 AND NYSDEC, 1998)
OVERBURDEN WELL (HALEY & ALDRICH, 2013)
BEDROCK/OVERBURDEN INTERVAL WELL (SEELER, ENV., 1993)
OVERBURDEN SOIL BORING (NYDEC, 1998)
SOIL VAPOR EXTRACTION WELL
LOCATION CATEGORIZED AS OVERBURDEN
LOCATION NOT CATEGORIZED AS OVERBURDEN
TARGET CHLORINATED VOLATILE ORGANIC COMPOUND (TCVOC) IN OVERBURDEN GROUNDWATER > TOGS 1.1.1 GA CRITERIA
NO TCVOC > TOGS 1.1.1 GA CRITERIA
66,687 SF EXTENT OF OVERBURDEN GROUNDWATER IMPACTS; TCVOCs > TOGS 1.1.1 GA CRITERIA IN MOST RECENT SAMPLING EVENT (MAY 2013 OR DEC 2013)
21,087 SF EXTENT OF POTENTIAL FREE PRODUCT PCE
NOTES
1. HISTORIC DATA FROM PREVIOUS EXPLORATION AND SAMPLE LOCATIONS SHOWN (SOURCE AND INSTALLATION DATE IN LEGEND).
2. UTILITY LOCATION AND PROPERTY BOUNDARY INFORMATION ADOPTED FROM MONROE COUNTY GIS SERVICES DIVISION.
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SCALE IN FEET
AECOM
FORMER ARTCO INDUSTRIAL LAUNDRIES, INC.
331-337 WEST MAIN STREET
ROCHESTER, NEW YORK
SITE PLAN -
INTERPRETED OVERBURDEN
IMPACTS IN GROUNDWATER
Source Map: Haley & Aldrich of New York Feasibility Study, April 2016
SCALE: AS SHOWN
JUNE 2015
FIGURE 1-3A
LIBBY, PAT
G:\70751 ARTCO\GLOBAL\CAD\DRAWINGS\70751-110-0004_FS-FIG-3B.DWG
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Layout: FIG 3B



LEGEND

- PROPERTY LINE
- SITE PROPERTY LINE
- PARCEL NUMBER (121.29-1-30.001)
- EXISTING BUILDING
- SANITARY SEWER
- STORM SEWER
- COMBINED SEWERS
- GAS PIPING
- WATER PIPING
- FIRE LINE
- WELL CLUSTER - VARIOUS INTERVALS (NYSDEC, 2009)
- BEDROCK WELL (HALEY & ALDRICH, 2001)
- BEDROCK WELL (HALEY & ALDRICH, 2013)
- SOIL VAPOR EXTRACTION WELL
- TARGET CHLORINATED VOLATILE ORGANIC COMPOUND (TCVOC) IN SHALLOW BEDROCK > TOGS 1.1.1 GA CRITERIA
- EXTENT OF SHALLOW BEDROCK GROUNDWATER IMPACTS; TCVOC > TOGS 1.1.1 GA CRITERIA (AREA = 329,687 SF)
- 600 — PCE CONCENTRATION POSTED FROM MOST RECENT SAMPLING RESULTS (MAY 2013 OR DECEMBER 2013)
- ND — PCE NOT DETECTED IN MOST RECENT SAMPLING RESULTS (MAY 2013 OR DECEMBER 2013)

PCE ISOCONCENTRATION CONTOURS INTERPRETED FROM MOST RECENT DATA (MAY 2013 OR DECEMBER 2013)

- PCE ≥10 PPB (AREA =118,226 SF)
- PCE ≥ 100 PPB (AREA = 90,008 SF)
- PCE ≥ 1,000 PPB (AREA = 49,711 SF)
- PCE ≥ 10,000 PPB (AREA = 12,488 SF)

NOTES

1. HISTORIC DATA FROM PREVIOUS EXPLORATION AND SAMPLE LOCATIONS SHOWN (SOURCE AND INSTALLATION DATE IN LEGEND).
2. UTILITY LOCATION AND PROPERTY BOUNDARY INFORMATION ADOPTED FROM MONROE COUNTY GIS SERVICES DIVISION.

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SCALE IN FEET

AECOM

FORMER ARTCO INDUSTRIAL LAUNDRIES, INC.
331-337 WEST MAIN STREET
ROCHESTER, NEW YORK

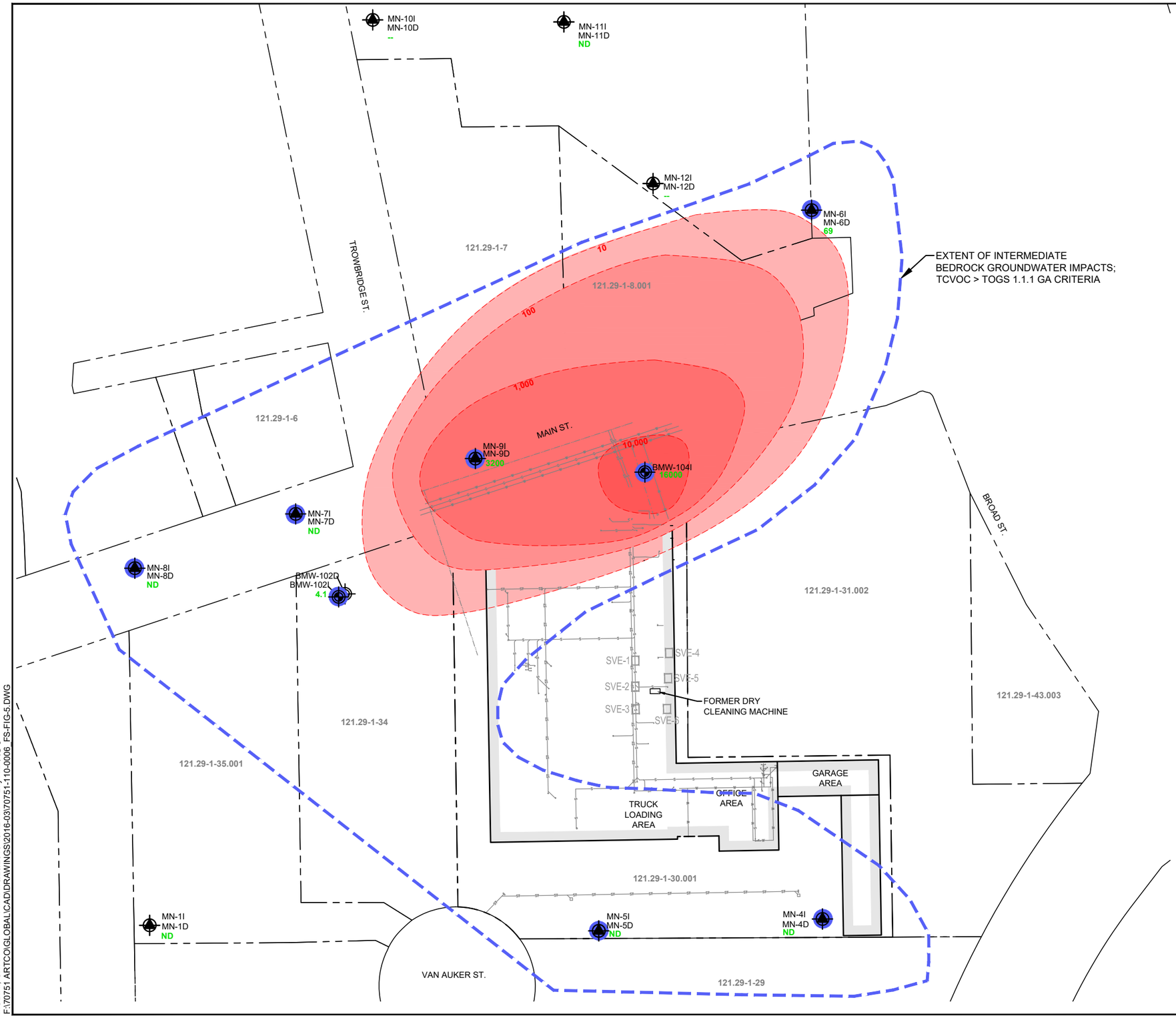
SITE PLAN - INTERPRETED SHALLOW BEDROCK IMPACTS

Source Map: Haley & Aldrich of New York Feasibility Study, April 2016

SCALE: AS SHOWN
MARCH 2016

FIGURE 1-3B

MOBINI, GITA
G:\70751 ARTCO\GLOBAL\CAD\DRAWINGS\2016-03\70751-110-0005_FS-FIG-4.DWG
Printed: 3/18/2016 11:10 AM Layout: FIG 4



LEGEND

- PROPERTY LINE
- SITE PROPERTY LINE
- PARCEL NUMBER
- EXISTING BUILDING
- SANITARY SEWER
- STORM SEWER
- COMBINED SEWERS
- GAS PIPING
- WATER PIPING
- FIRE LINE
- WELL CLUSTER - VARIOUS INTERVALS (NYSDEC, 2009)
- BEDROCK WELL (HALEY & ALDRICH, 2001)
- BEDROCK WELL (HALEY & ALDRICH, 2013)
- SOIL VAPOR EXTRACTION WELL
- TARGET CHLORINATED VOLATILE ORGANIC COMPOUND (TCVOC) IN INTERMEDIATE BEDROCK > TOGS 1.1.1 GA CRITERIA
- EXTENT OF INTERMEDIATE BEDROCK GROUNDWATER IMPACTS; TCVOC > TOGS 1.1.1 GA CRITERIA (AREA = 241,365 SF)
- 600 — PCE CONCENTRATION POSTED FROM MOST RECENT SAMPLING RESULTS (MAY 2013 OR DECEMBER 2013)
- ND — PCE NOT DETECTED IN MOST RECENT SAMPLING RESULTS (MAY 2013 OR DECEMBER 2013)
- -- — NOT SAMPLED IN MAY 2013 OR DECEMBER 2013

PCE ISOCONCENTRATION CONTOURS INTERPRETED FROM MOST RECENT DATA (MAY 2013 OR DECEMBER 2013)

- PCE ≥10 PPB (AREA = 125,347 SF)
- PCE ≥ 100 PPB (AREA = 77,350 SF)
- PCE ≥ 1,000 PPB (AREA = 36,834 SF)
- PCE ≥ 10,000 PPB (AREA = 3,684 SF)

NOTES

1. HISTORIC DATA FROM PREVIOUS EXPLORATION AND SAMPLE LOCATIONS SHOWN (SOURCE AND INSTALLATION DATE IN LEGEND).
2. UTILITY LOCATION AND PROPERTY BOUNDARY INFORMATION ADOPTED FROM MONROE COUNTY GIS SERVICES DIVISION.

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SCALE IN FEET

AECOM

FORMER ARTCO INDUSTRIAL LAUNDRIES, INC.
331-337 WEST MAIN STREET
ROCHESTER, NEW YORK

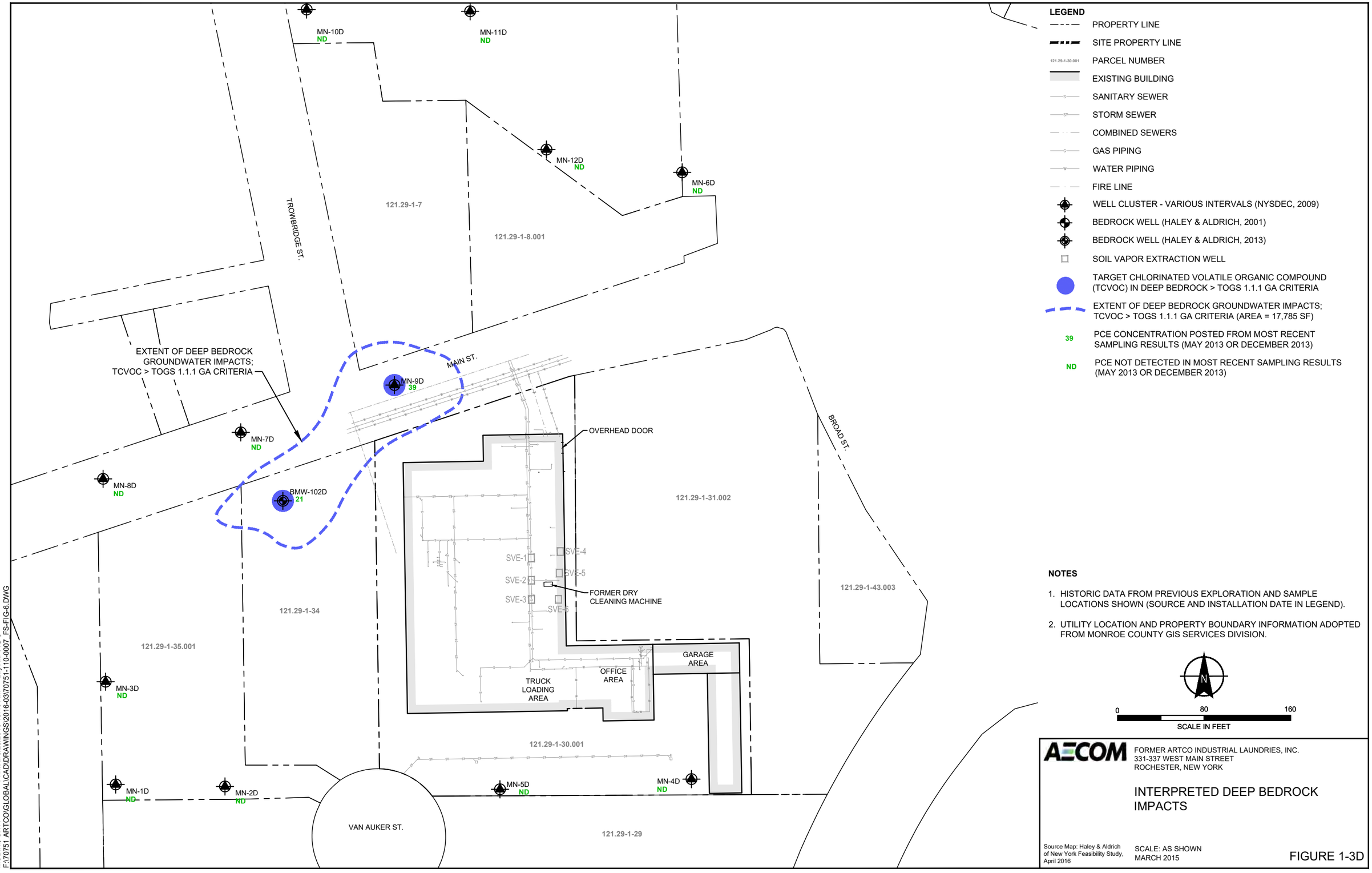
SITE PLAN - INTERPRETED INTERMEDIATE BEDROCK IMPACTS

Source Map: Haley & Aldrich of New York Feasibility Study, April 2016

SCALE: AS SHOWN
MARCH 2016

FIGURE 1-3C

MOBINI, GITA
F:\70751 ARTCO\GLOBAL\CAD\DRAWINGS\2016-03\70751-110-0006_FS-FIG-5.DWG
Printed: 3/23/2016 10:42 AM Layout: FIG 5



NOTES

1. HISTORIC DATA FROM PREVIOUS EXPLORATION AND SAMPLE LOCATIONS SHOWN (SOURCE AND INSTALLATION DATE IN LEGEND).
2. UTILITY LOCATION AND PROPERTY BOUNDARY INFORMATION ADOPTED FROM MONROE COUNTY GIS SERVICES DIVISION.

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SCALE IN FEET

AECOM

FORMER ARTCO INDUSTRIAL LAUNDRIES, INC.
331-337 WEST MAIN STREET
ROCHESTER, NEW YORK

INTERPRETED DEEP BEDROCK IMPACTS

Source Map: Haley & Aldrich of New York Feasibility Study, April 2016

SCALE: AS SHOWN
MARCH 2015

FIGURE 1-3D

MOBINI, GITA
F:\70751_ARTCO\GLOBAL\CAD\DRAWINGS\2016-03\70751-110-0007_FS-FIG-6.DWG
Printed: 3/23/2016 10:43 AM Layout: FIG 6

EXTRACTION (VIA BLASTED BEDROCK ZONES) AND TREATMENT OF GROUNDWATER TO CONTROL MIGRATION

APPROXIMATE LOCATION OF BLASTED BEDROCK ZONE

ENGINEERING AND INSTITUTIONAL CONTROLS IMPLEMENTED AND MAINTAINED THROUGH A SITE MANAGEMENT PLAN.

MAINTAIN LANDSCAPED COVER.

MAINTAIN BUILDING SLAB AS IMPERVIOUS COVER. MAINTAIN SUB-SLAB DEPRESSURIZATION SYSTEM.

MAINTAIN PAVED AREA AS IMPERVIOUS COVER.

121.29-1-8.001

121.29-1-7

121.29-1-6

121.29-1-31.002

121.29-1-43.003

121.29-1-30.001

121.29-1-35.001

121.29-1-29

121.37-1-2.003

TROWBRIDGE ST.

MAIN ST.

BROAD ST.

VAN AUKER ST.

CONCRETE FOOTER (TYP)

FORMER DRY CLEANING MACHINE

GARAGE AREA

OFFICE AREA

TRUCK LOADING AREA

LEGEND

- PROPERTY LINE
- SITE PROPERTY LINE
- 121.29-1-30.001 PARCEL NUMBER
- SANITARY SEWER
- STORM SEWER
- COMBINED SEWERS
- GAS PIPING
- WATER PIPING
- FIRE LINE
- EXTENT OF GROUNDWATER IMPACTS; TCVOCs > TOGS 1.1.1 GA CRITERIA
- EXISTING BUILDING; FLOOR SLAB TO BE MAINTAINED
- PAVED AREA TO BE MAINTAINED
- MAINTAIN LANDSCAPED COVER; MANAGE THROUGH SITE MANAGEMENT PLAN

NOTES

1. UTILITY LOCATION AND PROPERTY BOUNDARY INFORMATION ADOPTED FROM MONROE COUNTY GIS SERVICES DIVISION.

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SCALE IN FEET

AECOM

FORMER ARTCO INDUSTRIAL LAUNDRIES, INC.
331-337 WEST MAIN STREET
ROCHESTER, NEW YORK

CONCEPTUAL ALTERNATIVE 3

Source Map: Haley & Aldrich of New York Feasibility Study, April 2016

SCALE: AS SHOWN
MARCH 2016

FIGURE 1-4

MOBINI, GITA
Printed: 4/1/2016 9:46 AM Layout: FIG 11
G:\70751 ARTCO\GLOBAL\CAD\DRAWINGS\2016-03\70751-110-0012_FS-FIG-11.DWG

N

ROCHESTER EMERGENCY
COMMUNICATIONS OFFICE

120N 0E | 120N 10E | 120N 20E | 120N 30E | 120N 40E | 120N 50E
110N 0E | 110N 10E | 110N 20E | 110N 30E | 110N 40E | 110N 50E
100N 0E | 100N 10E | 100N 20E | 100N 30E | 100N 40E | 100N 50E
90N 0E | 90N 10E | 90N 20E | 90N 30E | 90N 40E | 90N 50E
80N 0E | 80N 10E | 80N 20E | 80N 30E | 80N 40E | 80N 50E
70N 0E | 70N 10E | 70N 20E | 70N 30E | 70N 40E | 70N 50E
60N 0E | 60N 10E | 60N 20E | 60N 30E | 60N 40E | 60N 50E
50N 0E | 50N 10E | 50N 20E | 50N 30E | 50N 40E | 50N 50E
40N 0E | 40N 10E | 40N 20E | 40N 30E | 40N 40E | 40N 50E
30N 0E | 30N 10E | 30N 20E | 30N 30E | 30N 40E | 30N 50E
20N 0E | 20N 10E | 20N 20E | 20N 30E | 20N 40E | 20N 50E
10N 0E | 10N 10E | 10N 20E | 10N 30E | 10N 40E | 10N 50E
0N 0E | 0N 10E | 0N 20E | 0N 30E | 0N 40E | 0N 50E

Legend

■ Sample Location

15 0 15 Feet

FORMER ARTCO
INDUSTRIAL LAUNDRIES
GRID LAYOUT

AECOM

FIGURE 2-1

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N

MW-14S

MW-14I

MW-10

SVE-4

SVE-1

MW-13OB

MW-13S

MW-13I

SVE-5

MW-15OB

SVE-2

MW-101

SVE-6

MW- 6

MW-12

Legend

- Proposed Monitoring Well
- Existing Monitoring Well
- Soil Vapor Extraction Well

NOTES:
OB = Overburden
S = Shallow
I = Intermediate

20 0 20 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES PROPOSED MONITORING WELL LOCATIONS

AECOM

FIGURE 2-2

C:\Users\maxwell.reis\Documents\Artco\Maps\Proposed_MW_Location.mxd 6/22/2022

N

120N 0E PID: 15.9
120N 10E PID: 11.5
120N 20E PID: NA
120N 30E PID: 14.2
120N 40E PID: 30.0
120N 50E PID: 31.8

110N 0E PID: 29.7
110N 10E PID: 9.3
110N 20E PID: 16.4
110N 30E PID: 27.9
110N 40E PID: 41.8
110N 50E PID: 52.8

100N 0E PID: NA
100N 10E PID: 11.8
100N 20E PID: 11.1
100N 30E PID: 42.5
100N 40E PID: 119.8
100N 50E PID: 100.6

90N 0E PID: NA
90N 10E PID: 12.9
90N 20E PID: 16.2
90N 30E PID: 31.6
90N 40E PID: 81.4
90N 50E PID: 118.4

80N 0E PID: NA
80N 10E PID: 8.9
80N 20E PID: 16.1
80N 30E PID: 62.5
80N 40E PID: 109.1
80N 50E PID: 94.6

70N 0E PID: NA
70N 10E PID: 12.5
70N 20E PID: 10.9
70N 30E PID: 23.4
70N 40E PID: 566.7
70N 50E PID: 65.8

60N 0E PID: NA
60N 10E PID: 12.8
60N 20E PID: 10.1
60N 30E PID: 44.2
60N 40E PID: 97.9
60N 50E PID: 55.8

50N 0E PID: NA
50N 10E PID: 26.3
50N 20E PID: 18.9
50N 30E PID: 50.5
50N 40E PID: 41.2
50N 50E PID: 73.6

40N 0E PID: NA
40N 10E PID: 31.8
40N 20E PID: 11.9
40N 30E PID: 47.0
40N 40E PID: 15000
40N 50E PID: 341.2

30N 0E PID: NA
30N 10E PID: 19.7
30N 20E PID: 16.0
30N 30E PID: 35.1
30N 40E PID: 68.7
30N 50E PID: 66.2

20N 0E PID: NA
20N 10E PID: 26.3
20N 20E PID: 8.2
20N 30E PID: 65.9
20N 40E PID: 15.1
20N 50E PID: 182.7

10N 0E PID: NA
10N 10E PID: 25.4
10N 20E PID: 40.1
10N 30E PID: 133.2
10N 40E PID: 68.8
10N 50E PID: 42.0

0N 0E PID: NA
0N 10E PID: 10.6
0N 20E PID: 52.5
0N 30E PID: 89.3
0N 40E PID: 101.3
0N 50E PID: 43.1

10
100
1000
10000

ROCHESTER EMERGENCY COMMUNICATIONS OFFICE

Legend

- Sample Location
- PID Concentration Contour

20N——— Row Line Number
10E——— Column Line Number
PID: 26.3—— PID Reading in PPM

15 0 15 Feet

C:\Users\maxwell.reis\Documents\Artco\Maps\PID Readings.mxd 6/24/2022

FORMER ARTCO INDUSTRIAL LAUNDRIES PID READING CONTOURS

AECOM

FIGURE 2-3

N

110N 20E
110N 30E
110N 50E
100N 20E
100N 35E
100N 40E
90N 10E
90N 50E
80N 30E
80N 35E
80N 40E
MW-14S
70N 20E
70N 40E
70N 50E
MW-14I
60N 10E
60N 40E
60N 50E
MW-13OB
50N 50E
42N 20E
40N 10E
MW-13I
40N 50E
40N 30E
40N 40E
MW-13S
30N 20E
30N 40E
25N 50E
MW-15OB
20N 10E
20N 50E
10N 30E
10N 36E
0N 20E

ROCHESTER EMERGENCY
COMMUNICATIONS OFFICE

Legend

- Monitoring Well
- JMC Soil Boring
- Geoprobe Soil Boring

15 0 15 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES MONITORING WELL AND SOIL BORING LOCATIONS

AECOM

FIGURE 2-4

C:\Users\maxwell.reis\Documents\Artco\Maps\Soil_Boring_MW_Locations.mxd 6/24/2022

N

TROWBRIDGE ST

WEST MAIN ST

FORD ST

GRASS

ASPHALT

ASPHALT

ROCHESTER EMERGENCY COMMUNICATIONS OFFICE

MN- 6OB, 507.24

MW- 3, 509.03

MW- 2, 505.38

MW-13OB, 505.66

MW-15OB, 505.72

MW- 6, 506.79

MW-101, 503.99

MW- 1, 503.47

507.0

507.5

506.5

506.0

508.0

508.5

505.5

509.0

505.0

504.5

504.0

503.5

80 0 80 Feet

Legend

- Monitoring Well
- Groundwater Flow Direction
- Overburden Groundwater Elevation Contour (2/2/21)

FORMER ARTCO
INDUSTRIAL LAUNDRIES
OVERBUDEN GROUNDWATER
ELEVATION CONTOURS

AECOM

FIGURE 2-5

C:\Users\maxwell.reis\Documents\Artco\Maps\GW Contours_February2021_Overburden.mxd 6/22/2022

N

MN-11S, 497.05

497.5
498.0
498.5
499.0
499.5
500.0
500.5
501.0
501.5
502.0
502.5
503.0
503.5
504.0

MN-12S, 504.40

MN- 6S, 502.38

TROWBRIDGE ST

MW-11, 501.50

FORD ST

BMW-104S, 499.77

ASPHALT

WEST MAIN ST

MW-15, 501.76

BMW-102S, 498.72

ROCHESTER EMERGENCY COMMUNICATIONS OFFICE

BMW-103S, 499.02

MW-14, 500.28

GRASS

MW-14S, 499.33

MW-13S, 499.15

MW-13, 500.20

499.5

MW-12, 501.41

MN- 3S, 503.36

503.0
502.5
502.0
501.5
501.0
500.5

ASPHALT

500.0

MN- 4S, 500.10

MN- 1S, 500.50

MN- 2S, 504.03

504.0
503.5
503.0
502.5
502.0
501.5
501.0
500.5
500.0

MN- 5S, 500.35

Legend

- Monitoring Well
- Groundwater Flow Direction
- Shallow Groundwater Elevation Contour (2/2/21)

80 0 80 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES SHALLOW GROUNDWATER ELEVATION CONTOURS

AECOM

FIGURE 2-6

C:\Users\maxwell.reis\Documents\Artco\Maps\GW Contours_February2021_Shallow.mxd 6/22/2022

N

MN-11I, 487.72

MN-12I, 486.38

MN- 6I, 488.97

BMW-104I, 484.95

BMW-102I, 484.16

MW-14I, 483.65

MW-13I, 483.63

MN- 3I, 500.45

MN- 1I, 484.32

MN- 2I, 500.42

MN- 5I, 484.05

MN- 4I, 483.95

487.0

487.5

486.5

486.0

485.5

485.0

484.5

484.0

488.0

488.5

TROWBRIDGE ST

WEST MAIN ST

FORD ST

ASPHALT

GRASS

ASPHALT

ROCHESTER EMERGENCY COMMUNICATIONS OFFICE

Legend

- Monitoring Well
- Groundwater Flow Direction
- Intermediate Groundwater Elevation Contour (2/2/21)

NOTE:
MN- 2I and MN- 3I were not used in the generation of contours due to anomalous values.

80 0 80 Feet

FORMER ARTCO
INDUSTRIAL LAUNDRIES
INTERMEDIATE GROUNDWATER
ELEVATION CONTOURS

AECOM

FIGURE 2-7

C:\Users\maxwell.reis\Documents\Artco\Maps\GW Contours_February2021_Intermediate.mxd 6/22/2022

N

MN-11D, 481.85

482.0

MN-12D, 481.85

482.5

MN- 6D, 482.74

TROWBRIDGE ST

483.5

484.0

WEST MAIN ST

BMW-102D, 484.26

GRASS

ASPHALT

FORD ST

ROCHESTER EMERGENCY COMMUNICATIONS OFFICE

ASPHALT

483.0

MN- 3D, 482.94

483.0

MN- 1D, 482.88

MN- 2D, 482.91

MN- 5D, 482.76

MN- 4D, 482.51

Legend

- Monitoring Well
- Groundwater Flow Direction
- Deep Groundwater Elevation Contour (2/2/21)

80 0 80 Feet

FORMER ARTCO
INDUSTRIAL LAUNDRIES
DEEP GROUNDWATER
ELEVATION CONTOURS

AECOM

FIGURE 2-8

C:\Users\maxwell.reis\Documents\Artco\Maps\GW Contours_February2021_Deep.mxd 6/20/2022

N

MN-10S
Overburden Thickness - 11
Depth to Water Not Measured

MN-10I
Overburden Thickness - 11
Depth to Water Not Measured

MN-10D
Overburden Thickness - 11
Depth to Water Not Measured

MN-11S
Overburden Thickness - 10
Depth to Water - 16.89
Water in Bedrock

MN-11I
Overburden Thickness - 10
Depth to Water - 26.22
Water in Bedrock

MN-11D
Overburden Thickness - 10
Depth to Water - 32.03
Water in Bedrock

MN-12OB
Overburden Thickness - 8
Depth to Water Not Measured

MN-12S
Overburden Thickness - 8
Depth to Water - 10.05
Water in Bedrock

MN-12I
Overburden Thickness - 8
Depth to Water - 28.08
Water in Bedrock

MN-12D
Overburden Thickness - 8
Depth to Water - 32.59
Water in Bedrock

MN- 6OB
Overburden Thickness - 9.5
Depth to Water - 10.57
Water in Bedrock

MN- 6S
Overburden Thickness - 9.5
Depth to Water - 15.05
Water in Bedrock

MN- 6I
Overburden Thickness - 9.5
Depth to Water - 28.27
Water in Bedrock

MN- 6D
Overburden Thickness - 9.5
Depth to Water - 34.28
Water in Bedrock

MN- 9OB
Overburden Thickness - 9.5
Depth to Water Not Measured

MN- 9S
Overburden Thickness - 9.5
Depth to Water Not Measured

MN- 9I
Overburden Thickness - 9.5
Depth to Water Not Measured

MN- 9D
Overburden Thickness - 9.5
Depth to Water Not Measured

MW-11
Overburden Thickness - 9
Depth to Water - 11.67
Water in Bedrock

MW- 9
Overburden Thickness - 10
Depth to Water - 8.33
Overburden Saturation - 1.67

MW- 5
Overburden Thickness - 8.5
Depth to Water Not Measured

MW- 3
Overburden Thickness - 9.2
Depth to Water - 4.45
Overburden Saturation - 4.75

MN- 7S
Overburden Thickness - 11
Depth to Water Not Measured

MN- 7I
Overburden Thickness - 11
Depth to Water Not Measured

MN- 7D
Overburden Thickness - 11
Depth to Water Not Measured

MN- 8S
Overburden Thickness - 12
Depth to Water Not Measured

MN- 8D
Overburden Thickness - 12
Depth to Water Not Measured

MN- 8I
Overburden Thickness - 12
Depth to Water Not Measured

BMW-102I
Overburden Thickness - 12.8
Depth to Water - 28.48
Water in Bedrock

BMW-102D
Overburden Thickness - 12.8
Depth to Water - 28.44
Water in Bedrock

BMW-102S
Overburden Thickness - 12.8
Depth to Water - 13.78
Water in Bedrock

BMW-103S
Overburden Thickness - 13.1
Depth to Water - 15.54
Water in Bedrock

MW-15
Overburden Thickness - 10.9
Depth to Water - 13.07
Water in Bedrock

BMW-104S
Overburden Thickness - 10.5
Depth to Water - 14.27
Water in Bedrock

BMW-104I
Overburden Thickness - 10.5
Depth to Water - 29.01
Water in Bedrock

MW- 7
Overburden Thickness - 11.5
Depth to Water Not Measured

SB-12
Overburden Thickness - 11
Depth to Water Not Measured

MW- 2
Overburden Thickness - 9.2
Depth to Water - 8.64
Overburden Saturation - 0.56

SB- 7
Overburden Thickness - 10.5
Depth to Water Not Measured

MW- 4
Overburden Thickness - 9.1
Depth to Water Not Measured

SB- 8
Overburden Thickness - 10.5
Depth to Water Not Measured

MW-10
Overburden Thickness - 11
Depth to Water Not Measured

SB-14
Overburden Thickness - 13
Depth to Water Not Measured

SB- 6
Overburden Thickness - 11
Depth to Water Not Measured

MW- 4R
Overburden Thickness - 10.5
Depth to Water Not Measured

SB-11
Overburden Thickness - 12.6
Depth to Water Not Measured

MW-14
Overburden Thickness - 12.3
Depth to Water - 12.22
Overburden Saturation - 0.08

MW-101
Overburden Thickness - 10.3
Depth to Water - 8.22
Overburden Saturation - 2.08

MW-13OB
Overburden Thickness - 11.8
Depth to Water - 8.51
Overburden Saturation - 3.29

SB- 5
Overburden Thickness - 11
Depth to Water Not Measured

MW- 6
Overburden Thickness - 11.5
Depth to Water - 7.69
Overburden Saturation - 3.81

MW-15OB
Overburden Thickness - 12
Depth to Water - 8.49
Overburden Saturation - 3.51

MW-13
Overburden Thickness - 12
Depth to Water - 11.48
Overburden Saturation - 0.52

MW- 8A
Overburden Thickness - 10.5
Depth to Water Not Measured

MW-12
Overburden Thickness - 11.2
Depth to Water - 10.86
Overburden Saturation - 0.34

SB-13
Overburden Thickness - 13
Depth to Water Not Measured

SB- 9
Overburden Thickness - 11
Depth to Water - 6.78
Overburden Saturation - 4.22

MN- 3S
Overburden Thickness - 13
Depth to Water - 12.15
Overburden Saturation - 0.85

MN- 3I
Overburden Thickness - 13
Depth to Water - 15.28
Water in Bedrock

MN- 3D
Overburden Thickness - 13
Depth to Water - 32.6
Water in Bedrock

SB-10
Overburden Thickness - 10.5
Depth to Water - 7.02
Overburden Saturation - 3.48

MN- 4OB
Overburden Thickness - 11
Depth to Water Not Measured

MN- 4S
Overburden Thickness - 11
Depth to Water - 12.59
Water in Bedrock

MN- 4I
Overburden Thickness - 11
Depth to Water - 28.65
Water in Bedrock

MN- 4D
Overburden Thickness - 11
Depth to Water - 29.98
Water in Bedrock

MN- 2I
Overburden Thickness - 12.5
Depth to Water - 13.81
Water in Bedrock

MN- 2S
Overburden Thickness - 12.5
Depth to Water - 10.28
Overburden Saturation - 2.22

MN- 2D
Overburden Thickness - 12.5
Depth to Water - 31.21
Water in Bedrock

MN- 1S
Overburden Thickness - 13
Depth to Water - 13.76
Water in Bedrock

MN- 1I
Overburden Thickness - 13
Depth to Water - 29.91
Water in Bedrock

MN- 1D
Overburden Thickness - 13
Depth to Water - 31.26
Water in Bedrock

MN- 5OB
Overburden Thickness - 12.4
Depth to Water Not Measured

MN- 5D
Overburden Thickness - 12.4
Depth to Water - 28.91
Water in Bedrock

MN- 5S
Overburden Thickness - 12.4
Depth to Water - 11.51
Overburden Saturation - 0.89

MN- 5I
Overburden Thickness - 12.4
Depth to Water - 27.73
Water in Bedrock

MW- 1
Overburden Thickness - 11.6
Depth to Water - 7.99
Overburden Saturation - 3.61

TRONWRIDGE ST

WEST MAIN ST

FORD ST

ASPHALT

FORMER ARTCO
INDUSTRIAL LAUNDRIES

COMMUNICATIONS OFFICE

Legend

- Monitoring Well
- Soil Boring Sample
- Overburden Thickness 1' Contour
- Site and Property Boundary
- Parcel Boundary

80 0 80 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES OVERBURDEN THICKNESS AND SATURATION

AECOM

FIGURE 3-1

C:\Users\maxwell.reis\Documents\Artco\Maps\Overburden_Thickness.mxd 6/24/2022

N

MN-10S
MN-10I
MN-10D

MN-11S
MN-11I
MN-11D

MN-12OB
MN-12S
MN-12I
MN-12D

MN- 6OB
MN- 6S
MN- 6D
MN- 6I

SB- 3

MW-11

MW- 9

MN- 9OB
MN- 9S
MN- 9I
MN- 9D

BMW-104I
SB-104
BMW-104S

MW- 7

SB- 2

SB- 1

MW- 3

MW- 5

MW- 2

SB-12

MW-15

SB- 7

MW- 8

MN- 7S
MN- 7I
MN- 7D

MN- 8I
MN- 8S
MN- 8D

BMW-102I
BMW-102D
BMW-102S

SB- 8

SB-14

MW-14I

MW-10

MW- 4

MW- 4R

BMW-103S

SB-11

MW-14

MW-13OB

MW-13I

FORMER DRY CLEANING MACHINE

SB-101
MW-101

SB- 6

MW-15OB

SB- 5

MW-13

MW- 8A

SB-13

MW- 6

MW-12

SB-10

SB- 9

MN- 3S
MN- 3I
MN- 3D

SB- 4

MN- 1S
MN-1I
MN- 1D

MN- 2I
MN- 2S
MN- 2D

MW- 1

MN- 5OB
MN- 5S
MN- 5I
MN- 5D

MN- 4OB
MN- 4S
MN- 4I
MN- 4D

WEST MAIN ST

TROWBRIDGE ST

FORD ST

ASPHALT

GRASS

ROCHESTER EMERGENCY COMMUNICATIONS OFFICE

FORMER ARTCO INDUSTRIAL LAUNDRIES

Legend

- Monitoring Well
- Soil Boring Sample
- Top of Rock 1' Contour
- Site and Property Boundary
- Parcel Boundary

80 0 80 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES TOP OF ROCK CONTOUR

AECOM

FIGURE 3-2

C:\Users\maxwell.reis\Documents\ArtcoMaps\Top_of_Rock_Contour.mxd 6/24/2022

N

MW- 9

TROWBRIDGE ST

WEST MAIN ST

SS- 1 (H&A)

SS- 4 (H&A)

SS- 8 (H&A)

SS- 6 (H&A)

SS- 5 (H&A)

GRASS

ASPHALT

SS-3

100N 40E

80N 40E

SP-10

ROCHESTER EMERGENCY COMMUNICATIONS OFFICE

SB-104 (0' - 0.17') | CRIT 1 | CRIT 2 | CRIT 3 | 09/13

Metals:				
Lead	63	450	1000	66

SB-104 (0' - 1') | CRIT 1 | CRIT 2 | CRIT 3 | 09/13

SVOCs:				
Benzo(a)anthracene	1	1	5.6	8.1
Benzo(a)pyrene	1	22	1	7.2
Benzo(b)fluoranthene	1	1.7	5.6	7.7
Benzo(k)fluoranthene	0.8	1.7	56	2.9
Chrysene	1	1	56	8.5
Indeno(1,2,3-cd)pyrene	0.5	8.2	5.6	3.5

SS- 4 (0' - 1') | CRIT 1 | CRIT 2 | CRIT 3 | 10/98

Metals:			
Calcium	10000	--	-- | 10500
Iron	2000	--	-- | 13300

SS- 5 (0' - 1') | CRIT 1 | CRIT 2 | CRIT 3 | 10/98

Metals:				
Calcium	10000	--	--	38200
Iron	2000	--	--	14200
Lead	63	450	1000	221
Mercury	0.18	0.73	2.8	0.42
Thallium	5	--	--	7.3
Zinc	109	2480	10000	234

110N 30E (0.5' - 1.9') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	9.7

110N 50E (0.5' - 2.2') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	3.9

90N 50E (0.5' - 1.8') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	500	1.6
Tetrachloroethene	1.3	1.3	150	37
Trichloroethene	0.47	0.47	200	1.6

80N 30E (0.7' - 3') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	500	0.61
Tetrachloroethene	1.3	1.3	150	48
Trichloroethene	0.47	0.47	200	0.89

100N 20E (0.5' - 2.3') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	6

70N 40E (0.7' - 1.3') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	9.6

70N 50E (0.5' - 1.8') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	8.4

60N 50E (0.5' - 2.2') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	5.2

50N 50E (0.5' - 1.8') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	500	0.74
Tetrachloroethene	1.3	1.3	150	79
Trichloroethene	0.47	0.47	200	1.6

40N 40E (0.7' - 2.1') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	500	1.6
Methylene chloride	0.05	0.05	500	2.2
Tetrachloroethene	1.3	1.3	150	450
Trichloroethene	0.47	0.47	200	8.3

40N 50E (0.5' - 2.2') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	500	4.9
Tetrachloroethene	1.3	1.3	150	640
Trichloroethene	0.47	0.47	200	11

30N 40E (0.5' - 1.3') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	180
Trichloroethene	0.47	0.47	200	5.2

20N 50E (0.5' - 2.1') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	94
Trichloroethene	0.47	0.47	200	2.8

40N 30E (0.5' - 2.3') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	500	0.27
Tetrachloroethene	1.3	1.3	150	21
Trichloroethene	0.47	0.47	200	0.61
Metals:				
Calcium	10000	--	--	64700
Iron	2000	--	--	13000
Lead	63	450	1000	91.7

30N 20E (0.5' - 1.8') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	14

10N 30E (0.7' - 2.1') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	820

0N 20E (0.5' - 1.5') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	48
Trichloroethene	0.47	0.47	200	0.57

SP- 9 (0' - 1') | CRIT 1 | CRIT 2 | CRIT 3 | 09/11

SVOCs:				
Benzo(a)anthracene	1	1	5.6	2.4
Benzo(a)pyrene	1	22	1	2.9
Benzo(b)fluoranthene	1	1.7	5.6	2.7
Benzo(k)fluoranthene	0.8	1.7	56	2.2
Chrysene	1	1	56	2.4
Indeno(1,2,3-cd)pyrene	0.5	8.2	5.6	1.8

90N 10E (0.5' - 1.3') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	5.2

70N 20E (0.5' - 1.8') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	500	2.8
1,2-Dichloroethene (trans)	0.19	0.19	500	0.42
Tetrachloroethene	1.3	1.3	150	15
Trichloroethene	0.47	0.47	200	0.52

60N 40E (0.5' - 1.8') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	500	2.1
Tetrachloroethene	1.3	1.3	150	100
Trichloroethene	0.47	0.47	200	2
SVOCs:				
Di-n-butylphthalate	0.014	8.1	--	0.058
Metals:				
Calcium	10000	--	--	37600
Iron	2000	--	--	9330
Lead	63	450	1000	120
Mercury	0.18	0.73	2.8	0.37

SB-101 (0' - 0.17') | CRIT 1 | CRIT 2 | CRIT 3 | 09/13

SVOCs:				
Benzo(a)anthracene	1	1	5.6	9.5
Benzo(a)pyrene	1	22	1	8.9
Benzo(b)fluoranthene	1	1.7	5.6	10
Benzo(k)fluoranthene	0.8	1.7	56	4.2
Chrysene	1	1	56	10
Indeno(1,2,3-cd)pyrene	0.5	8.2	5.6	4.4

SB-101 (0' - 1') | CRIT 1 | CRIT 2 | CRIT 3 | 09/13

Metals:				
Lead	63	450	1000	160
Mercury	0.18	0.73	2.8	0.21
Zinc	109	2480	10000	120

60N 10E (0.5' - 2') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
1,2-Dichloroethene (cis)	0.25	0.25	500	0.43
Methylene chloride	0.05	0.05	500	0.077
Tetrachloroethene	1.3	1.3	150	4.3
Pesticides:				
4,4'-DDT	0.0033	136	47	0.023

40N 10E (0.5' - 1.5') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

VOCs:				
Tetrachloroethene	1.3	1.3	150	1.9

SP- 4 (0' - 1') | CRIT 1 | CRIT 2 | CRIT 3 | 09/11

VOCs:				
Tetrachloroethene	1.3	1.3	150	5
SVOCs:				
Benzo(a)anthracene	1	1	5.6	13
Benzo(a)pyrene	1	22	1	14
Benzo(b)fluoranthene	1	1.7	5.6	12
Benzo(k)fluoranthene	0.8	1.7	56	11
Chrysene	1	1	56	13
Indeno(1,2,3-cd)pyrene	0.5	8.2	5.6	8.5
Metals:				
Lead	63	450	1000	83.6
Mercury	0.18	0.73	2.8	0.312

SP- 2 (0' - 1') | CRIT 1 | CRIT 2 | CRIT 3 | 09/11

Metals:				
Lead	63	450	1000	92.5

SS- 2 (0' - 1') | CRIT 1 | CRIT 2 | CRIT 3 | 10/98

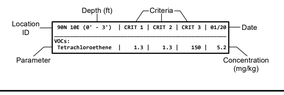
Metals:			
Iron	2000	--	-- | 14400

20N 10E (0.5' - 1.8') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20

SVOCs:				
2-Methylnaphthalene	0.41	36.4	--	2
Benzo(a)anthracene	1	1	5.6	39
Benzo(a)pyrene	1	22	1	33
Benzo(b)fluoranthene	1	1.7	5.6	37
Benzo(k)fluoranthene	0.8	1.7	56	18
Chrysene	1	1	56	37
Dibenz(a,h)anthracene	0.33	1000	0.56	7.3
Indeno(1,2,3-cd)pyrene	0.5	8.2	5.6	21
Pesticides:				
4,4'-DDT	0.0033	136	47	0.024

Legend

- Soil Sample - Exceedance of Criteria
- Soil Sample - No Exceedance of Criteria



NOTE:
CRIT 1 - 6NYCRR Part 375.6. Unrestricted Use, plus CP-51 Table 1.
CRIT 2 - 6NYCRR Part 375.6. Protection of Groundwater, plus CP-51 Table 1.
CRIT 3 - 6NYCRR Part 375.6. Protection of Public Health, Commercial, plus CP-51 Table 1.

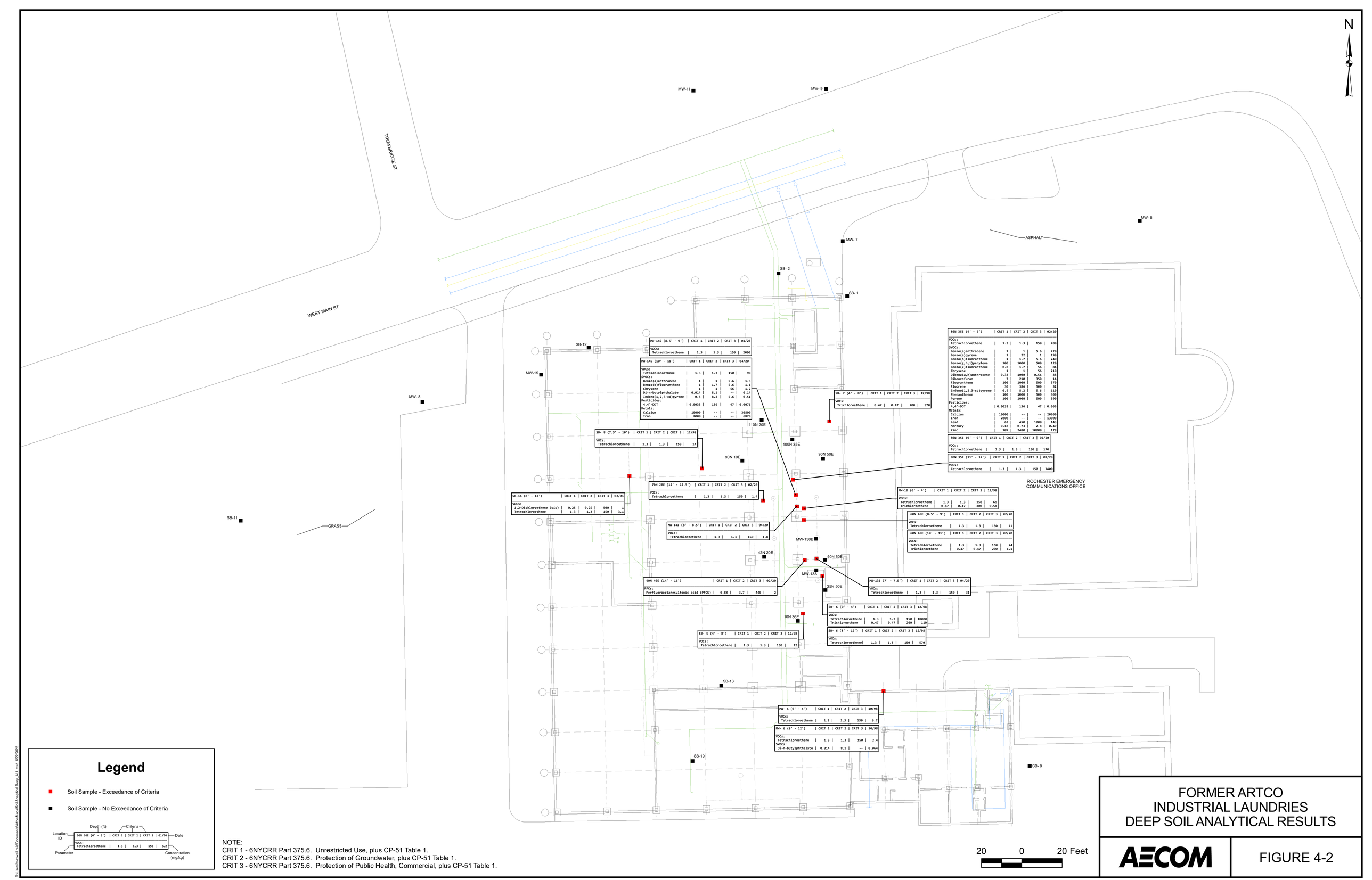
20 0 20 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES SHALLOW SOIL ANALYTICAL RESULTS

AECOM

FIGURE 4-1

C:\Users\rowanel.ren\Documents\Artco\Maps\Soil Analytical Shallow_ALL.mxd 6/22/2022



Legend

- Soil Sample - Exceedance of Criteria
- Soil Sample - No Exceedance of Criteria

Depth (ft) / Criteria / Location ID / Date / Parameter / Concentration (mg/kg)

90N 10E (0' - 3') | CRIT 1 | CRIT 2 | CRIT 3 | 01/20
VOCs:
Tetrachloroethene | 1.3 | 1.3 | 150 | 5.2

NOTE:
CRIT 1 - 6NYCRR Part 375.6. Unrestricted Use, plus CP-51 Table 1.
CRIT 2 - 6NYCRR Part 375.6. Protection of Groundwater, plus CP-51 Table 1.
CRIT 3 - 6NYCRR Part 375.6. Protection of Public Health, Commercial, plus CP-51 Table 1.

20 0 20 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES DEEP SOIL ANALYTICAL RESULTS

AECOM

FIGURE 4-2

C:\Users\mwood.reis\Documents\ArcGIS\Maps\Grid Analytical Deep_ALL.mxd 6/2/2025

N

110N 20E
10'-10.5', 0.4615

110N 30E
0.5'-1.9', 9.83

110N 50E
0.5'-2.2', 4.039

100N 20E
0.5'-2.3', 6.047

100N 35E
7'-7.5', 0.047

100N 40E
0.7'-1.2', 0.031

90N 50E
0.5'-1.8', 38.82

80N 35E
4'-5', 200.0371

90N 50E
5'-5', 0.0152

80N 35E
9'-9', 170

90N 10E
0.5'-1.3', 5.371

80N 35E
11'-12', 7400

80N 30E
0.7'-3', 49.28

90N 10E
6'-6.5', 0.16

80N 40E
0.7'-1.3', 0.024

MW-14S
8.5'-9', 2000

70N 20E
0.5'-1.8', 18.74

MW-14S
10'-11', 90

70N 40E
0.7'-1.3', 9.694

70N 20E
12'-12.5', 1.4104

60N 40E
0.5'-1.8', 104.1

70N 50E
0.5'-1.8', 8.66

60N 40E
8.5'-9', 11

MW-14I
8'-8.5', 1.8

60N 40E
10'-11', 25.26

60N 50E
0.5'-2.2', 5.66

60N 10E
0.5'-2', 4.842

MW-130B
7.5'-8.5', 0.48

50N 50E
0.5'-1.8', 80.74

40N 50E
0.5'-2.2', 655.9

42N 20E
11.5'-12.3', 0.077

MW-13I
7'-7.5', 31.46

40N 50E
12'-12', 0.2018

40N 10E
0.5'-1.5', 2.034

40N 30E
0.5'-2.3', 21.88

40N 40E
0.7'-2.1', 455.9

MW-13S
7.5'-8.5', 0.89

30N 20E
0.5'-1.8', 14.81

40N 40E
13'-13', 0.16

30N 40E
0.5'-1.3', 185.2

25N 50E
8.5'-8.5', 1.23551

20N 10E
0.5'-1.8', 0.09

20N 50E
0.5'-2.1', 96.8

10N 30E
0.7'-2.1', 820

10N 36E
7'-7', 0.063

0N 20E
0.5'-1.5', 48.57

ROCHESTER EMERGENCY
COMMUNICATIONS OFFICE

Legend

Total CVOC Concentration (mg/kg):

- ND
- < 1
- 1 - 25
- 25 - 50
- 50 - 100
- > 100

15 0 15 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES TOTAL CVOC RESULTS

AECOM

FIGURE 4-3

C:\Users\maxwell.reis\Documents\Artco\Maps\Soil Total CVOC.mxd 6/22/2022

N

MN- 6OB

MW- 3

TROWBRIDGE ST

WEST MAIN ST

FORD ST

ASPHALT

GRASS

ROCHESTER EMERGENCY COMMUNICATIONS OFFICE

ASPHALT

MW- 2	CRIT	05/13	12/13	02/21
VOCs:				
Tetrachloroethene	5	30	31	17
Trichloroethene	5	12	58	11
1,2-Dichloroethene (cis)	5	ND	32	8.5
Benzene	1	ND	1.6	ND

MW-15OB	CRIT	02/21
VOCs:		
Tetrachloroethene	5	1400
Trichloroethene	5	36

MW-13OB	CRIT	02/21
VOCs:		
1,2-Dichloroethene (cis)	5	6500
Tetrachloroethene	5	56000
Trichloroethene	5	9400
Metals:		
Iron	300	1700
Magnesium	35000	38800
Manganese	300	1100
Sodium	20000	281000

MW-101	CRIT	12/13	02/21
VOCs:			
1,2-Dichloroethene (cis)	5	2800	100
1,2-Dichloroethene (trans)	5	37	ND
Tetrachloroethene	5	1600	1300
Trichloroethene	5	370	51

MW- 6	CRIT	05/13	12/13	02/21
VOCs:				
1,2-Dichloroethene (cis)	5	9.5	13	41
Tetrachloroethene	5	BC	98	80
Trichloroethene	5	ND	10	11

MW- 1	CRIT	04/98	05/13	02/21
Metals:				
Chromium	50	131000	NA	NA
Lead	25	996	NA	NA
Manganese	300	29300	NA	NA
Sodium	20000	116000	NA	NA

Legend

- Groundwater Sample - Exceedance of Criteria
- Groundwater Sample - No Exceedance of Criteria

Criteria

Location ID — MN- 1I | CRIT | 02/21 — Date

VOCs:
Vinyl chloride | 2 | 8.7

Parameter — Concentration (ug/l)

NOTES:
1. BC = Below Criteria, ND = Not Detected, NA = Not Analyzed
2. CRIT - NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

80 0 80 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES GROUNDWATER ANALYTICAL RESULTS OVERBURDERN COMPARISON

AECOM

FIGURE 4-4

C:\Users\maxwell.reis\Documents\Artco\Maps\GW Analytical_2021_Overburden.mxd 6/21/2022

N

MN-11S

MN-12S

MN- 6S

MW-11	CRIT	05/13	12/13	02/21
VOCs:				
1,2-Dichloroethene (cis)	5	1800	2500	84
Tetrachloroethene	5	11000	11000	140
Trichloroethene	5	2700	3400	70
Vinyl chloride	2	17	13	5.6

BMW-104S	CRIT	12/13	02/21
VOCs:			
1,2-Dichloroethene (cis)	5	2300	8900
Tetrachloroethene	5	35000	82000
Trichloroethene	5	7500	20000
Methylene chloride	5	ND	1100

BMW-102S	CRIT	12/13	02/21
VOCs:			
1,2-Dichloroethene (cis)	5	120	330
Tetrachloroethene	5	600	3400
Trichloroethene	5	89	470
Vinyl chloride	2	5.5	ND

MW-15	CRIT	05/13	12/13	02/21
VOCs:				
1,2-Dichloroethene (cis)	5	170	320	880
Tetrachloroethene	5	5500	4600	27000
Trichloroethene	5	150	260	880
Vinyl chloride	2	4.3	ND	ND

MW-14S	CRIT	02/21
VOCs:		
1,2-Dichloroethene (cis)	5	1900
Tetrachloroethene	5	14000
Trichloroethene	5	1800
Metals:		
Iron	300	1800
Magnesium	35000	45000
Sodium	20000	576000

MW-4R	CRIT	05/09	05/13	02/21
VOCs:				
1,2-Dichloroethene (cis)	5	9.2	6.4	ND
Vinyl chloride	2	2.4	ND	ND

MW-14	CRIT	05/13	12/13	02/21
VOCs:				
1,2-Dichloroethene (cis)	5	160	23	61
Tetrachloroethene	5	1400	110	BC
Trichloroethene	5	200	16	BC
Vinyl chloride	2	3.6	17	45

BMW-103S	CRIT	12/13	02/21
VOCs:			
1,2-Dichloroethene (cis)	5	6	240
Vinyl chloride	2	11	7.3
Benzene	1	ND	3.4

MW-13	CRIT	05/13	12/13	02/21
VOCs:				
Tetrachloroethene	5	980	1200	410
Trichloroethene	5	43	43	17
Vinyl chloride	2	12	15	9.6
1,2-Dichloroethene (cis)	5	ND	58	12
SVOCs:				
1,4-Dioxane	0.35	NA	NA	0.57
Metals:				
Iron	300	NA	NA	1700
Magnesium	35000	NA	NA	45100
Sodium	20000	NA	NA	109000

MN- 3S

MW-13S	CRIT	02/21
VOCs:		
1,2-Dichloroethene (cis)	5	520
Tetrachloroethene	5	16000
Trichloroethene	5	900

MN- 5S	CRIT	05/13	12/13	02/21
VOCs:				
1,2-Dichloroethene (cis)	5	ND	14	17
Vinyl chloride	2	BC	20	8.2
SVOCs:				
1,4-Dioxane	0.35	NA	NA	0.91
Metals:				
Iron	300	NA	NA	1400
Magnesium	35000	NA	NA	51800
Sodium	20000	NA	NA	127000

MN- 4S	CRIT	05/13	12/13	02/21
VOCs:				
1,2-Dichloroethene (cis)	5	6.3	6	8.3
Vinyl chloride	2	19	17	5.9

MN- 1S	CRIT	05/09	05/13	02/21
VOCs:				
Vinyl chloride	2	3.6	ND	ND

MN- 2S

MW-12	CRIT	05/13	12/13	02/21
VOCs:				
Tetrachloroethene	5	6.6	12	66
1,2-Dichloroethene (cis)	5	ND	ND	14
Trichloroethene	5	ND	BC	18
Vinyl chloride	2	ND	ND	2.8

TROWBRIDGE ST

WEST MAIN ST

FORD ST

ASPHALT

GRASS

ASPHALT

ROCHESTER EMERGENCY COMMUNICATIONS OFFICE

Legend

- Groundwater Sample - Exceedance of Criteria
- Groundwater Sample - No Exceedance of Criteria

Criteria

Location ID — MN- 1I | CRIT | 02/21 — Date

VOCs:
Vinyl chloride | 2 | 8.7

Parameter — Concentration (ug/l)

NOTES:
1. BC = Below Criteria, ND = Not Detected, NA = Not Analyzed
2. CRIT - NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

80 0 80 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES GROUNDWATER ANALYTICAL RESULTS SHALLOW COMPARISON

AECOM

FIGURE 4-5

C:\Users\maxwell.reis\Documents\Artco\Maps\GW Analytical_2021_Shallow.mxd 6/21/2022

N

MN-11I

MN- 6I	CRIT	05/13	12/13	02/21
VOCs:				
1,2-Dichloroethene (cis)	5	580	300	1300
Tetrachloroethene	5	200	69	160
Trichloroethene	5	140	60	280
Vinyl chloride	2	BC	ND	27

MN-12I

BMW-104I	CRIT	12/13	02/21
VOCs:			
1,2-Dichloroethene (cis)	5	2500	1600
1,2-Dichloroethene (trans)	5	11	ND
Tetrachloroethene	5	16000	3100
Trichloroethene	5	3800	1300
Vinyl chloride	2	10	49
Methylene chloride	5	ND	19

TROWBRIDGE ST

FORD ST

ASPHALT

WEST MAIN ST

MW-14I	CRIT	02/21
VOCs:		
1,2-Dichloroethene (cis)	5	1200
Tetrachloroethene	5	2300
Trichloroethene	5	470
Vinyl chloride	2	85

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BMW-102I	CRIT	12/13	02/21
VOCs:			
Vinyl chloride	2	5.1	ND

GRASS

MW-13I	CRIT	02/21
VOCs:		
1,2-Dichloroethene (cis)	5	600
Tetrachloroethene	5	8700
Trichloroethene	5	730
Metals:		
Iron	300	3800
Magnesium	35000	53200
Sodium	20000	851000

MN- 3I	CRIT	05/09	05/13	02/21
VOCs:				
Vinyl chloride	2	ND	ND	2.7

MN- 4I	CRIT	05/13	12/13	02/21
VOCs:				
Benzene	1	3.9	2.7	ND
Vinyl chloride	2	38	25	ND
1,2-Dichloroethene (cis)	5	BC	BC	280
Tetrachloroethene	5	ND	ND	2100
Trichloroethene	5	ND	ND	280

ASPHALT

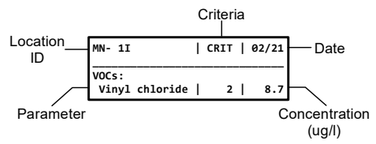
MN- 1I	CRIT	05/13	12/13	02/21
VOCs:				
1,2-Dichloroethene (cis)	5	12	BC	BC
Vinyl chloride	2	2.7	BC	8.7

MN- 2I	CRIT	05/09	05/13	02/21
VOCs:				
Vinyl chloride	2	ND	2.1	ND
1,2-Dichloroethene (cis)	5	BC	BC	5.2

MN- 5I	CRIT	05/13	12/13	02/21
VOCs:				
Benzene	1	6.7	5.9	5.3
Vinyl chloride	2	14	11	26
1,2-Dichloroethene (cis)	5	ND	ND	270

Legend

- Groundwater Sample - Exceedance of Criteria
- Groundwater Sample - No Exceedance of Criteria



NOTES:
1. BC = Below Criteria, ND = Not Detected, NA = Not Analyzed
2. CRIT - NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

80 0 80 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES GROUNDWATER ANALYTICAL RESULTS INTERMEDIATE COMPARISON

AECOM

FIGURE 4-6

C:\Users\maxwell.reis\Documents\Artco\Maps\GW Analytical_2021_Intermediate.mxd 6/22/2022

N

MN-11D

MN-12D

MN- 6D

MN- 9D	CRIT	05/13	12/13	04/21
VOCs:				
1,2-Dichloroethene (cis)	5	120	240	ND
Vinyl chloride	2	40	400	ND
Tetrachloroethene	5	ND	39	ND
Trichloroethene	5	ND	26	ND

TROWBRIDGE ST

FORD ST

ASPHALT

MN- 8D	CRIT	05/09	05/13	04/21
VOCs:				
Vinyl chloride	2	3.3	ND	ND

WEST MAIN ST

BMW-102D	CRIT	12/13	02/21
VOCs:			
Acetone	50	63	80
Carbon disulfide	60	140	BC
Tetrachloroethene	5	21	BC
Ethylbenzene	5	ND	5.3
Xylene (total)	5	ND	22

GRASS

ROCHESTER EMERGENCY COMMUNICATIONS OFFICE

MN- 3D

ASPHALT

MN- 1D	CRIT	05/09	05/13	02/21
VOCs:				
Ethylbenzene	5	NA	ND	5.4
Xylene (total)	5	NA	ND	32

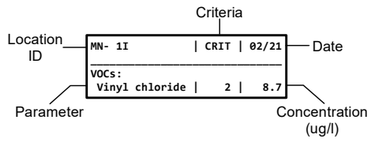
MN- 2D

MN- 5D

MN- 4D

Legend

- Groundwater Sample - Exceedance of Criteria
- Groundwater Sample - No Exceedance of Criteria



NOTES:
1. BC = Below Criteria, ND = Not Detected, NA = Not Analyzed
2. CRIT - NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

80 0 80 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES GROUNDWATER ANALYTICAL RESULTS DEEP COMPARISON

AECOM

FIGURE 4-7

C:\Users\maxwell.reis\Documents\Artco\Maps\GW Analytical_2021_Deep.mxd 8/12/2021

N

110N 20E (10'-10.5'), 0.44
110N 30E (0.5'-1.9'), 9.7
110N 50E (0.5'-2.2'), 3.9
100N 20E (0.5'-2.3'), 6
100N 40E (0.7'-1.2'), 0.031
100N 35E (7'-7.5'), 0.047
90N 10E (0.5'-1.3'), 5.2
90N 50E (0.5'-1.8'), 37
80N 35E (11'-12'), 7400
80N 30E (0.7'-3'), 48
80N 40E (0.7'-1.3'), 0.024
MW-14S (8.5'-9', 2000
70N 20E (0.5'-1.8'), 15
70N 50E (0.5'-1.8'), 8.4
70N 40E (0.7'-1.3'), 9.6
MW-14I (8'-8.5'), 1.8
60N 10E (0.5'-2'), 4.3
60N 40E (0.5'-1.8'), 100
60N 50E (0.5'-2.2'), 5.2
MW-130B (7.5'-8.5'), 0.48
50N 50E (0.5'-1.8'), 79
42N 20E (11.5'-12.3'), 0.077
MW-13I (7'-7.5'), 31
40N 50E (0.5'-2.2'), 640
40N 10E (0.5'-1.5'), 1.9
40N 30E (0.5'-2.3'), 21
40N 40E (0.7'-2.1'), 450
MW-13S (7.5'-8.5'), 0.89
30N 20E (0.5'-1.8'), 14
30N 40E (0.5'-1.3'), 180
25N 50E (8.5'), 1.2
20N 10E (0.5'-1.8'), 0.074
20N 50E (0.5'-2.1'), 94
10N 30E (0.7'-2.1'), 820
10N 36E (7'), 0.063
0N 20E (0.5'-1.5'), 48

Legend

- PCE Soil Sample

PCE Isoconcentration:

- Estimated Extent of Iso-Contour
- 1
- 10
- 100
- 1000

Location ID — 0N 20E (0'-3'), 48 — Maximum Concentration Depth (ft); PCE Concentration (mg/kg)

15 0 15 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES SOIL TETRACHLOROETHENE ISOCONCENTRATION CONTOURS

AECOM

FIGURE 5-1

C:\Users\maxwell.reis\Documents\Artco\Maps\Soil Analytical PCE Contour.mxd 6/24/2022

N

MN-10S
MN-10I
MN-10D

MN-11S
MN-11I
MN-11D

MN-12OB
MN-12S
MN-12I
MN-12D

MN- 6OB
MN- 6S
MN- 6I
MN- 6D

TROWBRIDGE ST

MW-11 (S)

MW- 9 (OB)

BMW-104S
BMW-104I

MN- 9OB
MN- 9S
MN- 9I
MN- 9D

MW- 7 (OB)

ASPHALT

MW- 3 (OB)

MW- 5 (OB)

FORD ST

MN- 7S
MN- 7I
MN- 7D

WEST MAIN ST

MW- 2 (OB)

MN- 8I
MN- 8S
MN- 8D

MW- 8

MW-15 (S)

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BMW-102S
BMW-102D
BMW-102I

MW- 4 (OB)

MW- 4R (S)

BMW-103S

GRASS

MW-14 (S)

MW-13I

MW-101 (OB)

MW-13 (S)

FORMER DRY
CLEANING MACHINE

MW- 8A

MN- 3S
MN- 3I
MN- 3D

ASPHALT

FORMER ARTCO
INDUSTRIAL LAUNDRIES

MN- 1S
MN- 1I
MN- 1D

MN- 2I
MN- 2S
MN- 2D

MW- 1 (OB)

MN- 5OB
MN- 5S
MN- 5I
MN- 5D

MN- 4OB
MN- 4S
MN- 4I
MN- 4D

Legend

- Shallow Bedrock Well
- Overburden/Shallow Bedrock Well Pair
- Overburden/Shallow/Intermediate Bedrock Well Group
- Monitoring Well
- Parcel Boundary

80 0 80 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES INJECTION WELL LOCATION MAP

AECOM

FIGURE 5-2

C:\Users\maxwell.reis\Documents\Artco\Maps\Injection_Well_Locations_REV.mxd 6/22/2022

APPENDIX A

HISTORICAL ANALYTICAL RESULTS

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			BMW-102D	BMW-102I	BMW-102S	BMW-103S	BMW-104I
Sample ID			4552-122013-1515	4527-122013-1500	4527-122013-1105	4552-122013-0940	4552-122013-1010
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/20/13	12/20/13	12/20/13	12/20/13	12/20/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5					
1,1-Dichloroethane	UG/L	5					
1,1-Dichloroethene	UG/L	5					
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	3.1		120	6.0	2,500
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					11
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-					
Acetone	UG/L	50	63				
Benzene	UG/L	1					
Bromodichloromethane	UG/L	50					
Bromoform	UG/L	50					
Carbon disulfide	UG/L	60	140	1.1			
Chlorobenzene	UG/L	5					
Chloroform	UG/L	7					
Cyclohexane	UG/L	-	3.8				
Ethylbenzene	UG/L	5					
Isopropylbenzene (Cumene)	UG/L	5					
Methyl ethyl ketone (2-Butanone)	UG/L	50	12				
Methyl tert-butyl ether	UG/L	10			2.5	2.0	
Methylcyclohexane	UG/L	-	7.4	5.6			
Methylene chloride	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			BMW-102D	BMW-102I	BMW-102S	BMW-103S	BMW-104I
Sample ID			4552-122013-1515	4527-122013-1500	4527-122013-1105	4552-122013-0940	4552-122013-1010
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/20/13	12/20/13	12/20/13	12/20/13	12/20/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5					
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5	21	4.1	600		16,000
Toluene	UG/L	5					
Trichloroethene	UG/L	5	2.8		89		3,800
Vinyl chloride	UG/L	2		5.1	5.5	11	10
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			BMW-104S	BMW-104S	MN- 1D	MN- 1D	MN- 1I
Sample ID			4527-121313-0001	4527-121313-1450	MN-1D-051909-N	MN1D-051513-0955	MN-1I-051809-N
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/13/13	12/13/13	05/19/09	05/15/13	05/18/09
Parameter	**Units**	**Criteria***	Field Duplicate (1-1)				
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5			NA		NA
1,1-Dichloroethane	UG/L	5			NA		NA
1,1-Dichloroethene	UG/L	5			NA		NA
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	2,300	2,200	1.1		3.5
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-			NA		NA
Acetone	UG/L	50			NA		NA
Benzene	UG/L	1			NA		NA
Bromodichloromethane	UG/L	50			NA		NA
Bromoform	UG/L	50			NA		NA
Carbon disulfide	UG/L	60			NA		NA
Chlorobenzene	UG/L	5			NA		NA
Chloroform	UG/L	7			NA		NA
Cyclohexane	UG/L	-			NA		NA
Ethylbenzene	UG/L	5			NA		NA
Isopropylbenzene (Cumene)	UG/L	5			NA		NA
Methyl ethyl ketone (2-Butanone)	UG/L	50			NA		NA
Methyl tert-butyl ether	UG/L	10			NA		NA
Methylcyclohexane	UG/L	-			NA		NA
Methylene chloride	UG/L	5			NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			BMW-104S	BMW-104S	MN- 1D	MN- 1D	MN- 1I
Sample ID			4527-121313-0001	4527-121313-1450	MN-1D-051909-N	MN1D-051513-0955	MN-1I-051809-N
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/13/13	12/13/13	05/19/09	05/15/13	05/18/09
Parameter	**Units**	**Criteria***	Field Duplicate (1-1)				
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5			NA		NA
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5	34,000	35,000			
Toluene	UG/L	5			NA		NA
Trichloroethene	UG/L	5	7,500	7,500			
Vinyl chloride	UG/L	2					3.7 JN
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5			NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 1I	MN- 1I	MN- 1S	MN- 1S	MN- 2D
Sample ID			MN1I-051513-1040	4527-122013-1415	MN-1S-051809-N	MN1S-051513-1245	MN-2D-051809-N
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/15/13	12/20/13	05/18/09	05/15/13	05/18/09
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5			NA		NA
1,1-Dichloroethane	UG/L	5			NA		NA
1,1-Dichloroethene	UG/L	5			NA		NA
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	12	1.5	3.1		
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-			NA		NA
Acetone	UG/L	50			NA		NA
Benzene	UG/L	1			NA		NA
Bromodichloromethane	UG/L	50			NA		NA
Bromoform	UG/L	50			NA		NA
Carbon disulfide	UG/L	60			NA		NA
Chlorobenzene	UG/L	5			NA		NA
Chloroform	UG/L	7			NA		NA
Cyclohexane	UG/L	-			NA		NA
Ethylbenzene	UG/L	5			NA		NA
Isopropylbenzene (Cumene)	UG/L	5			NA		NA
Methyl ethyl ketone (2-Butanone)	UG/L	50			NA		NA
Methyl tert-butyl ether	UG/L	10			NA		NA
Methylcyclohexane	UG/L	-			NA		NA
Methylene chloride	UG/L	5			NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 1I	MN- 1I	MN- 1S	MN- 1S	MN- 2D
Sample ID			MN1I-051513-1040	4527-122013-1415	MN-1S-051809-N	MN1S-051513-1245	MN-2D-051809-N
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/15/13	12/20/13	05/18/09	05/15/13	05/18/09
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5			NA		NA
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5			NA		NA
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2	2.7	1.3	3.6		
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5			NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 2D	MN- 2I	MN- 2I	MN- 2S	MN- 2S
Sample ID			MN2D-050713-1220	MN-2I-051809-N	MN2I-050713-1055	MN-2S-051809-N	MN2S-051413-1550
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/07/13	05/18/09	05/07/13	05/18/09	05/14/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethene	UG/L	5		NA		NA	
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5		0.96 J	4.4		
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		NA		NA	
Acetone	UG/L	50		NA		NA	
Benzene	UG/L	1		NA		NA	
Bromodichloromethane	UG/L	50		NA		NA	
Bromoform	UG/L	50		NA		NA	
Carbon disulfide	UG/L	60		NA		NA	
Chlorobenzene	UG/L	5		NA		NA	
Chloroform	UG/L	7		NA		NA	
Cyclohexane	UG/L	-		NA		NA	
Ethylbenzene	UG/L	5		NA		NA	
Isopropylbenzene (Cumene)	UG/L	5		NA		NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50		NA		NA	
Methyl tert-butyl ether	UG/L	10		NA		NA	
Methylcyclohexane	UG/L	-		NA		NA	
Methylene chloride	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 2D	MN- 2I	MN- 2I	MN- 2S	MN- 2S
Sample ID			MN2D-050713-1220	MN-2I-051809-N	MN2I-050713-1055	MN-2S-051809-N	MN2S-051413-1550
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/07/13	05/18/09	05/07/13	05/18/09	05/14/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5		NA		NA	
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5		NA		NA	
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2			2.1		
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 3D	MN- 3D	MN- 3I	MN- 3I	MN- 3S
Sample ID			MN-3D-051909-N	MN3D-051613-1625	MN-3I-051909-N	MN3I-051613-1550	MN-3S-051909-N
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/19/09	05/16/13	05/19/09	05/16/13	05/19/09
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA		NA		NA
1,1-Dichloroethane	UG/L	5	NA		NA		NA
1,1-Dichloroethene	UG/L	5	NA		NA		NA
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5				3.7	
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA		NA		NA
Acetone	UG/L	50	NA		NA		NA
Benzene	UG/L	1	NA		NA		NA
Bromodichloromethane	UG/L	50	NA		NA		NA
Bromoform	UG/L	50	NA		NA		NA
Carbon disulfide	UG/L	60	NA		NA		NA
Chlorobenzene	UG/L	5	NA		NA		NA
Chloroform	UG/L	7	NA		NA		NA
Cyclohexane	UG/L	-	NA		NA		NA
Ethylbenzene	UG/L	5	NA		NA		NA
Isopropylbenzene (Cumene)	UG/L	5	NA		NA		NA
Methyl ethyl ketone (2-Butanone)	UG/L	50	NA		NA		NA
Methyl tert-butyl ether	UG/L	10	NA		NA		NA
Methylcyclohexane	UG/L	-	NA		NA		NA
Methylene chloride	UG/L	5	NA		NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs

#Error

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 3D	MN- 3D	MN- 3I	MN- 3I	MN- 3S
Sample ID			MN-3D-051909-N	MN3D-051613-1625	MN-3I-051909-N	MN3I-051613-1550	MN-3S-051909-N
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/19/09	05/16/13	05/19/09	05/16/13	05/19/09
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5	NA		NA		NA
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5	NA		NA		NA
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2					
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5	NA		NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs

#Error

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 3S	MN- 4D	MN- 4D	MN- 4I	MN- 4I
Sample ID			MN3OB-051613-1510	MN-4D-052009-N	MN4D-051013-0925	MN-4I-052009-N	MN4I-051013-1005
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/16/13	05/20/09	05/10/13	05/20/09	05/10/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethene	UG/L	5		NA		NA	
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	2.1	3.6		3.9	2.8
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		NA		NA	
Acetone	UG/L	50		NA		NA	
Benzene	UG/L	1		NA		NA	3.9
Bromodichloromethane	UG/L	50		NA		NA	
Bromoform	UG/L	50		NA		NA	
Carbon disulfide	UG/L	60		NA		NA	
Chlorobenzene	UG/L	5		NA		NA	
Chloroform	UG/L	7		NA		NA	
Cyclohexane	UG/L	-		NA		NA	
Ethylbenzene	UG/L	5		NA		NA	
Isopropylbenzene (Cumene)	UG/L	5		NA		NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50		NA		NA	
Methyl tert-butyl ether	UG/L	10		NA		NA	
Methylcyclohexane	UG/L	-		NA		NA	
Methylene chloride	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 3S	MN- 4D	MN- 4D	MN- 4I	MN- 4I
Sample ID			MN3OB-051613-1510	MN-4D-052009-N	MN4D-051013-0925	MN-4I-052009-N	MN4I-051013-1005
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/16/13	05/20/09	05/10/13	05/20/09	05/10/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5		NA		NA	
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5		NA		NA	
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2				14	38
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 4I	MN- 4OB	MN- 4OB	MN- 4S	MN- 4S
Sample ID			4552-121913-1420	MN-4-OB-052009-N	MN4OB-051013-1130	MN-4S-052009-N	MN4S-051013-1035
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/19/13	05/20/09	05/10/13	05/20/09	05/10/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethane	UG/L	5		NA		NA	1.9
1,1-Dichloroethene	UG/L	5		NA		NA	
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	2.2			5.2	6.3
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		NA		NA	
Acetone	UG/L	50		NA		NA	
Benzene	UG/L	1	2.7	NA		NA	
Bromodichloromethane	UG/L	50		NA		NA	
Bromoform	UG/L	50		NA		NA	
Carbon disulfide	UG/L	60		NA		NA	
Chlorobenzene	UG/L	5		NA		NA	
Chloroform	UG/L	7		NA		NA	
Cyclohexane	UG/L	-		NA		NA	
Ethylbenzene	UG/L	5		NA		NA	
Isopropylbenzene (Cumene)	UG/L	5		NA		NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50		NA		NA	
Methyl tert-butyl ether	UG/L	10		NA		NA	4.4
Methylcyclohexane	UG/L	-		NA		NA	
Methylene chloride	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 4I	MN- 4OB	MN- 4OB	MN- 4S	MN- 4S
Sample ID			4552-121913-1420	MN-4-OB-052009-N	MN4OB-051013-1130	MN-4S-052009-N	MN4S-051013-1035
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/19/13	05/20/09	05/10/13	05/20/09	05/10/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5		NA		NA	
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5		NA		NA	
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2	25			36	19
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 4S	MN- 5D	MN- 5D	MN- 5I	MN- 5I
Sample ID			4552-121913-1230	MN-5D-052009-N	MN5D-050913-1250	MN-5I-052009-N	MN5I-050913-1450
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/19/13	05/20/09	05/09/13	05/20/09	05/09/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethane	UG/L	5	1.6	NA		NA	
1,1-Dichloroethene	UG/L	5		NA		NA	
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	6.0			1.3	
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		NA		NA	
Acetone	UG/L	50		NA		NA	
Benzene	UG/L	1		NA		NA	6.7
Bromodichloromethane	UG/L	50		NA		NA	
Bromoform	UG/L	50		NA		NA	
Carbon disulfide	UG/L	60		NA	1.1	NA	
Chlorobenzene	UG/L	5		NA		NA	
Chloroform	UG/L	7		NA		NA	
Cyclohexane	UG/L	-		NA		NA	
Ethylbenzene	UG/L	5		NA		NA	
Isopropylbenzene (Cumene)	UG/L	5		NA		NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50		NA		NA	
Methyl tert-butyl ether	UG/L	10	3.4	NA		NA	
Methylcyclohexane	UG/L	-		NA		NA	
Methylene chloride	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

(oval) Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 4S	MN- 5D	MN- 5D	MN- 5I	MN- 5I
Sample ID			4552-121913-1230	MN-5D-052009-N	MN5D-050913-1250	MN-5I-052009-N	MN5I-050913-1450
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/19/13	05/20/09	05/09/13	05/20/09	05/09/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5		NA		NA	
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5		NA		NA	
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2	17			12	14
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 5I	MN- 5OB	MN- 5OB	MN- 5S	MN- 5S
Sample ID			4552-121913-1040	MN-5-OB-052109-N	MN5OB-050913-1640	MN-5S-052009-N	MN5S-050913-1535
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/19/13	05/21/09	05/09/13	05/20/09	05/09/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethene	UG/L	5		NA		NA	
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5				31	
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		NA		NA	
Acetone	UG/L	50		NA		NA	
Benzene	UG/L	1	5.9	NA		NA	
Bromodichloromethane	UG/L	50		NA		NA	
Bromoform	UG/L	50		NA		NA	
Carbon disulfide	UG/L	60		NA		NA	
Chlorobenzene	UG/L	5		NA		NA	
Chloroform	UG/L	7		NA		NA	
Cyclohexane	UG/L	-		NA		NA	
Ethylbenzene	UG/L	5		NA		NA	
Isopropylbenzene (Cumene)	UG/L	5		NA		NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50		NA		NA	
Methyl tert-butyl ether	UG/L	10		NA		NA	
Methylcyclohexane	UG/L	-		NA		NA	
Methylene chloride	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 5I	MN- 5OB	MN- 5OB	MN- 5S	MN- 5S
Sample ID			4552-121913-1040	MN-5-OB-052109-N	MN5OB-050913-1640	MN-5S-052009-N	MN5S-050913-1535
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/19/13	05/21/09	05/09/13	05/20/09	05/09/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5		NA		NA	
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5		NA		NA	
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2	11			53	1.6
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 5S	MN- 6D	MN- 6D	MN- 6I	MN- 6I
Sample ID			4527-121913-0940	MN-6D-051909-N	MN6D-050813-1600	MN-6I-051909-N	MN6I-051013-0810
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/19/13	05/19/09	05/08/13	05/19/09	05/10/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethane	UG/L	5	3.2	NA		NA	
1,1-Dichloroethene	UG/L	5		NA		NA	
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	14			390	580
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5				1.3	
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		NA		NA	
Acetone	UG/L	50		NA		NA	
Benzene	UG/L	1		NA		NA	
Bromodichloromethane	UG/L	50		NA		NA	
Bromoform	UG/L	50		NA		NA	
Carbon disulfide	UG/L	60		NA		NA	
Chlorobenzene	UG/L	5		NA		NA	
Chloroform	UG/L	7		NA		NA	
Cyclohexane	UG/L	-		NA		NA	
Ethylbenzene	UG/L	5		NA		NA	
Isopropylbenzene (Cumene)	UG/L	5		NA		NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50		NA		NA	
Methyl tert-butyl ether	UG/L	10	3.7	NA		NA	
Methylcyclohexane	UG/L	-		NA		NA	
Methylene chloride	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 5S	MN- 6D	MN- 6D	MN- 6I	MN- 6I
Sample ID			4527-121913-0940	MN-6D-051909-N	MN6D-050813-1600	MN-6I-051909-N	MN6I-051013-0810
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/19/13	05/19/09	05/08/13	05/19/09	05/10/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5		NA		NA	
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5				120	200
Toluene	UG/L	5		NA		NA	
Trichloroethene	UG/L	5				120	140
Vinyl chloride	UG/L	2	20			33	1.9
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

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Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 6I	MN- 6OB	MN- 6OB	MN- 6S	MN- 6S
Sample ID			4552-121313-1035	MN-6-OB-051909-N	MN6OB-050813-1500	MN-6S-051909-N	MN6S-050913-1130
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/13/13	05/19/09	05/08/13	05/19/09	05/09/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethene	UG/L	5		NA		NA	
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	300				
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5	3.0				
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		NA		NA	
Acetone	UG/L	50		NA		NA	
Benzene	UG/L	1		NA		NA	
Bromodichloromethane	UG/L	50		NA		NA	
Bromoform	UG/L	50		NA		NA	
Carbon disulfide	UG/L	60		NA		NA	
Chlorobenzene	UG/L	5		NA		NA	
Chloroform	UG/L	7		NA		NA	
Cyclohexane	UG/L	-		NA		NA	
Ethylbenzene	UG/L	5		NA		NA	
Isopropylbenzene (Cumene)	UG/L	5		NA		NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50		NA		NA	
Methyl tert-butyl ether	UG/L	10		NA		NA	
Methylcyclohexane	UG/L	-		NA		NA	
Methylene chloride	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 6I	MN- 6OB	MN- 6OB	MN- 6S	MN- 6S
Sample ID			4552-121313-1035	MN-6-OB-051909-N	MN6OB-050813-1500	MN-6S-051909-N	MN6S-050913-1130
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/13/13	05/19/09	05/08/13	05/19/09	05/09/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5		NA		NA	
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5	69				
Toluene	UG/L	5		NA		NA	
Trichloroethene	UG/L	5	60				
Vinyl chloride	UG/L	2					
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 7D	MN- 7D	MN- 7I	MN- 7I	MN- 7I
Sample ID			MN-7D-052009-N	MN7D-051613-1400	MN-7I-052009-N	MN7I-051613-1310	4527-121813-0950
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/20/09	05/16/13	05/20/09	05/16/13	12/18/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA		NA		
1,1-Dichloroethane	UG/L	5	NA		NA		
1,1-Dichloroethene	UG/L	5	NA		NA		
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	1.0		2.6		
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA		NA		
Acetone	UG/L	50	NA		NA		
Benzene	UG/L	1	NA		NA	1.2	2.9
Bromodichloromethane	UG/L	50	NA		NA		
Bromoform	UG/L	50	NA		NA		
Carbon disulfide	UG/L	60	NA	1.9	NA		
Chlorobenzene	UG/L	5	NA		NA		1.2
Chloroform	UG/L	7	NA		NA		
Cyclohexane	UG/L	-	NA	2.5	NA		
Ethylbenzene	UG/L	5	NA		NA		
Isopropylbenzene (Cumene)	UG/L	5	NA		NA		
Methyl ethyl ketone (2-Butanone)	UG/L	50	NA		NA		
Methyl tert-butyl ether	UG/L	10	NA		NA		
Methylcyclohexane	UG/L	-	NA	1.3	NA		
Methylene chloride	UG/L	5	NA		NA		

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 7D	MN- 7D	MN- 7I	MN- 7I	MN- 7I
Sample ID			MN-7D-052009-N	MN7D-051613-1400	MN-7I-052009-N	MN7I-051613-1310	4527-121813-0950
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/20/09	05/16/13	05/20/09	05/16/13	12/18/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5	NA		NA		
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5	NA		NA		
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2			27	2.3	10
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5	NA		NA		

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 7S	MN- 7S	MN- 7S	MN- 7S	MN- 7S
Sample ID			MN-7S-052009-FD	MN-7S-052009-N	MN7S-051613-1210	4552-121713-0001	4552-121713-1510
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/20/09	05/20/09	05/16/13	12/17/13	12/17/13
Parameter	**Units**	**Criteria***	Field Duplicate (1-1)			Field Duplicate (1-1)	
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA	NA			
1,1-Dichloroethane	UG/L	5	NA	NA			
1,1-Dichloroethene	UG/L	5	NA	NA		1.1 J	1.2 J
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	480	370	94 J	650	560 J
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5	4.3	3.5 J		4.1	3.3
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA	NA			
Acetone	UG/L	50	NA	NA			
Benzene	UG/L	1	NA	NA	4.4 J	2.5	2.5
Bromodichloromethane	UG/L	50	NA	NA			
Bromoform	UG/L	50	NA	NA			
Carbon disulfide	UG/L	60	NA	NA			
Chlorobenzene	UG/L	5	NA	NA			
Chloroform	UG/L	7	NA	NA			
Cyclohexane	UG/L	-	NA	NA		1.4	1.4
Ethylbenzene	UG/L	5	NA	NA			
Isopropylbenzene (Cumene)	UG/L	5	NA	NA			
Methyl ethyl ketone (2-Butanone)	UG/L	50	NA	NA			
Methyl tert-butyl ether	UG/L	10	NA	NA	17 J	3.0	2.9
Methylcyclohexane	UG/L	-	NA	NA			
Methylene chloride	UG/L	5	NA	NA			

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 7S	MN- 7S	MN- 7S	MN- 7S	MN- 7S
Sample ID			MN-7S-052009-FD	MN-7S-052009-N	MN7S-051613-1210	4552-121713-0001	4552-121713-1510
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/20/09	05/20/09	05/16/13	12/17/13	12/17/13
Parameter	**Units**	**Criteria***	Field Duplicate (1-1)			Field Duplicate (1-1)	
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5	NA	NA			
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5	68	38		160 J	170
Toluene	UG/L	5	NA	NA			
Trichloroethene	UG/L	5	100	40		100 J	100
Vinyl chloride	UG/L	2	40	62 J	24 J	38 J	38
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5	NA	NA			

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 8D	MN- 8D	MN- 8I	MN- 8I	MN- 8S
Sample ID			MN-8D-052009-N	MN8D-051713-1115	MN-8I-052009-N	MN8I-051713-1025	MN-8S-052009-N
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/20/09	05/17/13	05/20/09	05/17/13	05/20/09
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA		NA		NA
1,1-Dichloroethane	UG/L	5	NA		NA		NA
1,1-Dichloroethene	UG/L	5	NA		NA		NA
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	1.6	1.4	2.9	2.3	4.1
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA		NA		NA
Acetone	UG/L	50	NA		NA		NA
Benzene	UG/L	1	NA		NA	6.2	NA
Bromodichloromethane	UG/L	50	NA		NA		NA
Bromoform	UG/L	50	NA		NA		NA
Carbon disulfide	UG/L	60	NA		NA		NA
Chlorobenzene	UG/L	5	NA		NA		NA
Chloroform	UG/L	7	NA		NA		NA
Cyclohexane	UG/L	-	NA		NA		NA
Ethylbenzene	UG/L	5	NA		NA		NA
Isopropylbenzene (Cumene)	UG/L	5	NA		NA		NA
Methyl ethyl ketone (2-Butanone)	UG/L	50	NA		NA		NA
Methyl tert-butyl ether	UG/L	10	NA		NA		NA
Methylcyclohexane	UG/L	-	NA		NA		NA
Methylene chloride	UG/L	5	NA		NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 8D	MN- 8D	MN- 8I	MN- 8I	MN- 8S
Sample ID			MN-8D-052009-N	MN8D-051713-1115	MN-8I-052009-N	MN8I-051713-1025	MN-8S-052009-N
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/20/09	05/17/13	05/20/09	05/17/13	05/20/09
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5	NA		NA		NA
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5	NA		NA		NA
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2	3.3 JN		15	4.8	6.5
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5	NA		NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 8S	MN- 9D	MN- 9D	MN- 9D	MN- 9I
Sample ID			MN8S-051713-0945	MN-9D-052009-N	MN9D-051513-1530	4552-121813-1020	MN-9I-052009-N
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/17/13	05/20/09	05/15/13	12/18/13	05/20/09
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA			NA
1,1-Dichloroethane	UG/L	5		NA			NA
1,1-Dichloroethene	UG/L	5		NA			NA
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	4.3	110	120	240	1,500 J
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5		0.63 J			3.0 J
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		NA			NA
Acetone	UG/L	50		NA			NA
Benzene	UG/L	1		NA			NA
Bromodichloromethane	UG/L	50		NA			NA
Bromoform	UG/L	50		NA			NA
Carbon disulfide	UG/L	60		NA			NA
Chlorobenzene	UG/L	5		NA			NA
Chloroform	UG/L	7		NA			NA
Cyclohexane	UG/L	-	5.5	NA			NA
Ethylbenzene	UG/L	5	1.4	NA			NA
Isopropylbenzene (Cumene)	UG/L	5		NA			NA
Methyl ethyl ketone (2-Butanone)	UG/L	50		NA			NA
Methyl tert-butyl ether	UG/L	10		NA			NA
Methylcyclohexane	UG/L	-	7.4	NA			NA
Methylene chloride	UG/L	5		NA			NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

(oval) Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 8S	MN- 9D	MN- 9D	MN- 9D	MN- 9I
Sample ID			MN8S-051713-0945	MN-9D-052009-N	MN9D-051513-1530	4552-121813-1020	MN-9I-052009-N
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/17/13	05/20/09	05/15/13	12/18/13	05/20/09
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5		NA			NA
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5		2,200		39	4.8 J
Toluene	UG/L	5		NA			NA
Trichloroethene	UG/L	5		190		26	5.6 J
Vinyl chloride	UG/L	2	3.4		40	400	19 J
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		NA			NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 9I	MN- 9S	MN- 9S	MN-10D	MN-10D
Sample ID			MN9I-051513-1500	MN-9S-052009-N	4552-121813-1000	MN-10D-051909-N	MN10D-050813-1335
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/15/13	05/20/09	12/18/13	05/19/09	05/08/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethene	UG/L	5	3.4 J	NA		NA	
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	2,000 J	91 J			
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5	8.0 J	0.54 J			
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		NA		NA	
Acetone	UG/L	50		NA		NA	
Benzene	UG/L	1		NA		NA	
Bromodichloromethane	UG/L	50		NA		NA	
Bromoform	UG/L	50		NA		NA	
Carbon disulfide	UG/L	60		NA		NA	
Chlorobenzene	UG/L	5		NA		NA	
Chloroform	UG/L	7		NA		NA	
Cyclohexane	UG/L	-		NA		NA	
Ethylbenzene	UG/L	5		NA		NA	
Isopropylbenzene (Cumene)	UG/L	5		NA		NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50		NA		NA	
Methyl tert-butyl ether	UG/L	10	2.7 J	NA		NA	
Methylcyclohexane	UG/L	-		NA		NA	
Methylene chloride	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN- 9I	MN- 9S	MN- 9S	MN-10D	MN-10D
Sample ID			MN9I-051513-1500	MN-9S-052009-N	4552-121813-1000	MN-10D-051909-N	MN10D-050813-1335
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/15/13	05/20/09	12/18/13	05/19/09	05/08/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5		NA		NA	
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5	3,200 J	3,600	44		
Toluene	UG/L	5		NA		NA	
Trichloroethene	UG/L	5	1,400 J	270	2.5		
Vinyl chloride	UG/L	2	17 J				
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN-10I	MN-10S	MN-11D	MN-11D	MN-11D
Sample ID			MN-10I-051909-N	MN10-051013-1330	MN-11D-051909-N	2306-050713-0002	MN11D-050713-1635
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/19/09	05/10/13	05/19/09	05/07/13	05/07/13
Parameter	Units	Criteria*				Field Duplicate (1-1)	
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA		NA		
1,1-Dichloroethane	UG/L	5	NA		NA		
1,1-Dichloroethene	UG/L	5	NA		NA		
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5					
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA		NA		
Acetone	UG/L	50	NA		NA		
Benzene	UG/L	1	NA		NA		
Bromodichloromethane	UG/L	50	NA		NA		
Bromoform	UG/L	50	NA		NA		
Carbon disulfide	UG/L	60	NA		NA		
Chlorobenzene	UG/L	5	NA		NA		
Chloroform	UG/L	7	NA		NA		
Cyclohexane	UG/L	-	NA		NA		
Ethylbenzene	UG/L	5	NA		NA		
Isopropylbenzene (Cumene)	UG/L	5	NA		NA		
Methyl ethyl ketone (2-Butanone)	UG/L	50	NA		NA		
Methyl tert-butyl ether	UG/L	10	NA		NA		
Methylcyclohexane	UG/L	-	NA		NA		
Methylene chloride	UG/L	5	NA		NA		

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN-10I	MN-10S	MN-11D	MN-11D	MN-11D
Sample ID			MN-10I-051909-N	MN10-051013-1330	MN-11D-051909-N	2306-050713-0002	MN11D-050713-1635
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/19/09	05/10/13	05/19/09	05/07/13	05/07/13
Parameter	Units	Criteria*				Field Duplicate (1-1)	
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5	NA		NA		
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5	NA		NA		
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2					
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5	NA		NA		

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN-11I	MN-11I	MN-11S	MN-11S	MN-12D
Sample ID			MN-11I-051909-N	MN11I-050813-1005	MN-11S-051909-N	MN11S-050813-1105	MN-12D-051909-FD
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/19/09	05/08/13	05/19/09	05/08/13	05/19/09
Parameter	Units	Criteria*					Field Duplicate (1-1)
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA		NA		NA
1,1-Dichloroethane	UG/L	5	NA		NA		NA
1,1-Dichloroethene	UG/L	5	NA		NA		NA
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5					
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA		NA		NA
Acetone	UG/L	50	NA		NA		NA
Benzene	UG/L	1	NA		NA		NA
Bromodichloromethane	UG/L	50	NA		NA		NA
Bromoform	UG/L	50	NA		NA		NA
Carbon disulfide	UG/L	60	NA		NA		NA
Chlorobenzene	UG/L	5	NA		NA		NA
Chloroform	UG/L	7	NA		NA		NA
Cyclohexane	UG/L	-	NA		NA		NA
Ethylbenzene	UG/L	5	NA		NA		NA
Isopropylbenzene (Cumene)	UG/L	5	NA		NA		NA
Methyl ethyl ketone (2-Butanone)	UG/L	50	NA		NA		NA
Methyl tert-butyl ether	UG/L	10	NA		NA		NA
Methylcyclohexane	UG/L	-	NA		NA		NA
Methylene chloride	UG/L	5	NA		NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN-11I	MN-11I	MN-11S	MN-11S	MN-12D
Sample ID			MN-11I-051909-N	MN11I-050813-1005	MN-11S-051909-N	MN11S-050813-1105	MN-12D-051909-FD
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/19/09	05/08/13	05/19/09	05/08/13	05/19/09
Parameter	Units	Criteria*					Field Duplicate (1-1)
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5	NA		NA		NA
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5	NA		NA		NA
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2					
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5	NA		NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN-12D	MN-12D	MN-12I	MN-12OB	MN-12OB
Sample ID			MN-12D-051909-N	4527-122313-1310	MN-12I-051909-N	MN-12-OB-051909-N	MN12OB-050813-1300
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/19/09	12/23/13	05/19/09	05/19/09	05/08/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA		NA	NA	
1,1-Dichloroethane	UG/L	5	NA		NA	NA	
1,1-Dichloroethene	UG/L	5	NA		NA	NA	
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5					
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA		NA	NA	
Acetone	UG/L	50	NA		NA	NA	
Benzene	UG/L	1	NA		NA	NA	
Bromodichloromethane	UG/L	50	NA		NA	NA	
Bromoform	UG/L	50	NA		NA	NA	
Carbon disulfide	UG/L	60	NA		NA	NA	
Chlorobenzene	UG/L	5	NA		NA	NA	
Chloroform	UG/L	7	NA		NA	NA	
Cyclohexane	UG/L	-	NA		NA	NA	
Ethylbenzene	UG/L	5	NA		NA	NA	
Isopropylbenzene (Cumene)	UG/L	5	NA		NA	NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50	NA		NA	NA	
Methyl tert-butyl ether	UG/L	10	NA		NA	NA	
Methylcyclohexane	UG/L	-	NA		NA	NA	
Methylene chloride	UG/L	5	NA		NA	NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN-12D	MN-12D	MN-12I	MN-12OB	MN-12OB
Sample ID			MN-12D-051909-N	4527-122313-1310	MN-12I-051909-N	MN-12-OB-051909-N	MN12OB-050813-1300
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/19/09	12/23/13	05/19/09	05/19/09	05/08/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5	NA		NA	NA	
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					
Toluene	UG/L	5	NA		NA	NA	
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2					
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5	NA		NA	NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN-12S	MN-12S	MW- 1	MW- 1	MW- 2
Sample ID			MN-12S-051909-N	MN12S-050813-1220	MW-1-041498	MW1-051413-0910	MW-2-041498
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/19/09	05/08/13	04/14/98	05/14/13	04/14/98
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA		NA		NA
1,1-Dichloroethane	UG/L	5	NA		NA		NA
1,1-Dichloroethene	UG/L	5	NA		NA		NA
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5			NA		NA
1,2-Dichloroethene (total)	UG/L	-	NA	NA		NA	86
1,2-Dichloroethene (trans)	UG/L	5			NA		NA
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA		NA		NA
Acetone	UG/L	50	NA				
Benzene	UG/L	1	NA				4.0
Bromodichloromethane	UG/L	50	NA		NA		NA
Bromoform	UG/L	50	NA		NA		NA
Carbon disulfide	UG/L	60	NA		NA		NA
Chlorobenzene	UG/L	5	NA		NA		NA
Chloroform	UG/L	7	NA		NA		NA
Cyclohexane	UG/L	-	NA		NA		NA
Ethylbenzene	UG/L	5	NA		NA		NA
Isopropylbenzene (Cumene)	UG/L	5	NA		NA		NA
Methyl ethyl ketone (2-Butanone)	UG/L	50	NA				
Methyl tert-butyl ether	UG/L	10	NA		NA		NA
Methylcyclohexane	UG/L	-	NA		NA		NA
Methylene chloride	UG/L	5	NA		NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MN-12S	MN-12S	MW- 1	MW- 1	MW- 2
Sample ID			MN-12S-051909-N	MN12S-050813-1220	MW-1-041498	MW1-051413-0910	MW-2-041498
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/19/09	05/08/13	04/14/98	05/14/13	04/14/98
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5	NA		NA		NA
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					1,500
Toluene	UG/L	5	NA				
Trichloroethene	UG/L	5					270
Vinyl chloride	UG/L	2			NA		NA
m&p-Xylene	UG/L	5	NA	NA		NA	
Xylene (total)	UG/L	5	NA		NA		NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 2	MW- 2	MW- 2	MW- 2	MW- 2
Sample ID			MW-2-060107	MW-2-052109-FD	MW-2-052109-N	MW2-051313-1135	4552-121613-1640
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	05/21/09	05/21/09	05/13/13	12/16/13
Parameter	**Units**	**Criteria***		Field Duplicate (1-1)			
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA	NA		
1,1-Dichloroethane	UG/L	5		NA	NA		
1,1-Dichloroethene	UG/L	5		NA	NA		
1,2,4-Trimethylbenzene	UG/L	5		NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	19.1	29	29		32
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5	1.6	3.3	3.3		2.6
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5		NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		NA	NA		
Acetone	UG/L	50		NA	NA		
Benzene	UG/L	1		NA	NA		1.6
Bromodichloromethane	UG/L	50		NA	NA		
Bromoform	UG/L	50		NA	NA		
Carbon disulfide	UG/L	60		NA	NA		
Chlorobenzene	UG/L	5		NA	NA		
Chloroform	UG/L	7		NA	NA		
Cyclohexane	UG/L	-	NA	NA	NA		
Ethylbenzene	UG/L	5		NA	NA		
Isopropylbenzene (Cumene)	UG/L	5		NA	NA		
Methyl ethyl ketone (2-Butanone)	UG/L	50		NA	NA		
Methyl tert-butyl ether	UG/L	10		NA	NA		
Methylcyclohexane	UG/L	-	NA	NA	NA		
Methylene chloride	UG/L	5		NA	NA		

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 2	MW- 2	MW- 2	MW- 2	MW- 2
Sample ID			MW-2-060107	MW-2-052109-FD	MW-2-052109-N	MW2-051313-1135	4552-121613-1640
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	05/21/09	05/21/09	05/13/13	12/16/13
Parameter	**Units**	**Criteria***		Field Duplicate (1-1)			
Volatile Organic Compounds							
Naphthalene	UG/L	10		NA	NA	NA	NA
n-Propylbenzene	UG/L	5		NA	NA	NA	NA
Styrene	UG/L	5		NA	NA		
tert-Butyl Alcohol	UG/L	-		NA	NA	NA	NA
Tetrachloroethene	UG/L	5	53.9	50	55	30	31
Toluene	UG/L	5		NA	NA		
Trichloroethene	UG/L	5	33.5	30	33	12	58
Vinyl chloride	UG/L	2					1.4
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		NA	NA		

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 3	MW- 3	MW- 3	MW- 4	MW- 4
Sample ID			MW-3-060107	MW-3-052109-N	MW3-051313-1020	MW-4-041498	MW-4-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	05/21/09	05/13/13	04/14/98	06/01/07
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethane	UG/L	5		NA		NA	
1,1-Dichloroethene	UG/L	5		NA		NA	
1,2,4-Trimethylbenzene	UG/L	5		NA	NA	NA	
1,2-Dichloroethene (cis)	UG/L	5				NA	
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA		NA
1,2-Dichloroethene (trans)	UG/L	5				NA	
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5		NA	NA	NA	
4-Methyl-2-pentanone	UG/L	-	5.3	NA		NA	
Acetone	UG/L	50	20.6	NA			
Benzene	UG/L	1		NA			
Bromodichloromethane	UG/L	50		NA		NA	
Bromoform	UG/L	50		NA		NA	
Carbon disulfide	UG/L	60		NA		NA	
Chlorobenzene	UG/L	5		NA		NA	
Chloroform	UG/L	7		NA		NA	
Cyclohexane	UG/L	-	NA	NA		NA	NA
Ethylbenzene	UG/L	5		NA		NA	
Isopropylbenzene (Cumene)	UG/L	5		NA		NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50	6.52	NA			
Methyl tert-butyl ether	UG/L	10		NA		NA	
Methylcyclohexane	UG/L	-	NA	NA		NA	NA
Methylene chloride	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 3	MW- 3	MW- 3	MW- 4	MW- 4
Sample ID			MW-3-060107	MW-3-052109-N	MW3-051313-1020	MW-4-041498	MW-4-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	05/21/09	05/13/13	04/14/98	06/01/07
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10		NA	NA	NA	
n-Propylbenzene	UG/L	5		NA	NA	NA	
Styrene	UG/L	5		NA		NA	
tert-Butyl Alcohol	UG/L	-		NA	NA	NA	
Tetrachloroethene	UG/L	5			3.7		
Toluene	UG/L	5	6.45	NA			
Trichloroethene	UG/L	5					
Vinyl chloride	UG/L	2				NA	
m&p-Xylene	UG/L	5	NA	NA	NA		NA
Xylene (total)	UG/L	5		NA		NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 4	MW- 4R	MW- 4R	MW- 4R	MW- 4R
Sample ID			MW4-051313-1445	MW-4R-060107	MW-4R-052109-N	2306-051313-0002	MW4R-051313-1550
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/13/13	06/01/07	05/21/09	05/13/13	05/13/13
Parameter	Units	Criteria*				Field Duplicate (1-1)	
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5			NA		
1,1-Dichloroethane	UG/L	5			NA		
1,1-Dichloroethene	UG/L	5			NA		
1,2,4-Trimethylbenzene	UG/L	5	NA		NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5		10.7	9.2	6.3	6.4
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA		NA	NA	NA
4-Methyl-2-pentanone	UG/L	-			NA		
Acetone	UG/L	50			NA		
Benzene	UG/L	1			NA		
Bromodichloromethane	UG/L	50			NA		
Bromoform	UG/L	50			NA		
Carbon disulfide	UG/L	60			NA		
Chlorobenzene	UG/L	5			NA		
Chloroform	UG/L	7			NA		
Cyclohexane	UG/L	-		NA	NA		
Ethylbenzene	UG/L	5			NA		
Isopropylbenzene (Cumene)	UG/L	5			NA		
Methyl ethyl ketone (2-Butanone)	UG/L	50			NA		
Methyl tert-butyl ether	UG/L	10		1.0	NA		
Methylcyclohexane	UG/L	-		NA	NA		
Methylene chloride	UG/L	5			NA		

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 4	MW- 4R	MW- 4R	MW- 4R	MW- 4R
Sample ID			MW4-051313-1445	MW-4R-060107	MW-4R-052109-N	2306-051313-0002	MW4R-051313-1550
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/13/13	06/01/07	05/21/09	05/13/13	05/13/13
Parameter	Units	Criteria*				Field Duplicate (1-1)	
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA		NA	NA	NA
n-Propylbenzene	UG/L	5	NA		NA	NA	NA
Styrene	UG/L	5			NA		
tert-Butyl Alcohol	UG/L	-	NA		NA	NA	NA
Tetrachloroethene	UG/L	5			0.53 J		
Toluene	UG/L	5			NA		
Trichloroethene	UG/L	5		1.48	1.0 J		
Vinyl chloride	UG/L	2		7.93	2.4		
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5			NA		

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 6	MW- 6	MW- 6	MW- 6	MW- 7
Sample ID			MW-6-102898	MW-6-052109-N	MW6-051313-1315	4527-122313-1035	MW-7-102998
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			10/28/98	05/21/09	05/13/13	12/23/13	10/29/98
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA	NA			NA
1,1-Dichloroethane	UG/L	5	NA	NA			NA
1,1-Dichloroethene	UG/L	5	NA	NA			NA
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	NA	660	9.5	13	NA
1,2-Dichloroethene (total)	UG/L	-	690 D	NA	NA	NA	
1,2-Dichloroethene (trans)	UG/L	5	NA	9.8			NA
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA	NA			NA
Acetone	UG/L	50	9.0 J	NA			90
Benzene	UG/L	1		NA			
Bromodichloromethane	UG/L	50	NA	NA			NA
Bromoform	UG/L	50	NA	NA			NA
Carbon disulfide	UG/L	60	NA	NA			NA
Chlorobenzene	UG/L	5	NA	NA			NA
Chloroform	UG/L	7	NA	NA			NA
Cyclohexane	UG/L	-	NA	NA			NA
Ethylbenzene	UG/L	5	NA	NA			NA
Isopropylbenzene (Cumene)	UG/L	5	NA	NA			NA
Methyl ethyl ketone (2-Butanone)	UG/L	50	63	NA			720
Methyl tert-butyl ether	UG/L	10	NA	NA			NA
Methylcyclohexane	UG/L	-	NA	NA			NA
Methylene chloride	UG/L	5	NA	NA			NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 6	MW- 6	MW- 6	MW- 6	MW- 7
Sample ID			MW-6-102898	MW-6-052109-N	MW6-051313-1315	4527-122313-1035	MW-7-102998
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			10/28/98	05/21/09	05/13/13	12/23/13	10/29/98
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5	NA	NA			NA
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5	220	140	4.6	98	170
Toluene	UG/L	5		NA			
Trichloroethene	UG/L	5	76	88		10	
Vinyl chloride	UG/L	2	NA				NA
m&p-Xylene	UG/L	5		NA	NA	NA	
Xylene (total)	UG/L	5	NA	NA			NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 8A	MW- 9	MW- 9	MW-101	MW-11
Sample ID			MW-8A-060107	MW-9-060107	4552-121813-1050	4552-122313-1020	MW-11-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	06/01/07	12/18/13	12/23/13	06/01/07
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5					
1,1-Dichloroethane	UG/L	5					
1,1-Dichloroethene	UG/L	5					4.04
1,2,4-Trimethylbenzene	UG/L	5			NA	NA	
1,2-Dichloroethene (cis)	UG/L	5				2,800	2,290
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5				37	9.72
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5			NA	NA	
4-Methyl-2-pentanone	UG/L	-					
Acetone	UG/L	50					
Benzene	UG/L	1					1.31
Bromodichloromethane	UG/L	50					
Bromoform	UG/L	50					
Carbon disulfide	UG/L	60					
Chlorobenzene	UG/L	5					
Chloroform	UG/L	7					
Cyclohexane	UG/L	-	NA	NA			NA
Ethylbenzene	UG/L	5					
Isopropylbenzene (Cumene)	UG/L	5					
Methyl ethyl ketone (2-Butanone)	UG/L	50					
Methyl tert-butyl ether	UG/L	10					2.82
Methylcyclohexane	UG/L	-	NA	NA			NA
Methylene chloride	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 8A	MW- 9	MW- 9	MW-101	MW-11
Sample ID			MW-8A-060107	MW-9-060107	4552-121813-1050	4552-122313-1020	MW-11-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	06/01/07	12/18/13	12/23/13	06/01/07
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10			NA	NA	
n-Propylbenzene	UG/L	5			NA	NA	
Styrene	UG/L	5					
tert-Butyl Alcohol	UG/L	-			NA	NA	5.42
Tetrachloroethene	UG/L	5		16.4	4.2	1,600	14,400
Toluene	UG/L	5					
Trichloroethene	UG/L	5				370	3,570
Vinyl chloride	UG/L	2					34.2
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-11	MW-11	MW-11	MW-11	MW-11
Sample ID			MW-11-052109-N	2306-051613-0001	MW11-051613-0855	4552-121313-0001	4552-121313-1200
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/21/09	05/16/13	05/16/13	12/13/13	12/13/13
Parameter	Units	Criteria*		Field Duplicate (1-1)		Field Duplicate (1-1)	
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA				
1,1-Dichloroethane	UG/L	5	NA				
1,1-Dichloroethene	UG/L	5	NA				
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	120	1,800	1,800	2,100	2,500
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5	0.60 J				
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA				
Acetone	UG/L	50	NA				
Benzene	UG/L	1	NA				
Bromodichloromethane	UG/L	50	NA				
Bromoform	UG/L	50	NA				
Carbon disulfide	UG/L	60	NA				
Chlorobenzene	UG/L	5	NA				
Chloroform	UG/L	7	NA				
Cyclohexane	UG/L	-	NA				
Ethylbenzene	UG/L	5	NA				
Isopropylbenzene (Cumene)	UG/L	5	NA				
Methyl ethyl ketone (2-Butanone)	UG/L	50	NA				
Methyl tert-butyl ether	UG/L	10	NA				
Methylcyclohexane	UG/L	-	NA				
Methylene chloride	UG/L	5	NA				

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-11	MW-11	MW-11	MW-11	MW-11
Sample ID			MW-11-052109-N	2306-051613-0001	MW11-051613-0855	4552-121313-0001	4552-121313-1200
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/21/09	05/16/13	05/16/13	12/13/13	12/13/13
Parameter	**Units**	**Criteria***		Field Duplicate (1-1)		Field Duplicate (1-1)	
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5	NA				
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5	450	10,000	11,000	11,000	11,000
Toluene	UG/L	5	NA				
Trichloroethene	UG/L	5	150	2,700	2,700	3,200	3,400
Vinyl chloride	UG/L	2		17	17	13	
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5	NA				

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-12	MW-12	MW-12	MW-12	MW-13
Sample ID			MW-12-060107	MW12-051013-1425	4527-121613-0001	4527-121613-1100	MW-13-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	05/10/13	12/16/13	12/16/13	06/01/07
Parameter	Units	Criteria*			Field Duplicate (1-1)		
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5					
1,1-Dichloroethane	UG/L	5					
1,1-Dichloroethene	UG/L	5					
1,2,4-Trimethylbenzene	UG/L	5		NA	NA	NA	
1,2-Dichloroethene (cis)	UG/L	5	3.55				155
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					2.99
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5		NA	NA	NA	
4-Methyl-2-pentanone	UG/L	-					
Acetone	UG/L	50					
Benzene	UG/L	1					3.15
Bromodichloromethane	UG/L	50					
Bromoform	UG/L	50					
Carbon disulfide	UG/L	60					
Chlorobenzene	UG/L	5					
Chloroform	UG/L	7					
Cyclohexane	UG/L	-	NA				NA
Ethylbenzene	UG/L	5					
Isopropylbenzene (Cumene)	UG/L	5					
Methyl ethyl ketone (2-Butanone)	UG/L	50					
Methyl tert-butyl ether	UG/L	10					2.1
Methylcyclohexane	UG/L	-	NA				NA
Methylene chloride	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs

#Error

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-12	MW-12	MW-12	MW-12	MW-13
Sample ID			MW-12-060107	MW12-051013-1425	4527-121613-0001	4527-121613-1100	MW-13-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	05/10/13	12/16/13	12/16/13	06/01/07
Parameter	Units	Criteria*			Field Duplicate (1-1)		
Volatile Organic Compounds							
Naphthalene	UG/L	10		NA	NA	NA	
n-Propylbenzene	UG/L	5		NA	NA	NA	
Styrene	UG/L	5					
tert-Butyl Alcohol	UG/L	-		NA	NA	NA	5.72
Tetrachloroethene	UG/L	5	534	6.6	12	12	8,000
Toluene	UG/L	5					
Trichloroethene	UG/L	5	22.9		1.0	1.0	320
Vinyl chloride	UG/L	2	3.99				22.9
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-13	MW-13	MW-14	MW-14	MW-14
Sample ID			MW13-051413-1240	4552-121813-1500	MW-14-060107	MW14-051413-1020	4527-121813-1340
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/14/13	12/18/13	06/01/07	05/14/13	12/18/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5					
1,1-Dichloroethane	UG/L	5					1.8
1,1-Dichloroethene	UG/L	5					
1,2,4-Trimethylbenzene	UG/L	5	NA	NA		NA	NA
1,2-Dichloroethene (cis)	UG/L	5		58	69.5	160	23
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5				1.8	
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA		NA	NA
4-Methyl-2-pentanone	UG/L	-					
Acetone	UG/L	50					
Benzene	UG/L	1				1.0	
Bromodichloromethane	UG/L	50					
Bromoform	UG/L	50					
Carbon disulfide	UG/L	60					
Chlorobenzene	UG/L	5					
Chloroform	UG/L	7					
Cyclohexane	UG/L	-			NA		
Ethylbenzene	UG/L	5					
Isopropylbenzene (Cumene)	UG/L	5					
Methyl ethyl ketone (2-Butanone)	UG/L	50					
Methyl tert-butyl ether	UG/L	10	2.1	2.1			3.0
Methylcyclohexane	UG/L	-			NA		
Methylene chloride	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-13	MW-13	MW-14	MW-14	MW-14
Sample ID			MW13-051413-1240	4552-121813-1500	MW-14-060107	MW14-051413-1020	4527-121813-1340
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/14/13	12/18/13	06/01/07	05/14/13	12/18/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA		NA	NA
n-Propylbenzene	UG/L	5	NA	NA		NA	NA
Styrene	UG/L	5					
tert-Butyl Alcohol	UG/L	-	NA	NA		NA	NA
Tetrachloroethene	UG/L	5	980	1,200	350	1,400	110
Toluene	UG/L	5					
Trichloroethene	UG/L	5	43	43	92	200	16
Vinyl chloride	UG/L	2	12	15	5.44	3.6	17
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

(oval) Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs

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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-15	MW-15	MW-15	SB- 1	SB- 2
Sample ID			MW-15-060107	MW15-051113-1045	4527-121313-1625	SB-1-102998	SB-2-103098
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	05/11/13	12/13/13	10/29/98	10/30/98
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5				NA	NA
1,1-Dichloroethane	UG/L	5				NA	NA
1,1-Dichloroethene	UG/L	5	1.44			NA	NA
1,2,4-Trimethylbenzene	UG/L	5		NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	760	170	320	NA	NA
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA		2.0 J
1,2-Dichloroethene (trans)	UG/L	5	3.94	1.4		NA	NA
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5		NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-				NA	NA
Acetone	UG/L	50				10	10
Benzene	UG/L	1		1.0			
Bromodichloromethane	UG/L	50				NA	NA
Bromoform	UG/L	50				NA	NA
Carbon disulfide	UG/L	60				NA	NA
Chlorobenzene	UG/L	5				NA	NA
Chloroform	UG/L	7				NA	NA
Cyclohexane	UG/L	-	NA			NA	NA
Ethylbenzene	UG/L	5				NA	NA
Isopropylbenzene (Cumene)	UG/L	5				NA	NA
Methyl ethyl ketone (2-Butanone)	UG/L	50				300 D	4.0 J
Methyl tert-butyl ether	UG/L	10	1.52	1.4		NA	NA
Methylcyclohexane	UG/L	-	NA			NA	NA
Methylene chloride	UG/L	5				NA	NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-15	MW-15	MW-15	SB- 1	SB- 2
Sample ID			MW-15-060107	MW15-051113-1045	4527-121313-1625	SB-1-102998	SB-2-103098
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	05/11/13	12/13/13	10/29/98	10/30/98
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10		NA	NA	NA	NA
n-Propylbenzene	UG/L	5		NA	NA	NA	NA
Styrene	UG/L	5				NA	NA
tert-Butyl Alcohol	UG/L	-	6.99	NA	NA	NA	NA
Tetrachloroethene	UG/L	5	15,700	5,500	4,600	34	150
Toluene	UG/L	5					2.0 J
Trichloroethene	UG/L	5	1,400	150	260		20
Vinyl chloride	UG/L	2	8.63	4.3		NA	NA
m&p-Xylene	UG/L	5	NA	NA	NA		1.0 J
Xylene (total)	UG/L	5				NA	NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			SB- 4	SB- 5	SB- 6	SB- 7	SB- 9
Sample ID			SB-4-103098	SB-5-120198	SB-6-120198	SB-7-120298	SB-9-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			10/30/98	12/01/98	12/01/98	12/02/98	06/01/07
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5	NA	NA	NA	NA	
1,1-Dichloroethane	UG/L	5	NA	NA	NA	NA	
1,1-Dichloroethene	UG/L	5	NA	NA	NA	NA	
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	
1,2-Dichloroethene (cis)	UG/L	5	NA	NA	NA	NA	
1,2-Dichloroethene (total)	UG/L	-		260	2,900	1,400	NA
1,2-Dichloroethene (trans)	UG/L	5	NA	NA	NA	NA	
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	
4-Methyl-2-pentanone	UG/L	-	NA	NA	NA	NA	
Acetone	UG/L	50	9.0 J				
Benzene	UG/L	1					
Bromodichloromethane	UG/L	50	NA	NA	NA	NA	
Bromoform	UG/L	50	NA	NA	NA	NA	
Carbon disulfide	UG/L	60	NA	NA	NA	NA	
Chlorobenzene	UG/L	5	NA	NA	NA	NA	
Chloroform	UG/L	7	NA	NA	NA	NA	
Cyclohexane	UG/L	-	NA	NA	NA	NA	NA
Ethylbenzene	UG/L	5	NA	NA	NA	NA	
Isopropylbenzene (Cumene)	UG/L	5	NA	NA	NA	NA	
Methyl ethyl ketone (2-Butanone)	UG/L	50	100	51			
Methyl tert-butyl ether	UG/L	10	NA	NA	NA	NA	
Methylcyclohexane	UG/L	-	NA	NA	NA	NA	NA
Methylene chloride	UG/L	5	NA	NA	NA	NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			SB- 4	SB- 5	SB- 6	SB- 7	SB- 9
Sample ID			SB-4-103098	SB-5-120198	SB-6-120198	SB-7-120298	SB-9-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			10/30/98	12/01/98	12/01/98	12/02/98	06/01/07
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	
Styrene	UG/L	5	NA	NA	NA	NA	
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	
Tetrachloroethene	UG/L	5		800	160,000 D	9,900 D	3.71
Toluene	UG/L	5	2.0 J				
Trichloroethene	UG/L	5		340	1,200 J	440	
Vinyl chloride	UG/L	2	NA	NA	NA	NA	
m&p-Xylene	UG/L	5					NA
Xylene (total)	UG/L	5	NA	NA	NA	NA	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			SB- 9	SB-10	SB-11	SB-11	SB-13
Sample ID			SB9-051313-0840	SB-10-060107	SB-11-060107	SB11-051413-1115	SB-13-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/13/13	06/01/07	06/01/07	05/14/13	06/01/07
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5					
1,1-Dichloroethane	UG/L	5					
1,1-Dichloroethene	UG/L	5					
1,2,4-Trimethylbenzene	UG/L	5	NA			NA	
1,2-Dichloroethene (cis)	UG/L	5		1.76			279
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					2.34
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA			NA	
4-Methyl-2-pentanone	UG/L	-					
Acetone	UG/L	50					
Benzene	UG/L	1					
Bromodichloromethane	UG/L	50					
Bromoform	UG/L	50					2.17
Carbon disulfide	UG/L	60					
Chlorobenzene	UG/L	5					
Chloroform	UG/L	7					
Cyclohexane	UG/L	-		NA	NA		NA
Ethylbenzene	UG/L	5					
Isopropylbenzene (Cumene)	UG/L	5					
Methyl ethyl ketone (2-Butanone)	UG/L	50					
Methyl tert-butyl ether	UG/L	10					
Methylcyclohexane	UG/L	-		NA	NA		NA
Methylene chloride	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			SB- 9	SB-10	SB-11	SB-11	SB-13
Sample ID			SB9-051313-0840	SB-10-060107	SB-11-060107	SB11-051413-1115	SB-13-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			05/13/13	06/01/07	06/01/07	05/14/13	06/01/07
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA			NA	
n-Propylbenzene	UG/L	5	NA			NA	
Styrene	UG/L	5					
tert-Butyl Alcohol	UG/L	-	NA			NA	
Tetrachloroethene	UG/L	5		37.1			2,100
Toluene	UG/L	5					
Trichloroethene	UG/L	5		6.94			503
Vinyl chloride	UG/L	2					
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			SB-13	SB-14	SB-14	SB-14	SVE-1
Sample ID			4552-121613-1300	SB-14-060107	SB14-051013-1545	4552-121613-1100	4527-121613-1235
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/16/13	06/01/07	05/10/13	12/16/13	12/16/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5		2.01			
1,1-Dichloroethane	UG/L	5		2.53			
1,1-Dichloroethene	UG/L	5		21.8			
1,2,4-Trimethylbenzene	UG/L	5	NA	26.1	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	660	37,900	30	190	65
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5		250			
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	13.2	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-		40.7			
Acetone	UG/L	50		250			
Benzene	UG/L	1		1.95			
Bromodichloromethane	UG/L	50					
Bromoform	UG/L	50		2.27			
Carbon disulfide	UG/L	60					
Chlorobenzene	UG/L	5					
Chloroform	UG/L	7		1.59			
Cyclohexane	UG/L	-		NA			
Ethylbenzene	UG/L	5		4.43			
Isopropylbenzene (Cumene)	UG/L	5		3.83			
Methyl ethyl ketone (2-Butanone)	UG/L	50		16.7			
Methyl tert-butyl ether	UG/L	10					
Methylcyclohexane	UG/L	-		NA			
Methylene chloride	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

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Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			SB-13	SB-14	SB-14	SB-14	SVE-1
Sample ID			4552-121613-1300	SB-14-060107	SB14-051013-1545	4552-121613-1100	4527-121613-1235
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/16/13	06/01/07	05/10/13	12/16/13	12/16/13
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	6.96	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	4.51	NA	NA	NA
Styrene	UG/L	5					
tert-Butyl Alcohol	UG/L	-	NA		NA	NA	NA
Tetrachloroethene	UG/L	5	5,500	111,000	8,300	48,000	500
Toluene	UG/L	5		53.5			
Trichloroethene	UG/L	5	140	18,700	42	460	20
Vinyl chloride	UG/L	2		4.81			
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5		19.34			

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			SVE-2	SVE-4	SVE-5	SVE-6	UL 1
Sample ID			SVE-2-060107	SVE-4-060107	SVE-5-060107	SVE-6-060107	UL 1-121500-WG
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	06/01/07	06/01/07	06/01/07	12/15/00
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5					
1,1-Dichloroethane	UG/L	5					
1,1-Dichloroethene	UG/L	5					
1,2,4-Trimethylbenzene	UG/L	5					NA
1,2-Dichloroethene (cis)	UG/L	5	1,530	550	865		5.0 J
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5					NA
4-Methyl-2-pentanone	UG/L	-					NA
Acetone	UG/L	50					75
Benzene	UG/L	1					
Bromodichloromethane	UG/L	50					2.0 J
Bromoform	UG/L	50					NA
Carbon disulfide	UG/L	60					
Chlorobenzene	UG/L	5					NA
Chloroform	UG/L	7					36
Cyclohexane	UG/L	-	NA	NA	NA	NA	NA
Ethylbenzene	UG/L	5					15
Isopropylbenzene (Cumene)	UG/L	5					NA
Methyl ethyl ketone (2-Butanone)	UG/L	50					5.0 J
Methyl tert-butyl ether	UG/L	10					NA
Methylcyclohexane	UG/L	-	NA	NA	NA	NA	NA
Methylene chloride	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			SVE-2	SVE-4	SVE-5	SVE-6	UL 1
Sample ID			SVE-2-060107	SVE-4-060107	SVE-5-060107	SVE-6-060107	UL 1-121500-WG
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	06/01/07	06/01/07	06/01/07	12/15/00
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10					NA
n-Propylbenzene	UG/L	5					NA
Styrene	UG/L	5					2.0 J
tert-Butyl Alcohol	UG/L	-					NA
Tetrachloroethene	UG/L	5	142,000	1,000	29,400	81,200	68
Toluene	UG/L	5					130
Trichloroethene	UG/L	5	11,200	65.1	6,140	721	17
Vinyl chloride	UG/L	2					1.0 J
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5					104

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			UL 2	UL 4	UL 5	UL 6	UL 8
Sample ID			UL 2-121500-WG	UL 4-121500-WG	UL 5-121500-WG	UL 6-121500-WG	UL 8-121500-WG
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/15/00	12/15/00	12/15/00	12/15/00	12/15/00
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
1,1,1-Trichloroethane	UG/L	5					
1,1-Dichloroethane	UG/L	5					
1,1-Dichloroethene	UG/L	5					
1,2,4-Trimethylbenzene	UG/L	5	NA	NA	NA	NA	NA
1,2-Dichloroethene (cis)	UG/L	5	10 DJ		22 DJ		1.0 J
1,2-Dichloroethene (total)	UG/L	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	UG/L	5					
1,3,5-Trimethylbenzene (Mesitylene)	UG/L	5	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	UG/L	-	NA	NA	NA	NA	NA
Acetone	UG/L	50	280 D		150 D	12	
Benzene	UG/L	1					
Bromodichloromethane	UG/L	50					
Bromoform	UG/L	50	NA	NA	NA	NA	NA
Carbon disulfide	UG/L	60					
Chlorobenzene	UG/L	5	NA	NA	NA	NA	NA
Chloroform	UG/L	7					
Cyclohexane	UG/L	-	NA	NA	NA	NA	NA
Ethylbenzene	UG/L	5					
Isopropylbenzene (Cumene)	UG/L	5	NA	NA	NA	NA	NA
Methyl ethyl ketone (2-Butanone)	UG/L	50			130 DJ	2.0 J	
Methyl tert-butyl ether	UG/L	10	NA	NA	NA	NA	NA
Methylcyclohexane	UG/L	-	NA	NA	NA	NA	NA
Methylene chloride	UG/L	5			15 DJ		

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID			UL 2	UL 4	UL 5	UL 6	UL 8
Sample ID			UL 2-121500-WG	UL 4-121500-WG	UL 5-121500-WG	UL 6-121500-WG	UL 8-121500-WG
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			12/15/00	12/15/00	12/15/00	12/15/00	12/15/00
Parameter	**Units**	**Criteria***					
Volatile Organic Compounds							
Naphthalene	UG/L	10	NA	NA	NA	NA	NA
n-Propylbenzene	UG/L	5	NA	NA	NA	NA	NA
Styrene	UG/L	5					
tert-Butyl Alcohol	UG/L	-	NA	NA	NA	NA	NA
Tetrachloroethene	UG/L	5					39
Toluene	UG/L	5			6.0 DJ		
Trichloroethene	UG/L	5	5.0 DJ				2.0 J
Vinyl chloride	UG/L	2			40 DJ		
m&p-Xylene	UG/L	5	NA	NA	NA	NA	NA
Xylene (total)	UG/L	5					

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW VOCs
#Error
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WHERE [LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA';

HISTORICAL GROUNDWATER SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 1	MW- 2	MW- 2	MW- 3	MW- 4
Sample ID			MW-1-041498	MW-2-041498	MW-2-060107	MW-3-060107	MW-4-041498
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			04/14/98	04/14/98	06/01/07	06/01/07	04/14/98
Parameter	**Units**	**Criteria***					
Metals							
Aluminum	UG/L	-	563	179	NA	NA	659
Arsenic	UG/L	25	12.9	16.9	NA	NA	15.3
Barium	UG/L	1000	99.3	61.2	NA	NA	36.7
Beryllium	UG/L	3		0.33	NA	NA	0.21
Cadmium	UG/L	5	0.79	0.91	NA	NA	153,000
Chromium	UG/L	50	131,000	117,000	NA	NA	1.7
Cobalt	UG/L	-	1.0	0.67	NA	NA	1.0
Copper	UG/L	200	7.7	2.3	NA	NA	4.3
Iron	UG/L	300	2.0	1.5	NA	NA	1,160
Lead	UG/L	25	996	2,970	NA	NA	2.0
Magnesium	UG/L	35000	4.9	29,600	NA	NA	42,500
Manganese	UG/L	300	29,300	1,980	NA	NA	33.8
Nickel	UG/L	100	21.1	2.4	NA	NA	2.5
Potassium	UG/L	-	11,300	16,500	NA	NA	9,880
Silver	UG/L	50	2.0	1.3	NA	NA	1.6
Sodium	UG/L	20000	116,000	342,000	NA	NA	96,500
Thallium	UG/L	0.5			NA	NA	10.4
Zinc	UG/L	2000	54.2	26.3	NA	NA	31.5
Miscellaneous Parameters							
Cyanide	UG/L	200	8.4	3.3	NA	NA	11.8
Gasoline	UG/L	-	NA	NA		6.45	NA

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW Non VOCs
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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL GROUNDWATER SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW- 4	MW- 4R	MW- 8A	MW- 9	MW-11
Sample ID			MW-4-060107	MW-4R-060107	MW-8A-060107	MW-9-060107	MW-11-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	06/01/07	06/01/07	06/01/07	06/01/07
Parameter	**Units**	**Criteria***					
Metals							
Aluminum	UG/L	-	NA	NA	NA	NA	NA
Arsenic	UG/L	25	NA	NA	NA	NA	NA
Barium	UG/L	1000	NA	NA	NA	NA	NA
Beryllium	UG/L	3	NA	NA	NA	NA	NA
Cadmium	UG/L	5	NA	NA	NA	NA	NA
Chromium	UG/L	50	NA	NA	NA	NA	NA
Cobalt	UG/L	-	NA	NA	NA	NA	NA
Copper	UG/L	200	NA	NA	NA	NA	NA
Iron	UG/L	300	NA	NA	NA	NA	NA
Lead	UG/L	25	NA	NA	NA	NA	NA
Magnesium	UG/L	35000	NA	NA	NA	NA	NA
Manganese	UG/L	300	NA	NA	NA	NA	NA
Nickel	UG/L	100	NA	NA	NA	NA	NA
Potassium	UG/L	-	NA	NA	NA	NA	NA
Silver	UG/L	50	NA	NA	NA	NA	NA
Sodium	UG/L	20000	NA	NA	NA	NA	NA
Thallium	UG/L	0.5	NA	NA	NA	NA	NA
Zinc	UG/L	2000	NA	NA	NA	NA	NA
Miscellaneous Parameters							
Cyanide	UG/L	200	NA	NA	NA	NA	NA
Gasoline	UG/L	-		1.0			4.13

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW Non VOCs
#Error
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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL GROUNDWATER SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID			MW-12	MW-13	MW-14	MW-15	SB- 9
Sample ID			MW-12-060107	MW-13-060107	MW-14-060107	MW-15-060107	SB-9-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	06/01/07	06/01/07	06/01/07	06/01/07
Parameter	**Units**	**Criteria***					
Metals							
Aluminum	UG/L	-	NA	NA	NA	NA	NA
Arsenic	UG/L	25	NA	NA	NA	NA	NA
Barium	UG/L	1000	NA	NA	NA	NA	NA
Beryllium	UG/L	3	NA	NA	NA	NA	NA
Cadmium	UG/L	5	NA	NA	NA	NA	NA
Chromium	UG/L	50	NA	NA	NA	NA	NA
Cobalt	UG/L	-	NA	NA	NA	NA	NA
Copper	UG/L	200	NA	NA	NA	NA	NA
Iron	UG/L	300	NA	NA	NA	NA	NA
Lead	UG/L	25	NA	NA	NA	NA	NA
Magnesium	UG/L	35000	NA	NA	NA	NA	NA
Manganese	UG/L	300	NA	NA	NA	NA	NA
Nickel	UG/L	100	NA	NA	NA	NA	NA
Potassium	UG/L	-	NA	NA	NA	NA	NA
Silver	UG/L	50	NA	NA	NA	NA	NA
Sodium	UG/L	20000	NA	NA	NA	NA	NA
Thallium	UG/L	0.5	NA	NA	NA	NA	NA
Zinc	UG/L	2000	NA	NA	NA	NA	NA
Miscellaneous Parameters							
Cyanide	UG/L	200	NA	NA	NA	NA	NA
Gasoline	UG/L	-		5.25		1.52	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW Non VOCs
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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL GROUNDWATER SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID			SB-10	SB-11	SB-13	SB-14	SVE-2
Sample ID			SB-10-060107	SB-11-060107	SB-13-060107	SB-14-060107	SVE-2-060107
Matrix			Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-	-	-
Date Sampled			06/01/07	06/01/07	06/01/07	06/01/07	06/01/07
Parameter	**Units**	**Criteria***					
Metals							
Aluminum	UG/L	-	NA	NA	NA	NA	NA
Arsenic	UG/L	25	NA	NA	NA	NA	NA
Barium	UG/L	1000	NA	NA	NA	NA	NA
Beryllium	UG/L	3	NA	NA	NA	NA	NA
Cadmium	UG/L	5	NA	NA	NA	NA	NA
Chromium	UG/L	50	NA	NA	NA	NA	NA
Cobalt	UG/L	-	NA	NA	NA	NA	NA
Copper	UG/L	200	NA	NA	NA	NA	NA
Iron	UG/L	300	NA	NA	NA	NA	NA
Lead	UG/L	25	NA	NA	NA	NA	NA
Magnesium	UG/L	35000	NA	NA	NA	NA	NA
Manganese	UG/L	300	NA	NA	NA	NA	NA
Nickel	UG/L	100	NA	NA	NA	NA	NA
Potassium	UG/L	-	NA	NA	NA	NA	NA
Silver	UG/L	50	NA	NA	NA	NA	NA
Sodium	UG/L	20000	NA	NA	NA	NA	NA
Thallium	UG/L	0.5	NA	NA	NA	NA	NA
Zinc	UG/L	2000	NA	NA	NA	NA	NA
Miscellaneous Parameters							
Cyanide	UG/L	200	NA	NA	NA	NA	NA
Gasoline	UG/L	-				134	

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW Non VOCs
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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL GROUNDWATER SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID			SVE-4	SVE-5	SVE-6
Sample ID			SVE-4-060107	SVE-5-060107	SVE-6-060107
Matrix			Groundwater	Groundwater	Groundwater
Depth Interval (ft)			-	-	-
Date Sampled			06/01/07	06/01/07	06/01/07
Parameter	**Units**	**Criteria***			
Metals					
Aluminum	UG/L	-	NA	NA	NA
Arsenic	UG/L	25	NA	NA	NA
Barium	UG/L	1000	NA	NA	NA
Beryllium	UG/L	3	NA	NA	NA
Cadmium	UG/L	5	NA	NA	NA
Chromium	UG/L	50	NA	NA	NA
Cobalt	UG/L	-	NA	NA	NA
Copper	UG/L	200	NA	NA	NA
Iron	UG/L	300	NA	NA	NA
Lead	UG/L	25	NA	NA	NA
Magnesium	UG/L	35000	NA	NA	NA
Manganese	UG/L	300	NA	NA	NA
Nickel	UG/L	100	NA	NA	NA
Potassium	UG/L	-	NA	NA	NA
Silver	UG/L	50	NA	NA	NA
Sodium	UG/L	20000	NA	NA	NA
Thallium	UG/L	0.5	NA	NA	NA
Zinc	UG/L	2000	NA	NA	NA
Miscellaneous Parameters					
Cyanide	UG/L	200	NA	NA	NA
Gasoline	UG/L	-			

*Criteria- NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998, including April 2000 and June 2004 Addenda, Class GA.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

Only Detected Results Reported.

Advanced Selection: HIST GW Non VOCs
#Error
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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'WG' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID					MW- 5	MW- 6	MW- 6	MW- 6	MW- 7
Sample ID					MW-5-102898-SO-8-9	MW-6-102898-SO-0-4	MW-6-102898-SO-8-12	MW-6-102998-SO-4-8	MW-7-102998-SO-8-11.5
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-9.0	0.0-4.0	8.0-12.0	4.0-8.0	8.0-11.5
Date Sampled					10/28/98	10/28/98	10/28/98	10/29/98	10/29/98
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Volatile Organic Compounds									
1,2-Dichloroethene (cis)	MG/KG	0.25	0.25	1000	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	MG/KG	-	-	-		0.0050 J	0.062	0.31 D	
1,2-Dichloroethene (trans)	MG/KG	0.19	0.19	1000	NA	NA	NA	NA	NA
Acetone	MG/KG	0.05	0.05	1000					
Carbon disulfide	MG/KG	2.7 CP-51	2.7 CP-51	-				0.0020 J	
Ethylbenzene	MG/KG	1	1	780				0.0010 J	
Methyl ethyl ketone (2-Butanone)	MG/KG	0.12	0.12	1000			0.027	0.044	0.021
Methylene chloride	MG/KG	0.05	0.05	1000	NA	NA	NA	NA	NA
Tetrachloroethene	MG/KG	1.3	1.3	300		6.7	2.4	0.086	0.013
Toluene	MG/KG	0.7	0.7	1000		0.0020 J		0.0030 J	
Trichloroethene	MG/KG	0.47	0.47	400		0.027	0.043	0.035	
Xylene (total)	MG/KG	0.26	1.6	1000		0.0020 J		0.0070 J	

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: HIST SO VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID					MW- 8	MW- 8	MW- 9	MW- 9	MW-10
Sample ID					MW-8-102998-SO-4-8	MW-8-102998-SO-8-10	MW-9-102998-SO-0-1	MW-9-102998-SO-8-10	MW-10-120198-SO-0-4
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					4.0-8.0	8.0-10.0	0.0-1.0	8.0-10.0	0.0-4.0
Date Sampled					10/29/98	10/29/98	10/29/98	10/29/98	12/01/98
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Volatile Organic Compounds									
1,2-Dichloroethene (cis)	MG/KG	0.25	0.25	1000	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	MG/KG	-	-	-		0.0010 J			0.37 J
1,2-Dichloroethene (trans)	MG/KG	0.19	0.19	1000	NA	NA	NA	NA	NA
Acetone	MG/KG	0.05	0.05	1000	0.0040 J	0.011 J	0.011	0.0080 J	
Carbon disulfide	MG/KG	2.7 CP-51	2.7 CP-51	-					
Ethylbenzene	MG/KG	1	1	780					
Methyl ethyl ketone (2-Butanone)	MG/KG	0.12	0.12	1000		0.010 J			
Methylene chloride	MG/KG	0.05	0.05	1000	NA	NA	NA	NA	NA
Tetrachloroethene	MG/KG	1.3	1.3	300		0.050	0.00080	0.0030 J	61
Toluene	MG/KG	0.7	0.7	1000					
Trichloroethene	MG/KG	0.47	0.47	400		0.0020 J			0.58 J
Xylene (total)	MG/KG	0.26	1.6	1000					

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: HIST SO VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID					MW-10	MW-11	MW-11	MW-15	MW-15
Sample ID					MW-10-120198-SO-4-8	MW-11-S3-021601	MW-11-S5-021601	MW-15-54-021301	MW-15-55-021301
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					4.0-8.0	4.0-6.0	8.0-10.0	6.0-8.0	8.0-10.0
Date Sampled					12/01/98	02/16/01	02/16/01	02/13/01	02/13/01
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Volatile Organic Compounds									
1,2-Dichloroethene (cis)	MG/KG	0.25	0.25	1000	NA				0.0040 J
1,2-Dichloroethene (total)	MG/KG	-	-	-	0.0030 J	NA	NA	NA	NA
1,2-Dichloroethene (trans)	MG/KG	0.19	0.19	1000	NA				
Acetone	MG/KG	0.05	0.05	1000					
Carbon disulfide	MG/KG	2.7 CP-51	2.7 CP-51	-					
Ethylbenzene	MG/KG	1	1	780					
Methyl ethyl ketone (2-Butanone)	MG/KG	0.12	0.12	1000					
Methylene chloride	MG/KG	0.05	0.05	1000	NA				
Tetrachloroethene	MG/KG	1.3	1.3	300	0.12			0.039	0.18 D
Toluene	MG/KG	0.7	0.7	1000					
Trichloroethene	MG/KG	0.47	0.47	400					0.0050 J
Xylene (total)	MG/KG	0.26	1.6	1000		0.0040 J			

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: HIST SO VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB- 1	SB- 2	SB- 3	SB- 3	SB- 4
Sample ID					SB-1-102898-SO-8-10.5	SB-2-102998-SO-8-10.5	SB-3-102998-SO-0-1	SB-3-102998-SO-4-8	SB-4-103098-SO-8-10.5
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-10.5	8.0-10.5	0.0-1.0	4.0-8.0	8.0-10.5
Date Sampled					10/28/98	10/29/98	10/29/98	10/29/98	10/30/98
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Volatile Organic Compounds									
1,2-Dichloroethene (cis)	MG/KG	0.25	0.25	1000	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	MG/KG	-	-	-					
1,2-Dichloroethene (trans)	MG/KG	0.19	0.19	1000	NA	NA	NA	NA	NA
Acetone	MG/KG	0.05	0.05	1000					0.0080 J
Carbon disulfide	MG/KG	2.7 CP-51	2.7 CP-51	-					
Ethylbenzene	MG/KG	1	1	780					
Methyl ethyl ketone (2-Butanone)	MG/KG	0.12	0.12	1000					
Methylene chloride	MG/KG	0.05	0.05	1000	NA	NA	NA	NA	NA
Tetrachloroethene	MG/KG	1.3	1.3	300	0.0020 J	0.0040 J	0.0030 J		
Toluene	MG/KG	0.7	0.7	1000			0.0010 J		
Trichloroethene	MG/KG	0.47	0.47	400					
Xylene (total)	MG/KG	0.26	1.6	1000			0.0010 J		

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.
NA = Not Analysed. Blank = Non Detect
D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: HIST SO VOCs
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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB- 5	SB- 6	SB- 6	SB- 6	SB- 7
Sample ID					SB-5-120198-SO-4-8	SB-6-120198-SO-0-4	SB-6-120198-SO-5-8	SB-6-120198-SO-8-12	SB-7-120198-SO-4-8
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					4.0-8.0	0.0-4.0	5.0-8.0	8.0-12.0	4.0-8.0
Date Sampled					12/01/98	12/01/98	12/01/98	12/01/98	12/01/98
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Volatile Organic Compounds									
1,2-Dichloroethene (cis)	MG/KG	0.25	0.25	1000	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	MG/KG	-	-	-	0.055	100			
1,2-Dichloroethene (trans)	MG/KG	0.19	0.19	1000	NA	NA	NA	NA	NA
Acetone	MG/KG	0.05	0.05	1000	0.012				
Carbon disulfide	MG/KG	2.7 CP-51	2.7 CP-51	-					
Ethylbenzene	MG/KG	1	1	780					
Methyl ethyl ketone (2-Butanone)	MG/KG	0.12	0.12	1000	0.023		0.014		0.010
Methylene chloride	MG/KG	0.05	0.05	1000	NA	NA	NA	NA	NA
Tetrachloroethene	MG/KG	1.3	1.3	300	12 D	18,000 D	1.1	570	0.057
Toluene	MG/KG	0.7	0.7	1000					
Trichloroethene	MG/KG	0.47	0.47	400	0.074	110			570
Xylene (total)	MG/KG	0.26	1.6	1000					

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.
NA = Not Analysed. Blank = Non Detect
D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: HIST SO VOCs
#Error
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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB- 8	SB- 9	SB-10	SB-101	SB-101
Sample ID					SB-8-120298-SO-7.5-10	SB9S3 8.5-11_022301	SB10G2 4-8_022301	SB-101 SURFACE	DUPLICATE-091713
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					7.5-10.0	8.5-11.0	4.0-8.0	0.0-0.2	0.0-1.0
Date Sampled					12/02/98	02/23/01	02/23/01	09/17/13	09/17/13
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					Field Duplicate (1-1)
Volatile Organic Compounds									
1,2-Dichloroethene (cis)	MG/KG	0.25	0.25	1000	NA				
1,2-Dichloroethene (total)	MG/KG	-	-	-	0.056	NA	NA	NA	NA
1,2-Dichloroethene (trans)	MG/KG	0.19	0.19	1000	NA				
Acetone	MG/KG	0.05	0.05	1000					
Carbon disulfide	MG/KG	2.7 CP-51	2.7 CP-51	-					
Ethylbenzene	MG/KG	1	1	780					
Methyl ethyl ketone (2-Butanone)	MG/KG	0.12	0.12	1000					
Methylene chloride	MG/KG	0.05	0.05	1000	NA				
Tetrachloroethene	MG/KG	1.3	1.3	300	14 D				
Toluene	MG/KG	0.7	0.7	1000					
Trichloroethene	MG/KG	0.47	0.47	400	0.037				
Xylene (total)	MG/KG	0.26	1.6	1000					

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

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Advanced Selection: HIST SO VOCs
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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB-101	SB-104	SB-104	SB-11	SB-12
Sample ID					SB-101 FILL 0-1FT	SB-104 SURFACE	SB-104 FILL 0-1FT	SB11S2 4-8_022301	SB12S2 4-8_022301
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-1.0	0.0-0.2	0.0-1.0	4.0-8.0	4.0-8.0
Date Sampled					09/17/13	09/16/13	09/16/13	02/23/01	02/23/01
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Volatile Organic Compounds									
1,2-Dichloroethene (cis)	MG/KG	0.25	0.25	1000					
1,2-Dichloroethene (total)	MG/KG	-	-	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	MG/KG	0.19	0.19	1000					
Acetone	MG/KG	0.05	0.05	1000				0.048	0.010 J
Carbon disulfide	MG/KG	2.7 CP-51	2.7 CP-51	-					
Ethylbenzene	MG/KG	1	1	780					
Methyl ethyl ketone (2-Butanone)	MG/KG	0.12	0.12	1000				0.010 J	
Methylene chloride	MG/KG	0.05	0.05	1000					
Tetrachloroethene	MG/KG	1.3	1.3	300		0.011 J	0.094 J	0.0020 J	0.0010 J
Toluene	MG/KG	0.7	0.7	1000					
Trichloroethene	MG/KG	0.47	0.47	400					
Xylene (total)	MG/KG	0.26	1.6	1000					

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

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Advanced Selection: HIST SO VOCs
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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB-13	SB-14	SP- 2	SP- 4	SP- 9
Sample ID					SB13G3 8-12_022301	SB14G3 8-12_022301	SP2-090911-1750	SP4-090911-1920	SP9-090911-1720
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-12.0	8.0-12.0	0.0-1.0	0.0-1.0	0.0-1.0
Date Sampled					02/23/01	02/23/01	09/09/11	09/09/11	09/09/11
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Volatile Organic Compounds									
1,2-Dichloroethene (cis)	MG/KG	0.25	0.25	1000	0.0030 J	1.0 DJ		0.029 J	
1,2-Dichloroethene (total)	MG/KG	-	-	-	NA	NA	NA	NA	NA
1,2-Dichloroethene (trans)	MG/KG	0.19	0.19	1000		0.0030 J		0.0064 J	
Acetone	MG/KG	0.05	0.05	1000	0.0060 J	0.012 J		0.015 J	
Carbon disulfide	MG/KG	2.7 CP-51	2.7 CP-51	-					
Ethylbenzene	MG/KG	1	1	780					
Methyl ethyl ketone (2-Butanone)	MG/KG	0.12	0.12	1000					
Methylene chloride	MG/KG	0.05	0.05	1000					
Tetrachloroethene	MG/KG	1.3	1.3	300	0.032	3.1 D	0.021 J	5.0 J	0.0074 J
Toluene	MG/KG	0.7	0.7	1000		0.0020 J			
Trichloroethene	MG/KG	0.47	0.47	400	0.0020 J	0.18 DJ	0.00070 J	0.057 J	
Xylene (total)	MG/KG	0.26	1.6	1000					

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.
NA = Not Analysed. Blank = Non Detect
D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: HIST SO VOCs
#Error
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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SP-10	SS- 1	SS- 1 (H&A)	SS- 2	SS- 3
Sample ID					SP10-090911-1810	SS-1-102998-SO-0-1	SS-1-HAI-110300	SS-2-102998-SO-0-1	SS-3-102998-SO-0-1
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-1.0	0.0-1.0	0.0-0.5	0.0-1.0	0.0-1.0
Date Sampled					09/09/11	10/29/98	11/03/00	10/29/98	10/29/98
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Volatile Organic Compounds									
1,2-Dichloroethene (cis)	MG/KG	0.25	0.25	1000		NA		NA	NA
1,2-Dichloroethene (total)	MG/KG	-	-	-	NA		NA		
1,2-Dichloroethene (trans)	MG/KG	0.19	0.19	1000		NA		NA	NA
Acetone	MG/KG	0.05	0.05	1000					
Carbon disulfide	MG/KG	2.7 CP-51	2.7 CP-51	-			NA		
Ethylbenzene	MG/KG	1	1	780			NA		
Methyl ethyl ketone (2-Butanone)	MG/KG	0.12	0.12	1000					
Methylene chloride	MG/KG	0.05	0.05	1000		NA	0.0024 J	NA	NA
Tetrachloroethene	MG/KG	1.3	1.3	300			0.0038 J		
Toluene	MG/KG	0.7	0.7	1000					
Trichloroethene	MG/KG	0.47	0.47	400					
Xylene (total)	MG/KG	0.26	1.6	1000			NA		

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

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Only Detected Results Reported.

Advanced Selection: HIST SO VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - VOCs ONLY
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SS- 4 (H&A)	SS- 5 (H&A)	SS- 6 (H&A)	SS- 8 (H&A)
Sample ID					SS-4-HAI-110300	SS-5-HAI-110300	SS-6-HAI-110300	SS-8-HAI-110300
Matrix					Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
Date Sampled					11/03/00	11/03/00	11/03/00	11/03/00
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**				
Volatile Organic Compounds								
1,2-Dichloroethene (cis)	MG/KG	0.25	0.25	1000				
1,2-Dichloroethene (total)	MG/KG	-	-	-	NA	NA	NA	NA
1,2-Dichloroethene (trans)	MG/KG	0.19	0.19	1000				
Acetone	MG/KG	0.05	0.05	1000				
Carbon disulfide	MG/KG	2.7 CP-51	2.7 CP-51	-	NA	NA	NA	NA
Ethylbenzene	MG/KG	1	1	780	NA	NA	NA	NA
Methyl ethyl ketone (2-Butanone)	MG/KG	0.12	0.12	1000				
Methylene chloride	MG/KG	0.05	0.05	1000	0.0025 J	0.0028 J	0.0024 J	
Tetrachloroethene	MG/KG	1.3	1.3	300				
Toluene	MG/KG	0.7	0.7	1000				
Trichloroethene	MG/KG	0.47	0.47	400				
Xylene (total)	MG/KG	0.26	1.6	1000	NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Only Detected Results Reported.

Advanced Selection: HIST SO VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] = 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					MW- 6	MW-11	MW-11	MW-15	MW-15
Sample ID					MW-6-102898-SO-8-12	MW-11-S3-021601	MW-11-S5-021601	MW-15-54-021301	MW-15-55-021301
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-12.0	4.0-6.0	8.0-10.0	6.0-8.0	8.0-10.0
Date Sampled					10/28/98	02/16/01	02/16/01	02/13/01	02/13/01
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Semivolatile Organic Compounds									
2-Methylphenol (o-cresol)	MG/KG	0.33	0.33	1000	NA	NA	NA	NA	NA
3&4-Methylphenol	MG/KG	-	-	-	NA	NA	NA	NA	NA
Acenaphthene	MG/KG	20	98	1000	0.055 J	NA	NA	NA	NA
Acenaphthylene	MG/KG	100	107	1000	NA	NA	NA	NA	NA
Anthracene	MG/KG	100	1000	1000	0.071 J	NA	NA	NA	NA
Benzo(a)anthracene	MG/KG	1	1	11	0.19 J	NA	NA	NA	NA
Benzo(a)pyrene	MG/KG	1	22	1.1	0.19 J	NA	NA	NA	NA
Benzo(b)fluoranthene	MG/KG	1	1.7	11	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	MG/KG	100	1000	1000	0.13 J	NA	NA	NA	NA
Benzo(k)fluoranthene	MG/KG	0.8	1.7	110	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	MG/KG	50 CP-51	435 CP-51	-	7.4 D	NA	NA	NA	NA
Butylbenzylphthalate	MG/KG	100 CP-51	122 CP-51	-	0.10 J	NA	NA	NA	NA
Carbazole	MG/KG	-	-	-	0.047 J	NA	NA	NA	NA
Chrysene	MG/KG	1	1	110	0.23 J	NA	NA	NA	NA
Dibenz(a,h)anthracene	MG/KG	0.33	1000	1.1	NA	NA	NA	NA	NA
Dibenzofuran	MG/KG	7	210	1000	NA	NA	NA	NA	NA
Di-n-butylphthalate	MG/KG	0.014 CP-51	8.1 CP-51	-	0.064 J	NA	NA	NA	NA
Di-n-octylphthalate	MG/KG	100 CP-51	120 CP-51	-	0.40	NA	NA	NA	NA
Fluoranthene	MG/KG	100	1000	1000	0.50	NA	NA	NA	NA
Fluorene	MG/KG	30	386	1000	0.047 J	NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					MW- 6	MW-11	MW-11	MW-15	MW-15
Sample ID					MW-6-102898-SO-8-12	MW-11-S3-021601	MW-11-S5-021601	MW-15-54-021301	MW-15-55-021301
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-12.0	4.0-6.0	8.0-10.0	6.0-8.0	8.0-10.0
Date Sampled					10/28/98	02/16/01	02/16/01	02/13/01	02/13/01
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Semivolatile Organic Compounds									
Indeno(1,2,3-cd)pyrene	MG/KG	0.5	8.2	11	0.12 J	NA	NA	NA	NA
Naphthalene	MG/KG	12	12	1000		NA	NA	NA	NA
Pentachlorophenol	MG/KG	0.8	0.8	55	NA	NA	NA	NA	NA
Phenanthrene	MG/KG	100	1000	1000	0.41	NA	NA	NA	NA
Phenol	MG/KG	0.33	0.33	1000	NA	NA	NA	NA	NA
Pyrene	MG/KG	100	1000	1000	0.55	NA	NA	NA	NA
Polychlorinated Biphenyls									
Aroclor 1016	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1221	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1232	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1242	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1248	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1254	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1260	MG/KG	-	-	-	NA	NA	NA	NA	NA
Metals									
Aluminum	MG/KG	10000 CP-51	-	-	NA	NA	NA	NA	NA
Antimony	MG/KG	12 CP-51	-	-	NA	NA	NA	NA	NA
Arsenic	MG/KG	13	16	16	NA	NA	NA	NA	NA
Barium	MG/KG	350	820	10000	NA	NA	NA	NA	NA
Beryllium	MG/KG	7.2	47	2700	NA	NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					MW- 6	MW-11	MW-11	MW-15	MW-15
Sample ID					MW-6-102898-SO-8-12	MW-11-S3-021601	MW-11-S5-021601	MW-15-54-021301	MW-15-55-021301
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-12.0	4.0-6.0	8.0-10.0	6.0-8.0	8.0-10.0
Date Sampled					10/28/98	02/16/01	02/16/01	02/13/01	02/13/01
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Metals									
Cadmium	MG/KG	2.5	7.5	60	NA	NA	NA	NA	NA
Calcium	MG/KG	10000 CP-51	-	-	NA	NA	NA	NA	NA
Chromium	MG/KG	30	NS	6800	NA	NA	NA	NA	NA
Cobalt	MG/KG	20 CP-51	-	-	NA	NA	NA	NA	NA
Copper	MG/KG	50	1720	10000	NA	NA	NA	NA	NA
Iron	MG/KG	2000 CP-51	-	-	NA	NA	NA	NA	NA
Lead	MG/KG	63	450	3900	NA	NA	NA	NA	NA
Magnesium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Manganese	MG/KG	1600	2000	10000	NA	NA	NA	NA	NA
Mercury	MG/KG	0.18	0.73	5.7	NA	NA	NA	NA	NA
Nickel	MG/KG	30	130	10000	NA	NA	NA	NA	NA
Potassium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Selenium	MG/KG	3.9	4	6800	NA	NA	NA	NA	NA
Silver	MG/KG	2	8.3	6800	NA	NA	NA	NA	NA
Sodium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Thallium	MG/KG	5 CP-51	-	-	NA	NA	NA	NA	NA
Vanadium	MG/KG	39 CP-51	-	-	NA	NA	NA	NA	NA
Zinc	MG/KG	109	2480	10000	NA	NA	NA	NA	NA
Miscellaneous Parameters									
Diesel Range Organics	MG/KG	-	-	-	NA	NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					MW- 6	MW-11	MW-11	MW-15	MW-15
Sample ID					MW-6-102898-SO-8-12	MW-11-S3-021601	MW-11-S5-021601	MW-15-54-021301	MW-15-55-021301
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-12.0	4.0-6.0	8.0-10.0	6.0-8.0	8.0-10.0
Date Sampled					10/28/98	02/16/01	02/16/01	02/13/01	02/13/01
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Miscellaneous Parameters									
Gasoline Range Organics	MG/KG	-	-	-	NA	NA	NA	NA	NA
Solids, Percent	%	-	-	-	NA	82.7	88.7	85.9	85.2
Total Petroleum Hydrocarbons	MG/KG	-	-	-	NA	NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB- 6	SB- 9	SB-10	SB-101	SB-101
Sample ID					SB-6-120198-SO-4-5	SB9S3 8.5-11_022301	SB10G2 4-8_022301	SB-101 SURFACE	DUPLICATE-091713
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					4.0-5.0	8.5-11.0	4.0-8.0	0.0-0.2	0.0-1.0
Date Sampled					12/01/98	02/23/01	02/23/01	09/17/13	09/17/13
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					Field Duplicate (1-1)
Semivolatile Organic Compounds									
2-Methylphenol (o-cresol)	MG/KG	0.33	0.33	1000	NA	NA	NA	NA	NA
3&4-Methylphenol	MG/KG	-	-	-	NA	NA	NA	NA	NA
Acenaphthene	MG/KG	20	98	1000		NA	NA	3.6	
Acenaphthylene	MG/KG	100	107	1000	NA	NA	NA		
Anthracene	MG/KG	100	1000	1000		NA	NA	4.8	0.32 J
Benzo(a)anthracene	MG/KG	1	1	11	0.15 J	NA	NA	9.5	0.67 J
Benzo(a)pyrene	MG/KG	1	22	1.1	0.085 J	NA	NA	8.9	0.47 J
Benzo(b)fluoranthene	MG/KG	1	1.7	11	NA	NA	NA	10	0.62 J
Benzo(g,h,i)perylene	MG/KG	100	1000	1000	0.069 J	NA	NA	5.6	0.27 J
Benzo(k)fluoranthene	MG/KG	0.8	1.7	110	NA	NA	NA	4.2	
bis(2-Ethylhexyl)phthalate	MG/KG	50 CP-51	435 CP-51	-	0.22 JB	NA	NA	NA	NA
Butylbenzylphthalate	MG/KG	100 CP-51	122 CP-51	-		NA	NA	NA	NA
Carbazole	MG/KG	-	-	-		NA	NA	NA	NA
Chrysene	MG/KG	1	1	110	0.18 J	NA	NA	10	0.58 J
Dibenz(a,h)anthracene	MG/KG	0.33	1000	1.1	NA	NA	NA		
Dibenzofuran	MG/KG	7	210	1000	NA	NA	NA	NA	NA
Di-n-butylphthalate	MG/KG	0.014 CP-51	8.1 CP-51	-		NA	NA	NA	NA
Di-n-octylphthalate	MG/KG	100 CP-51	120 CP-51	-		NA	NA	NA	NA
Fluoranthene	MG/KG	100	1000	1000	0.31 J	NA	NA	34	1.7 J
Fluorene	MG/KG	30	386	1000		NA	NA	2.8	

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB- 6	SB- 9	SB-10	SB-101	SB-101
Sample ID					SB-6-120198-SO-4-5	SB9S3 8.5-11_022301	SB10G2 4-8_022301	SB-101 SURFACE	DUPLICATE-091713
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					4.0-5.0	8.5-11.0	4.0-8.0	0.0-0.2	0.0-1.0
Date Sampled					12/01/98	02/23/01	02/23/01	09/17/13	09/17/13
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					Field Duplicate (1-1)
Semivolatile Organic Compounds									
Indeno(1,2,3-cd)pyrene	MG/KG	0.5	8.2	11	0.17 J	NA	NA	4.4	0.25 J
Naphthalene	MG/KG	12	12	1000	0.13 J	NA	NA	1.3	
Pentachlorophenol	MG/KG	0.8	0.8	55	NA	NA	NA	NA	NA
Phenanthrene	MG/KG	100	1000	1000	0.27 J	NA	NA	24	1.1 J
Phenol	MG/KG	0.33	0.33	1000	NA	NA	NA	NA	NA
Pyrene	MG/KG	100	1000	1000	0.31 J	NA	NA	20	0.96 J
Polychlorinated Biphenyls									
Aroclor 1016	MG/KG	-	-	-	NA	NA	NA	NA	
Aroclor 1221	MG/KG	-	-	-	NA	NA	NA	NA	
Aroclor 1232	MG/KG	-	-	-	NA	NA	NA	NA	
Aroclor 1242	MG/KG	-	-	-	NA	NA	NA	NA	
Aroclor 1248	MG/KG	-	-	-	NA	NA	NA	NA	
Aroclor 1254	MG/KG	-	-	-	NA	NA	NA	NA	
Aroclor 1260	MG/KG	-	-	-	NA	NA	NA	NA	
Metals									
Aluminum	MG/KG	10000 CP-51	-	-	NA	NA	NA	NA	NA
Antimony	MG/KG	12 CP-51	-	-	NA	NA	NA		
Arsenic	MG/KG	13	16	16	NA	NA	NA	6.1	3.8
Barium	MG/KG	350	820	10000	NA	NA	NA	NA	NA
Beryllium	MG/KG	7.2	47	2700	NA	NA	NA	0.65	0.34

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB- 6	SB- 9	SB-10	SB-101	SB-101
Sample ID					SB-6-120198-SO-4-5	SB9S3 8.5-11_022301	SB10G2 4-8_022301	SB-101 SURFACE	DUPLICATE-091713
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					4.0-5.0	8.5-11.0	4.0-8.0	0.0-0.2	0.0-1.0
Date Sampled					12/01/98	02/23/01	02/23/01	09/17/13	09/17/13
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					Field Duplicate (1-1)
Metals									
Cadmium	MG/KG	2.5	7.5	60	NA	NA	NA		
Calcium	MG/KG	10000 CP-51	-	-	NA	NA	NA	NA	NA
Chromium	MG/KG	30	NS	6800	NA	NA	NA	18.0	9.0
Cobalt	MG/KG	20 CP-51	-	-	NA	NA	NA	NA	NA
Copper	MG/KG	50	1720	10000	NA	NA	NA	32.0	20.0
Iron	MG/KG	2000 CP-51	-	-	NA	NA	NA	NA	NA
Lead	MG/KG	63	450	3900	NA	NA	NA	50.0 J	150 J
Magnesium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Manganese	MG/KG	1600	2000	10000	NA	NA	NA	NA	NA
Mercury	MG/KG	0.18	0.73	5.7	NA	NA	NA	0.12	0.041 J
Nickel	MG/KG	30	130	10000	NA	NA	NA	14.0 J	8.0 J
Potassium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Selenium	MG/KG	3.9	4	6800	NA	NA	NA		
Silver	MG/KG	2	8.3	6800	NA	NA	NA		
Sodium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Thallium	MG/KG	5 CP-51	-	-	NA	NA	NA		2.0
Vanadium	MG/KG	39 CP-51	-	-	NA	NA	NA	NA	NA
Zinc	MG/KG	109	2480	10000	NA	NA	NA	100 J	120 J
Miscellaneous Parameters									
Diesel Range Organics	MG/KG	-	-	-	NA	NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB- 6	SB- 9	SB-10	SB-101	SB-101
Sample ID					SB-6-120198-SO-4-5	SB9S3 8.5-11_022301	SB10G2 4-8_022301	SB-101 SURFACE	DUPLICATE-091713
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					4.0-5.0	8.5-11.0	4.0-8.0	0.0-0.2	0.0-1.0
Date Sampled					12/01/98	02/23/01	02/23/01	09/17/13	09/17/13
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					Field Duplicate (1-1)
Miscellaneous Parameters									
Gasoline Range Organics	MG/KG	-	-	-	NA	NA	NA	NA	NA
Solids, Percent	%	-	-	-	NA	83.2	86.6	49.5	81.0
Total Petroleum Hydrocarbons	MG/KG	-	-	-	NA	NA	NA	0.65	1.2 J

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB-101	SB-104	SB-104	SB-11	SB-12
Sample ID					SB-101 FILL 0-1FT	SB-104 SURFACE	SB-104 FILL 0-1FT	SB11S2 4-8_022301	SB12S2 4-8_022301
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-1.0	0.0-0.2	0.0-1.0	4.0-8.0	4.0-8.0
Date Sampled					09/17/13	09/16/13	09/16/13	02/23/01	02/23/01
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Semivolatile Organic Compounds									
2-Methylphenol (o-cresol)	MG/KG	0.33	0.33	1000	NA	NA	NA	NA	NA
3&4-Methylphenol	MG/KG	-	-	-	NA	NA	NA	NA	NA
Acenaphthene	MG/KG	20	98	1000				NA	NA
Acenaphthylene	MG/KG	100	107	1000				NA	NA
Anthracene	MG/KG	100	1000	1000			4.5	NA	NA
Benzo(a)anthracene	MG/KG	1	1	11			8.1	NA	NA
Benzo(a)pyrene	MG/KG	1	22	1.1			7.2	NA	NA
Benzo(b)fluoranthene	MG/KG	1	1.7	11			7.7	NA	NA
Benzo(g,h,i)perylene	MG/KG	100	1000	1000			4.7	NA	NA
Benzo(k)fluoranthene	MG/KG	0.8	1.7	110			2.9	NA	NA
bis(2-Ethylhexyl)phthalate	MG/KG	50 CP-51	435 CP-51	-	NA	NA	NA	NA	NA
Butylbenzylphthalate	MG/KG	100 CP-51	122 CP-51	-	NA	NA	NA	NA	NA
Carbazole	MG/KG	-	-	-	NA	NA	NA	NA	NA
Chrysene	MG/KG	1	1	110			8.5	NA	NA
Dibenz(a,h)anthracene	MG/KG	0.33	1000	1.1				NA	NA
Dibenzofuran	MG/KG	7	210	1000	NA	NA	NA	NA	NA
Di-n-butylphthalate	MG/KG	0.014 CP-51	8.1 CP-51	-	NA	NA	NA	NA	NA
Di-n-octylphthalate	MG/KG	100 CP-51	120 CP-51	-	NA	NA	NA	NA	NA
Fluoranthene	MG/KG	100	1000	1000	9.9 J	3.7	22	NA	NA
Fluorene	MG/KG	30	386	1000				NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB-101	SB-104	SB-104	SB-11	SB-12
Sample ID					SB-101 FILL 0-1FT	SB-104 SURFACE	SB-104 FILL 0-1FT	SB11S2 4-8_022301	SB12S2 4-8_022301
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-1.0	0.0-0.2	0.0-1.0	4.0-8.0	4.0-8.0
Date Sampled					09/17/13	09/16/13	09/16/13	02/23/01	02/23/01
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Semivolatile Organic Compounds									
Indeno(1,2,3-cd)pyrene	MG/KG	0.5	8.2	11			3.5	NA	NA
Naphthalene	MG/KG	12	12	1000				NA	NA
Pentachlorophenol	MG/KG	0.8	0.8	55	NA	NA	NA	NA	NA
Phenanthrene	MG/KG	100	1000	1000	5.8 J		17	NA	NA
Phenol	MG/KG	0.33	0.33	1000	NA	NA	NA	NA	NA
Pyrene	MG/KG	100	1000	1000	5.1 J	1.9	16	NA	NA
Polychlorinated Biphenyls									
Aroclor 1016	MG/KG	-	-	-		NA		NA	NA
Aroclor 1221	MG/KG	-	-	-		NA		NA	NA
Aroclor 1232	MG/KG	-	-	-		NA		NA	NA
Aroclor 1242	MG/KG	-	-	-		NA		NA	NA
Aroclor 1248	MG/KG	-	-	-		NA		NA	NA
Aroclor 1254	MG/KG	-	-	-		NA		NA	NA
Aroclor 1260	MG/KG	-	-	-		NA	0.025	NA	NA
Metals									
Aluminum	MG/KG	10000 CP-51	-	-	NA	NA	NA	NA	NA
Antimony	MG/KG	12 CP-51	-	-				NA	NA
Arsenic	MG/KG	13	16	16	5.9	4.9	5.8	NA	NA
Barium	MG/KG	350	820	10000	NA	NA	NA	NA	NA
Beryllium	MG/KG	7.2	47	2700	0.46	0.38	0.47	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB-101	SB-104	SB-104	SB-11	SB-12
Sample ID					SB-101 FILL 0-1FT	SB-104 SURFACE	SB-104 FILL 0-1FT	SB11S2 4-8_022301	SB12S2 4-8_022301
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-1.0	0.0-0.2	0.0-1.0	4.0-8.0	4.0-8.0
Date Sampled					09/17/13	09/16/13	09/16/13	02/23/01	02/23/01
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Metals									
Cadmium	MG/KG	2.5	7.5	60				NA	NA
Calcium	MG/KG	10000 CP-51	-	-	NA	NA	NA	NA	NA
Chromium	MG/KG	30	NS	6800	11.0	11.0	8.3	NA	NA
Cobalt	MG/KG	20 CP-51	-	-	NA	NA	NA	NA	NA
Copper	MG/KG	50	1720	10000	21.0	29.0	25.0	NA	NA
Iron	MG/KG	2000 CP-51	-	-	NA	NA	NA	NA	NA
Lead	MG/KG	63	450	3900	160 J	66.0 J	63.0 J	NA	NA
Magnesium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Manganese	MG/KG	1600	2000	10000	NA	NA	NA	NA	NA
Mercury	MG/KG	0.18	0.73	5.7	0.21 J	0.079	0.14	NA	NA
Nickel	MG/KG	30	130	10000	7.3 J	10.0 J	11.0 J	NA	NA
Potassium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Selenium	MG/KG	3.9	4	6800				NA	NA
Silver	MG/KG	2	8.3	6800				NA	NA
Sodium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Thallium	MG/KG	5 CP-51	-	-				NA	NA
Vanadium	MG/KG	39 CP-51	-	-	NA	NA	NA	NA	NA
Zinc	MG/KG	109	2480	10000	120 J	88.0 J	60.0 J	NA	NA
Miscellaneous Parameters									
Diesel Range Organics	MG/KG	-	-	-	NA	NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB-101	SB-104	SB-104	SB-11	SB-12
Sample ID					SB-101 FILL 0-1FT	SB-104 SURFACE	SB-104 FILL 0-1FT	SB11S2 4-8_022301	SB12S2 4-8_022301
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-1.0	0.0-0.2	0.0-1.0	4.0-8.0	4.0-8.0
Date Sampled					09/17/13	09/16/13	09/16/13	02/23/01	02/23/01
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Miscellaneous Parameters									
Gasoline Range Organics	MG/KG	-	-	-	NA	NA	NA	NA	NA
Solids, Percent	%	-	-	-	80.9	90.1	76.2	83.0	83.2
Total Petroleum Hydrocarbons	MG/KG	-	-	-		0.84	0.14	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB-13	SB-14	SP- 2	SP- 4	SP- 9
Sample ID					SB13G3 8-12_022301	SB14G3 8-12_022301	SP2-090911-1750	SP4-090911-1920	SP9-090911-1720
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-12.0	8.0-12.0	0.0-1.0	0.0-1.0	0.0-1.0
Date Sampled					02/23/01	02/23/01	09/09/11	09/09/11	09/09/11
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Semivolatile Organic Compounds									
2-Methylphenol (o-cresol)	MG/KG	0.33	0.33	1000	NA	NA			
3&4-Methylphenol	MG/KG	-	-	-	NA	NA			
Acenaphthene	MG/KG	20	98	1000	NA	NA			
Acenaphthylene	MG/KG	100	107	1000	NA	NA			
Anthracene	MG/KG	100	1000	1000	NA	NA		5.0	
Benzo(a)anthracene	MG/KG	1	1	11	NA	NA		13	2.4
Benzo(a)pyrene	MG/KG	1	22	1.1	NA	NA		14	2.9
Benzo(b)fluoranthene	MG/KG	1	1.7	11	NA	NA		12	2.7
Benzo(g,h,i)perylene	MG/KG	100	1000	1000	NA	NA		9.6	2.0
Benzo(k)fluoranthene	MG/KG	0.8	1.7	110	NA	NA		11	2.2
bis(2-Ethylhexyl)phthalate	MG/KG	50 CP-51	435 CP-51	-	NA	NA	NA	NA	NA
Butylbenzylphthalate	MG/KG	100 CP-51	122 CP-51	-	NA	NA	NA	NA	NA
Carbazole	MG/KG	-	-	-	NA	NA	NA	NA	NA
Chrysene	MG/KG	1	1	110	NA	NA		13	2.4
Dibenz(a,h)anthracene	MG/KG	0.33	1000	1.1	NA	NA			
Dibenzofuran	MG/KG	7	210	1000	NA	NA			
Di-n-butylphthalate	MG/KG	0.014 CP-51	8.1 CP-51	-	NA	NA	NA	NA	NA
Di-n-octylphthalate	MG/KG	100 CP-51	120 CP-51	-	NA	NA	NA	NA	NA
Fluoranthene	MG/KG	100	1000	1000	NA	NA		30	5.3
Fluorene	MG/KG	30	386	1000	NA	NA			

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB-13	SB-14	SP- 2	SP- 4	SP- 9
Sample ID					SB13G3 8-12_022301	SB14G3 8-12_022301	SP2-090911-1750	SP4-090911-1920	SP9-090911-1720
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-12.0	8.0-12.0	0.0-1.0	0.0-1.0	0.0-1.0
Date Sampled					02/23/01	02/23/01	09/09/11	09/09/11	09/09/11
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Semivolatile Organic Compounds									
Indeno(1,2,3-cd)pyrene	MG/KG	0.5	8.2	11	NA	NA		8.5	1.8
Naphthalene	MG/KG	12	12	1000	NA	NA			
Pentachlorophenol	MG/KG	0.8	0.8	55	NA	NA			
Phenanthrene	MG/KG	100	1000	1000	NA	NA		24	1.8
Phenol	MG/KG	0.33	0.33	1000	NA	NA			
Pyrene	MG/KG	100	1000	1000	NA	NA		25	3.5
Polychlorinated Biphenyls									
Aroclor 1016	MG/KG	-	-	-	NA	NA	NA		NA
Aroclor 1221	MG/KG	-	-	-	NA	NA	NA		NA
Aroclor 1232	MG/KG	-	-	-	NA	NA	NA		NA
Aroclor 1242	MG/KG	-	-	-	NA	NA	NA		NA
Aroclor 1248	MG/KG	-	-	-	NA	NA	NA		NA
Aroclor 1254	MG/KG	-	-	-	NA	NA	NA		NA
Aroclor 1260	MG/KG	-	-	-	NA	NA	NA		NA
Metals									
Aluminum	MG/KG	10000 CP-51	-	-	NA	NA	NA	NA	NA
Antimony	MG/KG	12 CP-51	-	-	NA	NA			
Arsenic	MG/KG	13	16	16	NA	NA	7.8	4.8	3.7
Barium	MG/KG	350	820	10000	NA	NA	NA	NA	NA
Beryllium	MG/KG	7.2	47	2700	NA	NA	1.09		

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB-13	SB-14	SP- 2	SP- 4	SP- 9
Sample ID					SB13G3 8-12_022301	SB14G3 8-12_022301	SP2-090911-1750	SP4-090911-1920	SP9-090911-1720
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-12.0	8.0-12.0	0.0-1.0	0.0-1.0	0.0-1.0
Date Sampled					02/23/01	02/23/01	09/09/11	09/09/11	09/09/11
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Metals									
Cadmium	MG/KG	2.5	7.5	60	NA	NA			
Calcium	MG/KG	10000 CP-51	-	-	NA	NA	NA	NA	NA
Chromium	MG/KG	30	NS	6800	NA	NA	9.8	9.8	10.3
Cobalt	MG/KG	20 CP-51	-	-	NA	NA	NA	NA	NA
Copper	MG/KG	50	1720	10000	NA	NA	18.4	20.2	14.0
Iron	MG/KG	2000 CP-51	-	-	NA	NA	NA	NA	NA
Lead	MG/KG	63	450	3900	NA	NA	92.5	83.6	62.1
Magnesium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Manganese	MG/KG	1600	2000	10000	NA	NA	NA	NA	NA
Mercury	MG/KG	0.18	0.73	5.7	NA	NA		0.312	0.144
Nickel	MG/KG	30	130	10000	NA	NA	8.1	9.1	9.1
Potassium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Selenium	MG/KG	3.9	4	6800	NA	NA	1.7		
Silver	MG/KG	2	8.3	6800	NA	NA			
Sodium	MG/KG	-	-	-	NA	NA	NA	NA	NA
Thallium	MG/KG	5 CP-51	-	-	NA	NA			
Vanadium	MG/KG	39 CP-51	-	-	NA	NA	NA	NA	NA
Zinc	MG/KG	109	2480	10000	NA	NA	63.6	87.6	60.2
Miscellaneous Parameters									
Diesel Range Organics	MG/KG	-	-	-	NA	NA		180	65

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

#Error

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SB-13	SB-14	SP- 2	SP- 4	SP- 9
Sample ID					SB13G3 8-12_022301	SB14G3 8-12_022301	SP2-090911-1750	SP4-090911-1920	SP9-090911-1720
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					8.0-12.0	8.0-12.0	0.0-1.0	0.0-1.0	0.0-1.0
Date Sampled					02/23/01	02/23/01	09/09/11	09/09/11	09/09/11
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Miscellaneous Parameters									
Gasoline Range Organics	MG/KG	-	-	-	NA	NA		0.13	
Solids, Percent	%	-	-	-	84.0	81.0	90.9	88.1	87.2
Total Petroleum Hydrocarbons	MG/KG	-	-	-	NA	NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

NA = Not Analysed. Blank = Non Detect

D - Result reported from a secondary dilution analysis.

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SP-10	SS- 1	SS- 2	SS- 4	SS- 5
Sample ID					SP10-090911-1810	SS-1-102998-SO-0-1	SS-2-102998-SO-0-1	SS-4-102998-SO-0-1	SS-5-102998-SO-0-1
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Date Sampled					09/09/11	10/29/98	10/29/98	10/29/98	10/29/98
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Semivolatile Organic Compounds									
2-Methylphenol (o-cresol)	MG/KG	0.33	0.33	1000		NA	NA	NA	NA
3&4-Methylphenol	MG/KG	-	-	-		NA	NA	NA	NA
Acenaphthene	MG/KG	20	98	1000		NA	NA	NA	NA
Acenaphthylene	MG/KG	100	107	1000		NA	NA	NA	NA
Anthracene	MG/KG	100	1000	1000		NA	NA	NA	NA
Benzo(a)anthracene	MG/KG	1	1	11		NA	NA	NA	NA
Benzo(a)pyrene	MG/KG	1	22	1.1		NA	NA	NA	NA
Benzo(b)fluoranthene	MG/KG	1	1.7	11		NA	NA	NA	NA
Benzo(g,h,i)perylene	MG/KG	100	1000	1000		NA	NA	NA	NA
Benzo(k)fluoranthene	MG/KG	0.8	1.7	110		NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	MG/KG	50 CP-51	435 CP-51	-	NA	NA	NA	NA	NA
Butylbenzylphthalate	MG/KG	100 CP-51	122 CP-51	-	NA	NA	NA	NA	NA
Carbazole	MG/KG	-	-	-	NA	NA	NA	NA	NA
Chrysene	MG/KG	1	1	110		NA	NA	NA	NA
Dibenz(a,h)anthracene	MG/KG	0.33	1000	1.1		NA	NA	NA	NA
Dibenzofuran	MG/KG	7	210	1000		NA	NA	NA	NA
Di-n-butylphthalate	MG/KG	0.014 CP-51	8.1 CP-51	-	NA	NA	NA	NA	NA
Di-n-octylphthalate	MG/KG	100 CP-51	120 CP-51	-	NA	NA	NA	NA	NA
Fluoranthene	MG/KG	100	1000	1000		NA	NA	NA	NA
Fluorene	MG/KG	30	386	1000		NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

Flags assigned during chemistry validation are shown.

Concentration Exceeds Criteria 1

Concentration Exceeds Criteria (2)

Border Concentration Exceeds Criteria (3)

J - The reported concentration is an estimated value.

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D - Result reported from a secondary dilution analysis.

Advanced Selection: HIST SO Non VOCs

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SP-10	SS- 1	SS- 2	SS- 4	SS- 5
Sample ID					SP10-090911-1810	SS-1-102998-SO-0-1	SS-2-102998-SO-0-1	SS-4-102998-SO-0-1	SS-5-102998-SO-0-1
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Date Sampled					09/09/11	10/29/98	10/29/98	10/29/98	10/29/98
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Semivolatile Organic Compounds									
Indeno(1,2,3-cd)pyrene	MG/KG	0.5	8.2	11		NA	NA	NA	NA
Naphthalene	MG/KG	12	12	1000		NA	NA	NA	NA
Pentachlorophenol	MG/KG	0.8	0.8	55		NA	NA	NA	NA
Phenanthrene	MG/KG	100	1000	1000		NA	NA	NA	NA
Phenol	MG/KG	0.33	0.33	1000		NA	NA	NA	NA
Pyrene	MG/KG	100	1000	1000		NA	NA	NA	NA
Polychlorinated Biphenyls									
Aroclor 1016	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1221	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1232	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1242	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1248	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1254	MG/KG	-	-	-	NA	NA	NA	NA	NA
Aroclor 1260	MG/KG	-	-	-	NA	NA	NA	NA	NA
Metals									
Aluminum	MG/KG	10000 CP-51	-	-	NA	7,210	9,430	7,490	5,580
Antimony	MG/KG	12 CP-51	-	-					
Arsenic	MG/KG	13	16	16	2.3	5.7	6.9	3.8	12.6
Barium	MG/KG	350	820	10000	NA	40.2	59.0	51.2	68.1
Beryllium	MG/KG	7.2	47	2700		0.19	0.31	0.19	0.11

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

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Advanced Selection: HIST SO Non VOCs

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[LOGDATE] <= #12/23/2013# AND [MATRIX] = 'SO' AND ([SACODE] = 'N' OR [SACODE] = 'FD') AND [PRCCODE] <> 'VOA'

HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SP-10	SS- 1	SS- 2	SS- 4	SS- 5
Sample ID					SP10-090911-1810	SS-1-102998-SO-0-1	SS-2-102998-SO-0-1	SS-4-102998-SO-0-1	SS-5-102998-SO-0-1
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Date Sampled					09/09/11	10/29/98	10/29/98	10/29/98	10/29/98
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Metals									
Cadmium	MG/KG	2.5	7.5	60		0.59	0.87	0.72	1.3
Calcium	MG/KG	10000 CP-51	-	-	NA	17,600	9,750	10,500	38,200
Chromium	MG/KG	30	NS	6800	5.5	10.7	14.4	9.4	15.2
Cobalt	MG/KG	20 CP-51	-	-	NA	3.9	6.8	5.6	5.4
Copper	MG/KG	50	1720	10000	9.0	12.5	16.9	9.8	43.8
Iron	MG/KG	2000 CP-51	-	-	NA	10,300	14,400	13,300	14,200
Lead	MG/KG	63	450	3900	8.9	39.3	39.6	18.9	221
Magnesium	MG/KG	-	-	-	NA	3,880	5,840	4,570	14,600
Manganese	MG/KG	1600	2000	10000	NA	312	562	942	362
Mercury	MG/KG	0.18	0.73	5.7		0.90	0.070	0.030	0.42
Nickel	MG/KG	30	130	10000	6.3	7.9	13.4	8.3	13.1
Potassium	MG/KG	-	-	-	NA	673	1,090	550	1,090
Selenium	MG/KG	3.9	4	6800		0.53		0.36	0.66
Silver	MG/KG	2	8.3	6800		0.65	0.66	0.57	1.3
Sodium	MG/KG	-	-	-	NA	43.4	50.6		108
Thallium	MG/KG	5 CP-51	-	-		3.8	2.8	4.0	7.3
Vanadium	MG/KG	39 CP-51	-	-	NA	12.5	17.0	14.8	14.4
Zinc	MG/KG	109	2480	10000	42.5	100	78.6	57.3	234
Miscellaneous Parameters									
Diesel Range Organics	MG/KG	-	-	-		NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

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Advanced Selection: HIST SO Non VOCs

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HISTORICAL SOIL SAMPLING RESULTS - NON VOCs
ARTCO INDUSTRIAL LAUNDRIES

Location ID					SP-10	SS- 1	SS- 2	SS- 4	SS- 5
Sample ID					SP10-090911-1810	SS-1-102998-SO-0-1	SS-2-102998-SO-0-1	SS-4-102998-SO-0-1	SS-5-102998-SO-0-1
Matrix					Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)					0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0	0.0-1.0
Date Sampled					09/09/11	10/29/98	10/29/98	10/29/98	10/29/98
Parameter	**Units**	**Criteria (1)**	**Criteria (2)**	**Criteria (3)**					
Miscellaneous Parameters									
Gasoline Range Organics	MG/KG	-	-	-		NA	NA	NA	NA
Solids, Percent	%	-	-	-	95.0	NA	NA	NA	NA
Total Petroleum Hydrocarbons	MG/KG	-	-	-	NA	NA	NA	NA	NA

Criteria (1)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use, plus CP-51 Table 1 10/21/10.

Criteria (2)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Restricted Use. Protection of Groundwater, plus CP-51 Table 1 10/21/10.

Criteria (3)- 6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Protection of Public Health, Industrial, plus CP-51 Table 1 10/21/10.

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Concentration Exceeds Criteria (2)

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APPENDIX B

REMEDIAL DESIGN WORK PLAN

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

REMEDIAL DESIGN

WORK PLAN

WORK ASSIGNMENT D007622-59

ARTCO INDUSTRIAL LAUNDRIES SITE NO. 828102
331-337 WEST MAIN STREET
ROCHESTER/MONROE COUNTY, NY

Prepared for:
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 Broadway, Albany, New York

Basil Seggos, Commissioner

DIVISION OF ENVIRONMENTAL REMEDIATION
Remedial Bureau E

URS Corporation
257 West Genesee Street
Suite 400
Buffalo, New York 14202

FINAL
January 2020

January 13, 2020

Mr. Benjamin Rung, PE
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau E
625 Broadway, 12th Floor
Albany, NY 12233-7016

RE: Contract No. D007622, WA-59
Remedial Design Work Plan
Artco Industrial Laundries Site No. 828102

Dear Mr. Rung:

URS Corporation – New York (URS) is pleased to submit this Project Work Plan for field activities at the Artco Industrial Laundries (Artco) Site. The Artco Site is located at 331-337 West Main Street in the City of Rochester, Monroe County, New York (Tax ID: 121.29-1-30.001) as shown on Figure 1.

The site is located on the south side of West Main Street approximately 0.6 miles west of the Genesee River and roughly 300 feet west of the intersection of West Main Street and Ford Street. Site Features: The site is approximately 1.8 acres in size. The main site feature is an approximately 54,500 square foot occupied building. The rest of the site is mostly paved with some grass and landscaped areas immediately north and west of the building. Current Zoning and Land Use: The site is currently used as an industrial laundry and is zoned Center City District which allows for commercial, and industrial uses. The site is owned by AFES, LLC and currently unoccupied. The surrounding parcels are currently used for a variety of non-residential activities including commercial, light industrial, roads, and utility rights-of-way. The nearest residence is approximately 300 feet southeast of the site on Favor Street. A site plan is presented in Figure 2.

Field activities will include: soil probes/vapor screening at approximately 24 locations; advancement of direct-push soil borings screening samples at 10 locations; and installation and sampling of approximately two overburden monitoring wells and two bedrock monitoring wells in the Artco Site (Figure 3). Locations of the soil borings and monitoring wells may change based on data collected during the soil probes/ vapor screening and site access constraints.

This Project Work Plan must be used in conjunction with the *Health and Safety Plan* (HASP) and *Generic Field Activity Plan* (FAP) for Work Assignments under Standby Engineering Services Contract D007622-59. Refer to these plans for routine field work activities, field forms, and quality assurance procedures. They have been included as Attachments 1 and 2.

SITE HISTORY

The site and adjoining properties have long been an area of commercial and industrial development since the early 1900s. The site property was previously developed with former structures dating back to the 1800s. The area, including the site parcel, was part of a former rail yard from the early 1900s through the 1960s. Redevelopment as the Artco facility occurred in the late 1960s to early 1970s. Artco operated an industrial laundry service at the site between approximately 1972 and 1999 and operations included a dry-cleaning process that used tetrachloroethene (PCE) as a solvent. It is this use that appears to have led to

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Buffalo, NY 14202
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the PCE contamination at the site. The current occupant has never used PCE at the site. Environmental testing performed in the early 1990s prior to and during construction of an adjacent building indicated that PCE was present in the soil and groundwater.

In 1999, the NYSDEC conducted an investigation which indicated that the dry-cleaning operation at Artco was an apparent source of the PCE. In 2000, Artco entered the Voluntary Cleanup Program (VCP). Elevated levels of PCE were detected in the soil underneath the building and in 2004 a soil vapor extraction (SVE) system was installed as an interim remedial measure to treat contaminated soil. Additional sampling indicated that groundwater contaminated with PCE appeared to be migrating off-site to the north, west and east. In 2005, Artco sold the property to KramKnarf, LLC, which assumed responsibility for the investigation and cleanup under the VCP. In 2006, KramKnarf notified the NYSDEC that they would not perform additional investigation and remediation activities. As a result, the VCP project was terminated and the SVE system was shut down. In 2007, a new property owner, Barnes/Stevens Redevelopment LLC (BSR), was accepted into the Brownfield Cleanup Program (BCP) as a Volunteer. BSR was responsible for investigating the contamination on the site while the NYSDEC, in consultation with NYSDOH, was responsible for investigating contaminants that had migrated off-site.

The NYSDEC's off-site investigation, conducted in conjunction with NYSDOH, started in 2009 and included collecting groundwater and soil vapor intrusion samples at several nearby properties. BSR failed to complete the on-site investigation, so the NYSDEC terminated the BCP project in August 2009. In October 2009, the NYSDEC and NYSDOH listed the site in the Registry of Inactive Hazardous Waste Disposal Sites. In September 2010, AFES, LLC, who acquired ownership of the property from BSR, entered into an Order on Consent with the NYSDEC to complete a full remedial program and also reimbursed the NYSDEC for the cost of the 2009 off-site investigation. In May 2018, AFES terminated the Order due to a lack of financial resources.

SCOPE OF WORK

The scope of work consists of the following tasks outlined below:

- Task 1 –Geophysical Survey and Utility Markout and Vac-Tron Clearance
- Task 2 –Soil Probe Sampling and Soil Vapor Screening
- Task 3 – Sub-Slab Soil Vapor Sampling
- Task 4 – Advancement of 10 Direct-push Soil Borings and Soil Sampling
- Task 5 - Installation of Two Overburden and Two Bedrock Monitoring Wells
- Task 6 – Monitoring Well Development
- Task 7 – Collection of Water Levels/Product Thickness
- Task 8 – Groundwater Sample Collection
- Task 9 – Investigation Derived Waste (IDW) Handling
- Task 10 – Letter Report

The work tasks are further described below.

Task 1 –Geophysical Survey and Utility Markout and Vac-Tron Clearance

URS will provide oversight for up to two days of a geophysical survey (using ground-penetrating radar) to identify underground obstructions and utilities beneath the building slab (Figure 2).

All soil boring and monitoring well locations will be cleared for subsurface utilities by conducting a geophysical survey/utility mark out. The purpose of the geophysical utility clearance is to screen for and identify the presence of underground utilities in areas where soil borings and monitoring wells for

groundwater sampling may be installed. The monitoring wells and soil boring locations will be predominantly installed through concrete slabs and/or asphalt covered surfaces. Since this site is situated in an urban setting and consists of fill, it is anticipated that both ground penetrating radar (GPR) and electromagnetic conductivity (EMC) methods will be necessary. A sufficient enough area around each location will be cleared to allow room for offsets if need. All anomalies will be marked and identified as soon as they are located by spray-painting the outline.

Following the geophysical survey/utility mark out, the absence of utilities will be confirmed by conducting a Vac-Tron utility clearance prior to drilling. Locations will be cleared for subsurface utilities to a minimum depth of 5-feet below ground surface (bgs) using a Vac-Tron. The procedures for Vac-Tron clearance are described in Section 3.5 of the FAP.

Task 2 –Soil Probe Sampling and Soil Vapor Screening

URS personnel will establish a 25-foot by 25-foot grid inside the eastern portion of Artco building where the former dry-cleaning equipment was positioned (Figure 3). We anticipate that the grid area will cover approximately 10,000 square feet for a total of 25 grid nodes. At each grid node, a soil core will be advanced as described in Section 3.3 of the FAP. One soil sample will be collected from each core and analyzed for target compound list (TCL) volatile organic compounds (VOCs). At two locations, the samples will also be analyzed for full TCL/target analyte list (TAL), and emerging contaminant parameters as listed in Table 1.

Task 3 – Sub-Slab Soil Vapor Sampling

Sub-slab soil-vapor samples will be collected using Summa canisters at six locations within the building as described in Section 3.27.2 of the FAP and analyzed for VOCs. Locations to be sampled will be based on the 25-foot by 25-foot grid PID screening.

Task 4 – Advancement of 10 Direct-push Soil Borings and Soil Sampling

Up to 10 direct-push soil borings will be advanced at the proposed locations shown on Figure 3. Soil samples will be collected as follows and shown on Table 1:

- Collect one soil samples at each of the 10 soil boring locations and analyze for TCL VOCs via USEPA Method 8260C.
- A minimum of one soil sample will be analyzed for full TCL/TAL parameters.

The procedures for Task 4 are described in Sections 3.14 of the FAP. Soils will be logged following the procedures described in Sections 3.11.1 and 3.11.2 of the FAP.

Task 5 – Installation of Two Overburden and Two Bedrock Monitoring Wells

Collect up to one soil sample at each of the four monitoring well locations and analyze for TCL VOCs via USEPA Method 8260C as indicated on Table 1. The soil sample will be collected from the depth with the highest PID reading. All soil samples will be analyzed for TCL VOCs. Approximately ten percent of the soil samples will also be analyzed for TCL/TAL, and emerging contaminant parameters as listed in Table 1.

Overburden wells will terminate at the top of bedrock. For bedrock monitoring wells, rock cores will be drilled at each of the drilling locations to a target depth of approximately 40 feet bgs.

Overburden monitoring wells will be continuous wrap #10 slot stainless-steel screen attached to Schedule 40 PVC riser. Bedrock wells will be constructed with 15-foot of 2-inch ID #10 slot stainless steel

continuous wrap screen with a 2-foot stainless steel riser beneath the screen as a sump attached to a 2-inch ID, Schedule 40 PVC riser to the ground surface. All wells will be completed with flush mount curb boxes.

The procedures for Task 5 are described in Sections 3.6, 3.8 and 3.20 of the FAP. Soils will be logged following the procedures described in Sections 3.11.1 and 3.11.2 of the FAP.

Task 6 – Monitoring Well Development

All new monitoring wells will be developed following the procedures described in Section 3.21 of the FAP.

Task 7 – Collection of Water Levels/Product Thickness

Collect a comprehensive round of water levels in all monitoring wells shown on Figures 2 and 3. Measure product thickness in wells determined to have non-aqueous phase liquid (NAPL). Collect a NAPL sample and analyze for parameters listed in Table 1 (including specific gravity), so adjusted water levels can be calculated, and the potentiometric surface can be mapped.

The procedures for Task 6 are described in Sections 3.25 and 3.26 of the FAP.

Product Sample Collection

If NAPL is determined to be present in any of the new monitoring wells, collect a NAPL sample and have it analyzed for parameters listed in Table 1. The procedures for Task 7 NAPL sample collection are described in Sections 3.24.5 of the FAP.

Task 8 – Groundwater Sample Collection

Collect groundwater samples at four new and 42 existing monitoring wells and analyze for VOCs via USEPA Method 8260C, with 10 percent of the samples also analyzed for full TCL/TAL parameters, as indicated on Table 1.

For monitoring wells without NAPL, groundwater samples may be collected using the procedures described in Section 3.24.1 through 3.24.3 of the FAP. For monitoring wells identified as containing NAPL the procedures described in Section 3.24.4 of the FAP will be used.

Task 9 – Investigation Derived Waste (IDW) Handling

All Investigation Derived Waste (IDW) generated during these activities will handled using the procedures described in Section 3.31 of the FAP.

Up to two samples will be collected from IDW and analyzed for waste characterization parameters as indicated on Table 1.

URS

Task 10 – Letter Report

The Pre-Design Investigation Report will be submitted as a draft report within 45 days after analytical data are received from the laboratory. Data will be validated by URS in accordance with *DER-10, Technical Guidance for Site Investigation and Remediation, Appendix 2B - Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, May 2010. A final version of the report will be submitted within 2 weeks after the Department's comments on the draft report are received by URS. The report for this task will include the following:

a. A description of all field activities conducted on the site;
b. A summary of previous investigations;
c. A site map depicting relevant site features;
d. Figure(s) depicting soil boring, monitoring well, and key site features;
e. Figures depicting sample locations and NYS SCG non-compliance values from the soil, soil vapor and groundwater analytical data collected during site work;
f. A discussion of analytical results;
g. Figure depicting groundwater elevation contours;
h. Data summary tables of detected compounds with NYS SCGs listed, and non-compliance values highlighted;
i. Field notes and/or daily activity logs;
j. Photographs taken at the site during field activities;
k. Monitoring well construction logs;
l. Monitoring well purging and sampling logs with water quality measurements (as applicable);
m. Manifests and/or bills of lading signed by the disposal facility documenting the proper disposal of IDW;
n. Survey field notes and site sketches;
o. A revised survey drawing;
p. A Data Usability Summary Report (DUSR) (including Form 1s) containing only data from the fieldwork;
q. Design parameters; and
r. Conclusions.

General Notes

Category B deliverables are required for all soil, groundwater and NAPL samples. A DUSR will be prepared.

Figures

Figure 1 – Site Location
Figure 2 – Site Plan
Figure 3 – Proposed Sampling Locations

Tables

Table 1 – Summary of Analytical Parameters

URS

Attachments

Health and Safety Plan (HASP)
Generic Field Activity Plan (FAP)

Closing

URS appreciates serving the Department with this challenging and interesting project. If you have any questions or comments, please call me at (716) 923-1120.

Sincerely,

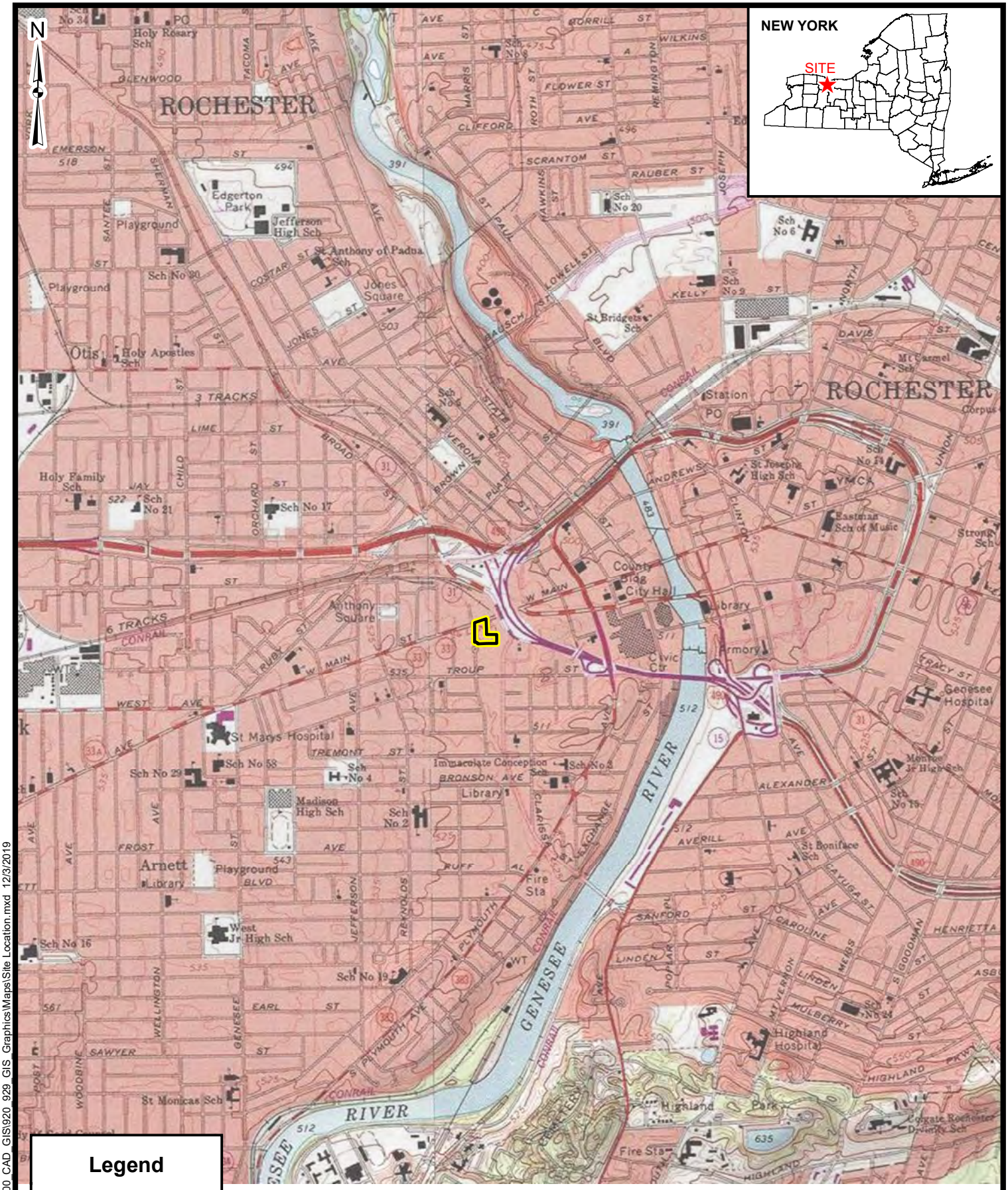
URS Corporation – New York



Michael Gutmann, PG
Project Manager

Enc.
cc: George Kisluk - URS
File: 60617211 C-1

FIGURES

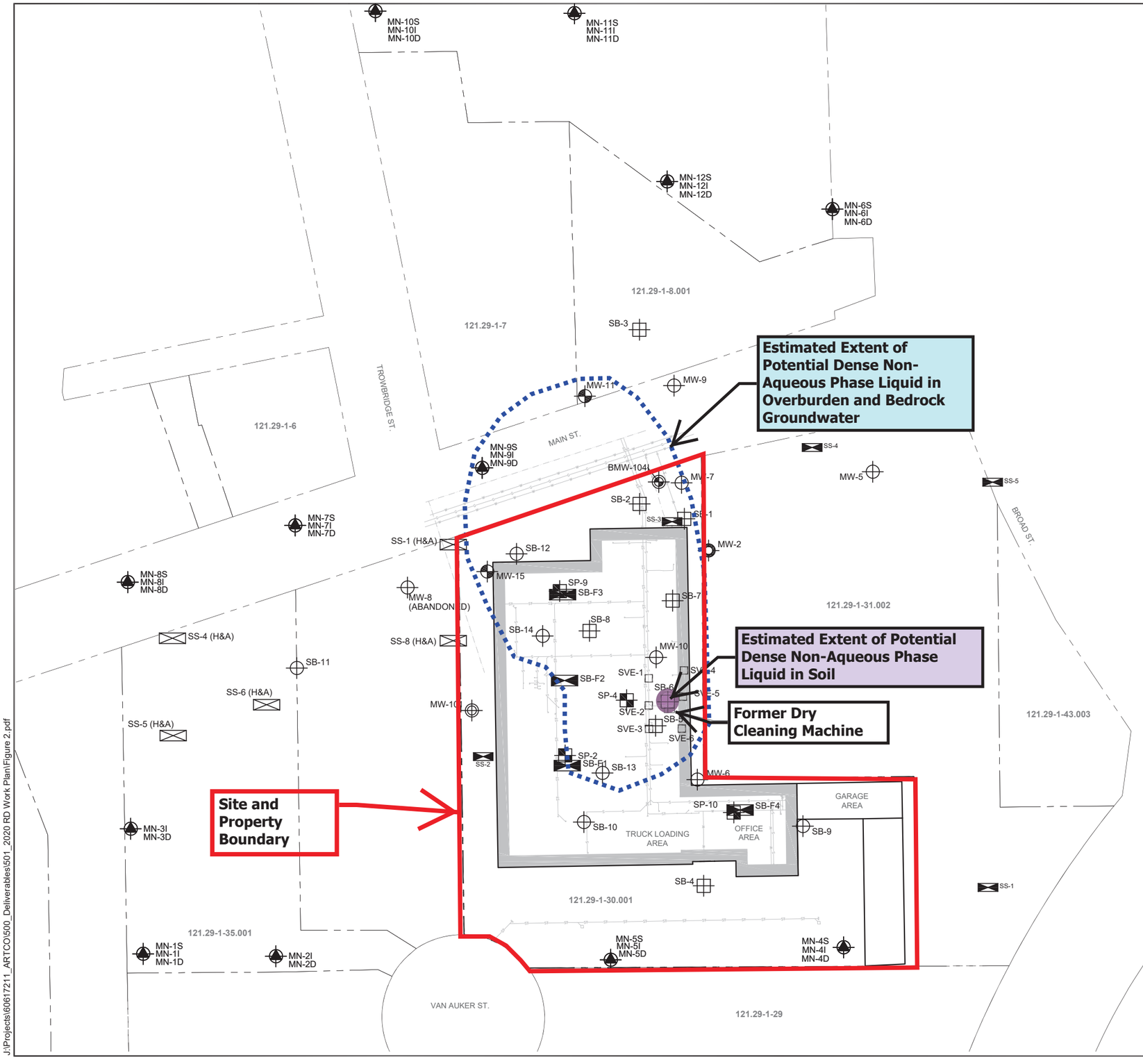


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URS

ARTCO INDUSTRIAL LAUNDRIES (SITE ID NO. 828102)
NYSDEC WORK ASSIGNMENT NO. D007622-59
CITY OF ROCHESTER, MONROE COUNTY, NEW YORK
SITE LOCATION

FIGURE 1



LEGEND

- PROPERTY LINE
- SITE PROPERTY LINE
- 121.29-1-30.001 PARCEL NUMBER
- EXISTING BUILDING
- SANITARY SEWER
- STORM SEWER
- COMBINED SEWERS
- GAS PIPING
- WATER PIPING
- FIRE LINE
- WELL CLUSTER - VARIOUS INTERVALS (NYSDEC, 2009)
- BEDROCK WELL (HALEY & ALDRICH, 2001)
- BEDROCK WELL (HALEY & ALDRICH, 2013)
- OVERBURDEN WELL (HALEY & ALDRICH, 2001 AND NYSDEC, 1998)
- OVERBURDEN WELL (HALEY & ALDRICH, 2013)
- BEDROCK/OVERBURDEN INTERVAL WELL (SEELER, ENV., 1993)
- OVERBURDEN SOIL BORING (NYDEC, 1998)
- OVERBURDEN SOIL BORING (HALEY & ALDRICH, 2011)
- SOIL VAPOR EXTRACTION WELL
- SURFACE SOIL SAMPLE (HALEY & ALDRICH 2001)
- SURFACE SOIL SAMPLE (NYDEC 1998)

NOTES

1. HISTORIC DATA FROM PREVIOUS EXPLORATION AND SAMPLE LOCATIONS SHOWN (SOURCE AND INSTALLATION DATE IN LEGEND).
2. UTILITY LOCATION AND PROPERTY BOUNDARY INFORMATION ADOPTED FROM MONROE COUNTY GIS SERVICES DIVISION.

Department Notes: The original figure was modified by the New York State Department of Environmental Conservation (Department) to show the estimated extent of dense non-aqueous phase liquid in the soil and groundwater based on data provided by Haley & Aldrich.

N

0 80 160

SCALE IN FEET

URS

REMEDIATION DESIGN
FORMER ARTCO INDUSTRIAL LAUNDRIES, INC.
331-337 WEST MAIN STREET
ROCHESTER, NEW YORK

SITE PLAN
SHOWING ESTIMATED EXTENT OF WASTE/ SOURCE AREAS IN SOIL AND GROUNDWATER

SCALE: AS SHOWN
JUNE 2015

FIGURE 2

J:\Projects\60617211_ARTCO\500_Deliverables\501_2020 RD Work Plan\Figure 2.pdf

N

W MAIN ST

VAN AUKER ST

FORD ST

Legend

- Proposed Soil Probe
- Proposed Overburden MW
- Proposed Bedrock MW
- Proposed Geoprobe Boring
- Soil Probe Grid
- Building_Footprint
- Site Boundary

0 50 100 Feet

FORMER ARTCO INDUSTRIAL LAUNDRIES
PROPOSED SAMPLING LOCATIONS

URS

FIGURE 3

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TABLES

TABLE 1
ARTCO INDUSTRIAL LAUNDRIES, SITE No. 828102
NYSDEC WA D007622-59
SAMPLE ANALYTICAL PROGRAM

Analytical Methods*	Samples	QC						Total No of Samples
		Field Dup	MS	MSD	Equipment/ Rinse Blank	Field Blank	Trip Blank	
Soils								
Soil Probes (Hand sampled)								
TCL Volatiles + 10 TICs by 8260C	25	1	1	1	0	0	0	28
TCL Semivolatiles, including 1,4-dioxane + 20 TICs by 8270D	2	1	1	1	0	0	0	5
TCL Pesticides by 8081A	2	1	1	1	0	0	0	5
TCL PCBs by 8082A	2	1	1	1	0	0	0	5
Chlorinated Herbicides by 8151A	2	1	1	1	0	0	0	5
TAL Metals by 6010C	2	1	1	1	0	0	0	5
Mercury by 7471A	2	1	1	1	0	0	0	5
Cyanide by 9012A	2	1	1	1	0	0	0	5
PFASs by EPA Method 537 modified	2	1	1	1	1	1	0	7
Soil Vapor Survey								
TCL Volatiles by TO-15	6	1	0	0	0	0	0	7
Direct Push Soils								
TCL Volatiles + 10 TICs by 8260C	10	1	1	1	0	0	0	13
TCL Semivolatiles, including 1,4-dioxane + 20 TICs by 8270D	1	1	1	1	0	0	0	4
TCL Pesticides by 8081A	1	1	1	1	0	0	0	4
TCL PCBs by 8082A	1	1	1	1	0	0	0	4
TAL Metals by 6010C	1	1	1	1	0	0	0	4
Mercury by 7471A	1	1	1	1	0	0	0	4
Cyanide by 9012A	1	1	1	1	0	0	0	4
PFASs by EPA Method 537 modified	1	1	1	1	1	1	0	6
Drill Rig Soils								
TCL Volatiles + 10 TICs by 8260C	4	0	0	0	0	0	0	4
TCL Semivolatiles, including 1,4-dioxane + 20 TICs by 8270D	1	0	0	0	0	0	0	1
TCL Pesticides by 8081A	1	0	0	0	0	0	0	1
TCL PCBs by 8082A	1	0	0	0	0	0	0	1
TAL Metals by 6010C	1	0	0	0	0	0	0	1
Mercury by 7471A	1	0	0	0	0	0	0	1
Cyanide by 9012A	1	0	0	0	0	0	0	1
PFASs by EPA Method 537 modified	1	0	0	0	1	1	0	3
Groundwaters								
TCL Volatiles + 10 TICs by 8260C	48	3	1	1	0	0	1	54
TCL Semivolatiles + 20 TICs by 8270D	5	1	1	1	0	0	0	8
TCL Pesticides by 8081A	5	1	1	1	0	0	0	8
TCL PCBs by 8082A	5	1	1	1	0	0	0	8
TAL Metals by 6010C	5	1	1	1	0	0	0	8
Mercury by 7470A	5	1	1	1	0	0	0	8
Cyanide by 9010B	5	1	1	1	0	0	0	8
1,4-dioxane by 8270D SIM	5	1	1	1	0	0	0	8
PFASs by EPA Method 537 modified	5	1	1	1	1	1	0	10
NAPL*								
TCL Volatiles + 10 TICs by 8260C	1	0	0	0	0	0	0	1
TCL Semivolatiles + 20 TICs by 8270D	1	0	0	0	0	0	0	1
TCL PCBs by 8082A	1	0	0	0	0	0	0	1
Fuel Fingerprint by 310-13	1	0	0	0	0	0	0	1
Flashpoint by 1010	1	0	0	0	0	0	0	1
Density	1	0	0	0	0	0	0	1
Waste Characterization								
Full TCLP	2	0	0	0	0	0	0	2
Ignitability	2	0	0	0	0	0	0	2
Corrosivity	2	0	0	0	0	0	0	2
Reactivity	2	0	0	0	0	0	0	2

DNAPL/LNAPL - Dense/light non-aqueous phase liquid
MS - Matrix Spike
MSD - Matrix Spike Duplicate
PCBs - Polychlorinated biphenyls
PFASs - Per- and polyfluoroalkyl substances
SIM - Selected Ion Monitoring
TAL - Target Analyte List
TCL - Target compound List
TCLP - Toxicity Characteristics Leaching Procedure
TICs - Tentatively Identified Compounds

* If LNAPL, analyze for VOCs and density. IF DNAPL analyze for all parameters.

ATTACHMENT 1

HEALTH AND SAFETY PLAN (HASP)

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

REMEDIAL DESIGN

HEALTH AND SAFETY PLAN

WORK ASSIGNMENT D007622-59

ARTCO INDUSTRIAL LAUNDRIES SITE NO. 828102
331-337 WEST MAIN STREET
ROCHESTER/MONROE COUNTY, NY

Prepared for:
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 Broadway, Albany, New York

Basil Seggos, Commissioner

DIVISION OF ENVIRONMENTAL REMEDIATION
Remedial Bureau E

URS Corporation
257 West Genesee Street
Suite 400
Buffalo, New York 14202

FINAL
January 2020

HAZWOPER Health and Safety Plan (DCSA)

Remedial Design

Artco Industrial Laundries Site No. 828102
331-337 West Main Street
Rochester, NY 14608

Expiration Date: **January 8, 2021**
(Max. 1-Year from signature date)

Prepared for: New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233

Prepared by: URS Corporation – New York
257 West Genesee Street, Suite 400
Buffalo, NY, 14202

Prepared By:
Name Kevin J. McGovern, PG, CHMM Signature:
Title Sr. Environmental Scientist Date: 1/10/2020

Reviewer: Area/Regional/ Business Line/Client SHEM:
Name Dale "Pete" Wray, CSP, CHMM, STS Signature:
Title Safety, Health & Environment Manager Date: 01/09/2020

Approval: Project Manager:
Name Mike Gutmann, PG Signature:
Title Project Manager Date: 1/10/2020

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HASP Summary

Note: This Summary is intended to provide key information only and cannot be substituted for reading, understanding, and complying with the full HASP. This summary may be continually updated as tasks and personnel change. Use Continuation Sheets if necessary.

Project Name:	Remedial Design Artco Industrial Laundries	**Project Number:**	60617211
Summary Revision Date:	1/10/2020	**Client Name:**	NYSDEC

Report ALL SH&E Incidents, no matter how minor, to the Incident Hotline: 800-348-5046
Injury, Property Damage, Vehicle, Security, Regulatory Inspection, Environmental Impact, and any potentially work-related injury, discomfort/ pain, or damage.

Identify the nearest Occupational Clinic and Hospital to the site that accepts URS Workers Compensation Insurance (see **Attachment A** for instructions). If the nearest such clinic or hospital is an unreasonable distance from the site, identify nearer hospitals or clinics. Attach maps and directions to the clinics and hospitals in **Attachment A**.

Occupational Clinic:	WellNow Urgent Care	**Nearest Hospital:**	Highland Hospital
Address:	2232 Lyell Ave, Rochester, NY 14606	**Address:**	1000 South Ave, Rochester, NY 14620
Phone Number:	(585) 417-4125	**Phone Number:**	(585) 473-2200

Key Personnel

Project Manager (PM):	Mike Gutmann, PG	**Cell Phone:**	(716) 345-4649
Site Supervisor (SS)	Sean Connelly	**Cell Phone**	(716) 393-0870
Safety Officer (SSO):		**Cell Phone**	
URS SH&E Mgr.	Pete Wray, CSP, CHMM, STS	**Cell Phone:**	(302) 660-9178
Client PM:	Benjamin Rung	**Cell Phone:**	(518) 402-9826

List ALL Short-Service Employees, including subcontractors (<6 Months with Company in Current Area/Job Description): NA

List ALL Subcontractors and their Site Safety Officers: M.J. Engineering & Land Surveying, P.C., (TBD); Pegasus Environmental Co. (Zeke Hurd); Nothnagle Drilling, Inc. (TBD); Sun Environmental Corp.(TBD)

PM must positively verify subcontractors, including lower-tier subs (i.e. 'subs of subs') are approved in Subport (or by an equivalent evaluation process) for the work described. If there were any limitations/ conditions of approval, describe them and how they are being met.

Pegasus Environmental Co. - The PM must require the sub to comply with AECOM's project-specific health and safety or safe work plan with associated activity-specific job safety analyses for each activity for each project. (2) The sub must also complete a task hazard assessment addressing all hazards expected and conducting a re-assessment any time there is a change in conditions. (3) The PM or their designee must conduct a safety orientation with the sub and all workers must be reminded that they have "stop work authority". (4) Require the sub to participate in AECOM's daily safety tailgate meetings or conduct their own if AECOM is not on site. (5) AECOM site personnel will conduct daily spot-checks of the sub's activities. (6) PM must comply with all other requirements of AECOM's SH&E Procedure S3NA-213-PR1, Subcontractor Management, available on the SH&E Webpage on Ecosystem. AECOM Project Team must request copies of licenses/certification for work being performed. Documentation should be maintained in project files.

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☒ I have verified that all subcontractors are approved in Subport (or equivalent), and that all conditions of approval are met.

Mike Gutmann, PG		1/10/2020
Project Manager Name	**Project Manager Signature**	**Date**

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Figure 2-1: Site Location

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Attachments

Attachment A: Hospital/Clinic Maps and Incident Reporting Flow Chart

Attachment B: Project Risk Register/Hazard Assessment, THA Forms, and Tailgate Safety Meeting Form

Attachment C: URS SHE Procedures

Attachment D. Stretch/Flex Poster

Attachment E. Safety Data Sheets

Attachment F. Site Orientation

Template Revision Log

Version	Revised By	Date	Summary of Revisions
1.0	Kevin J. McGovern	December 2019	Initial Version

1. Introduction

This written HASP is designed to identify, evaluate, and control safety and health hazards, and to outline emergency response actions for URS Corporation – New York (URS)-managed activities. This HASP must be kept on site during work activities and made available to all workers including subcontractors and other site occupants for informational purposes. URS subcontractors are expected to independently characterize, assess, and control site hazards created by their specific scope of work.

This section of the HASP summarizes important URS SH&E Procedures that apply to all Design and Consulting Services (DCS) Americas jobs. See **Attachment B** for the Project Risk Register/ Hazard Assessment and Task Hazard Assessment forms and **Attachment C** for complete copies of applicable field SH&E Procedures. This template has been designed primarily for use in the United States; see procedure attachment S3AM-320-ATT2 for Canadian Specific Requirements on URS' ecosystem.

In October 2014, URS was acquired by AECOM Technical Services (AECOM) and continues to operate as a subsidiary of AECOM. Standby Contract D007622 predates this acquisition, and URS continues to perform work under this contract until the Contract expires (Winter 2019).

1.1 Applicable References

This Health and Safety Plan (HASP) conforms to the regulatory requirements and guidelines established in the following documents:

- Title 29, Part 1910 of the Code of Federal Regulations (29 CFR 1910), Occupational Safety and Health Standards (with special attention to Section 120, Hazardous Waste Operations and Emergency Response).
- 29 CFR 1926, Safety and Health Regulations for Construction.
- National Institute for Occupational Safety and Health/Occupational Safety and Hazards Administration/U.S. Coast Guard/U.S. Environmental Protection Agency, Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, Publication No. 85-115, 1985.
- The requirements in this HASP also conform to URS' Safety for Life Program requirements as specified in the URS Safety, Health and Environment (SH&E) Manual.
- Scope of Work, Work Assignment D007622-59, Artco Industrial Laundries (Site #828102), Remedial Design November 4, 2019.

Project Assumptions

- This site is an URS-controlled site.
- No confined spaces will be entered on this project.
- No excavations will be entered.
- Work will be performed during daylight hours.

2. Site Information and Scope of Work

2.1 Site Description

The Artco Industrial Laundries (Artco) site is located in a commercial area on the west side of the City of Rochester, Monroe County (See Figure 2-1). The site is located on the south side of West Main Street approximately 0.6 miles west of the Genesee River and roughly 300 feet west of the intersection of West Main Street and Ford Street. Site Features: The site is approximately 1.8 acres in size. The main site feature is an approximately 54,500 square foot occupied building. The rest of the site is mostly paved with some grass and landscaped areas immediately north and west of the building. Current Zoning and Land Use: The site is currently used as an industrial laundry and is zoned Center City District which allows for commercial, and industrial uses. The site is owned by AFES, LLC and currently unoccupied. The surrounding parcels are currently used for a variety of non-residential activities including commercial, light industrial, roads, and utility rights-of-way. The nearest residence is approximately 300 feet southeast of the site on Favor Street. A site plan is presented in Figure 2-2.

2.2 Site Background/History

The site and adjoining properties have long been an area of commercial and industrial development since the early 1900s. The site property was previously developed with former structures dating back to the 1800s. The area, including the site parcel, was part of a former rail yard from the early 1900s through the 1960s. Redevelopment as the Artco facility occurred in the late 1960s to early 1970s. Artco operated an industrial laundry service at the site between approximately 1972 and 1999 and operations included a dry-cleaning process that used tetrachloroethene (PCE) as a solvent. It is this use that appears to have led to the PCE contamination at the site. The current occupant has never used PCE at the site. Environmental testing performed in the early 1990s prior to and during construction of an adjacent building indicated that PCE was present in the soil and groundwater. In 1999, the NYSDEC conducted an investigation which indicated that the dry-cleaning operation at Artco was an apparent source of the PCE. In 2000, Artco entered the Voluntary Cleanup Program (VCP). Elevated levels of PCE were detected in the soil underneath the building and in 2004 a soil vapor extraction (SVE) system was installed as an interim remedial measure to treat contaminated soil. Additional sampling indicated that groundwater contaminated with PCE appeared to be migrating off-site to the north, west and east. In 2005, Artco sold the property to KramKnarf, LLC, which assumed responsibility for the investigation and cleanup under the VCP. In 2006, KramKnarf notified the NYSDEC that they would not perform additional investigation and remediation activities. As a result, the VCP project was terminated and the SVE system was shut down. In 2007, a new property owner, Barnes/Stevens Redevelopment LLC (BSR), was accepted into the Brownfield Cleanup Program (BCP) as a Volunteer. BSR was responsible for investigating the contamination on the site while the NYSDEC, in consultation with NYSDOH, was responsible for investigating contaminants that had migrated off-site. The NYSDEC's off-site investigation, conducted in conjunction with NYSDOH, started in 2009 and included collecting groundwater and soil vapor intrusion samples at several nearby properties. BSR failed to complete the on-site investigation, so the NYSDEC terminated the BCP project in August 2009. In October 2009, the NYSDEC and NYSDOH listed the site in the Registry of Inactive Hazardous Waste Disposal Sites. In September 2010, AFES, LLC, who acquired ownership of the property from BSR, entered into an Order on Consent with the NYSDEC to complete a full remedial program and also reimbursed the NYSDEC for the cost of the 2009 off-site investigation. In May 2018, AFES terminated the Order due to a lack of financial resources.

2.3 Client or Third-Party Operations at Site

There are no client or third-party operations at the site.

2.4 Scope of Work

The scope of work includes the following:

- A geophysical survey (using ground-penetrating radar) to identify underground obstructions and utilities beneath the building slab.
- URS personnel will establish a 25-foot by 25-foot grid inside the eastern portion of the site building where the former dry-cleaning equipment was positioned. At each grid node, a nominal 2-inch diameter hole will be cored/drilled through the concrete slab. Soil cores will be collected using a hand driven soil core sampler to a depth of 2-3 feet below ground surface (bgs). Soil vapor will be measured with a PID and one soil sample will be collected from each core for laboratory analyses.
- Sub-slab soil-vapor samples will be collected using Summa canisters at six locations within the building and analyzed for VOCs.
- Soil borings will be advanced and sampled at 10 locations at the site using a direct push rig down to bedrock, with two (2) of those locations converted to overburden monitoring wells.
- Bedrock monitoring well installation at four locations with soil sampling.
- Developing new monitoring wells.
- Groundwater samples will be collected from six new and 42 existing monitoring wells using low-flow sampling or bailing procedures.
- If non-aqueous phase liquid (NAPL) is encountered, URS will collect a sample of the NAPL for laboratory analysis.
- One soil and one aqueous sample will be collected for disposal parameters.
- Drumming and staging of investigation derived waste.
- A survey of the location and elevation of the newly installed borings/monitoring wells.

2.5 Scope of Work Risk Assessment

☐ **Low Risk** *(examples: non-intrusive work, occasional exposure and/or low risk hazards)*

☐ **Medium Risk** *(examples: intrusive work, heavy equipment use, frequent exposure and/or moderate hazards)*

☒ **High Risk** *(examples: complicated scope, large/ multiple work crews, and/or constant exposure to hazards).*

The following tasks/ hazards automatically trigger high risk ranking. Check all which apply. Include hazard mitigation procedures later in the appropriate Physical, Chemical, or Environmental section of the HASP.

☐ Heights > 4 ft
☐ Confined Space
☐ Trench deeper than 4 ft
☐ Lock out/tag out
☐ Work on energized equipment
☐ Working with electricity
☐ Mobile equipment
☐ Materials under pressure
☐ Avalanche areas
☐ Work on water or ice
☒ Extreme heat or cold
☐ Remote/wilderness work
☐ Work in controlled areas
☐ Possible threat of violence including civil unrest
☒ Use of power tools or equipment
☒ Operating heavy equipment or machinery
☒ Hazardous substances or materials
☐ Work around live traffic
☐ Isolation from first aid services or immediate emergency assistance

3. URS Safety Health and Environment Program

3.1 URS Policy

AECOM Imagine it. Delivered.

Safety, Health & Environment Policy

Purpose

This policy establishes the framework to attain best-in-class Safety, Health and Environmental (SH&E) performance in the interest of benefitting AECOM's employees and stakeholders in the global marketplace.

Policy

AECOM is committed to exceptional levels of performance in safeguarding our people and the environment as one of our Core Values. Keeping our people safe is our most important measure of success. We strive to be the beacon of safety excellence in the industries and global communities in which we work.

To advance our SH&E program, we are committed to:

- Zero work-related injuries to AECOM employees and protection of the environment as a result of our activities.
- Providing a highly effective SH&E management system that drives continual review and improvement.
- Meeting client requirements and properly incorporating all safety, health and environmental rules and regulations at the local, state, provincial and national levels.
- Developing an exceptional safety culture where our people embrace ownership for the safety of themselves and others.
- Advancing our goals of pollution prevention, resource conservation and environmental sustainability.
- Setting and meeting aggressive SH&E performance goals and Core Value Metrics to promote continuous improvement.
- Working with employees and business partners to continuously improve SH&E performance.
- Recognizing and celebrating those who contribute to excellent SH&E performance.
- Striving to make AECOM the provider of choice for the safe execution of design, build, finance, operate and maintenance work globally.

The commitment to this policy by the leadership, management and employees of AECOM provides the foundation for a safe workplace, operational excellence and long-term business success.

Expectations

Safety is a core value and a key to our success. We demand continuous improvement in our journey toward a "zero" incident culture, where everyone is committed to safety, health and environmental excellence.

To that end, we demand:

- Our leaders, managers, supervisors and employees demonstrate their commitment in their actions and decisions to assure that every person goes home safe every day.
- Our employees embrace safety as a core value both on and off the job.
- Each employee is committed to his/her own safety and that of his/her fellow employees.
- We will incorporate AECOM's Life-Preserving Principles into our work planning and execution.
- We proactively and aggressively identify, manage and eliminate hazards in the workplace.
- We train and prepare our people to have the knowledge, skills, competency and equipment required to work safely.
- We stop our employees from working if the work cannot be executed safely or if conditions or behaviors on the work activity are unsafe.
- All employees immediately report safety, health and/or environmental incidents, near-misses, unsafe conditions, and at-risk behaviors to their supervisor; and that we diligently work to correct the problem.

Our SH&E expectations will be accomplished by the demonstrated leadership of management, compliance with regulatory requirements and participation of AECOM personnel.

Review and Communication

This Policy will be reviewed annually to ensure it meets the needs of the company, and will be made available to all persons under the control of the company.

M. Burke March 4, 2018

Michael S. Burke Date

Chairman and Chief Executive Officer

3.2 Safety for Life

"Safety for Life" is a comprehensive integrated URS Safety Management System that drives our nearly 100,000 employees toward URS' commitment to achieving zero work-related injuries and/or illnesses; preventing damage to property and the environment; and maintaining an environmentally friendly and sustainable workplace. Our Safety for Life program is supported by nine Life Preserving Principles that apply to all URS activities.

3.3 Life Preserving Principles

Demonstrated Management Commitment
Our Executive, senior and project managers will lead the SH&E improvement process and continuously demonstrate support and commitment.

Employee Participation
Our employees will be encouraged and empowered to become actively engaged in our safety processes through their active participation in safety committees, training, audits, observations and inspections. Employees will be encouraged to participate in health initiatives and adopt a healthy lifestyle.

Budgeting and Staffing for Safety
Our safety staff will be competent, fully trained and qualified to provide technical resources to our internal and external clients. A budget to support safety activities will be included in project proposals.

Pre-Planning
Our design, engineering, project and construction management staff will deploy effective risk mitigation efforts to design, plan and build safety into every project. Pre-Project and Pre-Task planning will be an effective tool in protecting our employees and the environment.

Contractor Management
Our project staff will work closely with our sub-consultants, subcontractors, contractors and Joint Venture Partners to provide a safe work environment for employees and members of the public. Our goal of SH&E performance excellence will be equally shared by all project participants.

Recognition and Rewards
Our employees will be recognized for their efforts in working safely and their support of our safety efforts.

Safety Orientation and Training
Our employees will be provided with effective safety training in order to identify and mitigate hazards in the workplace to prevent injuries to themselves and others who may be affected by their actions.

Incident Investigation
Our managers and safety professionals will investigate all recordable incidents and serious near misses to identify contributing factors and root causes in order to prevent a reoccurrence. Lessons learned shall be identified, communicated and implemented.

Fit for Duty
Our employees are responsible to report to work each day fit for duty and not to pose a health and safety hazard to themselves or others.

3.4 Driving and Vehicle Safety

The proper operation of vehicles is critical to protecting the safety of URS employees and subcontractors. Drivers face numerous hazards while operating vehicles. Some of the hazards include collision with another vehicle, collision with a fixed object, vehicle breakdown or failure, or falling asleep or becoming otherwise incapacitated while driving. All employees will adhere to Driving procedure S3AM-005-PR, which includes the following key practices:

1. **Authorized Drivers**
   Managers must authorize drivers following evaluation of driver criteria to drive and maintain an URS-owned, leased or rented vehicle, a client or customer-owned vehicle, or a personal vehicle operated in the course of conducting URS business.

2. **Electronic Devices Prohibited**

URS prohibits use of all portable electronic devices while operating a motor vehicle/ equipment which includes being stopped at a traffic light or stop sign. This includes cell phones, two-way radios and other items whether hand-held or hands-free. Electronic devices include, but are not limited to, all mobile phones, pagers, iPods, MP3s, GPS, DVD players, tablets laptops and other portable electronic devices that can cause driver distraction. Hands-free device use is not allowed.

- GPS units and devices used for navigation may only be used if factory installed or secured to the vehicle with a bracket that allows the driver to view the image without having to take their eyes off the road. Electronic devices shall be setup for operation prior to commencing driving activities and shall not be changed by the driver while driving.

3. **Vehicle Inspections**

The driver shall conduct pre-trip vehicle inspections prior to each trip. A vehicle inspection checklist, S3AM-005_FM2, can be used to guide and document the inspection process. Vehicle inspection is to include a 360-degree walk around and visual inspection under the vehicle for leaks and obstructions prior to moving the vehicle.

4. **Training**

All drivers shall complete defensive driver training. Additional training (i.e., hands-on defensive driver training) may apply for medium and high-risk drivers; see Driving procedure S3AM-005-PR and SHE Training procedure S3AM-003-PR for more details.

5. **Journey Management Plan**

Drivers who undertake trips in excess of 250 miles (400 kilometers) one way, drive in remote or hazardous areas, or when otherwise deemed necessary, shall develop and document a Journey Management Plan using S3AM-005-FM1 or equivalent.

6. **Secure Loads**

Cargo is only to be carried within the passenger compartment of a vehicle when segregated and restrained to prevent objects from becoming distractions, obstructions or projectiles to occupants should emergency vehicle maneuvers be required (e.g., harsh braking or crash). All goods transported on flatbed trucks or in pickup beds must be securely fastened to prevent them from becoming hazards. All applicable laws and regulations regarding securing of loads must be met. It is prudent to check the load after a few miles to ensure that load has not shifted or loosened prior to completing the remainder of the trip.

7. **Backing Up**

Reversing the vehicle is to be avoided if at all possible. If backing up is necessary, use the following guidelines:

- Pre-plan all vehicle movements.
- If the pull-through method of parking is not possible, drivers will scan parking spot/area for hazards and back in; thereby, facilitating departure where the first move is forward.
- A light tap of the horn should be used to alert others of your intention to back up.
- Avoid tight spaces.
- Vehicles over 10,000 pounds gross vehicular weight are required to have a competent spotter in place when backing. A competent spotter is one that has received spotter training.
- All vehicles shall have a competent spotter in place when backing in an active workzone. Parking and public access areas are recommended but not required to have a spotter.

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3.5 Fitness for Duty

One of URS' nine Life-Preserving Principles is Fitness for Duty (see Fitness for Duty procedure S3AM-008-PR). Fitness for Duty means that individuals are in a state (physical, mental, and emotional) that enables them to perform assignments competently and in a manner that does not threaten the health and safety of themselves or others. On certain projects or for specific tasks, fit for duty certifications may be requested of medical providers by SH&E Managers or Human Resources (HR). Employees should report to work fit for duty and unimpaired by substances or fatigue. Supervisors must observe their employees and work with the employee, SH&E staff, and HR to address deficiencies. URS will not tolerate retaliation against any employee for filing a complaint or concern regarding their fitness for duty or participating in any way in an investigation.

3.5.1 Medical Surveillance

URS' S3AM-128-PR, Medical Screening and Surveillance, details the requirements to participate in a medical monitoring program. Medical Surveillance provides a streamlined process to determine if employees meet the physical requirements to perform assigned duties as defined by applicable regulations. It is also designed to provide a means to collect data relevant to exposure to chemical and physical agents for the protection of the workers and to confirm the effectiveness of health and safety programs.

3.5.2 Proactive Health

URS is committed to promoting proactive health activities in addition to the planning for prevention of safety and environmental incidents. Proactive health activities will be completed on an on-going basis at URS on a corporate-wide basis (i.e. Wellness program associated with employee benefits), at offices, and at this project site. Management will be actively involved in providing and encouraging opportunities for health and wellness education and improvement. Health initiatives and education will be discussed periodically during office-based meetings as the safety moment or during the daily tailgate meeting as a toolbox talk. Topics may be related to, but are not limited to:

- Heart health;
- Stress management;
- Smoking cessation;
- Diabetes prevention;
- Diet; and
- Exercise benefits.

Topics and educational materials can be located on the URS Wellness page, National Institutes of Health website, Centers for Disease Control and Prevention website and other reputable sources online.

In addition, the field team will be encouraged to participate in a daily stretch and flex routine (a standardized way to avoid soft tissue damage from work activities) to the best of their abilities, given their own personal limits. It is particularly beneficial to warm and loosen muscles before repetitive work, manual handling of loads, and when working in cold temperatures or with static postures. The Stretch and Flex manual and poster (Attachment D) serve as guidance for the leader to follow.

3.5.3 Fatigue

One aspect of fit for duty is fatigue management. URS has developed procedures that limit work periods or requires additional rest under certain circumstances, including during long-distance travel or when working at high altitudes. These procedures also set limits on extended work periods of 14 hours per day or 60 hours per week. A fatigue management plan is required if longer working hours are necessary (see Fatigue Management Procedure S3AM-009-PR).

3.5.4 Substance Abuse

Drug and alcohol abuse pose a serious threat to the health and safety of employees, clients, and the general public as well as the security of our job sites, equipment and facilities. URS is committed to the elimination of illegal drug use and alcohol abuse in its workplace and regards any misuse of drugs or alcohol by employees to be unacceptable. URS Substance Abuse Prevention Procedure (S3AM-019-PR) prohibits the use, possession, presence in the body, manufacture, concealment, transportation, promotion or sale of the following items or substances on company premises. Company premises refer to all

property, offices, facilities, land, buildings, structures, fixtures, installations, aircraft, automobiles, vessels, trucks and all other vehicles and equipment - whether owned, leased, or used.

- Illegal drugs (or their metabolites), designer and synthetic drugs, mood- or mind-altering substances, and drug use related paraphernalia unless authorized for administering currently prescribed medication;
- Controlled substances that are not used in accordance with physician instructions or non-prescribed controlled substances; and
- Alcoholic beverages while at work or while on any customer- or URS-controlled property.

This policy does not prohibit lawful use and possession of current medication prescribed in the employee's name or over-the-counter medications. Employees must consult with their health care provider about any prescribed medication's effect on their ability to perform work safely and disclose any restrictions to their supervisor.

Although some states may pass laws legalizing medical or recreational marijuana use, the use, sale, distribution and possession of marijuana are violations of federal law and URS policy, and will subject an employee to disciplinary action up to and including termination in accordance with controlling law.

3.6 Rewards and Recognition

One of URS' Life Preserving Principles is Recognition and Rewards for proactive safety, health and environmentally focused behaviors. All projects are expected to participate in the rewards and recognition programs available on the Corporate and DCS Americas SH&E ecosystem pages. Large, long term projects are encouraged to establish a project specific rewards and recognition program which incorporates project specific goals and activities (template available S3AM-020-FM1). ***All rewards and recognition programs must emphasize the 9 Life Preserving Principles and proactive SH&E activities NOT solely the achievement of lagging metrics ("injury/incident-free" hours, etc.) as those may discourage incident reporting.***

There are several possible appropriate methods of rewarding and recognizing employees and contractors:

1. **Informal** – recognition via verbal acknowledgment, email, spot awards, luncheons, etc.
2. **Formal** – Safety Star Award nomination (link)
3. **Formal** – SH&E Challenge Coins (see local SH&E manager for details)

3.7 Hand Safety

The hands are exposed to hazards more than any body part. SH&E Hand Safety Procedure S3AM-317-PR describes requirements and best practices including these notable practices:

- **All personnel shall have gloves in their immediate possession 100%** of the time when in a shop or on a work site. Gloves that address the hazard shall be worn when employees work with or near any materials or equipment that present the potential for hand injury due to sharp edges, corrosives, flammable and irritating materials, extreme temperatures, splinters, etc. Use the Gloves Needs Assessment (S3AM-317-FM1) to help determine the appropriate glove for the hazard(s).
- **Fixed open-blade knives are prohibited** from use during the course of URS work. Examples of fixed open-blade knives include pocket knives, multi-tools, hunting knives, and standard utility knives. For more information about cutting tools, see S3AM-317-ATT1 Safe Alternative Tools.

3.8 Hazard Communication

Hazardous materials that may be encountered on-site as existing environmental or physical/health contaminants are addressed in this HASP. Their properties, hazards, and associated required controls will be communicated to all affected staff and

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subcontractors in accordance with the requirements of URS Procedure S3AM-115-PR1 Hazardous Materials Communication including these key elements:

- All personnel shall be briefed on the hazards of any chemical product they use and shall be aware of and have access to the Safety Data Sheets (SDS).
- All containers on site shall be properly labeled to indicate their contents. Labeling on any containers not intended for single-day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.).

In addition, any employee or organization (contractor or subcontractor) intending to bring any hazardous material onto this URS-controlled worksite must first provide a copy of the item's SDS to the Site Supervisor or Site Safety Officer for review and filing. The Site Supervisor or Site Safety Officer will maintain copies of all SDS on site and in **Attachment E**. SDS may not be available for locally obtained products, in which case an alternate form of product hazard documentation will be acceptable.

3.9 Hazardous Material handling and Waste Management

If hazardous, solid, and/or municipal wastes are generated during any phase of the project, the waste shall be accumulated, labeled, and disposed of in accordance with applicable Federal, State, Provincial, Territorial and/or local regulations and SH&E Procedure S3AM-116-PR Hazardous Materials Shipping. A site-specific Entity Letter may be required for the site/client; if so, only persons named on the entity letter are allowed to sign waste shipping papers "***on behalf of [client name]***". Any individual signing shipping papers must have valid NYSDEC of Transportation and Resource Conservation and Recovery Act training for waste shipment. Consult the HZM/HZW & TDG page on ecosystem or the SH&E Manager for further guidance on URS and regulatory procedures and training requirements.

3.10 Housekeeping and Personal Hygiene

Basic housekeeping requirements for offices and worksites, as well as personal hygiene and sanitation standards can be found in S3AM-013-PR Housekeeping. Inspections should be performed at the regular interval specified below. The housekeeping inspection form S3AM-013-FM1 is available for use.

Complete the table below regarding site-specific Housekeeping and Personal Hygiene requirements:

Housekeeping:	*Inspection Frequency:*	Daily	*Inspector:*	SS/ SSO or designee
Eating, Drinking, Smoking:	Permitted only in designated area(s) located in the support zone.			
Handwashing:	Water, soap and paper towels or equivalent supplies are located in restrooms in nearby restaurants/ convenient stores in town or provided by field staff. Site staff will wash hands and face after completing work activities and prior to breaks or meals.			
Toilets:	**Toilets** are located in restrooms in nearby restaurants/ convenient stores in town *NOTE: A minimum of one toilet must be provided for every 20 personnel on site. For mobile crews where work activities and locations permit transportation to nearby toilet facilities on-site facilities are not required.*			

Water:	**Water** is located containers provided by field staff. A water supply meeting the following requirements will be utilized: *Potable Water:* An adequate supply of potable water will be available for field personnel consumption. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Disposable drinking cups for single use and a waste receptacle will be provided as needed. Water containers will be refilled daily and disinfected regularly. Potable water containers will be properly identified in order to distinguish them from non-potable water sources. *Non-Potable Water:* Non-potable water may be used for hand washing and cleaning activities. Non-potable water will not be used for drinking purposes. All containers of non-potable water will be marked with a label stating ***"Non-Potable Water, Not Intended for Drinking Water Consumption"***
Illumination:	The work be performed during daylight hours only.

3.11 Lone Worker

URS discourages employees from working alone (i.e. where URS personnel are out of visual and audio range of others) when performing field tasks (see SH&E Procedure S3AM-314-PR, Working Alone). No lone work is anticipated at the site.

3.12 Safety Observations

Safety observations are observations made by employees or subcontractors of a condition or behavior which could contribute to an incident, prior to the incident occurring. Observations can also identify positive behaviors or interventions which contribute to the prevention of incidents. Large, long-term projects may benefit from the use of LifeGuard to track and trend observations on a site level. All other projects should log their observations using IndustrySafe. Both reporting systems can be accessed on any safety page of ecosystem. Or the QR codes below can be used while off the URS network from a smartphone/ device.

LifeGuard

IndustrySafe
Safety Management Software

3.13 Short Service Employee

A Short Service Employee is an employee with fewer than 6 months experience working on field projects or an employee who has not completed the required training or received required certifications (see the Short Service Employee procedure, S3AM-002-PR). The Project Manager will identify all Short Service Employees working on the project, and each Short Service Employee will be assigned to an experienced team member so all activities may be monitored. Short Service Employees shall be easily identified in the field environment, such as through wearing a specific colored hardhat, a manufacturer-approved orange stripe applied to their hardhat or be clearly identified by some other system. Any new employee shall wear the

designated Short Service Employee identifier until the Project Manager determines the employee has the knowledge, skills, and ability related to the specific hazard on the project.

3.14 Stop Work Authority

URS empowers and expects all employees to exercise their Stop Work Authority (see Stop Work Authority Procedure S3AM-002-PR) if an incident appears imminent, or when hazardous behaviors or conditions are observed. A stop work request can be informal if the situation can be easily corrected or may require shutting down operations if revised procedures are necessary to mitigate the hazard. If an URS employee observes an imminently hazardous situation on a site controlled by others (i.e., a client-managed contractor), the employee can always stop work for themselves by removing themselves from the situation. Employees also may attempt to stop work to avoid allowing the contractor to come to harm by immediately notifying the contractor foreman or site engineer, or if necessary, the client or party managing the contractor.



No employee should object to the issuance of a stop-work request, nor can any disciplinary action be levied against the employee. All employees must agree that the situation has been mitigated before resuming work. No employee will be disciplined for refusing to work if they feel it is unsafe.

4. Roles and Responsibilities

Roles and responsibilities for the project team are defined in SH&E Procedure S3AM-117-PR1, Hazardous Waste Operations. The Project Manager (PM) is ultimately responsible for the development of this HASP and establishing a budget to implement the controls and training required. The Project Manager is also responsible for ensuring that the plan is implemented, that appropriate documentation is generated, and that records are maintained. The SH&E Manager is responsible for reviewing and approving this HASP and assisting with other SH&E matters upon request. A Site Safety Officer may be appointed to oversee implementation of the HASP in the field. All project team members are responsible for reviewing and abiding by this HASP, performing daily (or more frequent) task hazard assessments, stopping work when necessary to correct unsafe behaviors or conditions, and reporting incidents promptly to the PM and URS Incident Reporting Hotline (Incident Hotline 800-348-5046).

4.1 Project Manager

The Project Manager has overall management authority and responsibility for all site operations, including safety. The Project Manager will provide the site supervisor with work plans, staff, and budgetary resources, which are appropriate to meet the safety needs of the project operations. Some of the Project Manager's specific responsibilities include:

- Project start-up activities require appropriate SH&E planning prior to work commencing, including identification of hazards, associated risk, and appropriate controls for each task and operation found in the work scope.
- Completed project risk registers /task hazard assessments shall be incorporated into the Project's SH&E Plan.
- Verifying that personnel, to whom this HASP applies, including URS subcontractors, have received a copy of it, with ample opportunity to review the document and to ask questions.
- Providing the concurring SH&E Manager with updated information regarding conditions at the site and the scope of site work if changes occur that will affect the accuracy of this HASP.
- Providing adequate authority and resources to the Site Supervisor or Site Safety Officer to allow for the successful implementation of all necessary SH&E Procedures.
- Maintaining regular communications with the Site Supervisor or Site Safety Officer and, when necessary, the URS Client SH&E Program Manager.
- Coordinating the activities of URS subcontractors and ensuring that they are aware of the pertinent health and safety requirements for these projects, when applicable.
- Conducting Safety System Auditing by way of Management Site Visits and/or Project Manager Self-Assessments on a regular basis.
- Approving amendments to the HASP (in conjunction with the Site Supervisor or Site Safety Officer).
- Coordinating activities with the client as needed to ensure the safe implementation of this HASP.

4.2 Site Supervisor

The Site Supervisor has the overall responsibility and authority to direct work operations at the job site according to the provided work plans and HASP. The Project Manager may act as the Site Supervisor while on site. The Site Supervisor's responsibilities include:

- Discussing deviations or drift from the work plan with the Site Safety Officer and Project Manager.
- Discussing safety issues with the Project Manager, Site Safety Officer, and field personnel.
- Assisting the Site Safety Officer with the development and implementation of corrective actions for site safety deficiencies.

- Assisting the Site Safety Officer with the implementation of this HASP and ensuring compliance.
- Assisting the Site Safety Officer with inspections of the site for compliance with this HASP and applicable SH&E Procedures.
- Reviewing Project Risk Register/ Task Hazard Assessments and Task Hazard Assessments (THAs) with the work crew.
- Reporting incidents and ensuring incidents and observations are logged into Lifeguard or IndustrySafe.
- Verifying that all operations are in compliance with the requirements of this HASP and halting any activity that poses a potential hazard to personnel, property, or the environment.
- Temporarily suspending individuals from field activities for infractions against the HASP pending consideration by the Site Safety Officer, the SH&E Manager, and the Project Manager.

4.3 Site Safety Officer

The Site Safety Officer supports the Site Supervisor in providing a safe work environment. Not all sites will have a designated Site Safety Officer; the decision should be made by the Project Manager and SH&E Manager taking into consideration the complexity and risks of the scope of work. The Site Supervisor may act as the Site Safety Officer on sites without one. The Site Safety Officer's responsibilities include:

- Updating the site-specific HASP to reflect changes in site conditions or the scope of work. HASP updates must be reviewed and approved by the SH&E Manager.
- Inspecting the site for compliance with this HASP and the SH&E Procedures using the appropriate field audit inspection checklist found in IndustrySafe.
- Coordinating with Site Supervisor to review THAs with the work crew.
- Assisting as needed to report incidents and verify that incidents and observations are logged into Lifeguard or IndustrySafe.
- Working with the Site Supervisor and Project Manager to develop and implement corrective action plans to correct deficiencies discovered during site inspections. Deficiencies will be discussed with project management to determine appropriate corrective action(s).
- Contacting the SH&E Manager for technical advice regarding safety issues.
- Determining emergency evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation.
- Checking that all site personnel and visitors have received the proper training, orientation and medical clearance prior to entering the site.
- Establishing controlled work areas (as designated in this HASP or other safety documentation).
- Facilitating or co-leading daily tailgate meetings and maintaining attendance logs and records.
- Discussing potential SH&E hazards with the Site Supervisor, the SH&E Manager and the Project Manager.
- Selecting an alternate Site Safety Officer by name and informing him/her of their duties, in the event that the Site Safety Officer must leave or is absent from the site.
- Verifying that all operations are in compliance with the requirements of this HASP.
- Issuing a "Stop Work Order" under the conditions set forth in this HASP.
- Temporarily suspending individuals from field activities for infractions against the HASP pending consideration by the SH&E Manager and the Project Manager.

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4.4 Employees

Responsibilities of employees associated with this project include, but are not limited to:

- Understanding and abiding by the SH&E Procedures specified in the HASP and other applicable safety policies, and clarifying those areas where understanding is incomplete.
- Providing feedback to SH&E management for continuous improvement relating to omissions and modifications in the HASP or other safety policies and procedures.
- Notifying the Site Supervisor or Site Safety Officer of unsafe conditions and acts.
- Stopping work if there is doubt about how to safely perform a task or if unsafe acts or conditions are observed (including subcontractors or team contractors).
- Speaking up and refusing to work on any site or operation where the SH&E procedures specified in this HASP or other safety policies are not being followed.
- Contacting the Site Supervisor or Site Safety Officer or the SH&E Manager at any time to discuss potential concerns and update the THA in the field to reflect the modifications
- Provide THA feedback to the supervisor for continuous improvement

4.5 Subcontractors

The requirements for subcontractor selection and subcontractor safety responsibilities are outlined in URS Procedure *S3AM-213-PR Subcontractor Management*. Each URS subcontractor is responsible for assigning specific work tasks to their employees. Each subcontractor's management will provide qualified employees and allocate sufficient time, materials, and equipment to safely complete assigned tasks. In particular, each subcontractor is responsible for equipping its personnel with any required personnel protective equipment (PPE) and all required training.

URS considers each subcontractor to be an expert in all aspects of the work operations for which they are tasked to provide, and each subcontractor is responsible for compliance with the regulatory requirements that pertain to those services as well as all other requirements applicable to their work. Each subcontractor is expected to perform its operations in accordance with its own unique safety policies and procedures, in order to ensure that hazards associated with the performance of the work activities are properly controlled. Copies of any required safety documentation for a subcontractor's work activities will be provided to URS for review prior to the start of on-site activities.

Hazards not listed in this HASP but known to any subcontractor, or known to be associated with a subcontractor's services, must be identified and addressed to the URS Project Manager or the Site Supervisor prior to beginning work operations. The Site Supervisor or authorized representative has the authority to halt any subcontractor operations, and to remove any subcontractor or subcontractor employee from the site for failure to comply with established health and safety procedures or for operating in an unsafe manner.

4.6 Visitors

Authorized visitors (e.g., client representatives, regulators, URS management staff, etc.) requiring entry to any work location on the site will be briefed by the Project Manager, Site Supervisor, or Site Safety Officer on the hazards present at that location. Visitors will be escorted at all times at the work location and will be responsible for compliance with their employer's health and safety policies. In addition, this HASP specifies the minimum acceptable qualifications, training and PPE that are required for entry to any controlled work area; visitors must comply with these requirements at all times.

If the site visitor requires entry to any exclusion zone (EZ), but does not comply with the above requirements, all work activities within the EZ must be suspended. Unauthorized visitors, and visitors not meeting the specified qualifications, will not be permitted within established controlled work areas.

5. Training and Documentation

The following sections describe the standard practices or programs that URS will establish to prepare employees to perform work safely and consistent with URS policy and Procedures.

5.1 HASP/SITE Orientation

The Project Manager shall conduct a project/site-specific HASP orientation prior to the start of field operations, with support as needed by the SH&E Manager, Site Safety Officer, or Site Supervisor. This meeting will involve representatives from all organizations with a direct contractual relationship with URS on the job site. Minimum items to be covered are listed in **Attachment F**. Participants will then sign the HASP Personnel Acknowledgement register at the end of the HASP.

5.2 Daily Tailgate Meetings and THA Review

The Site Supervisor, Site Safety Officer or designee shall facilitate a tailgate meeting to discuss the specific requirements of this HASP and review the applicable THAs prior to the commencement of daily project activities. Attendance at the daily tailgate meeting is mandatory for all employees and subcontractors at the site contracted to URS. Simultaneous operations are encouraged to attend each other's tailgate meetings or at the very least the supervisors shall discuss the coordination of activities and associated hazards of each other's tasks. The supervisor will then convey the information to the work crew. The Tailgate Meeting must be documented by the Site Supervisor or Site Safety Officer on a Daily Tailgate Meeting form, a blank copy of which is included in **Attachment B**.

As part of the daily tailgate meeting, employees and subcontractors will be encouraged to voluntarily warm up and stretch select muscle groups to the best of their ability and within each person's individual limitations. Stretching is particularly beneficial to warm and loosen muscles before repetitive work, manual handling of loads, and when working in cold temperatures or with static postures. The exercises included in Attachment D may be used to facilitate these efforts.

5.3 Worker Training and Qualifications

All personnel at this site must be qualified and experienced in the tasks they are assigned. SH&E Training Procedure S3AM-003-PR establishes the general training requirements for URS employees. In addition, S3AM-117-PR, Hazardous Waste Operations, explains the HAZWOPER training and S3AM-128-PR, Medical Screening and Surveillance, details the medical surveillance requirements.

Check all required training on the table below. Verify training records of employees and subcontractors.

Site-Specific Training Requirements	
Training	**Applies to**
☒ HASP Orientation	All Employees and Subcontractors
☒ HAZWOPER 40 –HR	On HAZWOPER sites, in EZ, exposed to hazardous contamination
☒ HAZWOPER Supervisor	Employees managing others in HAZWOPER activities
☒ Field Safety	Anyone visiting the field that does not require HAZWOPER
☒ Speak-Up/Listen Up	All Field Employees and Supervisors
☒ Fit Test/ Respiratory Protection	Employees needing to wear respirators
☒ Hazardous Materials Shipping	Employee responsible for shipping HZM/HZW/DG and/or signing manifests
☒ Annual Medical Surveillance/ Clearance	Employees working in an exclusion zone and the regulatory required exposure limit **is** exceeded for 30 or more days a year

Site-Specific Training Requirements	
Training	**Applies to**
☐ Biennial Medical Surveillance/ Clearance	Working in an exclusion zone more than 30 days a year and the regulatory required exposure limit is **not** exceeded
☒ OSHA 10 hr. Construction	Employees working near heavy equipment, including drill rigs and remediation equipment (see Section .5.3.1)
☐ OSHA 30 hr. Construction	Supervisor/SSO overseeing work with heavy equipment (see Section 5.3.1)
☐ Local requirements:	
☐ Client requirements:	

5.3.1 OSHA 10 Hr./OSHA 30 Hr. Training

OSHA 10/30 training is required for projects with construction or construction-like hazard, including. work where we, our client, or another contractor are presently building, removing, or disassembling structures or digging excavations of any size by mechanical means. This includes projects where we serve as PMCM, GC, Inspectors, or any work where our employees are exposed to construction site hazards. "Construction-like" hazards exist on n sites where the focus is NOT construction/demolition, but where our work scope includes use of heavy machinery movement, work at heights, confined space, hot work, lifting/hoisting loads, and/or ground breaking (includes drill rig, direct push and vac truck use).If these hazards exist, OSHA 10 hr. training is required for field staff. ***All training OSHA must be complete by the end of FY2019.***

OSHA 30 hr. training is required for supervisors. The term "supervisor" has many different meanings. As with HAZWOPER supervisor training, the requirement to complete the OSHA 30 hr. construction course will be based on field supervisory roles and responsibilities, not administrative supervision roles. Field supervisors required to take the OSHA 30 construction course are defined as those individuals who provide work direction and leadership directly to URS field personnel and/or our subcontractors for construction/demolition activities or tasks that have construction-like hazards. These supervisors must be knowledgeable of construction hazards and controls because they are responsible for:

- Field implementation of a construction/demolition scope of work
- Controlling performance on the job site
- Evaluating and controlling hazards & preventing site safety risks
- Intervening to prevent unsafe actions or conditions of employees, clients, and subcontractors related to construction/demolition hazards

As with OSHA 10, OSHA 30 is being phased in and must be completed by the end of FY2019.

5.4 Competent Person

A competent person is an employee who, through education, training and experience, has knowledge of applicable regulatory requirements, is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

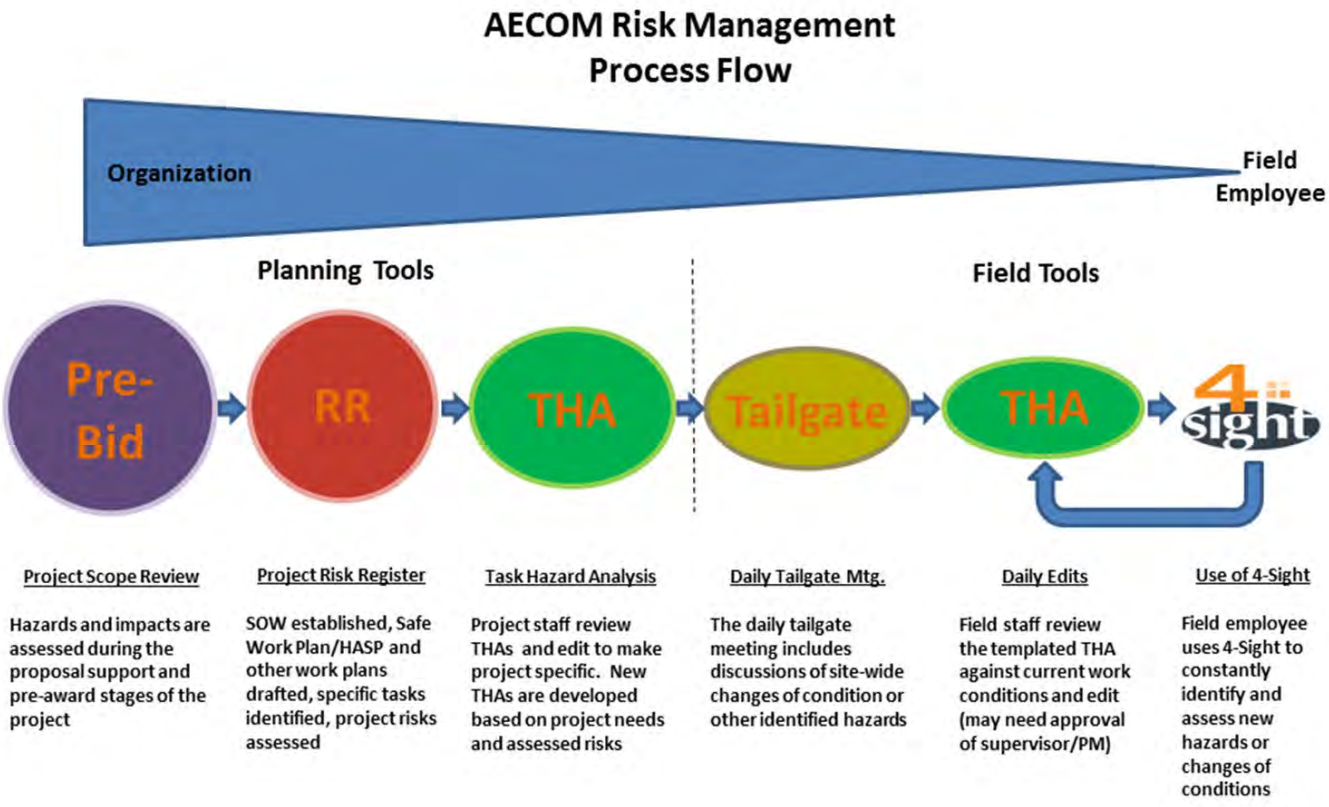
URS' Competent Person Designation Procedure, S3AM-202-PR, explains the roles, responsibilities and procedures of naming a competent person. Complete the table below and include a S3AM-202-FM1 Competent Person Designation Form for each URS competent person (subcontractors to use an equivalent process).

These activities require a competent person. Mark all that apply and list the name of the person.

	Activity	Name of Person
☐	Asbestos	
☐	Assured Equipment Grounding Conductor	
☐	Blasting & Explosives	
☒	Concrete & Masonry Construction	Nothnagle Superintendent
☐	Confined Spaces	
☐	Control of Hazardous Energy (Lockout-Tagout)	
☐	Crane Assembly / Disassembly	
☐	Cranes & Derricks	
☐	Demolition	
☐	Electrical Wiring Design & Protections	
☐	Elevated Work Platforms & Aerial Lifts	
☐	Fall Protection	
☒	Hearing Protection	SS/SSO
☒	Heavy Equipment	SS/SSO
☐	Ionizing Radiation	
☐	Lead	
☐	Material Hoists & Personnel Hoists	
☒	Respiratory Protection	SS/SSO
☐	Rigging Equipment	
☐	Scaffolds	
☐	Stairways & Ladders	
☐	Steel Erection	
☐	Trench & Excavations	
☐	Underground Construction	
☐	Welding & Cutting	

6. Hazard Assessment and Control

URS has adopted an approach to hazard assessment and control that incorporates both qualitative and quantitative methods to identify hazards and the degree to which they may impact employees and URS operations. See S3AM-209-PR, Risk Assessment and Management, for details regarding URS' process. This approach is illustrated below and described in the following section.



6.1 SH&E Procedures

All URS SH&E procedures, in their controlled copy version, are available on the internal SH&E Policy and Procedures ecosystem page. Programmatic procedures referenced in this document (for example SH&E Training) do no need to be printed for inclusion in this HASP. Only procedures that are needed for field activity reference and application MUST be printed in full and included in this HASP. The applicable field procedures checklist is in the Physical Hazards section below and procedures are included in **Attachment C**.

6.2 Project Risk Register/ Hazard Assessment

Project start-up activities require appropriate SH&E planning prior to work commencing, including identification of hazardous tasks required to complete the Scope of Work (SOW). A Project Risk Register/Hazard Assessment shall be developed to guide work. Form S4[DCS]AM-209-FM4-A may be used and should be included in **Attachment B**.

6.3 Task Hazard Assessments (THAs)

A task hazard assessment (THA) form (located in S3AM-209-PR1) shall be prepared for each task to be performed as part of the scope of work. This includes driving to the site, parking, and walking as well as the hazards, associated risk, and appropriate controls for all other work activities. The DCS Americas Templated THA Library may also be used to find previously approved THAs. The preparer shall have one THA form for each task in the Scope of Work found in this workplan and shall also include blank copies in Attachment B.

In the field, the THA forms are to be reviewed at the location where the work will take place, just prior to beginning work on that task. Many times when employees arrive in the field, situations are different than originally planned for or additional job steps are required. The THA asks workers update or 'dirty up' the THA in the 'On-Site Edits' rows to assess the risks presented by the changed condition and requires the worker to describe steps to reduce the risk. If the hazard(s) cannot be successfully mitigated, the work is not allowed to proceed.

6.3.1 Hazard Categories

THAs should include consideration of the following hazard categories when identifying hazards and task specific controls:

- Biological
- Chemical
- Electrical
- Gravity
- Mechanical
- Motion
- Pressure
- Noise
- Radiation
- Thermal



6.4 4-Sight

When preparing hazard assessments and throughout the day workers should use 4-Sight. This is a mental process through which workers ask themselves (and each other) four questions designed to effectively assess hazards. Using these questions during each task, especially those without established THAs, will help workers identify hazards and condition changes so that they can control them or stop work to seek assistance.

1) What am I about to do?
2) What could go wrong?
3) What could be done to make it safer?
4) What have I done to communicate the hazards?



6.5 Speak Up/Listen Up

All URS employees have a responsibility to help create the environment where the expectation is Safety for Life. Speak Up/Listen Up (SULU) is a technique to steward jobsite safety by utilizing 4-Sight as a basis for safety feedback conversations. SULU has two main parts:

- **Speak Up** where employees use three simple steps when providing feedback to others about unsafe acts:
  - Ask to discuss their hazard assessment or 4-Sight for the task
  - Get a commitment from the employee to apply the hazard controls and perform the task according to the accepted procedures
  - Follow up to ensure the employee is working safely

- **Listen Up** where employees use two simple steps when responding to safety feedback:
  - Listen – Focus on the message, not the messenger
  - Commit to performing the task the safer way

SULU conversations should happen consistently throughout the work day to create clear expectations of how work should be performed. All employees should recognize safe work behaviors in order to reinforce them and keep them going. An occasional correction is much more effective when employees are frequently encouraged and positively recognized for their safe actions. Managers and supervisors should be having SULU conversations during site visits and ensure peer to peer and site supervisor to crew SULU conversations are being held.

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7. Physical Hazard Assessment

7.1 Physical Hazards

A physical hazard is a hazard that threatens the physical safety of an individual; contact with the hazard typically results in an injury. The following table summarizes the physical hazards or activities containing physical hazards present at the site and the associated procedures that address protection and prevention of harm.

All checked procedures MUST be included in **Attachment C** for implementation and reference.

Check all applicable hazards/ activities and add site specific description of the hazard.

	Hazard/ Activity *(note: text in this column links to procedure)*	Site Specific Description *[where, what phase of work, frequency, etc.]*	Applicable Procedure
☐	**Abrasive Blasting**		S3AM-335-PR
☐	**Aerial Work Platforms**		S3AM-323-PR
☐	**All-Terrain Vehicles**		S3AM-319-PR
☐	**Blasting and Explosives**		S3AM-336-PR
☒	**Bloodborne Pathogens**	First aid providers	S3AM-111-PR
☐	**Cofferdams**		S3AM-344-PR
☒	**Cold Stress**	Working during winter	S3AM-112-PR
☐	**Compressed Air Systems and Testing**		S3AM-337-PR
☒	**Compressed Gases**	Soil vapor sampling, calibrating meters listed in Section 8.4.1.	S3AM-114-PR
☒	**Concrete Work**	Well pad construction	S3AM-338-PR
☐	**Confined Spaces**		S3AM-301-PR
☒	**Corrosive Reactive Materials**	Handling pre-preserved bottle ware for sampling	S3AM-125-PR
☐	**Cranes and Lifting Devices**		S3AM-310-PR
☐	**Demolition**		S3AM-339-PR
☐	**Diving (scientific and commercial)**		S3AM-334-PR
☒	**Drilling, Boring & Direct Push Probing**	Installing, borings, monitoring wells, and soil vapor implants.	S3AM-321-PR
☒	**Electrical Safety**	Working with generators.	S3AM-302-PR
☐	**Excavation**		S3AM-303-PR
☐	**Fall Protection**		S3AM-304-PR
☒	**Flammable and Combustible Liquids**	Portable generator	S3AM-126-PR
☐	**Gauge Source Radiation**		S3AM-122-PR
☒	**Hand and Power Tools**	Accessing monitoring wells and soil vapor implants.	S3AM-305-PR
☒	**Hazardous Waste Operations**	Generating hazardous investigation derived waste (IDW) and signing off on waste manifest	S3AM-117-PR
☒	**Heat Stress**	Working during summer.	S3AM-113-PR
☒	**Heavy Equipment**	Working alongside excavators/ drill rig equipment	S3AM-309-PR
☐	**High Altitude**		S3AM-124-PR
☐	**Highway and Road Work**		S3AM-306-PR
☐	**Hoists Elevators and Conveyors**		S3AM-343-PR
☐	**Hot Work**		S3AM-332-PR
☐	**Ladders**		S3AM-312-PR
☐	**Lockout Tagout**		S3AM-325-PR

	Hazard/ Activity *(note: text in this column links to procedure)*	Site Specific Description *[where, what phase of work, frequency, etc.]*	Applicable Procedure
☐	**Machine Guarding Safe Work Practice**		S3AM-326-PR
☐	**Marine Safety and Vessel Operations**		S3AM-333-PR
☐	**Material Storage**		S3AM-316-PR
☐	**Mine Site Activities**		S3AM-341-PR
☐	**Mining Operations**		S3AM-345-PR
☐	**Non-Ionizing Radiation**		S3AM-121-PR
☒	**Overhead Lines**	Positioning drill rigs adjacent to overhead power lines	S3AM-322-PR
☐	**Powder-Actuated Tools**		S3AM-327-PR
☐	**Powered Industrial Trucks**		S3AM-324-PR
☐	**Radiation**		S3AM-120-PR
☐	**Railroad Safety**		S3AM-329-PR
☒	**Respiratory Protection**	Removing free product from wells	S3AM-123-PR
☐	**Scaffolding**		S3AM-311-PR
☐	**Steel Erection**		S3AM-340-PR
☐	**Temp. Floors, Stairs, Railings, Toe-boards**		S3AM-342-PR
☒	**Underground Utilities**	Installing, borings, monitoring wells	S3AM-331-PR
☐	**Underground Work**		S3AM-330-PR
☒	**Wildlife, Plants and Insects**	Sampling monitoring wells.	S3AM-313-PR
☐	**Working Alone**		S3AM-314-PR
☐	**Working On and Near Water**		S3AM-315-PR

8. Chemical Hazard Assessment

URS will perform tasks that can expose personnel to a variety of hazards due to the operational activities, physical conditions of the work locations, and potential presence of environmental contaminants. This section presents a variety of potential chemical hazards, exposure pathways, and related mitigation actions. See S3AM-110-PR, Toxic and Hazardous Substances, for information on planning, training, monitoring, and details on several specific chemicals (Benzene, Cadmium, Chromium, Hydrogen Sulfide, Lead, and Silica).

8.1 Potential Chemical Hazards

The chemicals in the table below are known or suspected to be present at the site.

Summary of Hazardous Properties of Contaminant Exposure Hazards

PEL:.....Permissible Exposure Limits

TLV:.....Threshold Limit Values

		Chemical Name	Media	Primary Routes of Exposure	PEL	TLV	IP electron volts (eV)
Common Site COCs	☒	1,2-Dichloroethene (cis, trans)	Soil, GW, Vapor.	Inhalation	200 ppm	200 ppm	9.65
	☒	Trichloroethene (TCE)	Soil, GW, Vapor.	Inhalation	100 ppm	50 ppm	9.45
	☒	Tetrachloroethylene (PCE)	Soil, GW, Vapor.	Inhalation	100 ppm	25 ppm	9.32
	☒	Vinyl Chloride	Soil, GW, Vapor.	Inhalation	1 ppm	1 ppm	9.99

8.2 Potential Exposure Pathways

Occupational exposure to chemical hazards associated with the work activities could potentially occur by two primary routes (inhalation and skin contact) and one indirect route (incidental ingestion).

8.2.1 Inhalation

The primary risks associated with URS' scope of work pertain to potential exposure to airborne contaminants and explosion hazards. Constituents that potentially pose an occupational concern to employees by the inhalation route are carbon monoxide, hydrogen sulfide, methane, and volatile organic compounds. Air monitoring will be performed within the employee breathing zone to assess the need to implement appropriate control measures or stop work. In addition, air monitoring will be performed at the source to assess potential explosion hazards.

8.2.2 Skin Contact

Personnel handling residual product or waste and associated equipment may be exposed to chemical hazards by skin contact or adsorption. However, exposure is expected to be limited since workers will be required to wear appropriate PPE (i.e. appropriate work gloves, body clothing, and/or face shield).

8.2.3 Ingestion

Personnel handling residual product or waste and associated equipment, including project hazardous materials, may be exposed by incidental ingestion. Typically, this exposure occurs if proper PPE was not used or personal hygiene was not

practiced. Personal protection against exposure via ingestion can be accomplished by performance of proper decontamination procedures when exiting contaminated work areas as well as using the correct PPE.

8.3 Decontamination

All possible and necessary steps shall be taken to reduce or minimize contact with chemicals and contaminated/impacted materials while performing field activities. Decontamination steps are outlined in Hazardous Waste Operations procedure S3AM-117-PR. Some key elements are as follows:

- All persons and equipment entering the EZ shall be considered contaminated, and thus, must be properly decontaminated prior to exiting to clean areas of the site.
- Avoid reactions between the solutions and contaminated materials. Review the applicable SDS.
- All contaminated PPE and decontamination materials shall be contained, stored and disposed of in accordance with site-specific requirements determined by site management.
- Use caution while working around decontamination stations, including the decontamination pad, which may be a slip or trip hazard.
- Use disposable equipment when possible and practical.
- All employees performing equipment decontamination shall wear the appropriate PPE to protect against exposure to contaminated materials. The level of PPE may be equivalent to the level of PPE required in the EZ. Other PPE may include splash protection, such as face-shields and splash suits, and knee protectors.
- All decontaminated equipment shall be visually inspected for contamination prior to leaving the Contaminant Reduction Zone (CRZ).

Decontamination Procedures & Equipment	
Procedure	***Equipment Needed***
Remove all equipment, sample containers, and notes to the CRZ. Obtain decontamination solutions and decontaminate the tools (shovels, auger flights, etc.) by brushing them under a water rinse. A high-pressure steam cleaner also may be used for decontamination. All waste and spent decontamination solutions will be properly contained. Remove disposable booties, or scrub boots with a stiff bristle brush and water, when necessary. Washtubs and chairs will be provided. Remove outer gloves (and boot covers, if used). Remove Tyvek® coveralls; discard in provided container. Remove hardhat and eye protection. Remove respirator. Remove inner gloves. Wash hands and face. The decontamination area will be covered with plastic sheeting that will be replaced when torn or heavily soiled and at the end of each shift.	Alconox solution Deionized water Brushes Plastic sheeting

Equipment Decontamination Procedures		
Type Equipment	***Decontamination Solution***	***Procedure***
Respirator	Alconox solution and deionized water	**Washing**: Disassemble and wash with an Alconox solution in deionized water. A stiff bristle (not wire) brush may be used.

		Rinsing: Rinse in deionized water to remove all traces of detergent. This is important to prevent dermatitis. **Disinfecting**: Thoroughly rinse or immerse in a sanitizer provided by the manufacturer. **Final Rinsing**: Rinse thoroughly in clean water to remove all traces of disinfectant. **Drying**: Drain and dry by hanging by the straps from racks or by towel drying with clean, soft cloths or paper towels.
Water quality meter, oil/water interface probe, down-hole water sampling pumps, reusable sampling tools/ equipment		**Washing**: Disassemble and wash with an Alconox solution in deionized water. **Rinsing**: Rinse in deionized water to remove all traces of detergent.
Drilling Equipment/ Tools	High-pressure steam cleaner	Apply steam cleaner to used equipment/tools

Waste Handling for Decontamination	
Waste Streams/Products	***Disposal Procedures***
Wash water Used PPE Spent plastic sheets/ consumables from decontamination procedures	Containerize in 55-gallon DOT drums, and stage drums in temporary location pending shipment off site for treatment/ disposal.

8.4 Air Monitoring

Monitoring shall be performed within the work area on site in order to detect the presence and relative levels of toxic substances. The data collected throughout monitoring shall be used to determine the appropriate levels of PPE. Monitoring shall be in accordance with Exposure Monitoring Procedure S3AM-127-PR and specified in the work permit and/or THA for the tasks. Key elements of the procedure include:

- Calibration of monitoring equipment and/or daily bump tests to verify calibrations and confirm alarm function.
- Personal monitoring and result evaluation must be directed by a Certified Industrial Hygienist or Certified Safety Professional.

8.4.1 Real-Time Exposure Measurement/ Equipment

Monitoring shall be performed within the work area on site in order to detect the presence and relative levels of toxic substances. The data collected throughout monitoring shall be used to determine the appropriate levels of PPE. Monitoring shall be conducted as specified in the work permit and THA as work is performed. All instrumentation needs to be rated intrinsically safe to prevent fire or explosion.

Check which real-time monitoring equipment will be used and update the model type if needed:

	Instrument	Manufacturer/Model	Substances Detected
☒	**Photo Ionization Detector (PID)**	RAE Systems mini-RAE (min. 10.6 eV bulb)	• Petroleum hydrocarbons • Organic Solvents
☒	**Multi or 4 Gas Detectors**	RAE Systems Multi-RAE	• Lower Explosive Limit • Oxygen • Carbon Monoxide • Nitric Oxide
☒	**Combustible Gas Indicator (CGI)** *May be combined with individual or multi-gas detectors.*		• Explosivity
☒	**Particulate Monitor**	MIE Model PDM-3 mini-RAM	• Aerosols, mist, dust, and fumes

☒	**Single gas detectors**	Draeger Chip Measurement System (CMS)	• Vinyl Chloride • PCE • TCE
☒	**Noise Meter**	3M/?	• dB

8.4.2 Health and Safety Action Levels

An action level is a point at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. The concentration level (above background level) and the ability of the PPE to protect against that specific contaminant determine each action level. The action levels are based on concentrations in the breathing zone.

If ambient levels are measured which exceed the action levels in areas accessible to unprotected personnel, necessary control measures (barricades, warning signs, and mitigation actions to limit, etc.) must be implemented prior to commencing activities at the specific work area.

Personnel should also be able to upgrade or downgrade their level of protection with the concurrence of Site Supervisor or Site Safety Officer or the Safety Manager.

Reasons to Upgrade:

- Known or suspected presence of dermal hazards;
- Occurrence or likely occurrence of gas, vapor, or dust emission; or
- Change in work task that will increase the exposure or potential exposure to hazardous materials.

Reasons to Downgrade:

- New information indicating that the situation is less hazardous than was originally suspected;
- Change in site conditions that decrease the potential hazard; or
- Change in work task that will reduce exposure to hazardous materials.

8.4.3 Monitoring Procedures

The monitoring procedures shown below are general guidelines for sampling activities. A reading in excess of action level outlined below will require additional ventilation for 30 minutes, followed by re-monitoring.

Monitoring Procedures and Action Levels

Parameter	Zone Location and Monitoring Interval	Response Level	Response Activity
Volatile Organic Compounds (VOCs) and volatile hydrocarbons (total by PID)	Breathing zone, continuously during tasks where exposure to VOCs and volatile hydrocarbons is possible	< 5 ppm	Continue monitoring, may continue work in required PPE
		5- 25 ppm (sustained for 5 minutes)	STOP WORK and notify PM. Investigate the cause of elevated VOC measurements and identify measures to reduce concentrations (cover impacted soils, ventilation, etc.). Work activities shall only continue once levels have decreased to or below 5 units above background. If levels continue above 5 units, only individuals who are medically qualified to wear respiratory protection are permitted to continue work activities with Project Manager approval. Don Level C PPE (organic vapor respirator cartridges), continue monitoring, and initiate continuous air monitoring for benzene.
		> 25 ppm (sustained for 5 minutes)	Cease work, exit, and contact the Site Safety Officer, Site Supervisor, and Project Manager.
Vinyl Chloride (by CMS)	Breathing zone, continuously where indicated by VOC readings	> 0.25 ppm	Cease work, exit the area, and contact the Site Safety Officer, Site Supervisor and Project Manager.
Hydrogen Sulfide		< 5 ppm	Continue work activities. Contact the Site Safety Officer to investigate the potential for contributing factors.

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Parameter	Zone Location and Monitoring Interval	Response Level	Response Activity
(multi-gas detector or individual H_2S meter)	Breathing zone, continuously during tasks where exposure to hydrogen sulfide is possible	> 5 ppm	Cease work, exit the area or confined space, and contact the Site Safety Officer, Site Supervisor and Project Manager.
Combustible Gas (multi-gas meter or individual combustible gas indicator, CGI)	Breathing zone or in the immediate work area continuously during tasks where explosive atmospheres are possible	> 5% of LEL	Cease work, exit, and contact the Site Safety Officer, Site Supervisor, and Project Manager.
Oxygen (O_2) (multi-gas detector or individual O_2 meter)	Breathing zone, continuously during tasks were oxygen enriched or deficient atmospheres are possible	< 19.5 % O_2	Cease work deficient atmosphere), exit the area or confined space, and contact the Site Safety Officer, Site Supervisor, and Project Manager.
		> 23.5 % O_2	Cease work enriched atmosphere), exit the area or confined space, and contact the Site Safety Officer, Site Supervisor, and Project Manager.
Carbon Monoxide (CO) (multi-gas detector or individual CO meter)	Breathing zone, continuously during tasks where exposure to CO is possible	< 10 ppm	Continue work in Level D and continue monitoring
		> 10 ppm	Cease work, exit the area or confined space, and contact the Site Safety Officer, Site Supervisor, and Project Manager.
Noise Meter	Source Work Activity	>85dB	Hearing Protection Required
Dust not otherwise classified (total by aerosol monitor)	Breathing zone every 30 minutes during field activities where exposure to excessive dusts are possible	< 5 mg/m^3	Continue work in Level D and continue monitoring
		> 5 mg/m^3	Upgrade to Level C (P100 respirator cartridges), implement dust suppression measures; contact the Site Safety Officer & Site Supervisor.
		> 10 mg/m^3	Cease activities, implement more effective dust suppression measures; contact the Site Safety Officer & Site Supervisor.
Dust not otherwise classified (total by aerosol monitor)	Edge of Exclusion Zone, every 30 minutes during excavation activities	< 5 mg/m^3	Continue work in required PPE, monitor air, and implement engineering controls
		> 5 mg/m^3	Cease activities and contact the Site Safety Officer & Site Supervisor.

9. Environmental Impact Prevention

URS strives to avoid or control environmental impacts from our operations through planning and implementation of best practices as well as preparing responses to react to environmental incidents. Environmental Compliance procedure S3AM-204-PR provides details on permitting and planning requirements.

9.1 Incidental Spill Prevention and Containment

Spill prevention and containment planning must be conducted, and appropriate control measures established, consistent with regulatory requirements. Personnel are not expected to perform a response action related to an uncontrolled release of a hazardous substance. However, in the event of an incidental release of a hazardous material, a response will be performed to absorb, neutralize or otherwise control the release within the immediate work area. Procedures contained in the SDS of the hazardous material will be implemented to perform the response. The Emergency Response section of this HASP contains information on spill reporting, pre- and post- spill evaluation, and response

9.1.1 Spill Prevention and Containment Practices

Work activities may involve the use of hazardous materials (i.e. fuels, solvents) or work involving drums or other containers. When these activities exist the procedures outlined below will be used to prevent or contain spills:

- All hazardous material will be stored in appropriate containers and labelled.
- Tops/lids will be placed back on containers after use.
- Containers of hazardous materials will be stored appropriately away from moving equipment.
- Containers shall only be lifted using equipment specifically manufactured for that purpose.
- Drums/containers will be secured and handled in a manner which minimizes spillage and reduces the risk of musculoskeletal injuries.
- Equipment will be inspected daily for signs of leaks, wear, or strain on parts that, if ruptured or broken, would result in a spill.
- Refueling should occur in designated areas where incidental spills can be prevented from reaching permeable ground surfaces.
- Whenever possible, position parked or stationary equipment over secondary containment and/ or absorbent materials to prevent spills from reaching permeable ground surfaces.
- A spill response kit, to include an appropriate empty container, materials to allow for booming or diking the area to minimize the size of the spill, and appropriate clean-up material (i.e. speedy dri, absorbent pads, etc.) will be available on the project site and positioned for quick and easy access.

10. Personal Protective Equipment

PPE is considered the last line of defense in hazard control. PPE is meant to protect workers when all other methods (elimination, substitution, engineering, and administrative) have been exhausted. All employees must be trained in the proper use and maintenance of PPE. See Procedure S3AM-208-PR1, Personal Protective Equipment.

A PPE assessment (see S3AM-208-FM1) can be performed to help determine PPE requirements. PPE upgrades for individual tasks or steps of a task are to be identified in the appropriate THA(s).

Minimum Required PPE (per URS PPE and HAZWOPER Procedures):

- Hard hat
- Safety glasses w/ side shields (may be clear or shaded)
- Safety toe work boots
- Long pants and shirts with sleeves (short or long- cover shoulders no tank or muscle shirt styles)

Complete the table below for site-specific PPE:

Additional PPE Needed On Site

(to encompass all task specific additions and upgrades)

Face/ Eyes

- ☐ Spoggles (Safety Glasses with foam liner for dust protection)
- ☐ Welding Mask/Goggles
- ☐ Chemical Goggles
- ☐ Face Shield (splash)
- ☐ Face Shield (impact)

Head/ Ears

- ☐ Helmet with Chin Strap
- ☐ Wide Brimmed Hat
- ☒ Earplugs
- ☒ Over-ear Hearing Protection

Hands

- ☒ Nitrile
- ☒ Leather
- ☒ Cut, Abrasion and Puncture Resistant
- ☐ Impact-resistant
- ☒ Other Chemical Resistant: *(specify)*
  - neoprene
  - Butyl rubber

Legs/ Feet

- ☐ High Ankle Boots
- ☐ Snake Guards
- ☒ Rubber Boots/Waders
- ☐ Metatarsal Guards
- ☐ Electrically-resistant boots

Body

- ☒ Sunscreen
- ☒ Insect Repellent (DEET)
- ☐ Permethrin Applied to Clothing
- ☒ Long-sleeved Shirt
- ☒ High-visibility Vest
- ☐ High-visibility Pants
- ☒ Disposable Coveralls
- ☐ Flame Retardant Clothing
- ☐ Fall Protection
- ☐ Personal Floatation Device
- ☒ Other: *(specify)*
  - Disposable booties. Respirator w/organic vapor/HEPA cartridge
  - Potential for SCBA

Equipment

- ☒ **Air/Noise Monitoring Equipment:** *(specify)*
  - PID, Multi or 4 Gas, CGI, Particulate Monitor, Single Gas Detectors, Noise Dosimeter
- ☐ **Traffic/Work Zone Control Equipment:** *(specify)*
- ☐ **Communication Beyond Cell Phones:** *(specify)*
- ☒ **Fire Controls:** *(specify)*
  - Extinguishers per our procedure requirements

11. Site Control

The purpose of site control is to protect the public from inadvertently coming into contact with site hazards and to protect URS employees being impacted by hazards. This section details the equipment and actions needed to promote optimal site control.

11.1 Site Work Zones

Site layout and site control need to be coordinated achieve a productive work environment and efficient work process while minimizing exposure of employees and the public to hazards associated with the work. Consider the following items when planning the site layout and controls:

- "Line of Fire" hazards- overhead utilities, falling/ tipping equipment, release of energy/ pressure, flying debris,
- Noise, dust, odor suppression
- Contamination containment and decontamination area layout
- Traffic control for site vehicles/ equipment (public traffic control requires Traffic control Plan)
- Restricted access for areas requiring special training, skills, or certifications
- Restriction of work near railroads
- Presence or creation of excavations
- Loading/unloading areas
- Portable restrooms
- Dumpsters and bins
- Equipment lay down
- Heavy equipment parking
- Overnight safety and security needs

Check the description of the site controls **already** in place:

- ☒ Work area is within a facility/ property with secure and restricted access provided by client or third party
- ☐ Work area is enclosed within facility/ property, but access is not restricted via locks, guards, or gates
- ☐ Work area is on a property that is open and access by the public is likely
- ☐ Work area is on a property that is open but access by the public is unlikely
- ☐ Work area is in a roadway or right of way of a roadway (Traffic Control Plan [Attachment G])
- ☐ Work area is on or near railroad (including right of way, active lines, and crossings)
- ☐ Other: *(describe)*

_____

_____

Check and describe the site controls that need to be added to protect the public and the URS work team.

	Control Item	Description of Type and Application
☐	**Fence**	
☐	**Locks**	
☐	**Barricades**	
☒	**Cones**	Cones will be applied if working adjacent to a road. Such cones
☒	**Tape**	Caution tape will be used to establish a barrier around the work zone during heavy equipment (i.e. drill rig, excavator, etc.) use.
☒	**Hole Covers**	Boreholes left open overnight will be covered with a steel plate or other acceptable means.
☐	**Other:**	

11.2 Site Control Map/ Diagram

See Figure 2-2.

11.3 Simultaneous and Neighboring Operations

Simultaneous and neighboring operations present a need for added coordination and communication to address hazards that are presented by multiple operations.

	Activity/ Company	Hazard	Controls/Mitigations and Communication Methods
Simultaneous Operation *(within the site)*	NA		
Neighboring Operation *(outside/ bordering the site)*	NA		

11.4 Site Security

All projects should be reviewed for the potential for personal security issues (e.g., assault, robbery, threat, etc.). Check all of the following that apply:

- ☒ Project site located in a higher crime area or has a history of security incidents
- ☐ Working outside of regular cellular telephone service
- ☐ Idle property with potential for trespasser(s) to shelter in buildings/structures and assault personnel
- ☐ Working at night

Detail the security measures to address the above risks:

If possible, all equipment will be off site at the end of each work day. If a piece of equipment cannot leave the Site, then that piece equipment will be secured as not to be stolen or tampered (i.e., locked).

12. Emergency Response

URS requires that all projects plan for reasonably foreseeable emergencies (see Emergency Response Planning Procedure S3AM-010-PR). Prior to the start of site operations, all personnel shall review the table below for site-specific information regarding evacuations, muster points, communication, and other site-specific emergency procedures. An Incident Response Flow Chart is included in **Attachment A**.

12.1 Incident/Emergency Contact Information

URS Contacts			
Name	**Title**	**Telephone Number**	**Mobile Phone**
Mike Gutmann, PG	Project Manager	(716) 923-1120	(716) 345-4649
Sean Connelly	Site Supervisor	(716) 923-1103	(716) 393-0870
	Site Safety Officer		
Peter Gregory, CSP, MPH, STS	Region SH&E Manager	(973) 883-8683	(201) 602-3511
Pete Wray, CSP, CHMM, STS	Area SH&E Manager	(302) 781-5872	(302) 660-9178
Incident Reporting	DCS Incident Reporting & Help Line	800-348-5046	
URS Nurse direct	Use only after incident reporting line	877-878-9525	
Client Contacts			
Name	**Title**	**Telephone Number**	**Mobile Phone**
Benjamin Rung	Client Project Manager	(518) 402-9826	NA
Organization/Agency			
Police Department (local)			911
Fire Department (local)			911
Ambulance Service (EMT will determine appropriate hospital for treatment)			911
Hospital: (Site personnel to use for emergency care) Highland Hospital,1000 South Ave, Rochester, NY 14620			(585) 473-2200
Occupational Clinic: (Site personnel to use for non-emergency care) WellNow Urgent Care, 2232 Lyell Ave, Rochester, NY 14606			(585) 417-4125
Poison Control Center			(800) 222-1222
Pollution Emergency (NYSDEC Spill Hotline)			(800) 457-7362
INFOTRAC (URS' account number 74984)			800-535-5053
URS Hazardous Material Shipping Help Line			800-381-0664
Public Utilities			
Call Before You Dig			811

12.2 Muster Location

See Figure 2-2.

12.3 Communication Procedures

Air horn, cell phones and others as dictated by the work assignment and THAs.

12.4 CPR/ First Aid Trained Personnel

SS/SSO

12.5 Incident Reporting

Incidents involving or affecting an URS employee will be reported in a prompt manner verbally to the site supervisor and project manager.

1. If the incident is a significant or life-threatening emergency, the employee or supervisor shall immediately dial 911 or the appropriate emergency contact phone number for your site.
2. The employee or supervisor shall contact the Incident Hotline (800-348-5046). *Note: Do not report subcontractor injuries to the Incident Hotline as URS Nurses cannot provide direction to subcontractors. The Subcontractor should follow their injury reporting and response procedure. The incident should be reported to IndustrySafe as described below.*
3. The employee or supervisor must notify their operational leaders and the Area SH&E Manager.
4. The supervisor, or delegate, must make initial notification in IndustrySafe within 4 hours for significant incidents, including subcontractor injuries, or 24 hours for less significant events event.
5. Client and account management notifications may also apply. The Project Manager will make any necessary notifications.

Any injury, even if no treatment is required, and any incident for which assistance by SH&E Management is needed must be immediately communicated to the Incident Hotline at 1-800-348-5046.

All incidents are also to be reported to IndustrySafe within the timeframes listed below:

Incident Type	IndustrySafe Reporting Time Frame
Significant Incident, including any injury to an URS Employee or Subcontractor	➔ 4 Hours
All Other Incidents	➔ 24 Hours

Significant Incident:

- Fatality;
- Amputation;
- Hospitalization for treatment for more than 24 hours (admission);
- Any single event resulting in more than one employee requiring medical treatment or more than one employee being away from work more than 3 days;
- Any SH&E-related Consent Agreement/Order/Lawsuit or enforcement action seeking more than $10,000 or alleging criminal activity;

- Any spill or release of a hazardous material that is reportable to a regulatory agency;
- Any Notices of Violation resulting from not operating within a regulatory agency permit/license or consent;
- Any incident resulting in property damage expected to exceed $10,000 United States (US) dollars;
- Any security-related incident that could have caused significant harm to an URS employee; and/or
- Any Near Miss event that may have resulted in any of the above consequences but because of "luck" did not result in harm to persons, property or the environment.

All Other Incidents:

- Any injury or illness to an URS employee or subcontractor, even if it does not require medical attention, including work-related injuries/illnesses that have become significantly aggravated by the work environment;
- An injury to a member of the public, or clients, occurring on an URS-controlled worksite;
- Re-occurring conditions such as back pain or cumulative trauma disorders (e.g., carpal tunnel syndrome);
- Fire, explosion, or flash that is not an intended result of a planned event (e.g., remediation process, laboratory Procedure);
- Any incident involving company-owned, rented, or leased vehicles (including personal vehicles used for company business); and/or
- Any failure to comply with the requirements of a regulatory permit issued to URS.
- Scan the QR code below to access IndustrySafe reporting system from your smartphone/ device.

IndustrySafe
Safety Management Software

12.6 Medical Emergencies

In the event of a life-threatening or critical emergency, URS employees should dial 911 and follow the recommended instructions. However, in less serious situations, an injured employee or a co-worker should contact the Incident Hotline at 800-348-5046 to ensure that the employee receives the best care at the best time (i.e., within the first hour following an injury or potential injury). By contacting the Incident Hotline, the worker can be connected with URS' nurses for first aid advice. If recommended by the nurse, the supervisor or a co-worker should drive the injured employee to the project-designated clinic or hospital. A map to the designated hospital and clinic is attached as **Attachment A** and the locations and addresses are included in the table above as well as in the HASP Summary on Page i.

12.7 Vehicle Incidents

All vehicles should be rented through Carson Wagonlit Travel (accessible via Ecosystem) to ensure that URS insurance is included in the rental rate. All other insurances should be declined. URS' rental vehicle insurance policy for National/Enterprise or Avis can be found on the DCS Americas United States or Canada travel pages. **Drivers MUST print and carry the applicable insurance policy for the rental**.

In the event of a vehicle incident (including collisions as well as mechanical difficulties such as breakdowns and flat tires) the following responses are recommended:

- For breakdowns and flat tires, contact an emergency provider.
- For rental vehicles, contact the rental company.
- To the extent possible, URS personnel should not change flat tires or perform similar repairs.
- If a collision has occurred, assess the situation and move all occupants (except the injured) out of further harm's way. If safe to do so, remove the car from the traveled way. Call 911 if necessary and report the incident to the Incident Hotline at 800-348-5046 as soon as practical. If appropriate, wait for police to arrive before moving

vehicles. Provide insurance information to other drivers if necessary or requested and collect the same. If possible, obtain names and phone numbers of witnesses. Take photographs of the scene if possible. DO NOT ADMIT LIABILITY, AGREE TO PAY FOR DAMAGE, OR SIGN A DOCUMENT RELATED TO AN INCIDENT EXCEPT AS REQUIRED BY LAW.

12.8 Spill or Release

URS employees are not expected to take action or to participate in rescues or responses to chemical releases (including of petroleum products) beyond the initial discovery of the release and immediate mitigation actions such as closing a valve, placing absorbents, and notifying the client and or public emergency response system (911), unless there is a contractual provision for this response and specially trained employees.

12.8.1 Environmental Spill/Release Reporting

All environmental spills or releases of hazardous materials (e.g., fuels, solvents, etc.), whether in excess of the Reportable Quantity or not, will be reported according to the incident reporting procedure. In determining whether a spill or release must be reported to a regulatory agency, the Site Supervisor or qualified worker will assess the quantity of the spill or release and evaluate the reporting criteria against the state-specific reporting requirements, applicable regulatory permit, and/or client-specific reporting procedures. **If reporting to a US state or Federal regulatory agency is required, URS has 15 minutes from the time of the spill/release to officially report it.**

Chemical-specific Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Reportable Quantities for the known chemicals onsite are shown in the table below.

Table 12-1: CERCLA Reportable Quantities

Hazardous Substance	Regulatory Synonyms	Final RQ (lbs.)
1,1,1-Trichloroethane	TCA	1,000
Arsenic	N/A	1
Benzene	N/A	10
Cadmium	N/A	10
Carbon Tetrachloride	N/A	10
Chromium	N/A	5,000
Ethyl Benzene	N/A	1,000
Lead	N/A	10
Mercury	N/A	1
Methyl Ethyl Ketone	MEK	5,000
Nickel	N/A	100
Pentachlorophenol	PCP	10
Selenium	N/A	100
Tetrachloroethylene	Perchloroethylene, PCE	100
Toluene	N/A	1,000
Trichloroethylene	Trichloroethene, TCE	100
Xylene	N/A	100

CERCLA RQ's can be found at: http://www.epa.gov/oem/docs/er/302table01.pdf

NYSDEC Petroleum Spill Requirements

All petroleum spills that occur at the site must be reported to the NYSDEC Spill Hotline (1-800-457-7362) within 2 hours of discovery, except spills which meet all of the following criteria:

- The quantity is known to be less than 5 gallons; and

- The spill is contained and under the control of the spiller; and
- The spill has not and will not reach the State's water or any land; and
- The spill is cleaned up within 2 hours of discovery.

A spill is considered to have not impacted land if it occurs on a paved surface such as asphalt or concrete. A spill in a dirt or gravel parking lot is considered to have impacted land and is reportable.

NYSDEC's Spill Regulations/Guidelines can be found at: https://www.dec.ny.gov/chemical/8692.html.

The spill containment program addresses the following site-specific information:

- Potential hazardous substance spills and available controls;
- Initial notification and response;
- Spill evaluation and response; and
- Post-spill evaluation.

12.8.2 Spill Evaluation and Response

The SSO is responsible for evaluating spills and determining the appropriate response. When this evaluation is being made, the spill area is isolated and demarcated to the extent possible. When an incidental release occurs, clean-up personnel receive instructions in a pre-clean-up meeting as to spill conditions, PPE, response activities, decontamination, and waste handling.

The procedures of the Emergency Response section of this HASP are immediately implemented when the spill is determined to require emergency precautions and action. If necessary, to protect those outside the clean-up area, notification of the appropriate authorities is made. Table 12-1 lists the spill conditions that trigger notification of Federal, state, and local agencies.

The following are general measures that response/clean-up personnel take when responding to a spill:

- To minimize the potential for a hazardous spill, hazardous substances, control/absorbent media, drums and containers, and other contaminated materials are properly stored and labeled;
- When a spill occurs, only those persons involved in overseeing or performing spill containment operations will be allowed within the designated hazard areas. If necessary, the area will be roped or otherwise blocked off. Unauthorized personnel are kept clear of the spill area;
- Appropriate PPE is donned before entering the spill area;
- Appropriate spill control measures are applied during spill response;
- Whenever possible without endangerment of personnel, the spill is stopped at the source or as close to the source as possible;
- Ignition points are removed if fire or explosion hazards exist;
- Surrounding reactive materials are removed;
- Drains or drainage in the spill area are blocked or surrounded by berms to exclude the spilled waste and any materials applied to it;
- Provisions are made to contain and recover a neutralizing solution, if used;
- Small spills or leaks from a drum, tank, or pipe will require evacuation of at least Enter Distance feet in all directions to allow clean-up and to prevent employee exposure. For small spills, sorbent materials such as sand, saw dust, or commercial sorbents are placed directly on the spill to prevent further spreading and aid in recovery;
- Spill area is sprayed with appropriate foam where the possibility of volatile emissions exists;

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- If the spill results in the formation of a toxic vapor cloud, from vaporization, reaction with surrounding materials, or the outbreak of fire, further evacuation may be required;
- To dispose of spill waste, all contaminated sorbents, liquid waste, or other spill clean-up will be placed in small quantities Enter QTY pounds) in approved drums for proper storage or disposal as hazardous waste; and

12.8.3 Post Spill Evaluation

As part of the incident investigation and reporting documentation, a written spill response report shall be prepared at the conclusion of clean-up operations. The report will include, at a minimum, the following information:

- Date of spill incident;
- Cause of incident;
- Spill response actions;
- Any outside agencies involved, including their incident reports; and
- Lessons learned or suggested improvements.

The spill area is inspected to ensure the area has been satisfactorily cleaned. The use of surface and air sampling is utilized in this determination, as necessary. The root cause of the spill is examined, and corrective steps taken to ensure the engineering and control measures in place have performed as required. If alternative precautions or measures are needed, they are made available and implemented.

All durable equipment placed into use during clean-up activities is decontaminated for future utilization. All spill response equipment and supplies are re-stocked as required.

12.9 Fire

URS employees are not expected to attempt to put out fires. Stop work; notify all URS personnel, move upwind and contact 911 and/or emergency response at the site. If employees have been properly trained in the operation of a fire extinguisher, they may attempt to put out a small fire, provided that the following conditions are met:

- The fire must be small (i.e., smaller than a trash can) and in its early stages
- The employee must have an escape route
- The employee must be trained and know they have the right type of extinguisher
- The employee must be safe from toxic gases
- There must be no hazardous conditions that could quickly accelerate the fire (i.e., presence of chemicals, especially dry grass, etc.)
- Above all, if in doubt, the employee must not attempt to fight the fire

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13. Personnel Acknowledgement and Disclaimer

By signing below, the undersigned acknowledges that he/she has reviewed the URS Health and Safety Plan for the Artco Industrial Laundries Site No. 828102. The undersigned also acknowledges that he/she has been instructed in the contents of this document and understands the information pertaining to the specified work and will comply with the provisions contained therein. The employee understands that they are NOT to perform any work that they have not been adequately trained for and that they are to stop work if it is unsafe to proceed. Finally, the employee understands to notify the Site Supervisor and the Incident Hotline at 800-348-5046 for any incident, ***including ANY injury even if no first aid or medical treatment is required.***

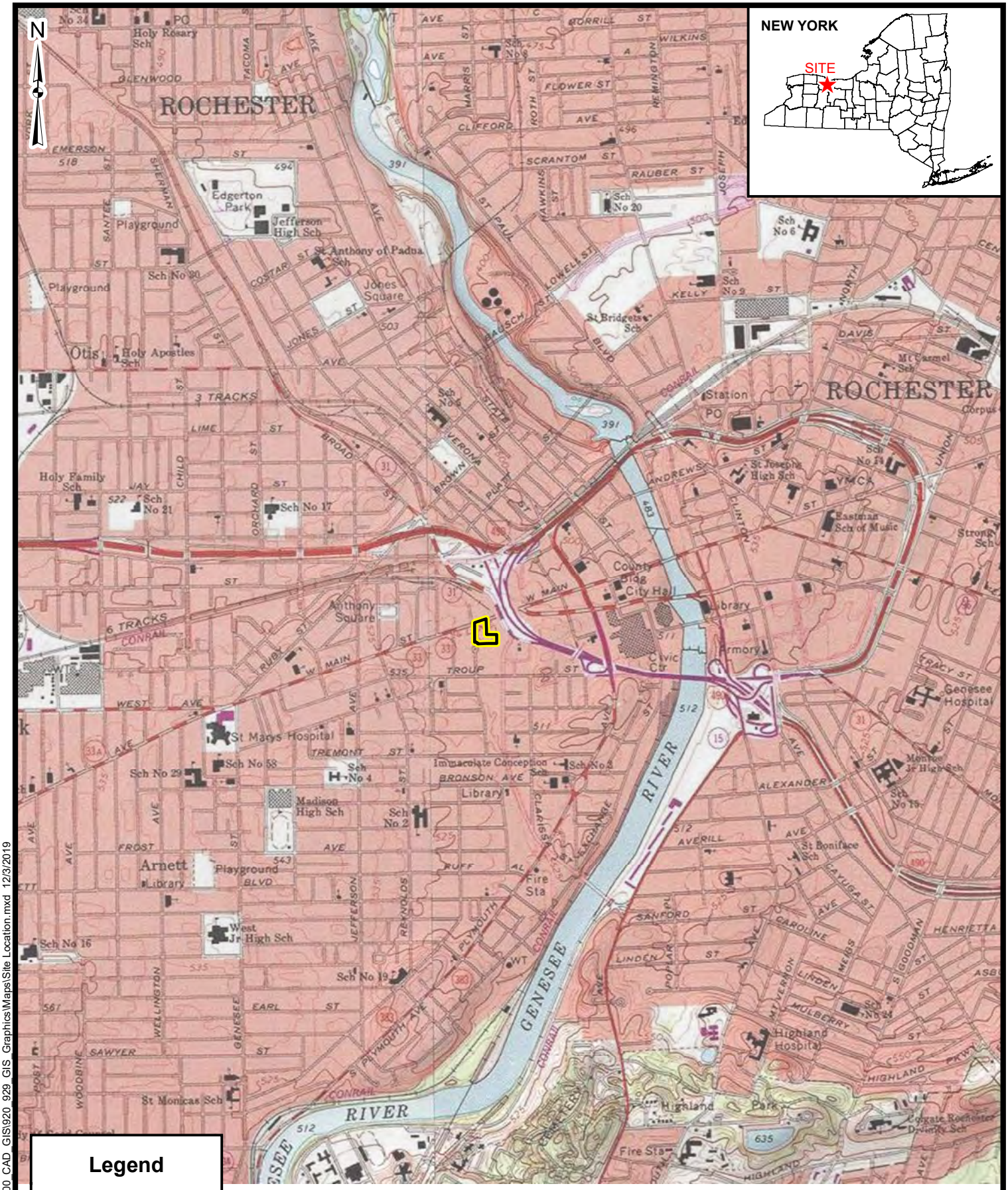
Print Name	Signature	Organization	Date

13.1 Disclaimer:

This SH&E Plan, and each of its provisions, is applicable only to, and for use only by, URS, its affiliates, and its subcontractors. Any use of this Plan by other parties, including, without limitation, third party contractors on industrial sites or projects where URS is providing engineering, construction management or similar services, without the express written permission of URS, will be at that party's sole risk, and URS Corporation shall have no responsibility therefore. The existence and use of this Plan by URS shall not be deemed an admission or evidence of any acceptance of any safety responsibility by URS for other parties unless such responsibility is expressly assumed in writing by URS in a specific project contract.

Figures

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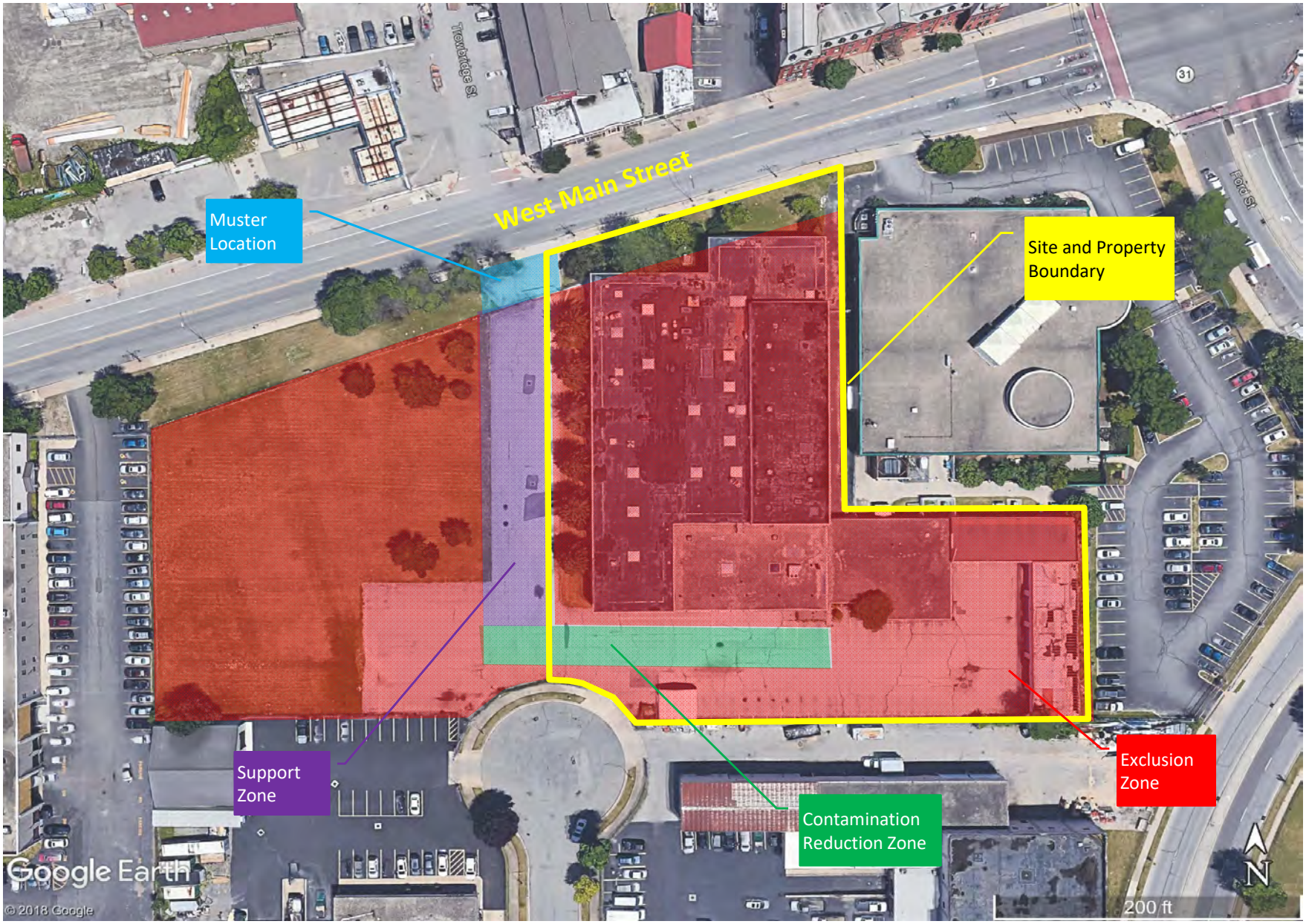


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URS

ARTCO INDUSTRIAL LAUNDRIES (SITE ID NO. 828102)
NYSDEC WORK ASSIGNMENT NO. D007622-59
CITY OF ROCHESTER, MONROE COUNTY, NEW YORK
SITE LOCATION

FIGURE 2-1



URS

Site Plan
Artco Industrial Laundries Site No. 828102
331-337 West Main Street
Rochester, NY 14608

FIGURE 2-2

Attachment A

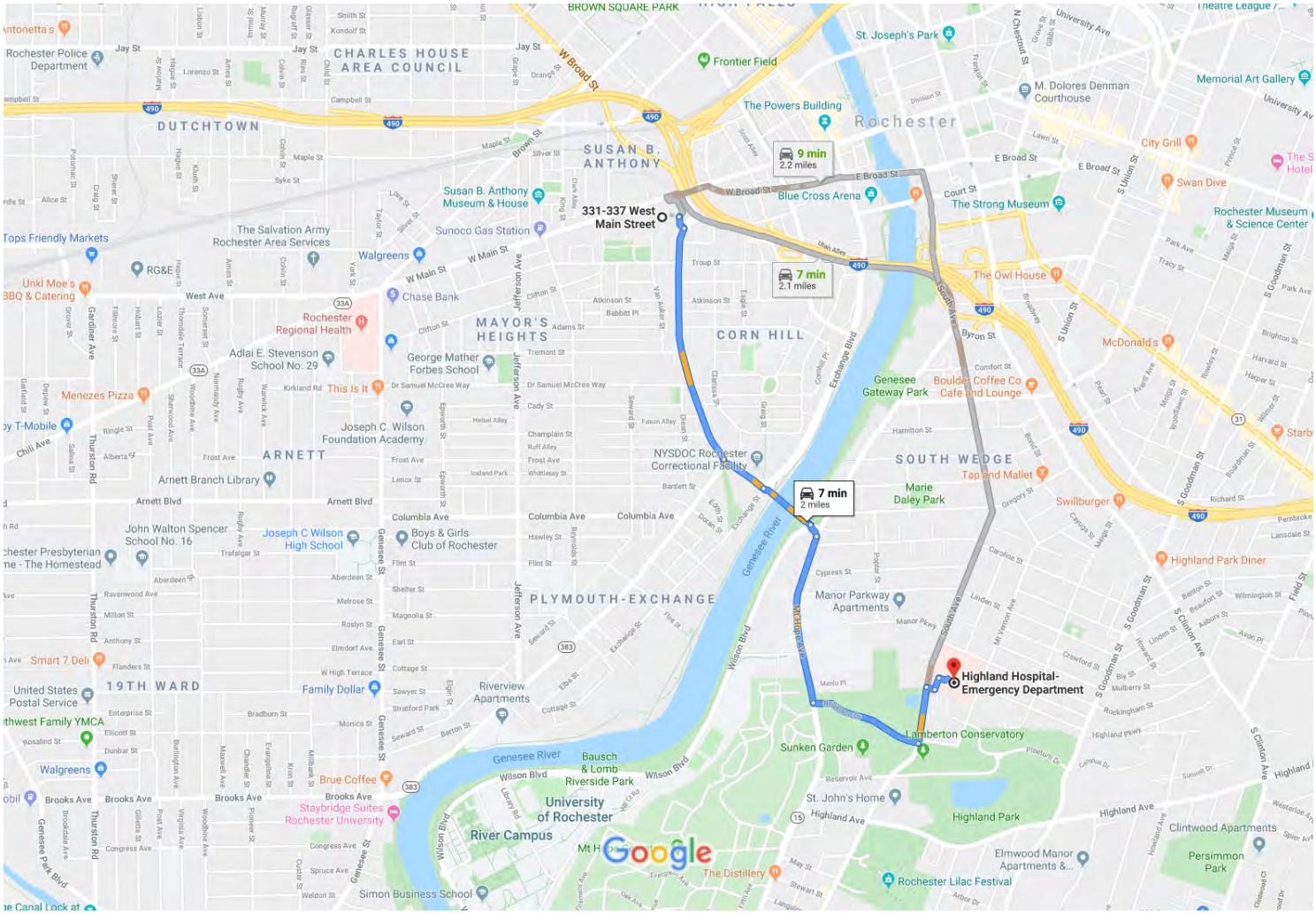
Hospital and Clinic Directions/ Maps
Incident Reporting and Response Flow Chart

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Google Maps

331-337 West Main Street, Rochester, NY to Highland Hospital- Emergency Department

Drive 2.0 miles, 7 min



Map data ©2019 1000 ft

331-337 W Main St

Rochester, NY 14608

1. Head south toward Ford St

7 s (190 ft)

Follow Ford St and Mt Hope Ave to Robinson Dr

4 min (1.4 mi)

2. Turn right onto Ford St

0.6 mi

3. At the traffic circle, continue straight to stay on Ford St

0.1 mi

4. Continue straight to stay on Ford St

0.2 mi

5. Turn right toward Mt Hope Ave

187 ft

6. Turn right onto Mt Hope Ave

0.4 mi

7. Turn left onto Robinson Dr

1 min (0.3 mi)

8. Turn left onto South Ave

26 s (0.1 mi)

Drive to your destination

1 min (420 ft)

9. Turn right onto Bellevue Dr

112 ft

10. Turn left

174 ft

11. Turn right

Destination will be on the right

135 ft

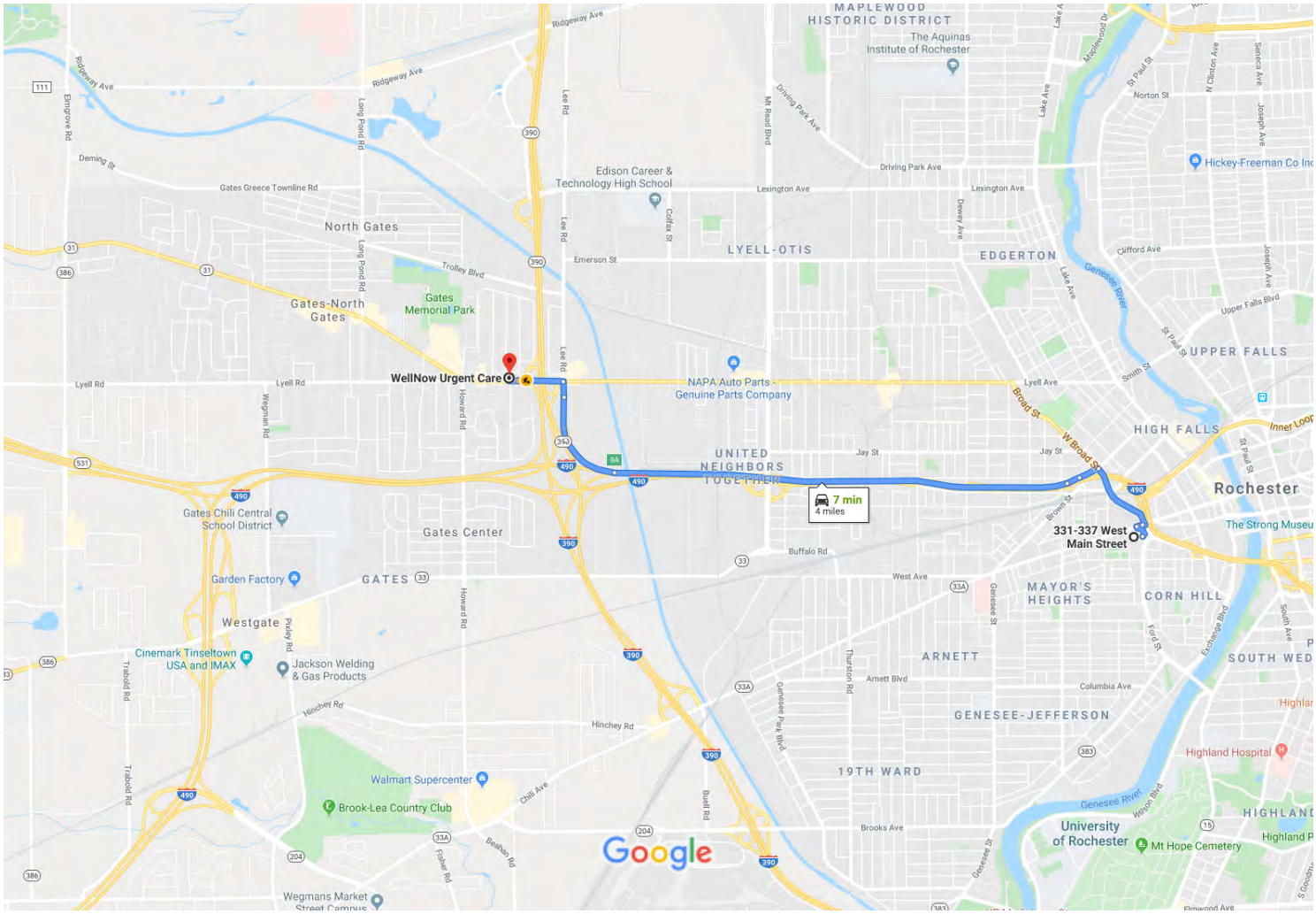
Highland Hospital- Emergency Department

1000 South Ave, Rochester, NY 14620

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

331-337 West Main Street, Rochester, NY to WellNow Urgent Care

Drive 4.0 miles, 7 min



Map data ©2019 2000 ft

331-337 W Main St

Rochester, NY 14608

Get on I-490 W from W Broad St

3 min (0.7 mi)

1. Head northeast toward W Main St

436 ft

2. Turn right onto W Main St

164 ft

3. Turn left onto W Broad St

0.4 mi

4. Turn left onto the I-490 W ramp

0.1 mi

5. Keep left, follow signs for Interstate 490 W and merge onto I-490 W

381 ft

Continue on I-490 W to Gates-North Gates. Take exit 9A from I-490 W

3 min (2.9 mi)

6. Merge onto I-490 W

2.4 mi

7. Take exit 9A for NY-390 N toward NY-31/Lyell Ave

0.3 mi

8. Keep right, follow signs for Route 390

0.2 mi

Drive to Lyell Ave

1 min (0.4 mi)

9. Continue onto Lee Rd Exd

443 ft

10. Turn left onto Lyell Ave

Destination will be on the right

0.3 mi

WellNow Urgent Care

2232 Lyell Ave, Rochester, NY 14606

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

AECOM

Work-Related Incident Flowchart for Employees | Updated October 2016

DCS - Americas



NOTE: The direct number to AECOM nurses, 1-877-878-9525, is active and can be used by employees. However, the AECOM SH&E team prefers that employees call the AECOM Incident Reporting Hotline. The Hotline will route all medical cases to AECOM nurses, AND they will trigger text messages directly to the SH&E team.

* Supervisor or Responsible Manager will initiate Client or Site Notification Process as appropriate

** If injured person is an AECOM subcontractor, call AECOM's nurses at 877-878-9525, or direct sub to their own provider.

*** For all AECOM vehicles, call Element at 1-800-446-7052.

Updated October 2016

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Attachment B

Project Risk Register/ Hazard Assessment, THA Forms, and Tailgate Safety Meeting Forms

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Project Risk Register/ Hazard Assessment (DCSA)

Location: Meeker Avenue Area Plume Trackdown Site

Date: 12/30/2019

Prepared By: Kevin J. McGovern, PG, CHMM

Approved By: Dale "Pete" Wray, CSP, CHMM, STS

Principal Tasks	Potential Safety/Health/Environmental Risks/Hazards	Risk/Hazard Control Methods
List principal tasks involved in the scope of work	Identify each safety, health, and environmental hazard associated with the completion of each task	Identify methods such as transfer of risk, creation of Safe Work Method Statements (SWMS), Task Hazard Assessments (THAs) & any specific required work plans (SWPP, SPCC, traffic control, hazardous weather contingency plan, etc.) to be drafted
TASK 1 – Driving to and From Site (Mob/De-mob)	Unauthorized driving Inclement weather Getting Lost Inadequate vehicle for the site/trip Vehicle malfunction	You must be an AECOM authorized driver to drive for AECOM business purposes. Consult the requirements of S3AM-005-PR1. Authorized Drivers shall maintain a current driver's license with full privileges applicable to the vehicle to be operated. Develop a Journey Management Plan if applicable. Evaluate weather conditions prior to beginning the travel to determine if travel should proceed. Verify your vehicle is equipped to travel in poor weather. Have supplies on hand in the event that you become stranded, including a communication device to call for help. Review route in advance and program GPS prior to leaving Understand what type of vehicle is necessary to transport tools & equipment to the site. Know site conditions before departure and obtain proper vehicle, 4-Wheel drive if necessary Inspect vehicle prior to leaving. Verify that maintenance records are current.
TASK 2 – Clearing Underground Utilities	Slip/Trip/Fall Dropping items from heights and harming toes or feet. Electrocution/contact with energized electrical lines	Personnel shall be vigilant in providing clear footing, clearly identifying obstructions, holes, stick ups, or other tripping hazards and maintaining an awareness of uneven terrain and slippery surfaces. Place survey meters and other items on a surface where they are not likely to fall. Do not over-reach. Locate all sources of electricity to site parking lights, air compressor, vacuum, car wash, and ID sign and if possible de-energize lines by using locks and tags. •Call public utility locating service prior to initiating work activities. •Use private locating service to mark out areas on private property. •Verify location of utility marks; do not perform intrusive work if utility location marks cannot be found or if marks are destroyed. Preserve utility

Principal Tasks	Potential Safety/Health/Environmental Risks/Hazards	Risk/Hazard Control Methods
		marks as much as possible. Call to have utilities remarked if unsure as to their location •If lockout/tagout procedures are used, notify all affected employees on-site of the de-energized condition. •Verify all public and private utility markouts.
TASK 3 – Oversight of Drilling, Soil Sampling, and Monitoring Well Installation.	Repetitive Strain/ Motion Injuries Vehicular/ Pedestrian traffic Potential explosive/flammable or ignitable conditions Nitric oxide (NO) exposure Chemical exposure (dermal and inhalation) Noise (>85 dB) Heavy Equipment Hot/Cold Weather Exposure	Participate in a "Stretch and Flex" program as part of morning tailgate meetings. Reflective vests required. Use cones or other barricades as necessary. Be aware of site traffic patterns. Try and place borings away from heavy traffic routes. Monitor with O2/LEL meter; adhere to action limits as specified in the HASP. Use non-sparking equipment. Monitor with NO meter; adhere to action limits as specified in the HASP. Wear nitrile gloves and other PPE as necessary. Monitor work zones/breathing zones with PID and Single gas detector monitoring for VC and benzene, as necessary. Adhere to action limits as specified in HASP Hearing protection required. Monitor with sound level meter. Avoid blind spots designated by operator. Check back-up alarms Reflective vests required while working near rigs. Wear appropriate PPE (hard hat safety glasses, steel-toed boots) Wear appropriate clothing. Take frequent warming breaks. Drink cool/hot liquids Rapid containment of soil cuttings upon generation

Principal Tasks	Potential Safety/Health/Environmental Risks/Hazards	Risk/Hazard Control Methods
TASK 4 – Gauging Liquid Levels in Groundwater Monitoring Wells	Exposure to biologic hazards: insects, poisonous plants and animals. Injuries could include anaphylactic shock, allergic reaction, rabies Damage to equipment or vehicles due to surface / subsurface obstructions Slips / trips / falls due to uneven terrain resulting in broken bones or torn ligaments. Struck by vehicle resulting in severe trauma or death Exposure to chemical hazards in groundwater resulting in inhalation hazard or illness Cross contamination of equipment Cuts / lacerations / bruises to knees (flush mount) Aches and strains from repetitive motion	Identify and avoid hazardous plants and animals on site. Look for signs (spider webs, droppings, etc.). Wear cut resistant gloves, insect repellant; use a broom or a rake to move vegetation, not your hand or foot; move slowly Investigate travel path. Look for surface obstructions such as rubble, debris, old foundations or rebar. Use spotter is available or park in such a manner as to not have to back-up. Identify, mark and avoid slip, trip and fall hazards (holes, obstructions protruding from the ground, or debris). Contact PM immediately and do not proceed if any conditions are observed that cannot be controlled to make well gauging in the area safe. Visually inspect roadway for moving equipment if walking and set up vehicle as a barrier if driving. Set up exclusion zone around each well. Don reflective vest. Stay upwind to avoid vapor exposure. Clean the tape and probe using non-phosphate soap and distilled water. Wipe with clean paper towel. Collect decontamination materials for waste disposal. Wear disposable nitrile gloves. Don knee pads and inspect ground before kneeling down and take frequent breaks to stand and stretch. Do not use awkward positioning. Keep back straight, take regular rest/stretch breaks. Change position regularly. Check for location of measuring tape before walking or moving around.
TASK 5 – Dense Non-Aqueous Phase Liquid (DNAPL) Recovery	Repetitive Strain/ Motion Injuries Vehicular/ Pedestrian traffic Chemical exposure (dermal and inhalation) Hot/Cold Weather Exposure Potential Electrical / Explosive Hazards Injury during lifting	Participate in a “Stretch and Flex” program as part of morning tailgate meetings. Reflective vests required Use cones, caution tape, or other barricades as necessary Wear appropriate PPE Wear nitrile gloves and other PPE as necessary. Monitor work zones/breathing zones with PID and Single gas detector monitoring for VC and benzene, as necessary.

Principal Tasks	Potential Safety/Health/Environmental Risks/Hazards	Risk/Hazard Control Methods
	Manage contaminated purge water and materials	Adhere to action limits as specified in HASP Wear appropriate clothing. Take frequent warming breaks. Drink cool/hot liquids If using extension cords and powered sampling equipment, check cords and equipment before use. Lift with knees Ask for assistance with heavy objects Keep back straight and do not twist Keep generation of excess contaminated purge water and materials to a minimum and manage according to work plan.
TASK 6 – Sampling Groundwater Monitoring Wells	Exposure to biologic hazards: insects, poisonous plants and animals. Injuries could include anaphylactic shock, allergic reaction, rabies Damage to equipment or vehicles due to surface / subsurface obstructions Slips / trips / falls due to uneven terrain resulting in broken bones or torn ligaments. Struck by vehicle resulting in severe trauma or death Exposure to chemical hazards in groundwater resulting in inhalation hazard or illness Cross contamination of equipment Cuts / lacerations / bruises to knees (flush mount) Aches and strains from repetitive motion	Identify and avoid hazardous plants and animals on site. Look for signs (spider webs, droppings, etc.). Wear cut resistant gloves, insect repellant; use a broom or a rake to move vegetation, not your hand or foot; move slowly Investigate travel path. Look for surface obstructions such as rubble, debris, old foundations or rebar. Use spotter is available or park in such a manner as to not have to back-up. Identify, mark and avoid slip, trip and fall hazards (holes, obstructions protruding from the ground, or debris). Contact PM immediately and do not proceed if any conditions are observed that cannot be controlled to make well gauging in the area safe. Visually inspect roadway for moving equipment if walking and set up vehicle as a barrier if driving. Set up exclusion zone around each well. Don reflective vest. Stay upwind to avoid vapor exposure. Clean the tape and probe using non-phosphate soap and distilled water. Wipe with clean paper towel. Collect decontamination materials for waste disposal. Wear disposable nitrile gloves. Don knee pads and inspect ground before kneeling down and take frequent breaks to stand and stretch.

Principal Tasks	Potential Safety/Health/Environmental Risks/Hazards	Risk/Hazard Control Methods
		Do not use awkward positioning. Keep back straight, take regular rest/stretch breaks. Change position regularly. Check for location of measuring tape before walking or moving around.
TASK 7 – Decontamination of Equipment.	Flying debris Chemical Exposure Noise (>85 dB) Particulates Hot water and steam Manage debris and wastewater appropriately	Use safety glasses with a face shield and/or goggles Wear appropriate PPE (nitrile inner gloves, chemical resistant outer gloves, coated Tyvek). Hearing protection required. Implement engineering controls (wetting) if high levels of particulates are created. Use PPE (polycoated Tyvek© coveralls, chemical-resistant overboots, nitrile outer gloves, and air purifying respirator) as directed by SSO. If pressure washer is used, use goggles and face shield, and gloves. Keep wand pointed away from hands and face and other people. Keep debris generation to a minimum if possible. Manage in accordance with work plan.
TASK 8 – Investigation Derived Waste (IDW) Management.	Struck by traffic Trips & falls Tools and emergency equipment not present Pinch points at drum ring Sharp edges on drum ring or rim Exertion/sprains/strains Exposure to contaminants	Establish work area so that each site vehicle used for activity are in close proximity of each other; this would prevent unnecessary trips outside of work zone and into potential traffic area. Establish barricaded area using cones and barricade tape. Wear required highly visible clothing. Clear any trip/fall hazards from work area. Scan ground prior to moving or walking Obtain tools and emergency equipment and stage adjacent to work area Use socket set to loosen drum ring, avoid placing fingers in to pinch points. Make sure cut-resistant gloves fit properly (not too big so fingertips get caught) Evaluate rim and ring for sharp edges, avoid handling as much as possible. Wear cut resistant gloves Exertion/sprains/strains •Use proper lifting techniques; this consists of bending your knees and lifting with your back straight. •Shovel loads heavier than 50 lbs. or awkward to handle use a mechanical loading device or ask for help. •Grasp shovel handle properly: Position one hand at base of shovel handle and your other hand near the top of the handle. •Rotate task with others if needed and take breaks. Exposure •Set up upwind of drum. •Wear PPE (e.g., eye protection-goggles, long pants, Nitrile exam gloves, Nitrile over-gloves (11-mil), long wrist) Tyvek coveralls, shirt with sleeves, steel-toed shoes with boot covers, half-face air purifying

Principal Tasks	Potential Safety/Health/Environmental Risks/Hazards	Risk/Hazard Control Methods
		respirator fitted with an organic vapor, acid, HEPA filter combination cartridge). •Perform air monitoring as per HASP. STOP WORK if action level is exceeded.
TASK 9 – Survey	Repetitive Strain/ Motion Injuries Adjacent Site Activities Hot/Cold Weather Exposure Spray Paint Injury during lifting	Participate in a "Stretch and Flex" program as part of morning tailgate meetings Reflective vests required Coordinate with appropriate personnel Keep aware of any adjacent activities and traffic Wear appropriate clothing Take frequent warming breaks Drink cool/hot liquids Keep can pointed away from face Do not use damaged cans. Wear gloves Wear appropriate PPE (safety glasses/goggles) to prevent flying debris from causing eye or other injuries Lift with knees Ask for assistance with heavy objects Keep back straight and do not twist

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Air Knifing	Control #:	01-01-03-04

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Nitrile, anti-vibrate ☒ Hearing Protection ☒ Other: Face shield
Tools & Equipment:	

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk (initial)	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk (final)
1. Identify/Lockout Utilities	1a. Electrocution/contact with energized electrical lines	15	1a. Locate all sources of electricity to site parking lights, air compressor, vacuum, car wash, and ID sign and if possible de-energize lines by using locks and tags. • Call public utility locating service prior to initiating work activities. • Use private locating service to mark out areas on private property. • Verify location of utility marks; do not perform intrusive work if utility location marks cannot be found or if marks are destroyed. Preserve utility marks as much as possible. Call to have utilities remarked if unsure as to their location • If lockout/tagout procedures are used, notify all affected employees on-site of the de-energized condition. • Verify all public and private utility mark outs.	4
On-Site Edits:				
2. Position Rig	**2a**. Injury from or damage to overhead utilities from direct contact with or proximity to (arcing) **2b**. Rig stuck in soft/slippery ground	10 3	**2a**. Check area for hazards. • While moving the rig on site, keep a minimum 4 foot clearance under any electrical lines. • While planning the working position of the rig, keep a minimum 10 foot clearance away from any electrical lines. • Use a spotter when backing. **2b**. Choose the most level path for travel with the rig. • If needed, consider the use of wood, sand, or crushed stone to create a stable working/traveling platform.	4 2

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Air Knifing	01-01-03-04

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk (initial)	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk (final)
	2c. Intrusion by 3rd parties	12	**2c**. Observe the site pedestrian and vehicular traffic patterns. Use cones, flags, and caution tape to establish traffic control and exclusion zones.	4
	2d. Stabilize Vehicles	6	**2d.** Chock wheels on all vehicles and trailers.	3
On-Site Edits:				
3. Remove concrete or asphalt by use of jackhammer to open/ cut concrete/asphalt at location	**3a**. Vibrational or contact injuries and excessive noise	4	**3a**. Wear leather or vibration-absorbing gloves, safety glasses, face shield, hearing protection, and a hard hat. • Use shovels to push debris out of way. • Follow manufacturer's operating procedures for equipment. • Have a stable stance; feet shoulder width apart, hold jackhammer lightly and balanced. • Do not wear excessively loose, baggy clothing or jewelry. • Take a 10-minute break every hour of operation during operation of jackhammer to prevent vibration/repetitive motion injuries.	2
	3b. Fire/explosion from sparks igniting a fuel/vapor source	6	**3b**. If sparks are generated within 35 feet of a vapor source (i.e., an operating pump island) a Hot Work permit must be furnished and air monitoring must take place throughout the cutting procedure if the possibility of flammable vapors exists.	2
	3c. Struck-by injury from disconnected pressurized air lines/hoses	6	**3c**. All hose connections must be secure. All lines should be inspected prior to use. Locking pins and whip checks must be used for all connections that could fail or become disconnected causing the hose to "whip."	2
On-Site Edits:				
4. Air knife operation ***Note:*** *If any evidence of pea stone is observed during any subsurface activity,* ***STOP WORK*** *and notify the project manager immediately.*	**4a**. Bodily injury or hearing damage from air compressor and associated air lines.	6	**4a**. Safety glasses, hearing protection, and work gloves must be worn at all times when compressor is running. • Keep hands and clothing away from rotating machinery. • All hose connections must be secure. All lines should be inspected prior to use. Locking pins and whip checks must be used for all connections that could fail or become disconnected causing the hose to "whip." • Ensure hopper door is securely fastened before work begins.	3

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Air Knifing	01-01-03-04

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
	4b. Personal injury and property damage from contact with high pressure jet and associated flying debris	6	• Ensure all personnel on site know how to shut down machine in case of an emergency. • If dust is generated by operation, use water spray to control. ***Note:*** *Staff must ensure that prior to turning on the air compressor that it is confirmed that the air knife is manned and that the air valve is closed.* **4b**. Do not spray persons with high-pressure jet. • Ensure air lance is equipped with a metal guard attachment, near the nozzle, that is capable of shielding the operator from airborne debris exiting the excavation. • A face shield **and** safety glasses shall be worn in addition to the Level D PPE within a 10 foot area where high-pressure jet is being utilized. Use caution when using high-pressure jet assembly around known underground utilities. • Do not direct high-pressure jet at one point for long periods of time; continually rotate high-pressure spray assembly. • Do not use unit indoors. • Pull the trigger while turning off the machine to make sure piping is not under pressure. • Inform all personnel of restricted area and do not permit unauthorized individuals (i.e., those not properly trained [40-hour OSHA training, etc.] or wearing appropriate PPE) access to the exclusion zone. • If in the vicinity of known pedestrian traffic, use a spotter to alert crew to stop operations to allow pedestrian to pass.	4
	4c. Exposure to or ignition of elevated levels of gasoline vapors	6	**4c**. If there is any gasoline odor or if air knifing activities are occurring in an impacted area, monitoring with a PID and LEL meter is required. Action levels are defined in the HASP.	2
	4d. Equipment damage/failure due to cold temperatures	4	**4d**. When temperatures drop below 20°F or when the water used to conduct subsurface clearance freezes, subsurface clearance should stop until warmer temperatures occur or the safe operation of the machinery is no longer impacted.	1
	4e. Injury from or damage to overhead utilities from direct contact with or proximity to (arcing)	**10**	**4e.** Maintain a distance of at least 10 feet from energized overhead power line. For other overhead lines such as phone or cable lines, if there is a chance of contacting and/or damaging the lines, the appropriate service company should be contacted so that the lines can be relocated or protected.	4
On-Site Edits:				

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Air Knifing	01-01-03-04

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
5. Vacuum operation	5a. Personal injury (burns, pinch points, cuts, hearing damage) from vacuum blower	6	**5a**. Keep hands, clothing, and equipment an arms length away from rotating machinery, inlet and discharge openings. • Avoid contact with blower casing and associated piping; may cause major skin burns on contact. • Ensure guards are in place on external moving parts. • Develop suction line vacuum break mechanism in the event of a vacuum emergency (object caught by the suction hose). • Wear hearing protection when unit is operational	4
	5b. Fire/explosion from ignition of elevated vapors	6	**5b**. Air monitoring must take place on ungrounded Vac-Trons • If LEL levels of breathing zone or working zone (air which is traveling through the Vac-Tron) air exceeds 10%, **STOP WORK**. • Vac-Tron is not to be used to vacuum free-phase petroleum products or soils saturated with petroleum products.	2
	5c. Injury from or damage to overhead utilities from direct contact with or proximity to (arcing)	**10**	**5c**. Maintain a distance of at least 10 feet from energized overhead power line. For other overhead lines such as phone or cable lines, if there is a chance of contacting and/or damaging the lines, the appropriate service company should be contacted so that the lines can be relocated or protected.	4
On-Site Edits:				
6.	6a.		6a.	
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Air Knifing	01-01-03-04

All Employees:

STOP WORK if uncertain about safety or if a hazard or additional precaution is not recorded on the THA.

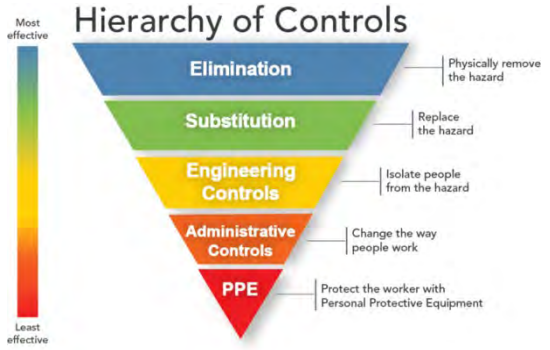
Be alert, recognize and communicate any changes in scope, personnel or conditions at the worksite to the supervisor.

Use **4-Sight**, AECOM's last minute risk assessment process continuously throughout the day by asking yourself and your co-workers to assess your task, hazards, and mitigations. Amend the THA when needed.

- ***What am I about to do?***
- ***What can go wrong?***
- ***What can be done to make it safer?***
- ***What have I done to communicate the hazards?***

For a more thorough identification of hazards, ask "What else could go wrong?" using the Hazard Categories





- ***Most hazards need more than one control***
- ***What should you do? Stack your controls***
- ***PPE can NEVER be your only means of protection***

Worker Sign On	
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Printed Name	**Signature**
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Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Air Knifing	01-01-03-04

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	CORE DRILLING	Control #:	01-01-08-01

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather, nitrile ☒ Hearing Protection ☐ Other:
Tools & Equipment:	Cutting tools, Hot Work Permit

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk (initial)	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk (final)
1. Pre-mobilization, Equipment Inspection	1a. Injury from equipment malfunction	5	1a. Ensure that PM or person responsible for scheduling rental equipment requests that the vendor inspects the equipment prior to site delivery to ensure all appliances are in working order and fit for use	4
On-Site Edits:				
2. Setup Core Drill	**1a**. Injury from improper operation	8	**1a**. Prior to acceptance of equipment from the vendor (if rented equipment), review the operating procedures and maintenance logs with the vendor representative (if applicable).	4
	1b. Contact with cutting tools	8	**1b**. Wear appropriate PPE (i.e., eye protection, long pants, nitrile sampling gloves (inner), leather gloves (outer), hard hat, hearing protection, shirt with sleeves, steel-toed boots.) No loose sleeves – may get caught in rotating drill.	4
	1c. Noise-related hearing loss	6	**1c**. Minimize duration of exposure by taking breaks or alternating operators. Wear hearing protection.	4
	1d. Electric shock causing injury or electrocution	10	**1d**. Utilize protective equipment as follows: • Plug into GFCI-protected outlet or GFCI-protected extension cord. • Use appropriate gauge extension cord. Amperage issues from electric motor could trip breaker • Make sure cord is in good shape. • Ensure water used in coring doesn't affect electric cords or equipment.	4
	1e. Rotating machinery	8	**1e**. Review and understand the following: • Make sure blade/bit is sharp and guards are in place. • Cut away from your body; keep feet out of the path of cutting tools.	4

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	CORE DRILLING	Control #:	01-01-08-01

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk (initial)	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk (final)
			• Place the core drill on a debris-free level surface before cutting. • Make sure base is level, adjust if needed; use adjustment screws for leveling. • Use vacuum pump if on machine to stabilize. Use concrete anchors that are attached to the drill to stabilize the base when there is no vacuum. Stand on the back of base to stabilize it only **ABSOLUTELY** necessary.	
	1f. Flying/shattering objects	8	**1f**. Have bystanders maintain a 5 foot distance from the operation at all times. Wear all required	4
	1g. Back strain from moving drill	6	**1g**. Bend knees to lift out of back of truck. Use two people to prevent back strain. Once on ground you should have wheels (i.e., dolly); item is heavy and awkward.	4
	1h. Hand Injury from moving drill	6	**1h**. Ensure that the drill body lock is engaged and functioning properly prior to transport.	4
	1i. Hand positioning/pinch points	8	**1i**. If feasible, move drill body down the drill pole and place your hand at the top of the drill pole away from the drill body to stabilize the rig during transport. While moving core drill, keep hands away from the top of the drill body where the vertical rollers move the body of the drill up and down on the mast.	4
On-Site Edits:				
3. Starting the core drill	**3a.** Strain or sprain from core drill binding in hole.	7	**3a**. Make sure water is on to hose bib fitting to ensure lubrication of cutting area (i.e., asphalt, concrete, etc.) • Water also displaces cutting debris from core hole. • Concrete is much more difficult to core; be careful of rebar and aggregate in concrete. • Gently and slowly apply force to penetrate the surface of the asphalt. **DO NOT FORCE.** This is not good for drill bit and may cause machine to bind up. Potential to spin and throw you. • If you force bit into concrete it may cause breakage of shaft-safety pin which is a sacrificial break point to alleviate too much force on machine (can be replaced, there usually is a spare on the machine) • Never start the Core Drill while holding it off the ground. • Be careful if restarting in borehole. Make sure the bit is not bound up or it could send the machine into a spin.	4
	3b. Finger injury from pinch points	8	**3b**. Make sure fingers are clear of drill head adjustment teeth. Turn adjustment pin to tighten or loosen drill head to move up and down with crank wheel	4

Task Hazard Analysis

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Task Name:	CORE DRILLING	Control #:	01-01-08-01

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On-Site Edits:				
4. Coring Concrete	**4a.** Flying debris, caught by/ struck by injuries	8	**4a.** Clear aw ay anything that has a chance of interfering w ith the operation. Remove debris that could cause you to slip or lose your balance or accidentally contact the drill blade/bit. Keep both hands aw ay from the rotating drill blade/bit. Make sure that all kill sw itches are functioning properly. If necessary, perform w et cut w hen possible to reduce amount of dust and sparks generated during the cutting process.	4
	4b. Pinch to fingers from removal of core	6	**4b**. If core gets stuck in borehole, use thin stiff w ire w /90 degree bend on end to slide dow n and beneath the core and lift out; be careful not to bang bit too hard (can be easily damaged). Watch you do not pinch fingers in betw een core and side of cored hole. Make sure w ater is on in bit; may push out a stuck core.	4
	4c. Fire/explosion injuries	8	**4c.** Complete a Hot Work Permit w hen completing cuts w ithin 35 feet of a vapor source. ***Note:*** *Air monitoring must take place throughout the cutting procedure if the possibility of flammable vapors exists.*	4
On-Site Edits:				
5.	5a.		5a.	
On-Site Edits:				
6.	6a.		6a.	
On-Site Edits:				

Task Hazard Analysis

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7.	7a.		7a.	
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	CORE DRILLING	Control #:	01-01-08-01

All Employees:

STOP WORK if uncertain about safety or if a hazard or additional precaution is not recorded on the THA.

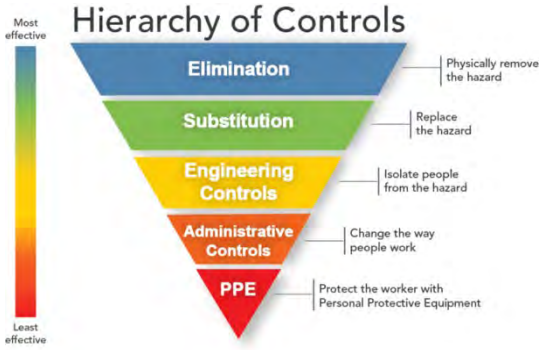
Be alert, recognize and communicate any changes in scope, personnel or conditions at the worksite to the supervisor.

Use **4-Sight**, AECOM's last minute risk assessment process continuously throughout the day by asking yourself and your co-workers to assess your task, hazards, and mitigations. Amend the THA when needed.

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Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	CORE DRILLING	Control #:	01-01-08-01

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Driving to and From Site	Control #:	01-01-12-02

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☐ Hard Hat ☐ Safety Glasses ☐ HiVis Vest ☐ Safety Toe Boots ☐ Gloves: Leather / Nitrile ☐ Hearing Protection ☐ Other:
Tools & Equipment:	Emergency kit Communication device (cell phone) Navigation system

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk (initial)	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk (final)
1. Trip Planning	1a. Unauthorized driving	9	1a. You must be an AECOM authorized driver to drive for AECOM business purposes. Consult the requirements of S3AM-005-PR1. Authorized Drivers shall maintain a current driver's license with full privileges applicable to the vehicle to be operated. Develop a Journey Management Plan if applicable.	4
	1b. Inclement weather	6	1b. Evaluate weather conditions prior to beginning the travel to determine if travel should proceed. Verify your vehicle is equipped to travel in poor weather. Have supplies on hand in the event that you become stranded, including a communication device to call for help.	4
	1c. Getting Lost	6	1c. Review route in advance and program GPS prior to leaving	3
	1d. Inadequate vehicle for the site/trip	7	1d. Understand what type of vehicle is necessary to transport tools & equipment to the site. Know site conditions before departure and obtain proper vehicle, 4-Wheel drive if necessary	4
	1e. Vehicle malfunction	8	1e. Inspect vehicle prior to leaving. Verify that maintenance records are current.	4
On-Site Edits:				
2. Driving	2a. Fatigue	**15**	2a. Start trip well rested & take breaks when needed. Share driving responsibilities where possible. **STOP DRIVING AND PULL OVER** in a safe place if you begin nodding off or showing other signs of fatigue.	4

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Driving to and From Site	Control #:	01-01-12-02

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

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	2b. Risky driving practices	15	2b. Practice defensive driving techniques and avoid bad driving habits • Allow for adequate time to make the trip • Do not speed or attempt to multi-task • Do not use cell phone or text or attempt to program GPS while driving	4
On-Site Edits:				
3. Stops/breaks during transit	3a. Theft of equipment/materials	6	3a. Place any likely theft items out of sight and lock vehicle when leaving it. Do not leave vehicle unattended for longer than necessary. If at all possible, avoid leaving packed vehicles in public parking areas overnight, unload if possible. Park in well lighted areas.	4
	3b. Personal security risk	10	3b. Be alert and aware of surroundings when making stops. Stop at areas which are well lit and have security if possible.	3
On-Site Edits:				
4.	4a.		4a.	
On-Site Edits:				

Additional Notes:

Task Hazard Assessment

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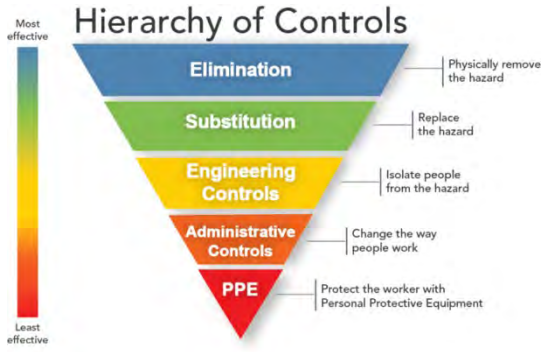
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Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Gauging Liquid Levels in Groundwater Monitoring Wells	Control #:	01-01-05-07

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather, nitrile ☐ Hearing Protection ☐ Other:
Tools & Equipment:	Hand Tools Liquid level/Interface probe Decon materials

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk (initial)	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk (final)
1. Visually clear proposed gauging locations	1a. Exposure to biologic hazards: insects, poisonous plants and animals. Injuries could include anaphylactic shock, allergic reaction, rabies	6	1a. Identify and avoid hazardous plants and animals on site. Look for signs (spider webs, droppings, etc.). Wear cut resistant gloves, insect repellant; use a broom or a rake to move vegetation, not your hand or foot; move slowly	4
	1b. Damage to equipment or vehicles due to surface / subsurface obstructions	6	1b. Investigate travel path. Look for surface obstructions such as rubble, debris, old foundations or rebar. Use spotter is available or park in such a manner as to not have to back-up.	4
	1c. Slips / trips / falls due to uneven terrain resulting in broken bones or torn ligaments.	6	1c. Identify, mark and avoid slip, trip and fall hazards (holes, obstructions protruding from the ground, or debris). Contact PM immediately and do not proceed if any conditions are observed that cannot be controlled to make well gauging in the area safe.	4
	1d. Struck by vehicle resulting in severe trauma or death	10	1d. Visually inspect roadway for moving equipment if walking and set up vehicle as a barrier if driving. Set up exclusion zone around each well. Don reflective vest. **Follow Traffic Control Plan (Attachment G).**	4
On-Site Edits:				
2. Opening well casings / flush-mount covers and well plug lock	2a. Cuts / lacerations / crushing, bruises	6	2a. Avoid touching sharp materials/ edges. Wear cut resistant ANSI 2 gloves. Keep face, hands, fingers, and feet clear when opening and closing well cover. Inspect ground before kneeling, d on knee pads.	2
	2b. Back strain	4	2b. Stretch before working. DO NOT use awkward positioning. Keep back	2

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Gauging Liquid Levels in Groundwater Monitoring Wells	Control #:	01-01-05-07

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk (initial)	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk (final)
		4	straight. Take regular rest/stretch breaks. Change position regularly.	2
	2c. Vapor exposure resulting in inhalation hazards or illness		2c. Stand upwind from the well opening to avoid vapor exposure. Loosen well cap slowly, keeping control if pressure is released due to vapors. Keep face out of line-of-fire.	
	2d. Biologic hazards: insects, poisonous plants, and animals	6	2d. Slowly lift the well cover away from person and look for insects underneath the well. Use long handle tool to remove or kill any insects (i.e. screw driver).	4
On-Site Edits:				
3. Lowering fluid meter probe and measuring tape to detect fluid level and total depth	3a. Cuts / lacerations / bruises to knees (flush mount)	4	3a. Inspect ground before kneeling. Remove any objects. Don knee pads	2
	3b. Aches and strains from repetitive motion	4	3b. Do not use awkward positioning. Keep back straight, take regular rest/stretch breaks. Change position regularly.	2
	3c. Exposure to chemical hazards in groundwater resulting in skin irritation or illness	3	3c. Use smooth movements to avoid splashes. Don nitrile gloves over cut resistant gloves and safety glasses with side shields. Check gloves for damages/ rips.	2
On-Site Edits:				
4. Removing fluid meter measuring tape and probe from well	4a. Exposure to chemical hazards in groundwater resulting in inhalation hazard or illness	4	4a. Stay upwind to avoid vapor exposure.	2
	4b. Cross contamination of equipment	4	4b. Clean the tape and probe using non-phosphate soap and distilled water. Wipe with clean paper towel. Collect decontamination materials for waste disposal. Wear disposable nitrile gloves.	2
	4c. Cuts / lacerations / bruises to knees (flush mount)	4	4c. Don knee pads and inspect ground before kneeling down and take frequent breaks to stand and stretch.	2
	4d. Aches and strains from repetitive motion	4	4d. See Step 3b.	2
	4e. Trips / falls from entanglement in measuring tape	3	4e. Check for location of measuring tape before walking or moving around.	2

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Gauging Liquid Levels in Groundwater Monitoring Wells	Control #:	01-01-05-07

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
On-Site Edits:				
5. Closing well casings / flush-mount covers	5a. Cuts / lacerations / crushing / bruises	4	5a. Avoid touching sharp materials/ edges. Keep face, hands, fingers, and feet clear when opening and closing well cover. Don knee pads and inspect ground before kneeling down.	2
	5b. Back strain from heavy / awkward materials handling	4	5b. Keep back straight. Take regular rest/stretch breaks. Change position regularly. * Verify that well covers are secure upon departure.	2
On-Site Edits:				
6. Gather gauging equipment and tools, place in work vehicle	6a. Cuts / lacerations / crushing / bruises from gathering or dropping equipment	3	6a. Maintain a secure grip on equipment and only carry manageable amount of equipment when demobilizing.	2
	6b. Aches and strains from improper lifting	4	6b. Bend and lift with legs. Keep back straight. Take regular rest/ stretch breaks. Change position regularly. Team lift is required for items over 50 lbs. (or awkward items). * Verify all tools and equipment are removed from the site.	2
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Gauging Liquid Levels in Groundwater Monitoring Wells	Control #:	01-01-05-07

All Employees:

STOP WORK if uncertain about safety or if a hazard or additional precaution is not recorded on the THA.

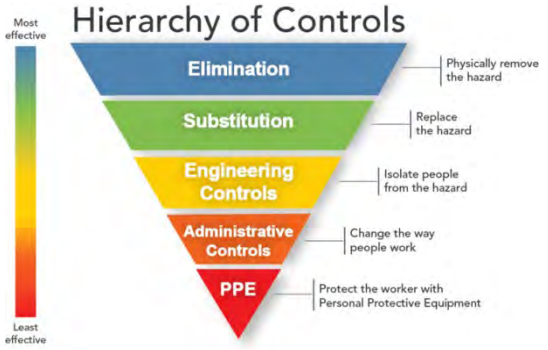
Be alert, recognize and communicate any changes in scope, personnel or conditions at the worksite to the supervisor.

Use **4-Sight**, AECOM's last minute risk assessment process continuously throughout the day by asking yourself and your co-workers to assess your task, hazards, and mitigations. Amend the THA when needed.

- ***What am I about to do?***
- ***What can go wrong?***
- ***What can be done to make it safer?***
- ***What have I done to communicate the hazards?***

For a more thorough identification of hazards, ask "What else could go wrong?" using the Hazard Categories





- ***Most hazards need more than one control***
- ***What should you do? Stack your controls***
- ***PPE can NEVER be your only means of protection***

Worker Sign On	
I participated in the on-site review and fully understand the content of this Task Hazard Assessment.	
Printed Name	**Signature**
1. Supervisor:	
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Visitor Acknowledgement
Visitors review task hazards and acknowledge understanding
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Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Gauging Liquid Levels in Groundwater Monitoring Wells	Control #:	01-01-05-07

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Geoprobe Drilling Oversight	Control #:	01-01-03-01

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather, nitrile ☒ Hearing Protection ☐ Other:
Tools & Equipment:	

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk (initial)	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk (final)
1. Mobilization	1a. Striking unidentified underground utilities	15	1a. Call public utility locating service prior to initiating work activities. Use private locating service to mark out areas on private property. Verify location of utility marks; do not perform intrusive work if utility location marks cannot be found or if marks are destroyed. Preserve utility marks as much as possible. Call to have utilities remarked if unsure as to their location.	4
	1b. Striking overhead utilities	15	1b. Follow the requirements of S3AM-322-PR1 Overhead Lines. Verify adequate clearance of all drilling locations prior to setting up at drilling location.	4
On-Site Edits:				
2. Setting up at drilling location	2a. Biological hazards causing bites, stings or other injury	8	2a. Examine ground surface for biological hazards prior to setting up equipment. If biological hazards exist, move equipment to a different area for set up if possible. Machetes, or other fixed open blade tools, are not permitted for clearing vegetation. Use insect repellent and check clothing for ticks periodically when applicable.	4
	2b. Struck by traffic	10	2b. Be alert to other vehicles or pedestrians if work area is in an area with public access. Communicate with any heavy equipment operators in the area to ensure they know where you and the equipment are located. Don high visibility vest.	4
	2c. Unstable Rig platform	10	2c. Verify with contractor that rig is set up level and properly chocked and blocked.	2
On-Site Edits:				

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Geoprobe Drilling Oversight	Control #:	01-01-03-01

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

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3. Oversight of rig inspection	3a. Mechanical failure of equipment	**10**	3a. Verify that drilling contractor inspects equipment daily using S3AM-321-FM1 Daily Drilling, Boring & Direct-Push Equipment Inspection or equivalent.	4
	3b. Emergency shut off disabled	6	3b. Verify that kill switch on rig is tested and operational	3
On-Site Edits:				
4. Drilling Oversight	4a. Flying debris, caught by/ struck by injuries	8	4a. Keep a safe distance away during rig operation. Do not talk on cell phone or be distracted by paperwork when in immediate proximity to rig. Wear PPE including hard hats, steel-toe safety boots, safety glasses, and hearing protection.	4
	4b. Caught in/by equipment	**10**	4b. Keep hands, feet and other body parts shall be kept away from moving parts. Do not approach operator without making eye contact and getting approval.	4
	4c. Exposure to contaminants	8	4c. Position yourself upwind of the borehole whenever possible. Perform air monitoring using a PID as described in the HASP. **STOP WORK** if the action level is exceeded.	4
	4d. Noise-induced hearing loss	5	4d. Setup away from noisy operations. Don't be near the rig when hammering. Wear hearing protection.	3
On-Site Edits:				
5.	5a.		5a.	
On-Site Edits:				
6.	6a.		6a.	
On-Site Edits:				

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Geoprobe Drilling Oversight	Control #:	01-01-03-01

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7.	7a.		7a.	
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

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Task Name:	Geoprobe Drilling Oversight	Control #:	01-01-03-01

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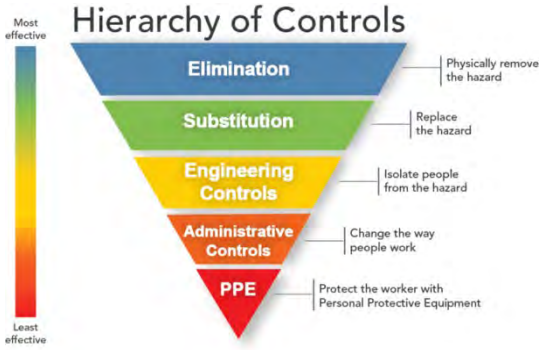
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Task Hazard Analysis

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Task Name:	Geoprobe Drilling Oversight	Control #:	01-01-03-01

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Groundwater Sampling – Bailer	Control #:	01-01-23-07

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: nitrile, cut resistant 2 ☐ Hearing Protection ☐ Other:
Tools & Equipment:	Hand tools Bailer/twine

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk (initial)	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk (final)
1. Visually clear proposed sampling locations	1a. Exposure to biological hazards: insects, poisonous plants and animals. Injuries could include anaphylactic shock, allergic reactions, rabies.	6	1a. Identify and avoid hazardous plants and animals on site. Look for signs (spider webs, droppings, etc.). Wear cut resistant gloves, insect repellant, use a broom or a rake to move vegetation, not your hand or foot, move slowly	4
	1b. Slip/trips, falls due to uneven terrain resulting in broken bones or torn ligaments.	6	1b. Identify, mark and avoid slip, trip and fall hazards (holes, obstructions protruding from ground, or debris). Contact PM immediately and do not proceed if any conditions are observed that cannot be controlled to make well sampling in the area safe.	4
	1c. Struck by vehicle resulting in severe trauma or death	**10**	1c. Visually inspect roadway for moving equipment if walking and set up vehicle as a barrier if driving. Set up exclusion zone around each well. Don reflective vest.	4
On-Site Edits:				
2. Open well casing/flush-mount covers and well plug lock.	2a. Cuts/lacerations/crushing, bruises	6	2a. Avoid touching sharp material/edges. Wear cut resistant ANSI 2 gloves. Keep face, hands, fingers, and feet clear when opening and closing well cover. Inspect ground before kneeling. Don knee pads.	2
	2b. Back strain from improper lifting	4	2b. Stretch before working. DO NOT use awkward positioning. Keep back straight. Take regular rest/stretch breaks. Change position regularly.	2
	2c. Vapor exposure resulting in inhalation hazards or illness	4	2c. Stand upwind from the well opening to avoid vapor exposure. Loosen well cap slowly, keeping control if pressure is released due to vapors. Keep face out of line-of-fire.	2
		6		4

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Groundwater Sampling – Bailer	Control #:	01-01-23-07

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	2d. Biologic hazards; insects, poisonous plants, and animals		2d. Slowly lift the well cover away from person and look for insects underneath the well. Use long handle tool to remove or kill any insects (i.e. screwdriver).	
On-Site Edits:				
3. Purge monitoring well	3a. Exposure to site contaminants causing health issues or irritation/dermatitis	6	3a. Bail slowly with controlled motions. Obtain a firm grasp on the bailer which may be slick with water and the presence of LNAPL. Wear appropriate PPE (i.e., eye protection, long pants, nitrile sampling gloves, shirt with sleeves, steel-toed boots).	2
	3b. Hand laceration from cutting bailing string	6	3b. When cutting bailing string to attach to bailer, cut away from the body, not towards. Use scissors or a cutting tool with a protected blade such as a safety knife. Wear a minimum of cut resistant level 2 gloves.	2
	3c. Repetitive motion injury from bailing purge water	6	3c. Take frequent breaks as needed to prevent fatigue to shoulder and arm muscles caused by bailing water. Be aware of pain, tingling or loss of feeling associated with repetitive stress injuries and report all symptoms immediately.	4
On-Site Edits:				
4. Sampling well	4a. Exposure to chemical hazards in groundwater resulting in inhalation hazard or illness	4	4a. Stay upwind to avoid vapor exposure. Do not splash purged water on clothing or skin. Maintain a firm grasp on the bailer which may be slick with water and the presence of LNAPL. Wear appropriate PPE (i.e., eye protection, long pants, nitrile sampling gloves, shirt with sleeves, steel-toed boots).	2
	4b. Burns to the skin/eyes from contact with sample preservatives	4	4b. Avoid contact with preservatives (HCl, HNO_3, and H_2SO_4). These are commonly corrosive and can burn the skin/eyes on contact. Cut resistant level 2 and nitrile surgical gloves should be worn when opening a cooler and retrieving sample collection containers as sample preservative may have leaked from a container or multiple containers.	2
	4c. Cuts to the hand from chipped/broken bottleware	6	4c. Inspect bottleware for cracks and chips. When closing glassware, close lid without exerting strong pressure. Keep hands separated when closing VOA vials (hold bottom of vial and close lid with fingertips of other hand). Wear cut resistant level 2 gloves beneath nitrile surgical gloves.	2

Task Hazard Analysis

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Task Name:	Groundwater Sampling – Bailer	Control #:	01-01-23-07

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On-Site Edits:				
5. Closing well casings/flush mount covers	5a. Cuts/ lacerations/crushing, bruises	4	5a. Avoid touching sharp material/edges. Wear cut resistant level 2 gloves. Keep face, hands, fingers feet clear when closing well cover. Don knee pads and inspect ground before kneeling down.	2
	5b. Back strain from heavy/awkward material handling	4	5b. Keep back straight. Take regular rest/stretch breaks. Change position regularly.	2
On-Site Edits:				
6. Gather sampling equipment and tools, place in work vehicle	6a. Cuts/crushing/bruises from gathering or dropping equipment	3	6a. Maintain a secure grip on equipment and only carry manageable amount of equipment when demobilizing. Wear cut resistant or leather gloves	2
	6b. Aches and strains from improper lifting	4	6b. Bend and lift with legs. Keep back straight. Take regular rest/stretch breaks. Change position regularly. Team lift is required for items over 50 lbs. (or awkward items).	2
On-Site Edits:				
7.	7a.		7a.	
On-Site Edits:				

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Groundwater Sampling – Bailer	Control #:	01-01-23-07

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Groundwater Sampling – Bailer	Control #:	01-01-23-07

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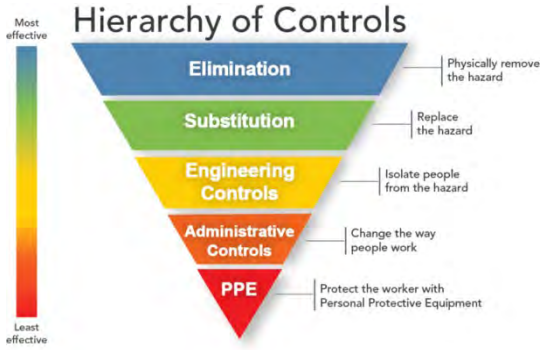
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Worker Sign On		Visitor Acknowledgement
I participated in the on-site review and fully understand the content of this Task Hazard Assessment.		*Visitors review task hazards and acknowledge understanding*
Printed Name	**Signature**	
1. **Supervisor:** Katie Scott		1.
2. Stuart Bell		2.
3.		3.
4.		4.
5.		5.
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Task Hazard Analysis

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Task Name:	Groundwater Sampling – Bailer	Control #:	01-01-23-07

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Grout Mixing and Pumping	**Control #:**	01-01-05-01

Project Name:	Remedial Design Artco Industrial Laundries	**Client:**	NYSDEC	**Date:**	12/30/2019
Permits Required? (list):		**Work Location:**	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather, Nitrile ☒ Hearing Protection ☒ Other: Face shield/goggles/Particulate dust mask
Tools & Equipment:	Grout mixer/pump Fire extinguisher Hand tools

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
1. Inspect grout mixer/pump	**1a.** Personnel, property, and/or equipment damage due to failure to inspect mixer/pump properly	6	**1a.** Read startup and shutdown procedures shown on grout mixer/pump or read operating manual that accompanies unit. Check all fluid levels if equipped with gas engine. Be familiar with how to shut off mixer/pump in case of an emergency. Check that unit has adequate amount of fuel in the tank. Check all hydraulic hoses and fittings for leaks, wear, and proper connection. Ensure all guards are in place.	2
	1b. Contact with fuel	3	**1b.** Never overfill tank due to fuels expanding when heated. Make certain that fuel cap is fastened tight. Wear nitrile gloves underneath leather gloves during inspection.	1
On-Site Edits:				
2. Start and operate grout mixer/pump	**2a.** Fire. Hydraulic oil leaks. Grout leaks.	6	**2a.** Have a fire extinguisher easily accessible. Do not stage extinguisher next to grout mixer/pump or fuel source so you can still reach it in case of fire. Remove all combustible materials from the work area. Inspect hydraulic hoses and fittings for leaks. Inspect grout pump, connections, and hose for leaks. Stop work and correct and leaks.	2
	2b. Carbon monoxide poisoning.	10	**2b.** Provide adequate ventilation for grout mixer/pump. Do not operate unit within enclosed spaces where carbon monoxide and other exhaust gases can accumulate.	2

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Grout Mixing and Pumping	Control #:	01-01-05-01

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
	2c. Burns or equipment damage from contact with hot surfaces and exhaust.	6	**2c.** Wear leather gloves when working around grout mixer/pump to avoid burns if you accidentally contact hot surfaces. Avoid contact with hot exhaust that could burn skin or melt/burn other equipment placed too close to the unit.	2
	2d. Noise.	4	**2d.** Wear hearing protection while operating grout mixer/pump.	2
On-Site Edits:				
3. Add grout materials to mixer	**3a.** Exposure to dust	**10**	**3a.** Wear a dust mask to protect against airborne particles. Wear leather gloves when adding materials to mixing tank. Open bags of dry materials in a controlled manner to minimize dust. Try to stay upwind from grout mixing.	2
	3b. Injury from entanglement in drive shaft or mixing paddles	6	**3b.** Do not reach into the mixing tank during operation. Do not wear loose clothing or use tools that could become entangled in drive shaft or mixing paddles. Turn the unit off before attempting to service the mixer or clear debris.	2
	3c. Splashes and spills	4	**3c.** Wear face shield to guard against splashes. Add water or other liquid additives in a controlled manner to avoid splashes. Do not exceed the capacity of the mixing tank.	1
	3d. Muscle strain.	9	**3d.** Stage bags of dry materials as close to mixer as possible. Use a buddy to help move heavy bags. If possible, lower the height of mixer to minimize lifting.	3
	3e. Hand injury from opening bags on breakers. Pinch points.	6	**3e.** Wear leather gloves when placing bags of dry materials onto bag breakers. Do not place hands between heavy bags and the bag breakers.	2
On-Site Edits:				

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Grout Mixing and Pumping	Control #:	01-01-05-01

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
4. Pump grout	**4a.** Splashes and spills	4	**4a.** Release grout in a controlled manner from the mixing tank into the pump hopper. Do not overfill the hopper.	1
	4b. Injury from pinch points	6	**4b.** Keep hands away from mechanical valve that feeds grout into the pump hopper.	6
	4c. Entanglement in grout hose reel	3	**4c.** Keep hands away from hose reel while in use. Do not wear loose clothing or use tools that could become entangled in hose reel. Always put the hose reel in neutral before starting the grout mixer/pump.	1
On-Site Edits:				
5. Refuel engine	**5a.** Fire	6	**5a.** NEVER fuel the engine while it is running. Turn the engine off (follow shut-down procedures). Allow engine to cool down prior to refueling. Watch the fuel level carefully when refueling; stop adding fuel when 90% full to prevent spillage and to allow fuel to expand when heated. Make sure to replace fuel cap tightly and clean any residual fuel from engine surfaces.	2
	5b. Spills	4	**5b.** In the event of a fuel spill, clean up immediately with an absorbent pad.	1
	5c. Contact with fuel	3	**5c.** Wear nitrile gloves when refueling engine.	1
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Grout Mixing and Pumping	Control #:	01-01-05-01

All Employees:

STOP WORK if uncertain about safety or if a hazard or additional precaution is not recorded on the THA.

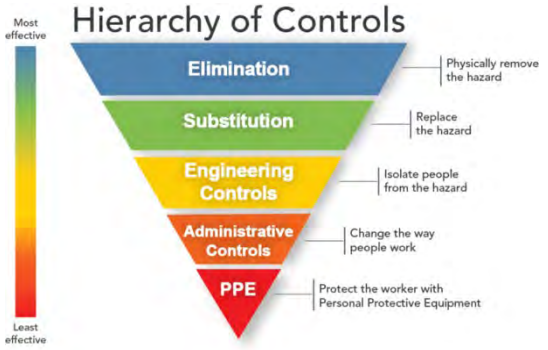
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For a more thorough identification of hazards, ask "What else could go wrong?" using the Hazard Categories





- ***Most hazards need more than one control***
- ***What should you do? Stack your controls***
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Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Grout Mixing and Pumping	Control #:	01-01-05-01

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Helium Trace Test	Control #:	01-01-05-11

Project Name:	**Remedial Design Artco Industrial Laundries**	**Client:**	NYSDEC	**Date:**	12/30/2019
Permits Required? (list):		**Work Location:**	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Nitrile, Kevlar, Leather ☒ Hearing Protection If noise level above 85dbA ☐ Other:
Tools & Equipment:	Helium Detector Insect Repellant

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
1. Preparation. Use 2% Helium to calibrate Dielectric MGD 2000 or Ion Science Gas Detector	1a. Inhalation of Helium may cause headache, dizziness, labored breathing, unconsciousness	8	1a. Do not inhale or allow others to inhale helium	2
	1b. Gas contained in pressurized container, container punctured or explodes causing injury from shrapnel or helium gas in confining area	**8**	1b. Remove regulator when not in use, Secure cylinder, keep cylinder away from heat source, do not store in automobile or truck with windows closed on hot days,	2I
On-Site Edits:				
2. At well, Inspect and open well cap and cover	2a. Potential exposure to site contaminants, potential injury dependent upon contaminate concentration and type	8	2a. Measure environment with an LEL or PID prior to using helium detector to ensure area is safe. Wear identified PPE.	4
	2b. Cuts or crushing injury from pinch points at lids / caps.	8	2b. Wear leather gloves. Note any damage to lids, bolts or locks and record in field book	4
	2c. Insect bites from ants, spiders, ticks.	8	2c. Inspect well carefully, if sign of insects, allow to scatter.	4

Task Hazard Analysis

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Task Name:	Helium Trace Test	Control #:	01-01-05-11

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On-Site Edits:				
3. Collect helium readings	3a. Exposure to site contaminates, unknown vapors causing dermatitis or inhalation injury	8	3a. Use PID and Multigas meter to determine area atmosphere is free of contaminates and vapors. If contaminates are found above acceptable levels, stop work and contact the SSO.	4
	3b. Trip and fall injury	7	3b. Ensure sample collection tubing and sampling materials are placed behind cones, flags or caution tape to increase visibility reduce chance of tripping over same	4
	3c.Pinch Point injury to fingers when attaching tubing to collection port	5	3c Keep fingers clear of collection port area when attaching tubing. Wear nitrile gloves under leather protective gloves. ***Note:*** *If the sampling event calls for the use of Tedlar bags to collect vapor for analysis, refer to the instruction below:* • Connect vapor sampling assembly (inlet and outlet tubing, vacuum pump) to the vapor sampling collection port. • Withdraw vapor sample from vapor stream and collect in sample container. • Secure container by closing the sample intake valve. • Preserve gas sample in chilled cooler for transport to analytical lab for analysis. • Secure vapor sampling collection port (lock and seal).	2
On-Site Edits:				
4.	4a.		4a.	

Task Hazard Analysis

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On-Site Edits:				
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On-Site Edits:				

Additional Notes:

Task Hazard Analysis

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Task Name:	Helium Trace Test	Control #:	01-01-05-11

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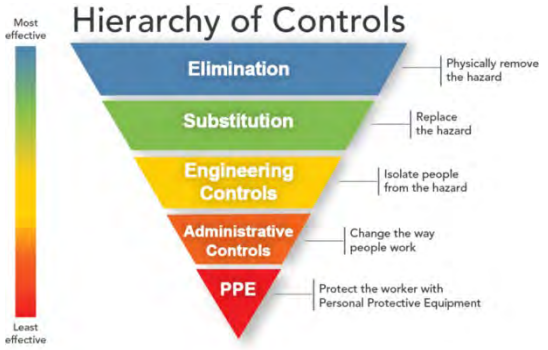
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Task Hazard Analysis

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Task Name:	Helium Trace Test	Control #:	01-01-05-11

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Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Hollow Stem Auger Drilling Oversight	Control #:	01-01-03-05

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather, nitrile ☒ Hearing Protection ☐ Other:
Tools & Equipment:	PID Noise/Sound Meter or app

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
1. Mobilization	1a. Striking unidentified underground utilities	15	1a. Call public utility locating service prior to initiating work activities. Use private locating service to mark out areas on private property. Verify location of utility marks; do not perform intrusive work if utility location marks cannot be found or if marks are destroyed. Preserve utility marks as much as possible. Call to have utilities remarked if unsure as to their location.	4
	1b. Striking overhead utilities	15	1b. Follow the requirements of S3AM-322-PR1 Overhead Lines. Verify adequate clearance of all drilling locations prior to setting up at drilling location.	4
On-Site Edits:				
2. Setting up at drilling location	2a. Biological hazards causing bites, stings or other injury	8	2a. Examine ground surface for biological hazards prior to setting up equipment. If biological hazards exist, move equipment to a different area for set up if possible. Machetes, or other fixed open blade tools, are not permitted for clearing vegetation. Use insect repellent and check clothing for ticks periodically when applicable.	4
	2b. Struck by traffic causing serious bodily injury	10	2b. Be alert to other vehicles or pedestrians if work area is in an area with public access. Communicate with any heavy equipment operators in the area to ensure they know where you and the equipment are located. Don high visibility vest.	4
	2c. Unstable Rig platform causing tip/fall with cruching injuries	10	2c. Verify with contractor that rig is set up level and properly chocked and blocked.	2

Task Hazard Analysis

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Task Name:	Hollow Stem Auger Drilling Oversight	Control #:	01-01-03-05

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On-Site Edits:				
3. Oversight of rig inspection	3a. Mechanical failure of equipment	**10**	3a. Verify that drilling contractor inspects equipment daily using S3AM-321-FM1 Daily Drilling, Boring & Direct-Push Equipment Inspection or equivalent.	4
	3b. Emergency shut off disabled	6	3b. Verify that kill switch on rig is tested and operational	3
On-Site Edits:				
4. Drilling Oversight	4a. Flying debris, caught by/ struck by injuries	8	4a. Keep a safe distance away during rig operation. Always stand outside of the tip/fall radius of the mast, recommended safe distance is to be no less than 30 feet away from the rig, or the mast height plus 5 feet. Do not talk on cell phone or be distracted by paperwork when in immediate proximity to rig. Stay a safe distance (minimum 5') from outriggers. Do not place or store any equipment on the rig. Verify that all personnel follow S3NA_321_PR1 Drilling, Boring, Direct Push Probing. Wear PPE including hard hats, steel-toe safety boots, safety glasses, and hearing protection.	4
	4b. Caught in/by equipment	**10**	4b. Keep hands, feet and other body parts shall be kept a minimum of 5' away from moving parts. When augers are rotating, stay clear of the rotating auger and other rotating/moving components of the drill rig, i.e. outriggers. Do not approach operator without making eye contact and getting approval. Watch for loose clothing (hooded sweatshirts, baggy clothing, loose shoelaces).	4
	4c. Exposure to contaminants causing injury or illness	8	4c. Position yourself upwind of the borehole whenever possible. Perform air monitoring using a PID as described in the HASP. **STOP WORK** if the action level is exceeded.	4
	4d. Noise-induced hearing loss from loud drilling operations	5	4d. Setup at least 30' away from noisy operations. Don't be near the rig when hammering. Measure dB levels with a noise meter. Wear hearing protection.	3
On-Site Edits:				

Task Hazard Analysis

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Task Name:	Hollow Stem Auger Drilling Oversight	Control #:	01-01-03-05

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On-Site Edits:				
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On-Site Edits:				
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On-Site Edits:				

Additional Notes:

Task Hazard Analysis

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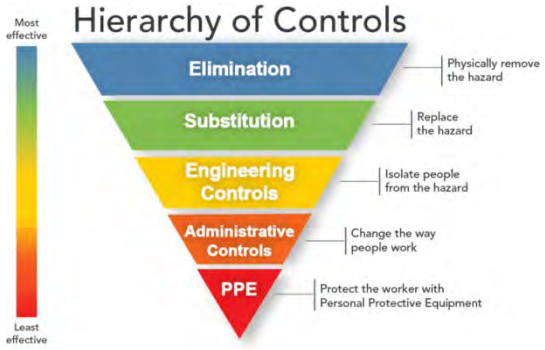
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Task Hazard Analysis

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Task Name:	Hollow Stem Auger Drilling Oversight	Control #:	01-01-03-05

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Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Investigation Derived Waste Management	Control #:	01-01-14-02

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☐ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather or work gloves with Nitrile undergloves ☐ Hearing Protection ☒ Other: Tyvek as needed to protect skin and clothing
Tools & Equipment:	Socket set; 55-gallon open top drum; Emergency eyewash and rinse water; Spill kit Photoionization detector with 11.7 eV lamp

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk (initial)	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk (final)
1. Secure work area from traffic	1a. Struck by traffic	10	1a. Establish work area so that each site vehicle used for activity are in close proximity of each other; this would prevent unnecessary trips outside of work zone and into potential traffic area. Establish barricaded area using cones and barricade tape. Wear required highly visible clothing.	4
On-Site Edits:				
2. Prepare work area	2a. Trips & falls 2b. Tools and emergency equipment not present	6 8	2a. Clear any trip/fall hazards from work area. Scan ground prior to moving or walking 2b. Obtain tools and emergency equipment and stage adjacent to work area	4 4
On-Site Edits:				
3. Remove drum lid	3a. Pinch points at drum ring 3b. Sharp edges on drum ring or rim	6 7	3a. Use socket set to loosen drum ring, avoid placing fingers in to pinch points. Make sure cut-resistant gloves fit properly (not too big so fingertips get caught) 3b. Evaluate rim and ring for sharp edges, avoid handling as much as possible. Wear cut resistant gloves	4 4

Task Hazard Analysis

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Task Name:	Investigation Derived Waste Management	Control #:	01-01-14-02

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On-Site Edits:				
4. Load soil into drums	4a. Exertion/sprains/strains	8	4a. Exertion/sprains/strains • Use proper lifting techniques; this consists of bending your knees and lifting with your back straight. • Shovel loads heavier than 50 lbs or awkward to handle use a mechanical loading device or ask for help. • Grasp shovel handle properly: Position one hand at base of shovel handle and your other hand near the top of the handle. • Rotate task with others if needed and take breaks.	7
	4b. Exposure to contaminants	6	4b. Exposure • Set up upwind of drum. • Wear PPE (e.g., eye protection-goggles, long pants, Nitrile exam gloves, Nitrile over-gloves (11-mil), long wrist) Tyvek coveralls, shirt with sleeves, steel-toed shoes with boot covers, half-face air purifying respirator fitted with an organic vapor, acid, HEPA filter combination cartridge). • Perform air monitoring as per HASP. **STOP WORK** if action level is exceeded.	4
	4c. Slips/trips/falls	6	4c. Be alert for uneven and slippery terrain. Keep tools and equipment away from walking paths.	4
	4d. Sharp edges on drum rim	6	4d. Inspect rim for sharp and rough edges, avoid leaning into drum or placing hands onto rim edge Wear cut-resistant gloves	2
On-Site Edits:				
5. Replacing drum ring	5a. Pinch points	7	5a. Use socket set to tighten drum ring, avoid placing fingers in to pinch points. Make sure gloves fit properly (not too big so fingertips get caught)	5

Task Hazard Analysis

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On-Site Edits:				
6. Moving/relocating drums	6a. Exertion 6b. Trips and Falls	**15** **6**	6a. Exertion • If drums must be moved utilize a drum dolly. • DO NOT ATTEMPT TO "WALK" or "ROCK" DRUMS TO MOVE THEM. • Drums can become unstable and easily tip-over causing possible damage and personal injury as well as releasing the material contained. 6b. See 2a above	4 5
On-Site Edits:				
7.	7a.		7a.	
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

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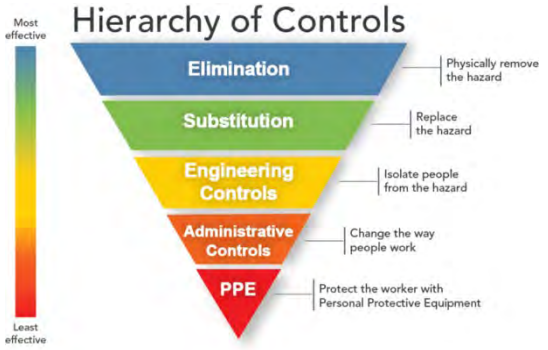
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Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Land Survey – At-Grade	Control #:	01-01-10-06

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rochester, NY		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather/mechanic ☐ Hearing Protection ☐ Other:
Tools & Equipment:	Survey Equipment Hammer Stakes/pins

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
1. Setup and use typical survey equipment	1a. Straining back or other parts of body due to improperly lifting or moving heavy objects	4	1a. Stretch before working. Bend and lift with legs and arms, not back. Team-lift any items that are awkward or over 50 pounds. If removing from the back of a truck, slide the case to the tailgate and lift from tailgate and not from over the side of the truck bed	2
	1b. Bruising or broken bone in finger due to getting caught in a pinch point in the survey equipment.	4	1b. Avoid placing hands near the sides or bottom of the tailgate. Ensure no other workers have their hands near the pinch points and that hands should be all clear. Carefully use the survey equipment watching for pinch points. Wear leather or Kevlar gloves	3
	1c. Straining, tearing or fracturing body parts from slipping, tripping or falling from carrying too much equipment at one time	4	1c. Do not try to carry too much. If you are carrying something over your shoulder and in both hands, you are at a much greater chance to trip and cannot catch yourself. Make multiple loads or get assistance.	2
	1d. Straining a wrist, arm or neck or sustaining other ergonomic injury due to prolonged survey work	4	1d. Survey work can be repetitive – stretch regularly and report ergonomic injuries (strain, etc) as soon as you notice them.	3
	1e. Injury or illness caused by unwanted contact with various animals, insects or other biological hazards	4	1e. There are many different types of biological hazards that can be encountered on a work site. These include ticks, spiders, mosquitoes, chiggers, poisonous or other noxious plants, alligators, bears, small mammals, bird droppings, small mammals, snakes, etc. Consult S3AM-313-PR1 and the multiple attachments to determine the biological hazards that may be present and the mitigation measures for each. Update to make site-specific	3

Task Hazard Analysis

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Task Name:	Land Survey – At-Grade	Control #:	01-01-10-06

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Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
	1f. Sunburn caused by over-exposure to direct sunlight	4	1f. Have sunblock available and apply and reapply as per directions. Avoid direct solar exposure when possible. Seek breaks in shaded areas	2
On-Site Edits:				
2. Hammering stakes/nails/benchmarks into ground	2a. Sustaining serious personal injury or utility damage from contacting nearby utilities	8	2a. Ensure subsurface clearance protocol and permit requirements are being followed (in many states one-call must be performed before driving benchmarks – which can be 36 inch long- into ground) before beginning work. If a utility, pea gravel, or non-native fill material is encountered, **STOP WORK** and call the PM	3
	2b. Straining back or pulling other muscles from repetitive hammering action	4	2b. Do not turn at waist, turn with arms and shoulders and keep both feet square. Be mindful to take breaks and rotate shifts.	3
	2c. Pinching hands or developing blisters from improper use of hammers and other equipment.	4	2c. Note line of fire and position hands where you cannot get struck by the hammer. Pay attention to the task at hand and avoid distractions. Wear gloves to avoid blisters and reduce chance of injury.	2
	2d. Eye injury due to flying debris	4	2d. Inspect tools and stakes/pins for chips, burs, and "mushrooming". Ensure no one is standing within 10' of your work area. Wear safety glasses when using the hammer to prevent flying debris from hitting eyes	2
On-Site Edits:				
3. Working near roadway	3a. Sustaining critical injuries caused by being struck by oncoming vehicles	**15**	3a. Place "Surveyor Ahead" signs when possible. Work outside guardrail whenever possible. Keep AECOM vehicle parked between you and oncoming traffic, with wheels pointed away from road, and all flashing lights on. Place cones between traveled way, and you. If working adjacent to high-speed roadway (55 mph or above), you MUST have a spotter who is observing traffic at all times. Wear high-visible vest. **Follow Traffic Control Plan (Attachment G).**	4
On-Site Edits:				

Task Hazard Analysis

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Task Name:	Land Survey – At-Grade	Control #:	01-01-10-06

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
4.	4a.		4a.	
On-Site Edits:				
5.	5a.		5a.	
On-Site Edits:				
6.	6a.		6a.	
On-Site Edits:				
7.	7a.		7a.	
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Land Survey – At-Grade	Control #:	01-01-10-06

All Employees:

STOP WORK if uncertain about safety or if a hazard or additional precaution is not recorded on the THA.

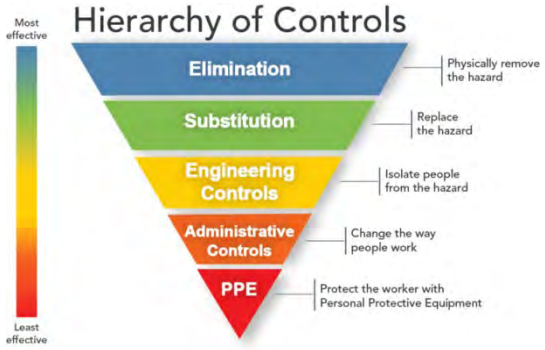
Be alert, recognize and communicate any changes in scope, personnel or conditions at the worksite to the supervisor.

Use **4-Sight**, AECOM's last minute risk assessment process continuously throughout the day by asking yourself and your co-workers to assess your task, hazards, and mitigations. Amend the THA when needed.

- ***What am I about to do?***
- ***What can go wrong?***
- ***What can be done to make it safer?***
- ***What have I done to communicate the hazards?***

For a more thorough identification of hazards, ask "What else could go wrong?" using the Hazard Categories





- ***Most hazards need more than one control***
- ***What should you do? Stack your controls***
- ***PPE can NEVER be your only means of protection***

Worker Sign On	
I participated in the on-site review and fully understand the content of this Task Hazard Assessment.	
Printed Name	**Signature**
1. Supervisor:	
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Visitor Acknowledgement
Visitors review task hazards and acknowledge understanding
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Submit a new THA for addition to the DCSA THA Library or send THA improvement suggestions to DCSA.THA.Library@AECOM.com

Task Hazard Analysis

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Task Name:	Land Survey – At-Grade	Control #:	01-01-10-06

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Load and Unload Vehicle	Control #:	01-01-12-04

Project Name:	**Remedial Design Artco Industrial Laundries**	**Client:**	NYSDEC	**Date:**	12/30/2019
Permits Required? (list):		**Work Location:**	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☐ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: High vis mechanix style gloves ☐ Hearing Protection ☐ Other:
Tools & Equipment:	Hand truck or dolly

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
1. Load & Unload Vehicle	1a. Sprains/strains/ overexertion	8	1a. To minimize the risk: • Use dollies, carts, come-alongs, or rollers whenever possible rather than the employee physically moving materials. • Use proper lifting techniques by bending and lifting with legs and not back, and do not over extend or twist. Do not lift over 49 lbs. without assistance. Seek assistance when needed and know your lifting limit • Minimize distance needed to move materials and stage loading and unloading areas as close as possible.	4
	1b. Pinch points between load and vehicle or between load items	**10**	1b. Know where your hands and other people's hands are at all times. Wear high vis gloves as a reminder. Avoid placing fingers under load while positioning. Use caution with tailgates and vehicle doors, especially under windy conditions.	4
	1c. Slips/trips/falls	**10**	1c. Inspect and clear walking path prior to beginning loading. Do not stack loads that impair visibility.	4
	1d. Nicks and cuts from equipment edges	6	1d. Inspect materials and equipment for rough edges and burrs. Wear cut resistant gloves.	4
On-Site Edits:				

Task Hazard Analysis

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Task Name:	Load and Unload Vehicle	Control #:	01-01-12-04

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
2. Secure & cover exposed loads	2a. Line of fire hazards from straps/bungee cords	15	2a. Do not throw straps toward other personnel. Using extreme caution when stretching the bungee cord over a load. ALWAYS use safety glasses when handling bungee cords. Securing hook ends carefully and never extend the cord beyond its capacity of length or load. Keep your face and other parts away from the cord's rebound path just in case of failure or recoil.	4
	2b. Load shift in transit	10	2b. Use straps or bungee cords to properly secure load. Use a bulkhead to prevent heavy loads from shifting upon sudden stops.	4
	2c. Theft of tools & equipment	8	2c. Place any likely theft items out of sight and lock vehicle when leaving it. Do not leave vehicle unattended for longer than necessary. If at all possible, avoid leaving packed vehicles in public parking areas overnight, unload if possible. Park in well lighted areas.	4
On-Site Edits:				
3.	3a.		3a.	
On-Site Edits				
4.	4a.		4a.	

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Load and Unload Vehicle	Control #:	01-01-12-04

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Load and Unload Vehicle	Control #:	01-01-12-04

All Employees:

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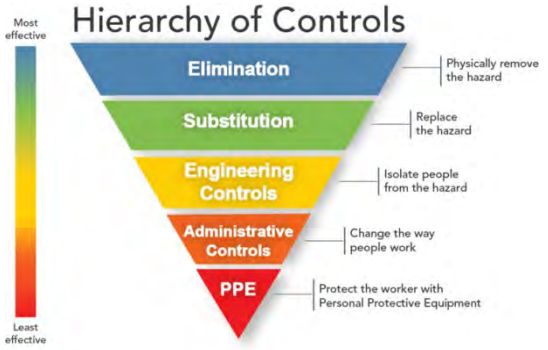
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Task Hazard Analysis

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Task Name:	Load and Unload Vehicle	Control #:	01-01-12-04

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Low Flow Groundwater Sampling	**Control #:**	01-01-05-12

Project Name:	Remedial Design Artco Industrial Laundries	**Client:**	NYSDEC	**Date:**	12/30/2019
Permits Required? (list):		**Work Location:**	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather, nitrile, cut resistant ☐ Hearing Protection ☐ Other:
Tools & Equipment:	Hand tools YSI Pump

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	**Potential Hazards** *How could you be hurt? What would the injury be?*	**Risk** *(initial)*	**Critical Actions To Mitigate Hazards** *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	**Risk** *(final)*
1. Visually clear proposed sampling locations	1a. Exposure to biological hazards: insects, poisonous plants and animals. Injuries could include anaphylactic shock, allergic reactions, rabies.	6	1a. Identify and avoid hazardous plants and animals on site. Look for signs (spider webs, droppings, etc.). Wear cut resistant gloves, insect repellant, use a broom or a rake to move vegetation, not your hand or foot, move slowly	4
	1b. Slip/trips, falls due to uneven terrain resulting in broken bones or torn ligaments.	6	1b. Identify, mark and avoid slip, trip and fall hazards (holes, obstructions protruding from ground, or debris). Contact PM immediately and do not proceed if any conditions are observed that cannot be controlled to make well sampling in the area safe.	4
	1c. Struck by vehicle resulting in severe trauma or death	**10**	1c. Visually inspect roadway for moving equipment if walking and set up vehicle as a barrier if driving. Set up exclusion zone around each well. Don reflective vest. **Follow Traffic Control Plan (Attachment G).**	4
On-Site Edits:				
2. Open well casing/flush-mount covers and well plug lock.	2a. Cuts/lacerations/crushing, bruises	6	2a. Avoid touching sharp material/edges. Wear cut resistant ANSI 2 gloves. Keep face, hands, fingers, and feet clear when opening and closing well cover. Inspect ground before kneeling. Don knee pads.	2
	2b. Back strain from improper lifting	4	2b. Stretch before working. DO NOT use awkward positioning. Keep back straight. Take regular rest/stretch breaks. Change position regularly.	2
			2c. Stand upwind from the well opening to avoid vapor exposure. Loosen well cap slowly,	2

Task Hazard Analysis

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Task Name:	Low Flow Groundwater Sampling	Control #:	01-01-05-12

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	2c. Vapor exposure resulting in inhalation hazards or illness	4	keeping control if pressure is released due to vapors. Keep face out of line-of-fire.	
	2d. Biologic hazards; insects, poisonous plants, and animals	6	2d. Slowly lift the well cover away from person and look for insects underneath the well. Use long handle tool to remove or kill any insects (i.e. screw driver).	4
On-Site Edits:				
3. Installing tubing in well and setting up equipment.	3a. Cuts/lacerations/crushing, bruises	6	3a. Avoid touching sharp material/edges. Keep face, hands, fingers feet clear when cutting tubing and setting up equipment. Wear cut resistant ANSI 2 gloves with disposable nitrile over gloves	2
On-Site Edits:				
4. Removing tubing from well	4a. Exposure to chemical hazards in groundwater resulting in inhalation hazard or illness	4	4a. Stay upwind to avoid vapor exposure	2
	4b. Cuts/lacerations/bruises to knee (flush mount)	4	4b. Don knee pads and inspect ground before kneeling down and take frequent breaks to stand and stretch	2
On-Site Edits:				
5. Closing well casings/flush mount covers	5a. Cuts/ lacerations/crushing, bruises	4	5a. Avoid touching sharp material/edges. Wear cut resistant ANSI 2 gloves. Keep face, hands, fingers feet clear when closing well cover. Don knee pads and inspect ground before kneeling down.	2
	5b. Back strain from heavy/awkward material handling	4	5b. Keep back straight. Take regular rest/stretch breaks. Change position regularly.	

Task Hazard Analysis

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Task Name:	Low Flow Groundwater Sampling	Control #:	01-01-05-12

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On-Site Edits:				
6. Gather sampling equipment and tools, place in work vehicle	6a. Cuts/lacerations/crushing/bruises from gathering or dropping equipment 6b. Aches and strains from improper lifting	3 4	6a. Maintain a secure grip on equipment and only carry manageable amount of equipment when demobilizing. 6b. Bend and lift with legs. Keep back straight. Take regular rest/stretch breaks. Change position regularly. Team lift is required for items over 50 lbs (or awkward items)	2 2
On-Site Edits:				
7.	7a.		7a.	
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

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Task Name:	Low Flow Groundwater Sampling	Control #:	01-01-05-12

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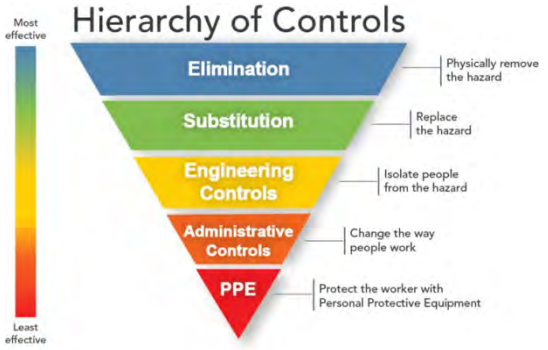
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Task Hazard Analysis

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Task Name:	Low Flow Groundwater Sampling	Control #:	01-01-05-12

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Monitoring Well Construction	Control #:	01-01-05-05

Project Name:	**Remedial Design Artco Industrial Laundries**	**Client:**	NYSDEC	**Date:**	12/30/2019
Permits Required? (list):		**Work Location:**	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	X Hard Hat X Safety Glasses X HiVis Vest X Safety Toe Boots X Gloves: _____ ☐ Hearing Protection ☐ Other: _____
Tools & Equipment:	First Aid Kit Fire Extinguisher Decon Supplies 4-gas multi-meter Hand tools

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
1. Contact One-Call, private utility contractor, and/or site personnel to locate and mark underground utilities.	1a. Failure to have underground utilities identified could result in explosion, electrocution, injury, death, property damage.	**10**	1a. Call public utility locating service prior to initiating work activities. Use private locating service to mark out areas on private property. Verify location of utility marks; do not perform intrusive work if utility location marks cannot be found or if marks are destroyed. Preserve utility marks as much as possible. Call to have utilities remarked if unsure as to their location.	4
On-Site Edits:				
2. Unload equipment	2a. Cuts or hand injuries from pinch points	6	2a. Inspect equipment for damage and sharp edges, replace all broken or damaged equipment. Wear cut resistant gloves at all times and watch hand placement to avoid sharp edges and pinch points. Keep face, hands, fingers, and feet out of the line of fire of moving parts and tools	2
	2b. Back strain/ overexertion when unloading equipment	6	2b. Stretch before working. Bend and lift with legs and arms, not back. Team-lift any items that are awkward or over 50 pounds. If removing from the back of a truck, slide the case to the tailgate and lift from tailgate and not from the side of the truck bed.	2
On-Site Edits:				

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Monitoring Well Construction	Control #:	01-01-05-05

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
3. Set up work zone	3a. Struck by vehicle or equipment traffic	8	3a. Establish work zone using traffic control devices, signs, cones, etc. in advance of initiating monitoring well abandonment activities. Restrict access to observers and passersby.	4
	3b. Slip, Trip or Fall	6	3b. Maintain good housekeeping in work area, do not carry equipment where visibility of ground is impaired, remove or mark all trip hazards in work area.	2
On-Site Edits:				
4. Position drill rig over pre-cleared borehole in position to tower up mast	4a. Struck-by, crushed-by, caught-by drill rig.	**10**	4a. Communicate path of movement to all project personnel. Establish and use agreed upon hand signals during spotting activities. Always use a spotter(s) to direct movement of drill rig and watch for vehicle and pedestrian traffic. Additional spotter(s) will be used in high traffic areas and in areas with blind spots where traffic is difficult to observe.	4
	4b. Contact with overhead utilities.	**10**	4b. Keep a minimum of 15 feet from overhead power lines (20 ft. if 230-285 KV, 25 ft. if 285-345 KV, 35 ft. if 345-500 KV) Check HASP to ensure client/site does not have stricter requirements.	4
	4c. Slip, trip, and fall (STF) hazards from uneven	8	4c. Check walking/movement path for STF obstructions. Conduct pre-site walk with crew prior to drilling and remove or isolate STF hazards.	4
	4d. Hydraulic failure causing release to the environment.	**10**	4d. Place secondary containment on ground under rig. Ensure that secondary containment is setup with 'berms/barriers' or containment is securely clipped onto the rig tracks/wheels to protect from any fluid leaking off the plastic.	3
On-Site Edits:				
5. Commence drilling	5a. Pinch points	6	5a. Never place hands, fingers, feet under the bottom of an auger flight, or other location where these heavy items could be set down or could fall suddenly.	2
	5b. Entanglement	**10**	5b. Ensure rotating parts are properly guarded. Remove loose clothing and jewelry that could become entangled in moving parts. Use a long handled shovel to remove cuttings from the auger.	4
	5c. Noise		5c. Wear hearing protection while equipment is in use.	2

Task Hazard Analysis

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Task Name:	Monitoring Well Construction	Control #:	01-01-05-05

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	5d. Back strain/ overexertion when unloading equipment	6 8	5d. Stretch before working. Bend and lift with legs and arms, not back. Team-lift any items that are awkward or over 50 pounds.	4
On-Site Edits:				
6. Well Casing Assembly and Installation	6a. Muscle strain. 6b. Slip, trip, and fall (STF) hazards from uneven 6c. Injury from improper tool use. 6d. Dust inhalation. 6e. Cutting PVC, cuts, lacerations 6f. Exposure to airborne chemicals or explosive atmosphere 6g. Crushed by, pinch point on drill rig	8 8 8 6 8 8 **10**	6a. Stretch before working. Bend and lift with legs and arms, not back. Team-lift any items that are awkward or over 50 pounds. 6b. Check walking/movement path for STF obstructions. Conduct pre-site walk with crew prior to work and remove or isolate STF hazards. 6c. Do not use tools for unintended purposes (such as a saw to open bags of bentonite instead of an approved cutting tool). 6d. Wear a dust mask and minimize dust when pouring powdered bentonite, concrete, or cement. 6e. Use PVC cutter for cutting PVC. Wear cut-resistant gloves (Level 2), keep fingers and other body parts away from cutting tool blade. 6f. Conduct air monitoring with PID and 4-gas in background areas and breathing zone of all workers, Stop work if PID or LEL indicates action level, Wear respirator with organic vapor cartridge if VOCs cannot be controlled. 6g. Keep body parts away from moving parts on drill rig.	4 4 3 2 3 4 4
On-Site Edits:				
7. Installation of sand filter pack/bentonite	7a. Injury form cutting bags open 7b. Eye and respiratory injury due to dust and other airborne particles 7c. Back or muscle strain due to improper load or lifting techniques	8 6 8	7a. Use a safety knife. No fixed-blade knifes allowed on site. Wear minimum Level 2 cut-resistant gloves. Cut away from the body 7b. Refer to the SDS for use information. Wear long sleeved shirt, long pants, gloves, and safety glasses. Wear a P, N, or R-95 dust respirator when dealing with quartz sand (moving bags, pouring, mixing, and putting bags in trash). 7c. Do not lift anything over 50 lbs. without assistance (partner or appropriate mechanical device). Use proper lifting techniques, lift with legs, keep back straight, and carry object close to body.	4 2 4

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Monitoring Well Construction	Control #:	01-01-05-05

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!				
Job Steps *List all steps required to perform a task in the sequence they are performed*	**Potential Hazards** *How could you be hurt? What would the injury be?*	**Risk** *(initial)*	**Critical Actions To Mitigate Hazards** *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	**Risk** *(final)*
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Monitoring Well Construction	Control #:	01-01-05-05

All Employees:

STOP WORK if uncertain about safety or if a hazard or additional precaution is not recorded on the THA.

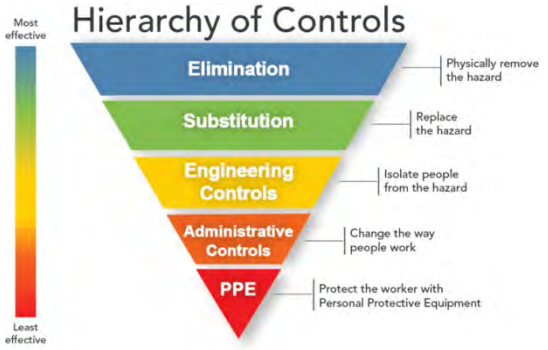
Be alert, recognize and communicate any changes in scope, personnel or conditions at the worksite to the supervisor.

Use **4-Sight**, AECOM's last minute risk assessment process continuously throughout the day by asking yourself and your co-workers to assess your task, hazards, and mitigations. Amend the THA when needed.

- ***What am I about to do?***
- ***What can go wrong?***
- ***What can be done to make it safer?***
- ***What have I done to communicate the hazards?***

For a more thorough identification of hazards, ask "What else could go wrong?" using the Hazard Categories





- ***Most hazards need more than one control***
- ***What should you do? Stack your controls***
- ***PPE can NEVER be your only means of protection***

Worker Sign On	
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Printed Name	**Signature**
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Task Hazard Analysis

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Task Name:	Monitoring Well Construction	Control #:	01-01-05-05

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Portable Generator Operation	Control #:	01-01-08-03

Project Name:	Remedial Design Artco Industrial Laundries	**Client:**	NYSDEC	**Date:**	12/30/2019
Permits Required? (list):		**Work Location:**	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☐ Hard Hat ☒ Safety Glasses ☐ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: _____ ☐ Hearing Protection ☒ Other: _____
Tools & Equipment:	Spill kit Fire extinguisher Eye wash and rinse water

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
1. Selecting proper generator and electrical connections	1a. Inadequate power for needs	6	1a. Verify that the generator will provide sufficient wattage to safely operate the equipment you need.	2
	1b. Overheating/fire of electrical cords	6	1b. Select a UL rated 3 pronged heavy- duty outdoor construction rated extension cord with proper wire gauge to handle the load.	2
	1c. Lack of sustainability causing fire hazards	8	1c. When long term power is needed, evaluate alternative sources for sustainability.	4
On-Site Edits:				
2. Familiarize yourself with generator hazards and prevention measures	2a. Not recognizing the potential hazards associated with a generator (fires, sprains/strains, electric shock, etc.)	**12**	2a. Read Owners Manual!	2
On-Site Edits:				
3. Load and unload generator	3a. Sprains, strains, exertion	**10**	3a. Stretch and flex before attempting to load or unload. Know the weight of the generator and your personal ability. Use assistance.	6
	3b. Burns to hands from hot parts	6	3b. Always allow a generator to cool completely before attempting to load/unload.	2

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Portable Generator Operation	Control #:	01-01-08-03

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
On-Site Edits:				
4. Position & setting up generator	4a. Carbon monoxide poisoning & entrainment of Carbon monoxide gas into adjacent buildings/structures	15	4a. NEVER OPERATE A GENERATOR INDOORS. Direct generator exhaust away from personnel and work area. Know the symptoms of Carbon Monoxide poisoning including headache, nausea, dizziness, fatigue and shortness of breath. Leave area immediate if symptoms are experienced. Set generator away from doors, windows, and potential entrainments sources such as air intakes, HVAC systems, etc.	4
	4b. Electric shock	12	4b. Verify that generator is grounded using a grounding rod and that it is equipped with a Ground Fault Circuit Interrupter.	4
	4c. Nearby materials catching fire	8	4c. Position generators away from flammable/combustible materials. Routinely inspect all areas where generators are positioned to verify that area is kept clear of combustible materials.	4
	4d. Noise-related hearing loss	6	4d. Position generator as far away as possible from workers. Use barriers to deflect noise where possible.	2
On-Site Edits:				
5. Inspect generator and check fluids	5a. Fires from malfunction	9	5a. Inspect the generator for any signs of damage, fuel or oil leaks, etc.	3
	5b. Mechanical failure from low oil	8	5b. Verify that oil is at appropriate level and appears clean	4
On-Site Edits:				
6. Fuel generator	6a. Fires from fueling	12	6a. Allow generator to cool for a minimum of 30 minutes after operation before refueling. Keep a portable ABC fire extinguisher in the fueling area. No open flames allowed within 50' of fueling operations.	4
	6b. Fuel spills	8	6b. Store fuel in an ANSI approved container of no more than 5 gallons Have a spill kit available in case of spills. Fuel and store fuel in a secondary containment.	8
	6c. Splash of fuel to eyes/face	6	6c. Wear safety glasses when fueling. Have eyewash and clean rinse water available in	6

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Portable Generator Operation	Control #:	01-01-08-03

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

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			case of splash.	
On-Site Edits:				
7. Starting and operating generator	7a. Electric shock from improper use 7b. Exertion/strain/sprain from pull starting	12 4	7a. Do not start a generator when it is raining or when you are wet. Verify that generator is equipped with a GFCI. Inspect all equipment to be attached to the generator including tools & electrical cords prior to attaching to the generator. 7b. Pull cord start generators can be difficult to start, especially if cord is old or gummy. Make sure pull cord is in good condition upon inspection. Get an electric – start generator if possible.	4 2
On-Site Edits:				
8. Periodic maintenance	8a. Fires and mechanical failure from inadequate maintenance	6	8a. Verify ongoing inspection and scheduled maintenance for owned and leased equipment. The maintenance schedule should be presented in the Owner's Manual but routinely should include oil and spark plug change, air filter replacement, ensuring the battery is properly charged and that battery connections are cleaned, the equipment is started every 30 days or so, and that it is drained of fuel when not in use.	4
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Portable Generator Operation	Control #:	01-01-08-03

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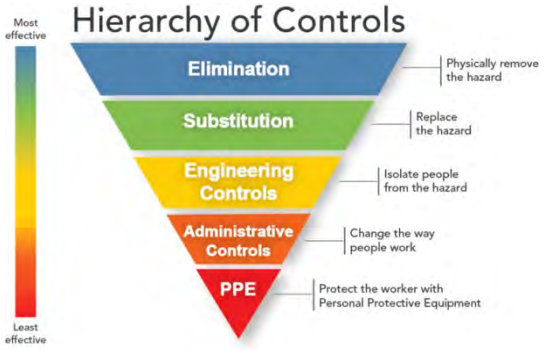
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Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Portable Generator Operation	Control #:	01-01-08-03

Include a copy of the new THA or a photo of the THA modifications as appropriate.

Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Summa Canister Sampling	Control #:	01-01-09-04

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Brooklyn, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather ☐ Hearing Protection ☐ Other:
Tools & Equipment:	Summa canister Wrenches Tubing

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
1. Set up equipment	1a. Muscle strain	6	1a. Use proper precautions (lift with legs, not back) when lifting equipment into/out of vehicle. If lifting >50 lbs, use the buddy system. Avoid twisting, stooping, and/or extended reaching positions when handling or moving equipment.	4
	1b. Equipment damage	3	1b. Use a solid work surface when assembling summa canisters to avoid dropping or damaging equipment. Work from the ground surface, floor, or the tailgate of the truck when applicable. Adhere to laboratory assembly instructions. Use correct size wrenches to connect fittings. Ensure wrenches are properly seated on fittings prior to loosening or tightening fittings.	2
	1c. Pinch points, lacerations	6	1c. Wear leather gloves to prevent hand injury in case the wrench slips off a fitting or while cutting tubing.	1
	1d. Tool/equipment failure caused by use	3	1d. Conduct physical inspection of all equipment. Worn or broken tools should be repaired or replaced.	1
On-Site Edits:				
2. Collect Sample	2a. Slips, trips, falls	6	2a. Maintain clean and organized work area; keep walking paths clear of equipment and debris.	3

Task Hazard Analysis

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Task Name:	Summa Canister Sampling	Control #:	01-01-09-04

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

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	2b. Injury from poor ergonomics	6	2b. Maintain proper body positioning/good ergonomic form. Avoid stooping and twisting.	2
On-Site Edits:				
3. Pack Sample Cooler	3a. Muscle strain	6	3a. Use proper lifting techniques (lift with legs, not back) and use buddy system if lifting items >50 pounds. Avoid twisting, stooping, and/or extended reaching body positions when moving full coolers.	2
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Summa Canister Sampling	Control #:	01-01-09-04

All Employees:

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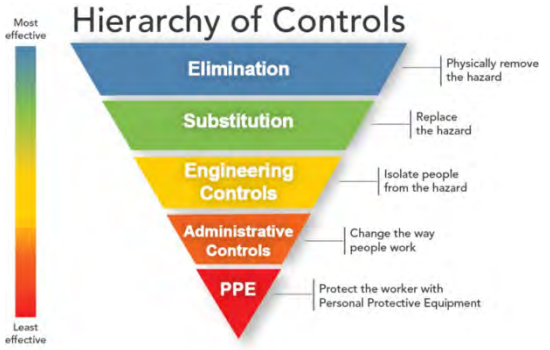
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Task Hazard Analysis

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Task Name:	Summa Canister Sampling	Control #:	01-01-09-04

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Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Monitoring Well Development (Utilizing Surge Blocks)	Control #:	01-01-05-13

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rochester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Leather/Nitrile ☐ Hearing Protection ☐ Other:
Tools & Equipment:	Tubing Surge Block Pump

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
1. Inspect and Open Wells	1a. Pinch Points between cover and ground, abrasion while opening lid with ratchet.	4	1a. Remove/replace manhole covers so that they do not pinch fingers. Wear leather gloves for this task.	2
	1b. Back Strain	6	1b. Utilize proper lifting procedure when removing covers – Bend at the knees and lift with your legs rather than bending/lifting with your back.	2
On-Site Edits:				
2. Attach surge block to tubing and lower in well.	2a. Pinch points	4	2a. Note and avoid pinch points between block and well casing. Wear coated nitrile gloves, or leather gloves when handling tubing.	2
	2b. Overhead hazards, back strain.	6	2b. Watch out for overhead hazards. If well is at deeper depth to be performed comfortably by one person it may be necessary to use two people to insert/handle tubing.	4
On-Site Edits:				
3. Surge well.	3a. Repetitive Motion injury from moving surging up and down.	6	3a. Take frequent breaks as needed to prevent fatigue to shoulder/arm/back muscles caused by surging well. Be aware of the signs/symptoms of repetitive stress injuries (tingling, sharp pains, numbness) and report all symptoms immediately.	2

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Monitoring Well Development (Utilizing Surge Blocks)	Control #:	01-01-05-13

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
On-Site Edits:				
4. Bail or pump water from well. Purge Water Handling	4a. Repetitive motion bailing/pumping well.	6	4a. Take frequent breaks as needed to prevent fatigue to shoulder/arm/back muscles caused by surging well. Be aware of the signs/symptoms of repetitive stress injuries and report all symptoms immediately.	2
	4b. Exposure from splashes during bailing/pumping activities.	4	4b. Wear additional PPE (Tyvek) if deemed necessary, pace bailing actions. Wear eye protection, long pants, nitrile gloves, and steel-toed boots.	2
	4c. Spill or release of impacted water.	4	4c. Have spill pillows/socks available to contain any release or impacted water spill.	2
	4d. Slip, trip, fall.	6	4d. Wear appropriate PPE (eye protection, long pants, leather gloves, long sleeves, steel-toed boots.	2
	4e. Back strain.	6	4e. Use proper lifting technique (lift with the knees) while handling purge water containers/buckets. Secure bucket lids to prevent splashes/spills.	2
On-Site Edits:				
5. Remove tubing from well.	5a. Exposure to contaminants.	4	5a. When removing tubing use nitrile gloves and paper towels (if necessary to wipe down tubing) as removed. Wipe tubing in downward motion.	2
	5b. Overhead/Horizontal hazards.	4	5b. Remove and coil tubing as removed or lay-out on ground surface. Ensure that tubing on ground surface does not hinder any nearby operations.	2
	5c. Back strain.	6	5c. Depending on depth of well, two people may be needed to hold/guide tubing out of the well. Dispose of tubing within a contractor trash bag.	2
On-Site Edits:				
6. Decontamination - Soak/spray durable equipment to prevent cross-contamination between	6a. Exposure to decontamination chemicals	4	6a. Wear appropriate PPE (eye protection, long sleeves and pants, nitrile gloves, steel-toed boots). Avoid contact with all decontaminated chemicals (Liquinox, Alconox, Simple Green, methanol, and any other solvents used on development equipment).	2

Task Hazard Analysis

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Task Name:	Monitoring Well Development (Utilizing Surge Blocks)	Control #:	01-01-05-13

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multiple well locations; properly store disposable equipment			Store decontaminated equipment in clean dry area.	
On-Site Edits:				
7. Replace well cap and cover	7a. Pinch Points	4	7a. Refer to **1b** and **2a** above.	2
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

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Task Name:	Monitoring Well Development (Utilizing Surge Blocks)	Control #:	01-01-05-13

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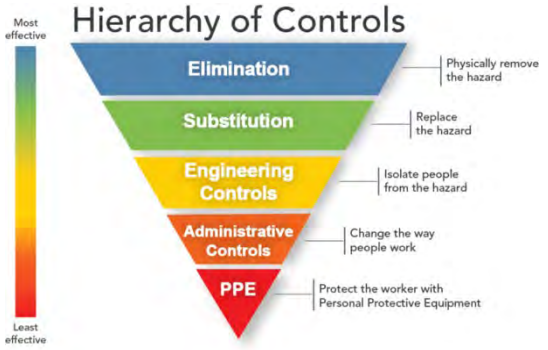
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Task Hazard Analysis

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Task Name:	Monitoring Well Development (Utilizing Surge Blocks)	Control #:	01-01-05-13

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Task Hazard Assessment

AECOM Imagine it. Delivered.

Task Name:	Well Pad Construction	Control #:	01-01-05-06

Project Name:	Remedial Design Artco Industrial Laundries	Client:	NYSDEC	Date:	12/30/2019
Permits Required? (list):		Work Location:	Rchester, New York		

This THA must be fully reviewed with all staff members. All job steps, hazards, work practices, and PPE are clearly understood and have been implemented. All necessary revisions have been written on the THA.

Required PPE:	☒ Hard Hat ☒ Safety Glasses ☒ HiVis Vest ☒ Safety Toe Boots ☒ Gloves: Cut Resistant, ☒ Hearing Protection ☐ Other:			
Tools & Equipment:	First Aid Kit	Spill Kit	Fire Extinguisher Hand Tools	Traffic cones or other suitable barrier

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
1. Contact One-Call, private utility contractor, and/or site personnel to locate and mark underground utilities.	1a. Failure to have underground utilities identified could result in explosion, electrocution, injury, death, property damage.	10	1a. Call public utility locating service prior to initiating work activities. Use private locating service to mark out areas on private property. Verify location of utility marks; do not perform intrusive work if utility location marks cannot be found or if marks are destroyed. Preserve utility marks as much as possible. Call to have utilities remarked if unsure as to their location.	1
On-Site Edits:				
2. Unload equipment	2a. Cuts or hand injuries from pinch points 2b. Back strain/ overexertion when unloading equipment	6 6	2a. Inspect equipment for damage and sharp edges, replace all broken or damaged equipment. Wear cut resistant gloves at all times and watch hand placement to avoid sharp edges and pinch points. Keep face, hands, fingers, and feet out of the line of fire of moving parts and tools 2b. Stretch before working. Bend and lift with legs and arms, not back. Team-lift any items that are awkward or over 50 pounds. If removing from the back of a truck, slide the case to the tailgate and lift from tailgate and not from the side of the truck bed.	2 2
On-Site Edits:				

Task Hazard Analysis

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Task Name:	Well Pad Construction	Control #:	01-01-05-06

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
3. Set up work zone	3a. Struck by vehicle or equipment traffic	8	3a. Establish work zone using traffic control devices, signs, cones, etc. in advance of initiating monitoring well abandonment activities. Restrict access to observers and passersby.	4
	3b. Slip, Trip or Fall	6	3b. Maintain good housekeeping in work area, do not carry equipment where visibility of ground is impaired, remove or mark all trip hazards in work area.	2
On-Site Edits:				
4. Excavating Well Pad/ Area	4a. Underground Utility Strike	**10**	4a. Ensure area of well pad was cleared during underground utility clearance procedure for well.	4
	4b. Back or muscle strain	6	4b. Keep shovel loads and twisting motions to a minimum. Do not lift anything over 50 lbs. without assistance (partner or appropriate mechanical device). Use proper lifting techniques, lift with legs, keep back straight, and carry object close to body.	2
	4c. Struck by shovel	6	4c. When shoveling, know area of shovel movement is clear from people or objects. Do not use shovel in the direction of people and objects. If in area of shoveling, do not approach shoveled area unless they acknowledge you and stop working.	2
On-Site Edits:				
5. Installing Well Pad Frame (Frame may not be needed in the case of Flag replacement)	5a. Cutting Wood Frame	8	5a. Wear cut-resistant gloves (Level 2), keep fingers and other body parts away from blade, watch for jumping of saw, work in area where other employees will not enter	4
	5b. Injury from assembling well frame	8	5b. Wear cut resistant gloves at all times and watch hand placement to avoid sharp edges and pinch points. Keep face, hands, fingers, and feet out of the line of fire of moving parts and tools	4
On-Site Edits:				

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Well Pad Construction	Control #:	01-01-05-06

REMINDER: Use 4-Sight at the start of, and continuously throughout the job/task to identify additional and/or hazards to act on!

Job Steps *List all steps required to perform a task in the sequence they are performed*	Potential Hazards *How could you be hurt? What would the injury be?*	Risk *(initial)*	Critical Actions To Mitigate Hazards *List control measures required to eliminate, control or protect against the potential hazards associated with each job step to minimize the risk of injury or environmental impact.* ***Identify any 'Stop Work' triggers.***	Risk *(final)*
6. Pouring and Troweling Concrete Pad	6a. Exposure to cement dust and mixed cement, skin, eye, and inhalation irritation. 6b. Back or muscle strain	6 6	6a. Refer to the SDS for use information. Wear long sleeved shirt, long pants, gloves, and safety glasses. Wear a P, N, or R-95 dust respirator when dealing with dry cement (moving bags, pouring, mixing, and putting bags in trash). 6b. Keep shovel loads and twisting motions to a minimum. Do not lift anything over 50 lbs. without assistance (partner or appropriate mechanical device). Use proper lifting techniques, lift with legs, keep back straight, and carry object close to body.	2 2
On-Site Edits:				
7.	7a.		7a.	
On-Site Edits:				

Additional Notes:

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Well Pad Construction	Control #:	01-01-05-06

All Employees:

STOP WORK if uncertain about safety or if a hazard or additional precaution is not recorded on the THA.

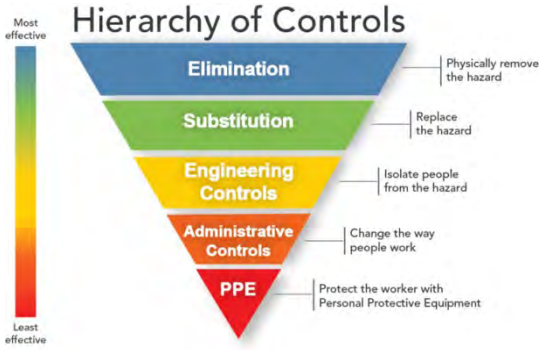
Be alert, recognize and communicate any changes in scope, personnel or conditions at the worksite to the supervisor.

Use **4-Sight**, AECOM's last minute risk assessment process continuously throughout the day by asking yourself and your co-workers to assess your task, hazards, and mitigations. Amend the THA when needed.

- ***What am I about to do?***
- ***What can go wrong?***
- ***What can be done to make it safer?***
- ***What have I done to communicate the hazards?***

For a more thorough identification of hazards, ask "What else could go wrong?" using the Hazard Categories





- ***Most hazards need more than one control***
- ***What should you do? Stack your controls***
- ***PPE can NEVER be your only means of protection***

Worker Sign On	
I participated in the on-site review and fully understand the content of this Task Hazard Assessment.	
Printed Name	**Signature**
1. Supervisor:	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Visitor Acknowledgement
Visitors review task hazards and acknowledge understanding
1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

Submit a new THA for addition to the DCSA THA Library or send THA improvement suggestions to DCSA.THA.Library@AECOM.com

Task Hazard Analysis

AECOM Imagine it. Delivered.

Task Name:	Well Pad Construction	Control #:	01-01-05-06

Include a copy of the new THA or a photo of the THA modifications as appropriate.

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Daily Tailgate Meeting

S3AM-209-FM5

Instructions: Conduct meeting prior to sending crews to individual tasks. Require attendance of all AECOM employees and subcontractors. Invite personnel from simultaneous operations for coordination purposes. Review scope of work and briefly discuss required and applicable topics**. This meeting is a daily refresher, not a full orientation**. Task-specific discussions associated with Task Hazard Assessment (THA) follow this meeting at the task location immediately before individual task is started.

AECOM Supervisor Name: **Phone Number:**	
AECOM SH&E Rep. Name: **Phone Number:**	
Meeting Leader:	

Date:	**Project Name/Location:** Remedial Design/ Artco Industrial Laundries	**Project Number:** 60617211

Today's Scope of Work:

Muster Point Location:	**First Aid Kit Location:**	**Fire Extinguisher Location:**	**Spill Kit Location:**
Site Entrance	In Vehicle	NA	NA

1. Required Topics

- ☑ Fitness for Duty requirements, all sign in / sign out
- ☑ Required training (incl. task specific) completed and current
- ☑ SH&E Plan onsite - understood, reviewed, signed by all (incl. scope, preplanning hazard assessments / risk registers, controls, procedures, requirements, etc.)
- ☑ Task Hazard Assessments (THAs) are to be reviewed and completed for each task immediately prior to conducting
- ☑ STOP WORK Right & Responsibility- all task changes/changed conditions re-assess with THA
- ☑ Requirement to report to supervisor any injury, illness, damage, near miss, unsafe act / condition
- ☑ Emergency Response Plan – including muster point, first aid kit, fire extinguisher, clinic/hospital location
- ☑ Personal Protective Equipment (PPE) - Required items per hazard assessments in good condition / in use by all
- ☑ Equipment/machinery inspected (documented as required) and in good condition - operators properly trained/certified
- ☑ Work area set up and demarcation/ barricades in place to protect workers, site staff, and the public
- ☑ Required checklists/records available, understood (describe):
- ☑ Lessons Learned / SH&E improvements (describe):

2. Discuss if Applicable to Today's Work

☑ ■ **Check ☑ as reviewed or mark ■ as not applicable**

- ☐ ☐ Biological/ Chemical / Electrical Hazards
- ☐ ☐ Ergonomics - Lifting, Body Position
- ☐ ☐ Lock Out/ Tag Out
- Short Service Employees - visual identifier and mentor/ oversight assignment
- ☐ ☐ Simultaneous/ Neighbouring Operations
- ☐ ☐ Slip/ Trip/ Fall Hazards
- ☐ ☐ Specialized PPE Needs
- ☐ ☐ Traffic Control
- ☐ ☐ Waste Management/ Decontamination
- ☐ ☐ Weather Hazards / Heat Stress / Cold Stress
- ☐ ☐ Subcontractor Requirements (e.g., JHAs, THAs, procedures, reporting, etc.)
- ☐ ☐ Work Permits / Plans required (e.g., Fall Protection, Confined Space, Hot Work, Critical Lifts, etc.); in place, understood (identify/attach):
- ☐ ☐ Other Topics (describe/attach):
- ☐ ☐ Client specific requirements (describe):

3. Daily Check Out by Site Supervisor

Describe incidents, near misses, observations or Stop Work interventions from today:	Describe Lessons Learned/ Improvement Areas from today:

The site is being left in a safe condition and work crew checked out as fit unless otherwise specified as above.

Site Supervisor Name	**Signature**	**Date** **Time** (at end of day / shift)

Worker Acknowledgement / Sign In Sign Out sheets applicable to this meeting are on reverse and, if applicable, attached.

All employees:

- **STOP WORK if concerned / uncertain about safety / hazard or additional precaution is not recorded on the THA.**
- **Be alert and communicate any changes in personnel or conditions at the worksite to the supervisor.**
- **Reassess task, hazards, & mitigations on an ongoing basis; amend the THA if needed.**

SITE WORKERS (including AECOM Contractors and Subcontractors): Your signature below means that you understand:

* The requirement to participate in creating, reviewing, & updating hazard assessments (THA) applicable to your task(s).
* The hazards & control measures associated with each task you are about to perform.
* The permit to work requirements applicable to the work you are about to perform (if it includes permitted activities).
* That no tasks or work is to be performed without a hazard assessment.
* Your authority & obligation to "Stop Work" intervene, speak up/ listen up.

Your initials (right columns) certify that you arrived & departed fit for duty, & have reported all incidents/near misses; meaning:

* You are physically and mentally fit for duty and have inspected your required PPE to ensure satisfactory condition.
* You are not under the influence of any type of medication, drugs, or alcohol that could affect your ability to work safely.
* You are aware of your responsibility to immediately report any illness, injury (regardless of where or when it occurred), or impairment/fatigue issue to the AECOM Supervisor.
* You signed out as fit / uninjured unless you have otherwise informed the AECOM Supervisor.

Print Name & Company	Signature	Initials & Sign In Time	Initials & Sign Out Time
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit
		In & Fit	Out & Fit

(Attach additional Site Worker sign-in/out sheets if needed) Identify number of attached sheets: _____

SITE VISITOR / SITE REPRESENTATIVE

Name	Company Name	Arrival Time	Departure Time	Signature

DCS Americas THA Review Guide

Task Hazard Assessment Instructions:

Each unique task or workgroup should have their own THAs. If workers have a THA for their task(s) in hand, they should simply review it and document the site-specific edits in red pen in the appropriate section. If workers do ***not*** have a THA for all tasks to be performed, a THA must be obtained or drafted *prior to starting work* on that task. Use additional pages as needed.

- Identify the basic steps of the task that must be performed in order and their associated hazards. Identify controls or barriers to mitigate each identified hazard.
- Clearly identify any **STOP WORK** triggers
- Document stop work and change management if conditions/ scope changes.
- Use 4-Sight to identify and mitigate site-specific hazards throughout the day. Modify the THA as needed. Contact site supervisors or the PM for any significant scope changes or changes of expected conditions.
- All THAs shall be 3 pages (maximum) or less (preferred). If they are longer, the task is too broad
- All hazards will use standardized nomenclature (Hazard Wheel), should be specific, detail how someone could be hurt and what the outcome could be
- All actions to mitigate hazards must be specific, clearly aligned with its respective hazard and not generic. Avoid words such as "*proper", "correct*", or "*appropriate*"). Use specifics and numerical values (i.e. wear disposable nitrile gloves, stand back 6 feet/1.8 meters, take a 10-minute break every hour)
- PPE cannot be the only line of defense - PPE is always the last line of defense, so think through what other controls (engineering, administrative, etc.) could mitigate hazards

Discuss as Applicable and Modify THA as Needed

Check ☑ if reviewed or mark N/A

- ☐ *Biological/ Chemical/ Electrical Hazards*
- ☐ *Decontamination Procedures*
- ☐ *Ergonomics- Lifting, Body Position*
- ☐ *Lock Out/ Tag Out*
- ☐ *Short Service Employees- visual identifier and mentor/ oversight assignment*
- ☐ *Simultaneous/ Neighboring Operations*
- ☐ *Slip/ Trip/ Fall Hazards*
- ☐ *Specialized PPE Needs*
- ☐ *Traffic Control*
- ☐ *Waste Management/ Decontamination*
- ☐ *Weather Hazards/ Heat Stress/ Cold Stress*
- ☐ *Work Permit requirements (identify):*
- ☐ *Other (describe):*

Probability	Severity				
	5 - Catastrophic	4 – Critical	3 – Major	2 – Moderate	1 - Minor
5 – Frequent	25	20	15	10	5
4 – Probable	20	16	12	8	4
3 – Occasional	15	12	9	6	3
2 – Remote	10	8	6	4	2
1 - Improbable	5	4	3	2	1

Risk Rating (Probability x Severity)	Risk Acceptance Authority
1 to 4 (Low)	Risk is tolerable, manage at local level
5 to 9 (Medium)	Risk requires approval by Operations Lead/Supervisor & Safety Manager
10 to 25 (High)	Risk requires the approval of the Operations Manager & Safety Director

Severity – Potential Consequences				
	People	Property Damage	Environmental Impact	Public Image/Reputation
Catastrophic	Fatality, Multiple Major Incidents	>$1M USD, Structural collapse	Offsite impact requiring remediation	Government intervention
Critical	Permanent impairment, Long term injury/illness	>$250K to $1M USD	Onsite impact requiring remediation	Media intervention
Major	Lost/Restricted Work	> $10K to $250K USD	Release at/above reportable limit	Owner intervention
Moderate	Medical Treatment	> $1K to $10K USD	Release below reportable limit	Community or local attention
Minor	First Aid	</=$1K USD	Small chemical release contained onsite	Individual complaint

Probability		
Frequent	Expected to occur during task/activity	9/10
Probable	Likely to occur during task/activity	1/10
Occasional	May occur during the task/activity	1/100
Remote	Unlikely to occur during task/activity	1/1,000
Improbable	Highly unlikely to occur, but possible during task/activity	1/10,000

Using the Matrix:

1. Identify basic steps of the task and associated hazards.
2. Calculate the initial risk rating.
3. Identify control measure to eliminate or reduce the hazard's risk and calculate the residual risk rating.
4. If the risk rating (after controls are implemented) cannot be reduced to 4 or lower, additional approvals are needed before the activity can begin.

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Attachment C

URS SH&E Procedures

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Attachment C. URS SH&E Field Applicable Procedures

	Hazard/ Activity *(note: text in this column links to procedure)*	Site Specific Description *[where, what phase of work, frequency, etc.]*	Applicable Procedure
☒	**Bloodborne Pathogens**	First aid providers	S3AM-111-PR
☒	**Cold Stress**	Working during winter	S3AM-112-PR
☒	**Compressed Gases**	Soil vapor sampling, calibrating meters listed in Section 8.4.1.	S3AM-114-PR
☒	**Concrete Work**	Well pad construction	S3AM-338-PR
☒	**Corrosive Reactive Materials**	Handling pre-preserved bottle ware for sampling	S3AM-125-PR
☒	**Drilling, Boring & Direct Push Probing**	Installing, borings, monitoring wells, and soil vapor implants.	S3AM-321-PR
☒	**Electrical Safety**	Working with generators.	S3AM-302-PR
☒	**Flammable and Combustible Liquids**	Portable generator	S3AM-126-PR
☒	**Hand and Power Tools**	Accessing monitoring wells and soil vapor implants.	S3AM-305-PR
☒	**Hazardous Waste Operations**	Generating hazardous investigation derived waste (IDW) and signing off on waste manifest	S3AM-117-PR
☒	**Heat Stress**	Working during summer.	S3AM-113-PR
☒	**Heavy Equipment**	Working alongside excavators/ drill rig equipment	S3AM-309-PR
☒	**Overhead Lines**	Positioning drill rigs adjacent to overhead power lines	S3AM-322-PR
☒	**Respiratory Protection**	Removing free product from wells	S3AM-123-PR
☒	**Underground Utilities**	Installing, borings, monitoring wells	S3AM-331-PR
☒	**Wildlife, Plants and Insects**	Sampling monitoring wells.	S3AM-313-PR

Americas

Bloodborne Pathogens

S3AM-111-PR1

1.0 Purpose and Scope

1.1 Define the AECOM procedures for eliminating and/or controlling occupational exposure to Bloodborne Pathogens on AECOM projects and activities.

1.2 A written Exposure Control Plan shall be developed and implemented during all AECOM operations where there is a reasonable potential for occupational exposure of AECOM employees and/or subcontractors to bloodborne pathogens as a regulated waste.

1.3 This procedure's requirements apply to all AECOM Americas employees and operations and any other entity and its personnel contractually required to comply with this document's content. Any jurisdictional requirements exceeding those identified in this procedure shall be met when conduction work in the given jurisdiction.

2.0 Terms and Definitions

2.1 **Blood** – Human whole blood; human blood components such as plasma or platelets; and human blood products such as clotting factors.

2.2 **Bloodborne Pathogens (BBP)** – Pathogenic microorganisms that are present in human blood and that can infect and cause disease in persons who are exposed to blood containing these pathogens including but not limited to hepatitis B virus (HBV), human immunodeficiency virus (HIV), hepatitis C, malaria, syphilis, babesiosis, brucellosis, leptospirosis, arboviral infections, relapsing fever, human T-lymphotropic virus Type I, and viral haemorrhagic fever (Ebola).

2.3 **Exposure Control Plan** *(S3AM-111-ATT1)* – A plan that addresses the requirements applicable to specific AECOM projects and activities designed to eliminate or minimize employee exposure. The Exposure Control Plan shall be incorporated into the location specific SH&E Plan and shall be accessible to all employees. The Exposure Control Plan shall include:

- Exposure determination.
- The schedule and method of implementation for:
  - Methods of compliance;
  - Hepatitis B Vaccination;
  - Post exposure Evaluation;
  - Communications of Hazards to employees; and
  - Record Keeping.
- Documentation methods for exposure incidents, to include:
  - Routes of exposure; and
  - The circumstances for which and exposure incident occurred.

Note: In the State of California this plan shall also address exposures to airborne pathogens.

2.4 **SH&E Plan** – A document prepared for a specific project or program that details the hazards, precautions, emergency planning, medical, and training requirements for that project or program.

2.5 **Occupational Exposure (Exposed) –** Reasonably anticipated skin, eye mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties. Employees will be considered to be potentially exposed, even though they are using the universal precautions specified for the project or program.

2.6 **Other Potentially Infectious Materials (OPIM)** – Body fluids and tissues including: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid, saliva, and any other body fluid that is visibly contaminated with blood. When it is difficult or impossible to differentiate between body fluids, all body fluids should be treated as if they are potentially infectious.

Note: In the State of California airborne pathogens are also considered infectious materials.

2.7 **Regulated Waste** – (1) liquid or semi-liquid blood or other potentially infectious materials; (2) contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; (3) items that are caked with dried blood or other potentially infectious materials and are capable of being released during handling; (4) objects contaminated with blood that can pierce the skin; and (5) pathological and microbiological wastes containing blood or other potentially infectious materials.

2.8 **Source Individual** – An individual, typically one who has been injured, whose blood or saliva has come in contact with another individual, typically one who has rendered first aid or Cardio Pulmonary Resuscitation (CPR) to the injured party.

2.9 **Universal Precautions** – All body fluids and materials potentially contaminated by body fluids will be considered to be infectious unless the fluids were from the person performing the clean up or decontamination activities. All employees coming in contact with another person's body fluids shall assume that the fluids are infectious and shall wear prescribed Personal Protective Equipment.

3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-004-PR1 Incident Reporting, Notifications & Investigation

3.3 S3AM-017-PR1 Injury & Illness Recordkeeping

3.4 S3AM-128-PR1 Medical Screening & Surveillance

3.5 S3AM-208-PR1 Personal Protective Equipment

3.6 S3AM-209-PR1 Risk Assessment & Management

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Occupational Health Manager**

- Will review and maintain all medical records generated as a result of post-exposure follow-up and maintain all medical records related to the follow-up.
- Will, where appropriate, consult with AECOM's local medical providers about follow-up recommendations.

4.1.2 **SH&E Manager**

- Will review project / program-specific Exposure Control Plans (normally part of the SH&E Plan) prior to the initial mobilization, at least annually for continuing projects or programs, and whenever necessary to reflect modified tasks or procedures that affect occupational exposure to bloodborne pathogens.
- Will consult with the Occupational Health Manager regarding all bloodborne pathogens exposure incidents.
- Will maintain training records and post-exposure follow-up information.
- Will confirm that site-specific training is conducted for all employees working at sites where regulated wastes were disposed or for employees who may be occupationally exposed while working at a facility that handles regulated wastes.

- Will confirm the Hepatitis B vaccine is made available to all employees with a potential occupational exposure (e.g. paramedic, medical laboratory employee, etc.).
- Will review all incident reports and arrange for post-exposure follow-up with AECOM's local medical provider.
- Will offer recommendations on how to prevent an incident from recurring.

4.1.3 **Manager**

- See that all recommendations made by the SH&E Manager are implemented.
- Support the SH&E Manager in their efforts to prevent occupational and non-occupational exposures to bloodborne pathogens.

4.1.4 **Employee**

- Use all PPE and universal precautions required to prevent exposure to infectious materials.
- Follow the exposure control methods outlined in their Exposure Control Plan.
- Report potential exposure incidents to their Supervisor or Manager immediately.

4.2 Potential Exposure Situations

4.2.1 There are a few activities within AECOM where potential occupational exposures to blood or other potentially infectious materials are of concern. These activities may include:

- Investigations of properties that received regulated wastes.
- Site visits or audits at Treatment Storage and Disposal facilities where medical waste is handled.
- Site visits or audits at medical or health care facilities.
- The provision of first-aid or cardiopulmonary resuscitation (CPR) to AECOM, subcontractor, or client personnel (if the action is part of the employee's occupations duties [e.g. paramedic] and not provided as a voluntary action).

4.2.2 Although AECOM does offer first-aid and CPR training to its employees on a regular basis, providing such aid is often on a voluntary basis and not directed by AECOM. As such, potential exposures may not be considered occupational exposures within the context of the OSHA Bloodborne Pathogens Standard. Site-specific Exposure Control Plans shall differentiate voluntary first-aid duties from occupational exposures as a component of the exposure determination. Refer to *S3AM-209-PR1 Risk Assessment & Management.*

4.3 Unforeseen Exposure Situations

4.3.1 Occasionally, potentially infectious material is encountered during a activity where none was expected; when this happens, the work shall be stopped, employee training conducted, and an exposure control plan prepared prior to resuming activities with potential exposures.

4.4 Employee Training

4.4.1 All personnel who will work on projects or programs which involve potential contact with regulated wastes will be required to attend a training class prior to the start of the project or program and annually for continuing projects or programs. Refer to *S3AM-003-PR1 SH&E Training.* The specific requirements and provisions of the written Exposure Control Plan shall be provided to each AECOM Employee and subcontractor assigned to work at the program / project.

4.4.2 Either of the following two sources of employee training will be used by AECOM to educate Employees on the hazards of exposure to bloodborne pathogens:

- The local chapter of the American Red Cross or other recognized training provider.
- AECOM's in-house training program.

4.4.3 Training sessions will review the following:

- Requirements of OSHA's Bloodborne Pathogens Standard or equivalent, applicable jurisdictional requirements.
- Review of AECOM's Bloodborne Pathogen Procedure (this document).
- Situations within AECOM that may involve exposure to bloodborne pathogens.
- Bloodborne diseases and symptoms of disease.
- Means of transmission.
- Work practice controls to reduce risk.
- Use of personal protective equipment to reduce risk.
- Incident reporting.
- AECOM's Post-Exposure Medical Follow-Up Procedures:

4.4.4 When contracting for CPR and first-aid training sessions, AECOM will request that each session include a section on the hazards associated with exposure to bloodborne pathogens and protective measures that shall be followed when administering first aid, CPR, or other emergency medical care. At the end of the session, Employees will be provided with a copy of this procedure. This procedure will be reviewed and a question-and-answer session will be conducted at the end of the presentation.

4.4.5 If the training provider cannot provide such training, AECOM will conduct a Blood Borne Pathogen training session prior to the start of the first aid or CPR class.

4.4.6 AECOM has and will have little control over employees who have not received AECOM provided first aid or CPR training, but who choose to perform Good Samaritan acts. Any Employee who does perform a Good Samaritan act that results in exposure to blood or other potentially infectious materials will, however, be provided with post-exposure medical follow-up as described in this procedure.

4.5 Personal Protective Equipment

4.5.1 All body fluids and materials potentially contaminated by body fluids will be considered to be infectious. All Employees coming in contact with another person’s body fluids shall assume that the fluids are infectious and shall wear prescribed personal protective equipment (PPE), refer to *S3AM-208-PR1 Personal Protective Equipment*.

4.5.2 The use of PPE to prevent exposure is more appropriate for the types of occupational and non-occupational exposures Employees might encounter than is the use of engineering or work practice controls that are more effectively instituted in medical care or laboratory facilities where employees are actually handling blood and other potentially infectious materials.

4.5.3 PPE such as Tyvek coveralls, shoe covers, and gloves will be provided to all field team members involved in site activities where regulated wastes may be present. Site-specific PPE requirements will be identified in the written Exposure Control Plan. The same type of PPE will also be available, if it is deemed necessary, for Employees involved with activities at TSD facilities that handle regulated wastes.

4.5.4 PPE will be provided to affected Employees at no cost.

4.6 Universal Precautions Kits

4.6.1 In those work areas where there is the potential for exposure to infectious materials, a universal precaution kit shall be readily available. The kit shall permit the clean-up, neutralization, transportation, and disposal of up to 1 litre of blood or body fluids. The kit shall contain the following items at a minimum:

- Safety shield/mask combination
- Liquid proof apron
- Medical-grade vinyl/nitrile gloves
- Liquid solidifier/deodorizer
- Pickup scoop with scraper
- Red biohazard waste bag with tie
- Germicidal solution with dry wipe
- Antimicrobial hand wipe
- ID tag
- Instructions for use

4.7 Personal Hygiene

4.7.1 Special provisions will be made so that hand washing facilities are available on-site for sites that are known to be contaminated with regulated wastes. Alcohol wipes will be available in the event that hand washing facilities are not immediately available.

4.7.2 To reduce the potential for infection, if skin contact with blood or other potentially infectious materials occurs, the exposed area should be washed with non-abrasive soap and water as soon as possible. Hand washing will also help to prevent the transfer of contamination from the hands to other areas of the body or other surfaces that may be contacted later. Even when protective gloves are worn, hands should be washed with non-abrasive soap and running water as soon as possible after the gloves are removed.

4.7.3 The use of an alcohol wipes should not be relied upon as the primary means of personal hygiene. Hands should be thoroughly washed with soap and running water as soon as possible.

4.7.4 If mucous membranes, such as the eyes, come in direct contact with blood or other potentially infectious materials, the area should be washed or flushed with water as soon as possible and reported immediately.

4.8 Reporting Exposure Incidents

4.8.1 All incidents in which an employee has been exposed to blood or other potentially infectious materials shall be reported to the employee's Supervisor and to the SH&E Manager immediately. An IndustrySafe on-line report shall be completed in accordance with *S3AM-004-PR1 Incident Reporting, Notifications & Investigation*. After reviewing the report, the SH&E Manager will provide recommendations, when appropriate, for preventing recurrence of the incident.

4.9 Medical Follow-Up to Exposure Incidents

4.9.1 Once notified, the SH&E Manager will in turn discuss the incident with AECOM's Occupational Health Manager and/or medical provider and make arrangements for an evaluation, refer to *S3AM-128-PR1 Medical Screening & Surveillance*. Prompt medical attention is important in the event of an exposure incident. If the incident occurs in the field, the Employee will either be asked to visit the local hospital or, if he/she chooses, return immediately to the office to visit AECOM's local medical provider.

4.9.2 An attempt will be made to test the affected employee, and if applicable, the source individual's blood, for bloodborne pathogens. No testing will be performed without the written consent of the exposed Employee or the source individual. If initially, the exposed Employee or the source individual does not consent to HIV serological testing, but does consent to HBV serological testing, AECOM will make provisions with the local medical provider to preserve the blood sample for at least 90 days in the event that after counselling efforts, the Employee voluntarily consents to HIV testing.

4.9.3 AECOM will rely on the professional judgment of its Occupational Health Manager and/or local medical providers in the event of an exposure incident. Evaluations and follow-up procedures will be provided according to the recommendations of the United States Public Health Service (USPHS), World Health Organization, or other Public Health organization in Canada and other countries in the Americas current at the time these evaluations and procedures take place. Minimally, a post-exposure evaluation and follow-up will include the following elements:

- Documentation of the route(s) of exposure
- Circumstances under which the exposure incident occurred
- Identification and documentation of the source individual in the case of first aid or emergency medical treatments
- Collection and testing of source individuals and exposed employee's blood for HBV and HIV serological status as soon as feasible and upon consent
- Post-exposure vaccination when medically indicated, as recommended by the USPHS
- Counselling, if necessary
- Evaluation of reported illnesses

4.9.4 Any and all follow-up recommendations offered by the physician will be immediately instituted by the SH&E Manager with the guidance of the Occupational Health Manager and/or the local medical provider and at no cost to the affected Employee. Repeat testing, counselling, and follow-up, if recommended, will also be provided at no cost to the Employee. AECOM will rely on the Occupational Health Manager and/or the local medical provider to provide counselling to Employees concerning infection status, including results of and interpretation of medical tests and advising the Employee about the protection of personal contacts.

4.9.5 All medical providers shall submit to AECOM's Occupational Health Manager and the affected Employee a written opinion of the post-exposure evaluation within 15 days of the completion of the evaluation.

4.9.6 All medical records generated as a result of the post-exposure evaluation will be retained in the office of the Occupational Health Manager, and as applicable AECOM’s medical services provider, under lock and key and will be maintained with the strictest confidentiality. Refer to *S3AM-017-PR1 Injury & Illness Recordkeeping.*

4.10 Hepatitis Vaccination

4.10.1 Prior to performing site visits or field investigations where regulated wastes are stored, processed, or known to have been disposed of, AECOM will consult with the Occupational Health Manager and/or the local medical providers to determine if a hepatitis A or B vaccination is appropriate given the site conditions and the proposed scope of work. Where possible the first Hepatitis B vaccinations will be given prior to working at sites with known, potential occupational exposures.

4.10.2 Although AECOM does offer first-aid and CPR training to its Employees on a regular basis, providing such aid is often voluntary and not as a specified job duty of an Employee. As such, potential exposures may not be considered occupational within the context of the government Bloodborne Pathogens Standard. Pre-exposure hepatitis vaccinations will not typically be offered for voluntary roles.

4.10.3 Post-exposure hepatitis vaccination will be offered to Employees involved in an exposure incident within 24 hours of possible exposure.

4.10.4 The vaccinations discussed above shall be provided to Employees at no cost if required by the exposure determination.

4.11 Housekeeping

4.11.1 Other than through the provision of first aid or CPR, there is no potential for occupational exposure to blood or other potentially infectious materials within any of the AECOM offices. Therefore, the housekeeping requirements and requirements for warning signs and labels contained in the OSHA Bloodborne Pathogens standard are not applicable to our office operations.

4.11.2 When working at a site where regulated wastes have been disposed of, the specific housekeeping and warning sign requirements will be prescribed by the client and/or in the site-specific HASP.

4.11.3 When working at a client's facility, AECOM will review the facilities plan for compliance with all the requirements of the Bloodborne Pathogens Standard and will observe all housekeeping requirements, wear required PPE, and acknowledge all warning signs and labels as specified in the client's plan. If the client does not have an effective plan, AECOM will prepare a plan as part of the written Exposure Control Plan.

4.12 Regulated Waste Generated by AECOM

4.12.1 Any regulated waste generated by AECOM as a result of first aid activities or clean-up of potentially infectious material will be collected in sealed, watertight containers and disposed of according to the Host Employer's BBP program or disposed of through a permitted regulated waste facility.

4.12.2 Disposal manifests shall be maintained in accordance with local or governmental regulations.

4.13 Material Decontamination

4.13.1 Any areas or equipment that are contaminated by potentially infectious material will be decontaminated using a 10% solution of household bleach. Utilize appropriate personal protective equipment to control exposure to the bleach (e.g. safety goggles, gloves, etc.). Refer to *S3AM-208-PR1 Personal Protective Equipment*.

4.14 Procedure and Plan Review

4.14.1 All Exposure Control Plans for projects or programs extending over one year shall be reviewed annually by the SH&E Manager and affected Employees.

5.0 Records

5.1 Each SH&E Manager will maintain records and provide copies of the records to the Occupational Health Manager, related to bloodborne pathogens in accordance with the provisions of the standard and *S3AM-017-PR1 Injury & Illness Recordkeeping.*

5.2 Records maintained in accordance will include bloodborne pathogens exposure incidents, post-exposure follow-up, vaccination status, and training for all Employees with potential occupational exposure.

5.3 Employee medical and training records required by this procedure shall be provided upon request for examination and copying to the Employee, to anyone having written consent of the subject employee, or to State, Province, or Federal Occupational Safety and Health regulatory agencies.

6.0 Attachments

6.1 S3AM-111-ATT1 Bloodborne Pathogens Exposure Control Plan

6.2 S3AM-111-FM1 Hepatitis B Vaccination Declination

Americas

Bloodborne Pathogens Exposure Control Plan

S3AM-111-ATT1

1.0 Introduction

Employees are at risk for exposure to and possible transmission of infectious diseases each time they are in contact with blood or body fluids. Bloodborne pathogens are microorganisms present in human blood and other body fluids that can cause serious disease in humans and include, but are not limited to Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus (HIV). Therefore, this exposure control plan (ECP) has been established to ensure that employees are effectively informed concerning potential workplace health hazards, and that protective measures necessary to eliminate or minimize bloodborne exposure incidents are used whenever possible.

2.0 Exposure Determination

2.1 The Medical Screening Evaluation form will be used to evaluate which employees may incur occupational exposure to blood or other potentially infectious materials when performing routine tasks and procedures. Refer to *S3AM- 128-PR1 Medical Screening & Surveillance*. These exposure determinations will be made without regard to the use of personal protective equipment, and regardless of exposure frequency.

2.1.1 The employees in the following job classifications may have occupational exposure to bloodborne pathogens, and are covered by this program:

- Occupational health nurse
- Paramedics
- Registered nurses
- Designated first aid providers (providing first aid identified as part of the employee's occupational duties and not a voluntary action)
- Medical laboratory employees
- Janitorial workers in medical facilities and clinics.

2.1.2 Tasks and procedures that may expose the above employees to bloodborne pathogens include:

- Treating cuts, abrasions, and burns
- Cleaning contaminated environmental surfaces
- Administering cardiopulmonary resuscitation (CPR).

3.0 Exposure Control

3.1 "Universal precautions" are a required method of control to prevent exposure to blood and body fluids. This term refers to the concept that all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, HCV, and other bloodborne pathogens, regardless of the perceived risk status of another individual. Universal precautions apply to blood, other body fluids containing visible blood, semen, and vaginal fluids. Universal precautions do not apply to feces, nasal secretions, saliva, sweat, tears, sputum, urine, and vomitus unless they contain visible blood. Although these fluids have an extremely low or nonexistent risk for bloodborne pathogens, they are a potential source for other infectious diseases, and precautions shall also be followed when these body fluids are present.

3.2 Engineering and Work Practice Controls

3.2.1 The following engineering controls will be in place in all areas of occupational exposure:

- Containers for disposable contaminated sharps shall be puncture-resistant, labeled a biohazard, leak-proof, and have a closable top.

- Containers for storage, transport, or shipment of blood or other potentially infectious materials, regulated waste, and contaminated laundry will be labeled with the biohazard symbol and site address, and have a securely closing lid.
- Engineering controls will be reviewed and maintained on a regular basis to ensure effectiveness.

3.2.2 The following work practice controls (administrative and personal protective equipment) shall be strictly followed to minimize exposure, and isolate or remove bloodborne pathogens from the workplace:

- Accessible handwashing facilities. If soap and running water are not available, an antiseptic hand cleaner in conjunction with clean paper towels or antiseptic towelettes are acceptable temporary alternatives to running water. When this alternative method is used, employees shall wash their hands with soap and running water as soon as feasible.
- Personal protective equipment (PPE) will be provided at no cost to the employee, and will be chosen based on the anticipated exposure to blood. PPE is considered appropriate if it does not permit blood or other potentially infectious materials to reach or pass through clothes, skin, or mucous membranes of the eyes or mouth under normal conditions of use, and for the duration of time the equipment will be used. PPE shall be readily accessible and will be removed prior to leaving the work area.
- Disposable single-use gloves shall be used as a protective barrier in all situations in which contact with body fluids is anticipated. Gloves of the correct size will be provided. Disposable gloves will not be washed or disinfected for reuse, and will be replaced between employees, and if they become torn or punctured. Gloves are especially important if the employee has cuts, abraded skin, chapped hands, or dermatitis.
- Liquid-impermeable gowns, boots, and masks, in combination with eye-protective devices such as goggles and shatterproof glasses with solid-side shields or chin-length face shields, shall be worn whenever splashing, spraying, or spattering of blood droplets or body fluids can be reasonably anticipated.
- Disposable pocket mask ventilation devices shall be provided in all first aid kits and used to avoid mouth-to-mouth contact during emergency cardiopulmonary resuscitation.
- Examples of Recommended PPE (depending on task, more PPE may be needed).

Task	Gloves	Gown	Mask	Goggles
Bleeding control w/ minimal bleeding	Yes	No	No	No
Bleeding control w /spurting blood	Yes	Yes	Yes	Yes
Cardiopulmonary resuscitation	No	No	Yes	No
Decontamination/clean-up	Yes	No	No	No
Medical laboratory activities	Yes	Yes	Yes	Yes

3.2.3 Eating, drinking, smoking, applying cosmetics, and handling of contact lenses is prohibited in work areas where there is a reasonable likelihood of occupational exposure. Food and drink cannot be kept in refrigerators, freezers, shelves, cabinets, or on counter tops where blood or body fluids are present.

3.2.4 Contaminated needles and other sharps shall not be bent or recapped unless a one-handed technique is used. They shall be disposed of in an appropriate sharps container.

3.2.5 All regulated biohazardous waste will be placed in a waste receptacle that has designated red biohazard bags and a closable top controlled by a foot peddle. When full, the bags shall be removed with gloved hands, tied off, and placed in a biohazard shipping carton, to be held for pick-

up. If any biohazard bag appears to be leaking, it shall be double-bagged. The waste will be incinerated per federal, provincial/territorial/state regulations.

3.3 Housekeeping

3.3.1 Universal precautions shall be used when cleaning or decontaminating any surface or equipment that may be contaminated. Appropriate PPE shall be used for protection during decontamination.

3.3.2 All contaminated environmental work surfaces such as countertops or floors will be cleaned according to regulatory requirements or with a household bleach solution diluted 1:10 with water directly following contamination with blood or body fluids.

3.3.3 Instruments such as tweezers, bandage scissors, and thermometers shall be disposable rather than reusable equipment, and shall be disposed of in an appropriate manner.

3.3.4 Broken, contaminated glassware shall not be picked up directly with the hands. It shall be cleaned up using a mechanical means such as a brush and dustpan or tongs.

4.0 Hepatitis B Vaccination

4.1 Within 10 working days of placement, all employees assigned to tasks with potential occupational exposure to bloodborne pathogens shall be offered the Hepatitis B vaccination at no cost to the employee, unless the employee has had a previous Hepatitis B vaccination series, antibody testing reveals the employee is immune, or the vaccine is contraindicated for medical reasons. Further, this vaccination series shall be made immediately available to employees who have an occupational exposure, whether as a result of their assigned tasks, or occurring from an incidental contact.

4.2 The local occupational medical facility used for routine medical surveillance will administer the vaccinations.

4.3 Employees who decline the Hepatitis B vaccine shall sign a copy of the waiver form located at the end of this Work Instruction. The signed waiver will be stored in the employee's medical record with the Occupational Health Manager. Employees may initially decline the vaccination, but may decide to take them at a later date, while still covered under this plan. The vaccinations will be made available to the employee at that time.

4.4 Employees choosing to take the vaccination series will sign a consent form at the occupational clinic prior to receiving the injections, and are advised to read the package insert regarding the efficacy, safety, method of administration, and benefits of the vaccine. Employees may also ask questions directly of the Medical Service Provider or local occupational physician. Employees are not required to participate in a prescreening program (to determine immunity) before receiving the vaccinations. If a routine booster of Hepatitis B vaccine is recommended by the U.S. Public Health Service at a future date, such booster dose(s) will be made available to affected employees.

5.0 Post-Exposure Incident Evaluation And Follow-Up

5.1 All occupational bloodborne pathogen exposures shall be reported to the HSE representative and Occupational Health Manager immediately after initial decontamination first aid is accomplished. Following the report of an exposure incident, a confidential medical evaluation with an occupational physician will be arranged as soon as possible, ideally no later than 1 to 2 hours after the incident has occurred. In some jurisdictions, depending on applicable workers' compensation law, employees may choose treatment from their personal physician. A copy of the OSHA Bloodborne Pathogen Standard, if applicable to the jurisdiction, will be provided if the physician does not have a copy. A written incident report shall be completed as soon as possible, fully describing the incident.

5.2 First aid protocol for treatment immediately after an exposure incident:

5.2.1 Lacerations, punctures, and abrasions should be washed under cool running water for at least 5 minutes, allowing free bleeding. Cleanse area well with soap or iodine solution. Apply sterile dressing as needed. Give tetanus booster if indicated (7 to10 years since last booster).

5.2.2 Ocular exposure requires irrigation of the eye with water or sterile normal saline solution for 15 minutes.

5.2.3 Mucous membrane exposure requires rinsing mouth with ½ strength 3 percent hydrogen peroxide for 30 seconds, four separate and consecutive times.

5.3 Confidential Medical Evaluation

5.3.1 The treating occupational physician will receive documentation of the routes of exposure, the circumstances surrounding the incident, and identification of the source individual (the individual the employee was exposed to). The blood of the source individual will be tested if possible, and after consent is obtained. When legally permissible, results of the source individual's tests will be made available to the exposed employee, with the exposed employee informed about the applicable laws and regulations concerning the disclosure of the identity and infectivity of the source individual.

5.3.2 Testing of the exposed employee's blood, if consented to (the employee may consent to baseline blood collection, but may request that the sample not be tested for HIV for up to 90 days, if at all), is recommended.

5.3.3 Post-exposure medical treatment will be offered in accordance with the current recommendations of the U.S. Public Health Services. This may include, but is not limited to:

- A series of HIV post-exposure blood tests
- Hepatitis B vaccination and/or Hepatitis B immune globulin
- HIV post-exposure prophylactic medications
- Evaluation of acute febrile illnesses following exposure
- Employee counseling concerning precautions to take during the period after the exposure incident, and information on signs and symptoms of potential illnesses.

5.4 Healthcare Professional's Written Opinion

5.4.1 The Occupational Health Manager shall obtain and provide the employee with a copy of the evaluating physician's written opinion within 15 days of the completion of the medical evaluation. A copy will be maintained in the employee's confidential medical record. The written opinion shall be in accordance with the requirements of the OSHA Bloodborne Pathogens Standard indicating that the employee has been informed of any medical conditions resulting from exposure that require further evaluation or treatment. All other findings or diagnoses shall remain confidential and will not be included in the report.

6.0 Hazard Communication

6.1 Fluorescent red or orange-red warning labels bearing the universal biohazard symbol and the legend BIOHAZARD shall be firmly affixed to all containers (e.g., waste cans, sharps containers, and refrigerators) used for the storage or shipment of blood or other potentially infectious materials.

6.2 All employees designated to perform tasks involving occupational exposure shall receive bloodborne pathogens training at the time of initial assignment to the job. This training will be given during working hours and at no cost to employees. Refresher courses will be provided annually (within 1 year of previous training), and if new tasks or procedures are implemented. Material appropriate in content and vocabulary to education level, literacy, and language of the employees shall be used for all required training.

6.3 Training will include: making accessible a copy of the regulatory text of the standard and explanation of its contents, general discussion on bloodborne diseases and their transmission, exposure control plan, engineering and work practice controls, personal protective equipment, Hepatitis B vaccine, response to emergencies involving blood, how to handle exposure incidents, the post-exposure evaluation and follow-up program, signs/labels/color-coding, and question and answer time with the trainer.

7.0 Exposure Incident Investigation

7.1 The SH&E Manager will review the circumstances of any exposure incident to determine corrective actions. The incident report will include:

7.1.1 Engineering controls in use at the time

7.1.2 Work practices followed

7.1.3 A description of any equipment being used

7.1.4 A description of the work being performed

7.1.5 PPE that was used at the time of the incident

7.1.6 Date, time, and location of the incident

7.1.7 Employee's training.

7.2 An incident report shall be completed within four hours of the incident and entered into AECOM's on-line incident reporting system (e.g., IndustrySafe) in accordance with *S3AM-004-PR1 Incident Reporting, Notifications & Investigations*. A copy of this incident report will be forwarded to the Occupational Health Manager, who will evaluate what follow-up actions should be addressed, including if revisions need to be made to the Exposure Control Plan.

8.0 Recordkeeping

8.1 The Occupational Health Manager will be responsible for establishing and maintaining accurate, confidential workers' compensation medical records for each employee with occupational exposure for the duration of employment plus 30 years, in accordance with OSHA 29 CFR 1910.1020 – Access to Employee Exposure and Medical Records.

8.2 The SH&E Manager will be responsible for maintaining the bloodborne pathogens training class records for at least 3 years from the date of training. The records will include the date of the training class, a summary of the class contents, the names of the qualified instructors, and the names and job titles of personnel attending the training.

8.3 Employee medical records shall be made available to employees (or their designated representative) with written consent by the employee within 15 working days of request.

8.4 An exposure incident will be evaluated by the Occupational Health Manager and SH&E Manager to determine if the case meets OSHA's Recordkeeping Requirements (29 CFR 1904).

Americas

Hepatitis B Vaccination Declination

S3AM-111-FM1

I understand that due to my occupational exposure to blood or other potentially infectious materials, I may be at risk of acquiring Hepatitis B virus (HBV) infection.

I have been given the opportunity to be vaccinated with Hepatitis B vaccine, at no charge to myself; however, I decline Hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring Hepatitis B, a serious disease.

If, in the future, I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with the Hepatitis B vaccine, I can receive the vaccine series at no cost to me.

Name: _____

Date: _____

Witness: _____

Date: _____

Americas

Cold Stress

S3AM-112-PR1

1.0 Purpose and Scope

1.1 To protect employees from the severest effects of cold stress (hypothermia) and cold injury and to identify exposures to cold working conditions under which it is believed nearly all employees can be repeatedly exposed without adverse health effects.

1.2 This procedure applies to all AECOM Americas based employees and operations, and any other entity and its personnel contractually required to comply with this document's content, working outdoors in damp and cool (below 50 degrees Fahrenheit [°F] or 10 degrees Celsius [°C]) conditions or anytime temperatures are below 32°F or 0°C.

2.0 Terms and Definitions

2.1 **Cold Stress** – The production of physiological effects due to cold temperatures and\or wind chill.

2.2 **Equivalent Chill Temperature (ECT)** – Also known as Wind Chill (see below).

2.3 **Frostnip** – Superficial cooling of tissues without cellular destruction.

2.4 **Frostbite –** Freezing of tissue, resulting in tissue destruction.

2.5 **Hypothermia –** Condition of reduced core body temperature to 95ºF (35ºC) resulting in loss of dexterity, loss of mental alertness, collapse, and possible death.

2.6 **Wind Chill –** The combined effect of air temperature and wind. Also expressed as "equivalent chill temperature" (ECT), wind chill is defined as heat loss resulting from the effects of air temperature and wind velocity upon exposed skin.

3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-128-PR1 Medical Screening & Surveillance Program

3.3 S3AM-208-PR1 Personal Protective Equipment

3.4 S3AM-314-PR1 Working Alone

3.5 S3AM-315-PR1 Working On or Near Water

3.6 S3AM-333-PR1 Marine Safety & Vessel Operations

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Manager**

- Ensuring the safety of employees on their project sites, consistent with regulatory standards.
- Implement cold stress prevention measures as applicable at each work site.
- Develop/coordinate a work-warning regimen, as applicable.
- Confirm cold stress hazard assessments/evaluations were completed for the planned activities.
- Assign employees physically capable of performing the assigned tasks. Consider acclimation to cold weather when evaluating employee capability.

- Confirm employees are properly trained to recognize the symptoms of cold stress.

4.1.2 **Safety, Health and Environment (SH&E) Manager**

- Conduct/support cold stress assessments/evaluations.
- Conduct/support incident investigations related to potential cold stress-related illnesses.
- Assist project teams develop appropriate work-warming regimens.
- Provide cold stress awareness training.

4.1.3 **Supervisor**

- Identify the tasks that may be most impacted by cold stress and communicate the hazard to the assigned employees.
- Confirm that employees have been trained on the recognition of cold stress-related illnesses.
- Confirm that adequate supplies of warm fluids/drinks are readily available to employees.
- Confirm that a warm/sheltered rest area is available, as applicable.
- Conduct cold stress monitoring, as applicable.
- Implement the work-warming regimen.
- Confirm that first aid measures are implemented once cold stress symptoms are identified.
- Confirm that employees are physically capable of performing the assigned tasks and are not in a physically compromised condition.

4.1.4 **Employee**

- Observe each other for the early symptoms of cold stress-related illnesses.
- Maintain an adequate intake of available fluids.
- Report to work in a properly rested condition.
- Report all suspected cold stress-related illnesses.

4.2 Requirements

4.2.1 Carefully plan work anticipated to be performed in cool or cold conditions. If possible, heavy work should be scheduled during the warmer parts of the day or when the wind is most calm. Include costs in project budgets for specialized equipment and supplies needed to complete the field activities.

4.2.2 Staff working in extreme cold (wind chill or ECT below 10ºF or -12ºC) shall not work alone. The Buddy System shall be utilized to keep an eye on each other and to watch for signs of cold stress. Refer to *S3AM-314-PR1 Working Alone*. Watch for symptoms and signs of hypothermia

4.2.3 Monitor weather forecasts and weather conditions such as ambient temperature, wind speed, and precipitation. Use observations prior to entering and while in the field to ensure appropriate protections are in place:

- If possible, move the work to a warm location.
- If possible and as applicable, erect shelters or screens around the work area.
- If possible, heat the work area.
- If possible, adjust schedule according to the cold conditions, work level and worker acclimatization.
- Implement a work-warming regimen by taking breaks out of the cold. As applicable, consult *S3AM-112 ATT1 Temperature Thresholds* to determine wind chill and work-warming schedule.
- Take frequent short breaks in warm dry shelters to allow your body to warm up. Limit time of exposure to the cold. If shelter is not readily available, consider supplying temporary shelters.

- Provide assistance to prevent body heat loss, such as:
  - Providing appropriate sources of heat (e.g. warm packs, portable heaters, etc.).
  - Use of insulating materials on equipment handles when temperatures drop below 30°F (-1°C).

4.2.4 All staff working in extreme cold or snow conditions should understand the following guidelines for preventing and detecting hypothermia and frostbite; refer to *S3AM-112-ATT2 Symptoms & Treatment*:

- Ensure appropriate PPE requirements are established and adhered to.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Because prolonged exposure to cold air or to immersion in cold water at temperatures even well above freezing can lead to dangerous hypothermia, whole-body protection shall be used.
- Eat high calorie snacks to help maintain body metabolism.
- Confirm extra blankets or sleeping bags are on-site.
- Drink plenty of warm liquids. It is easy to become dehydrated in cold weather.
- Avoid caffeine and alcohol, which can act as diuretics. Alcohol consumption, depending upon quantity, can dilate blood vessels enhancing body heat loss or constrict blood vessels decreasing heat delivery to extremities.
- NEVER IGNORE SHIVERING. Persistent or violent shivering is a clear warning that you are on the verge of hypothermia.
- If you experience frost bite or hypothermia, find shelter and warmth and contact a medical practitioner if symptoms persist, refer to *S3AM-128-PR1 Medical Screening & Surveillance*.

4.3 Training

Before they begin work in a cold environment, employees that might be exposed to cold stress will be informed of the potential for cold stress and how to prevent cold stress. Employees that have not had the training within the twelve prior months shall repeat the training before exposure to cold stress, refer to *S3AM-003-PR1 SH&E Training*. Employees potentially exposed to cold stress will receive training including, but not limited to:

4.3.1 Sources of cold stress, the influence of protective clothing, and the importance of acclimatization.

4.3.2 How the body loses heat.

4.3.3 Recognition of cold-related illness symptoms.

4.3.4 Cold stress preventative/corrective measures including, but not limited to:

- Weather monitoring.
- Proper eating and drinking practices.
- Work-warming schedules and proper re-warming techniques.
- Buddy system.
- Safe cold work practices appropriate to the work that is to be performed.
- Proper use of cold environment personal protective clothing.

4.3.5 The harmful effects of excessive alcohol consumption in a cold stress environment.

4.3.6 The hazards associated with unstable snow or ice build ups.

4.3.7 First aid procedures for symptoms related to cold stress.

4.4 Personal Protective Equipment (PPE)

Wearing the right clothing is crucial to avoiding cold stress. The type of fabric also makes a difference. Cotton loses its insulation value when it becomes wet. Wool, on the other hand, retains its insulation even when wet. Adequate insulating dry clothing will be required in air or wind chill temperatures below 40 °F (4.4°C)

All PPE will comply with the requirements of *S3AM-208-PR1 Personal Protective Equipment* and consider the following requirements:

4.4.1 Wear at least 3 layers of clothing to help prevent cold stress. It is important to preserve the air space between the body and the outer layer of clothing to retain body heat.

- Wear a middle layer of down, wool, or similar materials to provide insulation.
- Avoid cotton, especially blue jeans.
- Wear an outer layer to break the wind and allow some ventilation (e.g., Gortex® or nylon)
- Do not wear tight clothing. Loose clothing allows better ventilation.

4.4.2 Wear proper clothing, including head coverings and gloves or mittens for cold, wet, and windy conditions.

4.4.3 Wear a hat or hardhat liner. Up to 40 percent of body heat can be lost when the head is left exposed.

4.4.4 Use insulated footwear with adequate traction to prevent slips and falls.

4.4.5 Wear insulated boots or other insulated footwear, and insulated gloves to help reduce the chance of frostbite.

4.4.6 Keep a change of dry clothing available in case work clothes become wet.

4.4.7 Eye and face protection for employees employed outdoors in a snow and/or ice-covered terrain should be supplied.

- Sunglasses (with UVA and UVB protection) and sunscreen should be used when there is a persistent combination of snow and direct sun.
- Special safety goggles to protect against blowing ice crystals and ultraviolet light and glare (which can produce temporary conjunctivitis and/or temporary loss of vision) should be required when there is an expanse of snow coverage causing a potential eye exposure hazard.
- Ensure face guards are used to protect skin in cold, windy conditions, including riding on an unshielded vehicle.

4.5 General Cold Stress Prevention Measures

4.5.1 In order to prevent hypothermia:

- Wear appropriate clothing and PPE as determined by the weather conditions.
- When active, ventilate excess heat by opening or removing outer layers of clothing to avoid sweating.
    - Start with the mitten or gloves, unless protection from ice, snow, or cold metal surfaces is needed.
    - Next remove head gear and neck wrappings.
    - Then coats/parkas should be opened at the waist and sleeves.
    - Finally, layers of clothing should be taken off.
    - When resting or tired, or colder conditions are encountered, add additional layers of clothing/ close outer layers in the reverse of the above order, or get out of the cold. Have a sweet drink but do not indulge in heavy eating.

- Garments worn to keep out rain and spray should also allow water vapor to escape.
- Take advantage of heat from the sun and stay out of the wind as much as possible.
- Have available emergency shelter providing protection from wind and rain and insulation from the ground.
- Replace wet clothing. If wet clothing cannot be replaced, then cover it with a layer of non-breathing material to prevent evaporation. Place an insulation layer over this non-breathing material.
- Get adequate rest; conserve energy.
- Get adequate nutrition to replenish energy stores; rest after meals.
- Drink adequate fluids to avoid dehydration.
- If any project / location staff member shows signs of hypothermia, stop and treat him/her.

4.5.2 In order to prevent frost bite:

- Dress to prevent hypothermia and protect the feet and hands.
- Avoid obstruction of circulation by, for example, tight boots or tightly fitting clothing.
- Avoid nicotine (particularly cigarettes) and do not consume alcohol.
- Keep ears and nose covered and out of the wind.
- Frostbite of the corneas of the eyes can be prevented by protective goggles.
- Adopt a “buddy system” of constantly watching the faces of others in the party for white skin tissue, which is evidence of frostbite (frostnip).
- Practice constant personal vigilance for signs of trouble in one’s own fingers and toes; when in doubt, investigate thoroughly before it is too late.

4.5.3 Adequate, insulating dry clothing that will help maintain core temperatures above 96.8°F (37°C) shall be provided to employees if work is performed in air temperatures below 40°F (4.4°C). Wind chill cooling rate and the cooling power of air are critical factors. The higher the wind speed and the lower the temperature in the work area, the greater the insulation value of the protective clothing required.

4.5.4 An Equivalent Chill Temperature (ECT) chart relating the actual dry bulb air temperature and the wind velocity is presented in *S3AM-112-ATT1 Temperature Thresholds*. Unless unusual or extenuating circumstances exist, cold injury to other than hands, feet, and head is not likely to occur without the development of the initial signs of hypothermia. Superficial or deep local tissue freezing will occur only at temperatures below 32°F (0°C) regardless of wind speed. However, older employees, those with circulatory problems and those with previous cold injuries require special precautionary protection against cold injury. The use of extra insulating clothing and/or a reduction in the duration of the exposure period are among the special precautions that should be considered.

4.5.5 Continuous exposure of skin should not be permitted when the air speed and temperature results in an ECT of –25°F (-32°C) or below.

4.5.6 At air temperatures of 40°F (4.4°C) or less, it is imperative that employees who become immersed in water or whose clothing becomes wet be immediately removed from the cold environment, provided a change of clothing, and be treated for hypothermia.

4.5.7 If the air velocity at the job site is increased by wind, draft, or artificial ventilating equipment, the cooling effect of the wind should be reduced by shielding the work area or by wearing an easily removable windbreak garment.

4.5.8 Adequate protection, such as general ventilation, shall be incorporated into any warming shelter design to prevent carbon monoxide poisoning.

4.5.9 Operation of internal combustion or similar devices within warming shelters is prohibited.

4.5.10 If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work should be modified or suspended until adequate clothing is made available or until weather conditions improve.

4.5.11 Walking and working surfaces shall be cleared of ice and snow to prevent slips and falls.

4.5.12 Confirm that employees carry fire starter materials if working in remote areas.

4.5.13 Supplies such as PPE, fuels, enclosures, de-icing, traction aids, warm drinks, and batteries will be specified by the SH&E Manager and/or the Manager and made available. These supplies will be inspected at least weekly during cold weather projects and replaced when necessary.

4.6 Cold Stress Prevention Measures for the Hands

4.6.1 Special protection of the hands is required to maintain manual dexterity for the prevention of accidents including, but not limited to the following:

- If fine work is to be performed with bare hands for more than 10 to 20 minutes in an environment below 60ºF (15ºC), special provisions should be established for keeping the employees' hands warm. For this purpose, warm air jets, radiant heaters (fuel burner or electric radiator), or contact warm plates may be utilized. Metal handles of tools and control bars should be covered by thermal insulating material at temperatures below 30ºF (-1º C).
- If the air temperature falls below 60ºF (15ºC) for sedentary work, 40ºF (4.4º C) for light work, or 20ºF (-6ºC) for moderate work, and fine manual dexterity is not required, employees should use gloves.

4.6.2 To prevent contact frostbite, employees should wear anti-contact gloves:

- When cold surfaces below 20°F (-6°C) are within reach, each employee should be warned to prevent inadvertent contact by bare skin.
- If the air temperature is 0°F (-18°C) or less, employees should protect their hands with mittens or appropriate gloves. Machine controls and tools for use in cold conditions should be designed so that they can be handled without removing the mittens or gloves.
- Ensure an adequate supply of dry gloves is available to replace wet gloves.

4.6.3 Provisions for additional total body protection are required if work is performed in an environment at or below 40ºF (4.4ºC). The employees should wear cold protective clothing appropriate for the level of cold and physical activity.

4.6.4 Additional Cold Stress Prevention Measures:

For work practices at or below 10ºF (-12ºC) ECT, the following will apply:

- The employee should be under constant protective observation (buddy system or supervision).
- The work rate should not be so high as to cause heavy sweating that will result in wet clothing. If heavy work is being performed, rest periods should be taken in heated shelters and opportunities to change into dry clothing should be provided.
- New employees should not be required to work full time in the cold during the first days of employment until they become acclimated to the working conditions and required protective clothing. Refer to *S3AM-112-ATT1 Temperature Thresholds* for guidance.
- The weight and bulkiness of clothing should be included in estimating the required work performance and weights to be lifted by the employee.
- The work should be arranged in such a way that sitting still or standing still for long periods is minimized. Unprotected metal chair seats should not be used. The employee should be protected from drafts to the greatest extent possible.

4.6.5 Employees handling evaporative liquid (gasoline, alcohol, or cleaning fluids) at air temperatures below 40ºF should take special precautions to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling. Special note should be taken of the particularly acute effects of splashes of “cryogenic fluids” or those liquids with a boiling point that is just above ambient temperature.

4.6.6 Trauma sustained in freezing or subzero conditions requires special attention, because an injured employee is predisposed to cold injury. Special provisions should be made to prevent hypothermia and freezing of damaged tissue in addition to providing for first aid treatment.

4.7 Hypothermia in Water

4.7.1 Loss of body heat heat to the water is a major cause of deaths in boating and working near water incidents. Often the cause of death is listed as drowning; however, the primary cause is often hypothermia. It should also be noted that alcohol lowers the body temperature around 2 to 3 degrees by dilating the blood vessels. Do not drink alcohol around cold water. The following table shows the effects of hypothermia in water:

WATER TEMPERATURE		EXHAUSTION	SURVIVAL TIME
32.5°F	(0°C)	Under 15 minutes	Under 15 to 45 minutes
32.5 to 40°F	(0 to 4°C)	15 to 30 minutes	30 to 90 minutes
40 to 50°F	(4 to 10°C)	30 to 60 minutes	1 to 3 hours
50 to 60°F	(10 to 16°C)	1 to 2 hours	1 to 6 hours
60 to 70°F	(16 to 21°C)	2 to 7 hours	2 to 40 hours
70 to 80°F	(21 to 27°C)	3 to 12 hours	3 hours to indefinite
Over 80°F	(27°C)	Indefinite	Indefinite

4.7.2 Some points to remember when water is a potential hazard:

- Wear a personal flotation device when drowning is a potential hazard. Refer to *S3AM-315-PR1 Working On or Near Water*, and *S3AM-333-PR1 Marine Safety & Vessel Operations*.
- If the water is less than 50°F (10°C), wear a wet suit or dry suit for work in water (e.g., wading, or if a significant potential to fall in water exists).
- While in the water, do not attempt to swim unless to reach nearby safety. Unnecessary swimming increases the rate of body heat loss. Keep the head out of the water. This will increase survival time.
- Keep a positive attitude about rescue. This will increase chances of survival.
- If there is more than one person in the water, huddling is recommended to conserve body heat.

4.7.3 If an employee or equipment is to work on ice and the water beneath the ice is or may be more than 3¼ feet (1m) deep at any point:

- Test the ice prior to commencing to ensure it will support the load to be placed on it. Ongoing testing may be necessary.
- If there is any risk of falling through the ice employees must wear personal protective equipment that will ensure buoyancy and protect against hypothermia at all times while on the ice.

4.8 Work-Warming Regimen

4.8.1 If work is performed continuously in the cold at an equivalent chill temperature (ECT) at or below 19ºF (–7ºC), heated warming shelters (tents, cabins, rest rooms, etc.) should be made available nearby. The employees should be encouraged to use these shelters at regular intervals; the frequency will depend on the severity of the environmental exposure. Refer to *S3AM-112-ATT1 Temperature Thresholds* for guidance.

4.8.2 The onset of heavy shivering, minor frostbite (frostnip), the feeling of excessive fatigue, drowsiness, irritability, or euphoria are indications for immediate return to the shelter.

4.8.3 When entering the heated shelter, the outer layer of clothing should be removed and the remainder of the clothing should be loosened to permit sweat evaporation or a change of dry work clothing provided.

4.8.4 A change of dry work clothing should be provided as necessary to prevent employees from returning to the cold environment with wet clothing.

5.0 Records

5.1 Exposure assessments will be documented in the location's files.

6.0 Attachments

6.1 S3AM-112-ATT1 Temperature Thresholds

6.2 S3AM-112-ATT2 Symptoms & Treatment

Americas

Temperature Thresholds

S3AM-112-ATT1

1.0 Purpose and Scope

1.1 The following Tables 1 and 2 give apparent temperatures (wind chill of equivalent chill temperature [ECT]) for various combinations of wind and air temperature, as well as guidelines to the danger of skin exposure.

Table 1. Wind Chill Chart (C)

Actual Temp (°C)	Wind Speed in km/hour									
	8	16	24	32	40	48	56	64	72	80
	Ambient Temperature (°C)									
0	-2	-8	-11	-14	-16	-17	-18	-19	-19	-20
-5	-7	-14	-18	-21	-23	-25	-26	-27	-28	-28
-10	-12	-20	-25	-28	-31	-33	-34	-35	-36	-36
-15	-18	-26	-32	-35	-38	-40	-42	-43	-43	-44
-20	-23	-32	-38	-43	-46	-48	-50	-51	-52	-52
-25	-28	-38	-45	-50	-53	-56	-57	-59	-59	-60
-30	-33	-45	-52	-57	-61	-63	-65	-67	-67	-68
-35	-39	-51	-59	-64	-68	-71	-73	-75	-75	-76
-40	-44	-57	-65	-71	-75	-79	-81	-83	-83	-84
-45	-49	-63	-72	-78	-83	-86	-89	-90	-91	-92
-50	-54	-69	-79	-85	-90	-94	-96	-98	-99	-100

Note: A. Little Danger: if less than one hour of exposure to dry skin.
B. Danger: Exposed flesh freezes within one minute.
C. Great Danger: Flesh may freeze within 30 seconds.

*Source: *2014 Threshold Limit Values (TLV™) and Biological Exposure Indices (BEI™) booklet; published by ACGIH, Cincinnati, Ohio.*

Table 2. Equivalent Chill Temperature Chart (F)

Estimated Wind Speed (mph)	Actual Temperature Reading (°F)									
	50	40	30	20	10	0	-10	-20	-30	-40
	Equivalent Chill Temperature (°F)									
Calm	50	40	30	20	10	0	-10	-20	-30	-20
5	48	37	27	16	6	-5	-15	-26	-36	-47
10	40	28	16	4	-9	-24	-33	-46	-58	-70
15	36	22	9	-5	18	-32	-45	-58	-72	-85
20	32	18	4	-10	-25	-39	-53	-67	-82	-96
25	30	16	0	-15	-29	-44	-59	-75	-88	-104
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109
35	27	11	-4	-20	35	-51	-67	-82	-98	-113
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116
Wind speeds >40 mph have little additional effect	LITTLE DANGER				INCREASING DANGER			GREAT DANGER		
	Trenchfoot and immersion foot may occur at any point on this chart.									

1.2 How fast a person's body cools in cold weather depends on: air temperature, wind speed, heat of the sun, and work being done.

1.2.1 The following Table 3 provides guidelines for establishing periods of work to warming break periods based on ambient temperature and wind speed for workers wearing dry clothing.

1.2.2 Notes following the Table take into account additional factor such as physical exertion, whether workers are acclimatized, etc.

Table 3. Work-Warming Schedule Guidelines

Air Temp. (Sunny Sky) °F	No Noticeable Wind		5 mph Wind (8 km/h)		10 mph Wind (16 km/h)		15 mph Wind (24 km/h)		20 mph Wind (32 km/h)		25 mph Wind (40 km/h)		Air Temp. (Sunny Sky) °C
	Max. Work Period	Breaks	Max. Work Period	Breaks	Max. Work Period	Breaks	Max. Work Period	Breaks	Max. Work Period	Breaks	Max. Work Period	Breaks	
above 5°	Normal Work Schedule		Normal Work Schedule		Normal Work Schedule		Normal Work Schedule		Normal Work Schedule		Normal Work Schedule		above -15°
5° to -1°											100 min	2	-15° to -17°
0° to -4°									100 min	2	75 min	2	-18° to -20°
-5° to -9°							100 min	2	75 min	2	55 min	3	-21° to -22°
-10° to -14°					100 min	2	75 min	2	55 min	3	40 min	4	-23° to -25°
-15° to -19°			100 min	2	75 min	2	55 min	3	40 min	4	30 min	5	-26° to -28°
-20° to -24°	100 min	2	75 min	2	55 min	3	40 min	4	30 min	5	Cease Work		-29° to -31°
-25° to -29°	75 min	2	55 min	3	40 min	4	30 min	5	Cease Work				-32° to -34°
-30° to -34°	55 min	3	40 min	4	30 min	5	Cease Work						-35° to -37°
-35° to -39°	40 min	4	30 min	5	Cease Work								-38° to -39°
-40° to -44°	30 min	5	Cease Work										-40° to -42°
-44° & below	Cease Work												-43° & below

Modified from ACGIH 2014 Threshold Limit Values for Chemical Substances and Physical Agents.

Note 1: Schedule describes the maximum continuous duration of work and number of 10-15 minute breaks to be observed during any 4-hour work period and assumes that period will be followed by an extended warm-up period (e.g., lunch). Allowed breaks should be taken in a warm environment.

Note 2: Schedule applies to moderate to heavy work performed by acclimated workers wearing appropriate layered clothing. For light to moderate work apply the schedule for conditions one step lower. For unacclimated workers apply the schedule for conditions two steps lower. These modifications are additive.

Note 3: For work under 25%–50% overcast/clouds, apply the schedule for conditions one step lower. For work at night or under greater than 50% overcast/clouds, apply the schedule for conditions two steps lower. These modifications are additive with any applicable modifications from Note 2.

Note 4: For wind speeds in excess of 25 mph (40 km/h), cease all nonemergency work when temperatures fall below 5°F (-21°C).

Note 5: When the work involves riding on an unshielded vehicle or some other activity that generates wind, the number of breaks should be increases appropriately.

Note 6: If effective protection against the wind can be provided by shields or screens, work modifications or measures, then the work warm-up schedule for “No Noticeable Wind” would apply.

Note 7: If reliable weather reports are not available, use the following as a guide to estimate wind velocity:

- A 5 mph (8 km/h) wind will move a light flag
- A 10 mph (16 km/h) wind will fully extend the flag
- A 15 mph (24 km/h) wind will raise a newspaper sheet
- A 20 mph (32 km/h) wind will produce blowing and drifting snow.

1.0 Cold Stress-related Illnesses

1.1 Frostbite

1.1.1 Frostbite is a localized cold injury characterized by freezing of the tissues with ice crystal formation. There are several degrees of damage. Frostbite can be categorized into:

- **Frost Nip or Initial Frostbite**: (1st degree frostbite) Characterized by blanching or whitening of skin.
- **Superficial Frostbite**: (2nd degree frostbite) Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient. Blistering and peeling of the frozen skin will follow exposure.
- **Deep Frostbite**: (3rd degree frostbite) Tissues are cold, pale, and solid; extremely serious injury with possible amputation of affected area.

1.1.2 Frostbite injury is almost always limited to the upper and lower extremities (finger and toes) or to such appendages as the ears, nose or cheeks.

1.1.3 Conditions conducive to frostbite include sub-zero temperatures, hypothermia, dehydration, obstruction of the blood supply to the extremities (by constricting clothing, especially on the feet or at the wrists or ankles), contact with cold metal, contact with organic liquids (such as gasoline or solvents that have been left outdoors in sub-zero temperatures), use of substances that cause vasoconstriction (such as smoking tobacco), or other injury or shock.

1.1.4 Frostbite can occur without hypothermia when the extremities do not receive sufficient heat. Frostbite occurs when there is freezing of the fluids around the cells of the affected tissues.

1.1.5 Contact by the skin with tools or other metal objects below 20°F (-7°C) may result in contact frostbite.

1.1.6 The first symptom of frostbite is an uncomfortable sensation of coldness and pain, followed by numbness. There may be tingling, stinging, or cramping. Ongoing symptoms of frostbite include:

- Sudden and complete cessation of cold or discomfort in affected fingers or toes, often followed by a pleasant feeling of warmth;
- Subsequently the only symptom may be the absence of any sensation in the frozen part;
- Paleness in the affected tissues;
- Firm or hard tissues; and
- Purple tissue, if a large area, such as an entire hand or food, is frostbitten.

1.1.7 If exposure occurs in temperatures that are below freezing (32ºF or below), frostbite or trench foot (immersion foot) may accompany or complicate the symptoms of hypothermia. Frostbite is the freezing of living tissues with a resultant breakdown of cell structure. Symptoms due to frostbite may include, but is not limited to:

- Superficial redness of the skin;
- Slight numbness;
- Blisters;
- Obstruction of blood flow (ischemia);
- Blood clots (thrombosis); and
- Skin discoloration due to insufficient oxygen in the blood (cyanosis).

1.1.8 Frostbite may occur if the skin comes into contact with objects with a surface temperature below freezing, such as metal tool handles. Trench foot is caused by continuous exposure to cold combined with persistent dampness or immersion in water. Injuries in this case include permanent tissue damage due to oxygen deficiency, damage to capillary walls, severe pain, blistering, tissue death, and ulceration.

1.1.9 Additionally, cold exposures may either induce or intensify vascular abnormalities. These include chilblain (a swelling or sore), Raynaud's disease, acrocyanosis (blueness of hands and feet) and thromboangiitis (inflammation of the innermost walls of blood vessels with accompanying clot formation). Workers suffering from these ailments should take particular precautions to avoid chilling.

1.2 Hypothermia

1.2.1 Hypothermia is a lower than normal body temperature that occurs when outer cold cools the body faster than the body can produce heat to stay warm. When this situation first occurs, blood vessels in the skin constrict in an attempt to conserve vital internal heat. Hands and feet are the first affected.

- If the body continues to lose heat, involuntary shivers begin. This is the body's way of attempting to produce more heat, and it is usually the first real warning sign of hypothermia.
- Further heat loss produces speech difficulty, confusion, loss of manual dexterity, collapse, and finally death.

1.2.2 Hypothermia can be caused by exposure to wind, cold, and/or moisture. The combination of wind, cold, and moisture can be deadly. Wet clothes or immersion in cold water greatly increases the hypothermia risk. The progressive clinical presentation of hypothermia is described in the table below.

Condition	Core Body Temp.	Signs/Symptoms	Treatment
Mild Hypothermia	99 – 97 F 37 – 36 C	Normal, shivering may begin	Seek dry shelter; replace wet clothing, insulate whole body and head, avoid sweating, use external warmth (bath, fire) only if core above 95 degrees F, give warm sweet drinks and food.
	97 – 95 F 36 – 35 C	Cold sensation, goose bumps, unable to perform complex tasks with hands, shiver can be mild to severe, hands numb.	
Moderate Hypothermia	95 – 93 F 35 – 34 C	Intense shivering, muscle in-coordination becomes apparent, movements slow and labored, stumbling pace, mild confusion may appear alert.	Avoid exercise and external warmth, gently rest; give warm sweet drinks and calories, internal warming via warm moist air, monitor pulse and breathing.
	93 – 90 F 34 – 32 C	Violent shivering persist, difficulty speaking, sluggish thinking, amnesia starts to appear, gross muscle movements sluggish, unable to use hands, stumbles frequently, signs of depression, withdrawn.	
Severe Hypothermia	90 – 86 F 32 – 30 C	Shivering stops, exposed skin blue or puffy, muscle coordination very poor, inability to walk, confusion, incoherent/irrational behavior, but may be able to maintain posture and appearance of awareness.	Medical emergency, give nothing by mouth, wrap in an insulated blanket, avoid rapid rewarming, transfer to hospital immediately.
	86 – 82 F 30 – 28 C	Muscle rigidity, semiconscious, stupor, loss of awareness of others, pulse and respiration rate decrease, possible heart fibrillation.	
	82 – 78 F 28 – 25.5 C	Unconscious, heart beat and respiration erratic, pulse may not be palpable.	
	78 – 75 F 25.5 – 24 C	Pulmonary edema, cardiac and respiratory failure, death. Death may occur before this temperature is reached.	

1.2.3 Early warning signs of hypothermia:

- Feeling of being cold and tired;
- Heavier breathing and increased pulse rate;
- Tendency to keep moving (e.g., stamping feet, rubbing hands, continued walking/pacing);
- Goose bumps, holding arms tightly wrapped around the body, hunching of shoulders, and
- Shivering.

1.2.4 Hypothermia damages both the body's internal temperature mechanisms (hypothalamus) and the peripheral mechanisms to prevent heat loss (vasoconstriction and perspiration.) These effects may last up to three years after the initial hypothermia episode. Symptoms of hypothermia may include, but are not limited to:

- Pain in the extremities;
- Severe shivering and numbness;
- Low core body temperature;
- Drowsiness and muscular weakness;
- Apathy;
- Mental confusion;
- Loss of consciousness;
- Shock, and
- Decreasing pulse and breathing rate.

2.0 Recommended Treatment for Cold Stress-related Illnesses

2.1 Frostbite

2.1.1 Wrap the victim in woollen blanket and keep dry until he or she can be brought inside.

2.1.2 Remove the victim from the cold environment.

2.1.3 Do not rub, chafe, or manipulate frozen parts.

2.1.4 Place the victim in warm water (102ºF to 105ºF) and make sure the water remains warm. Test the water by pouring it on the inner surface of your forearm. Never thaw affected body parts if the victim has to go back out into the cold; refreezing can cause significant tissue damage.

2.1.5 Do not use hot water bottles or a heat lamp, and do not place the victim near a hot stove.

2.1.6 Do not allow the victim to walk if his or her feet are affected.

2.1.7 Have the victim gently exercise the affected parts once they are thawed.

2.1.8 Seek immediate medical attention for thawing of serious frostbite.

2.2 Hypothermia

2.2.1 Bring the victim into a warm room or shelter as quickly as possible.

2.2.2 Give artificial respiration and stop any bleeding, if necessary.

2.2.3 If the victim cannot be moved (spinal injury, etc.), carefully place newspapers, blankets, or some other insulation between the victim and the ground.

2.2.4 Remove all wet clothing.

2.2.5 Provide an external heat source, because the body cannot generate its own heat. Wrap the victim in prewarmed blankets, place him or her in the liner of a portable hypothermia treatment unit, put the torso (not the extremities) into a tub of warm water, or use body-to-body contact to rewarm the body core. These measures will slowly reopen the peripheral circulation, minimizing the possibility

of after-shock or after-drop (the flowing of cooled, stagnated blood from the limbs to the heart), which may cause ventricular fibrillation, cardiac arrest, or death.

2.2.6 Do not allow the victim to sleep.

2.2.7 Give warm, sweet drinks. Do not give alcohol or pain relievers.

2.2.8 Keep the victim still. Do not try to walk.

2.2.9 Do not rub numb skin.

2.2.10 Get medical attention as soon as possible.

Americas

Heat Stress

S3AM-113-PR1

1.0 Purpose and Scope

1.1 Establishes a Heat Illness Prevention Program to guide employees in preventing heat illness, recognition of the symptoms of heat stress-related illnesses and in taking the appropriate corrective action.

1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

2.1 **Acclimated –** Employees who have developed physiological adaptation to hot environments characterized by increased sweating efficiency, circulation stability, and tolerance of high temperatures without stress. Acclimatization occurs after 7 to 10 consecutive days of exposure to heat and much of its benefit may be lost if exposure to hot environments is discontinued for a week.

2.2 **Chemical Protective Clothing (CPC)** – Apparel that is constructed of relatively impermeable materials intended to act as a barrier to physical contact of the Employee with potentially hazardous materials in the workplace. Such materials include Tyvek® coveralls (all types) and polyvinyl chloride coveralls and rain suits.

2.3 **Heat Cramps** – A form of heat stress brought on by profuse sweating and the resultant loss of salt from the body.

2.4 **Heat Exhaustion** – A form of heat stress brought about by the pooling of blood in the vessels of the skin and in the extremities.

2.5 **Heat Rash** – A heat-induced condition characterized by a red, bumpy rash with severe itching.

2.6 **Heat Stress** – The combination of environmental and physical work factors that constitute the total heat load imposed on the body.

2.7 **Heat Stroke** – The most serious form of heat stress, which involves a profound disturbance of the body's heat-regulating mechanism.

2.8 **Sunburn** – Caused by unprotected exposure to ultraviolet radiation present in sunlight that is damaging to the skin (Refer to *S3AM-121-PR1 Non-Ionizing Radiation*). The injury is characterized by red painful skin, blisters, and/or peeling.

2.9 **Unacclimated** – Employees who have not been exposed to hot work conditions for one week or more or who have become heat-intolerant due to illness or other reasons.

3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-004-PR1 Incident Reporting, Notifications & Investigation

3.3 S3AM-010-PR1 Emergency Response Planning

3.4 S3AM-121-PR1 Non-Ionizing Radiation

3.5 S3AM-208-PR1 Personal Protective Equipment

3.6 S3AM-209-PR1 Risk Assessment & Management

4.0 Procedures

4.1 Roles and Responsibilities

4.1.1 Managers

- Evaluate the need for heat illness prevention measures and incorporate as appropriate into the Safe Work Plan or Task Hazard Analysis.
- Allocate sufficient resources for the management of heat illness in the field including the provision of water, a shaded break area, and sufficient schedule to allow for breaks.

4.1.2 Safety, Health and Environment (SH&E) Manager

- Provide heat illness awareness training.
- Assist in developing appropriate work-rest schedules.
- Conduct/support incident investigations related to potential heat stress-related illnesses.

4.1.3 Supervisor

- Identify those tasks that may be most impacted by heat stress and communicate the hazard to the assigned Employees.
- Confirm that Employees have been trained on the recognition of heat illness.
- Confirm that this procedure, along with any applicable Safe Work Plan and/or Task Hazard Analysis (and heat exposure control plan that may be contained therein) are made available to affected Employees.
- Confirm that adequate supplies of appropriate fluids are readily available to Employees.
- Confirm that a proper rest area is available.
- Conduct heat illness monitoring, as applicable.
- Implement the work-rest schedule.
- Confirm that first aid measures are implemented once heat stress symptoms are identified.
- Confirm personnel are physically capable of performing the assigned tasks and are not in a physically compromised condition.
- Report all suspected heat illnesses.

4.1.4 Employee

- Observe each other for the early symptoms of heat illnesses.
- Maintain an adequate intake of available fluids.
- Be familiar with heat stress hazards, predisposing factors, and preventative measures.
- Report to work in a properly vested and hydrated condition.
- Report all suspected heat stress-related illnesses.

4.2 Restrictions

4.2.1 The Buddy System is required when working in high heat conditions; Employees shall not work alone.

4.2.2 Employees shall not be exposed to levels exceeding those specified for the given work level and work-rest regimen as listed in *S3AM-113-ATT1 Temperature Thresholds*.

4.2.3 Clothing corrections shall be applied in accordance with the tables provided in *S3AM-113-ATT1 Temperature Thresholds*.

4.3 Exposure Controls

4.3.1 It shall be determined whether Employees are or may be exposed to hazardous heat levels. The Supervisor shall:

- Conduct a heat stress assessment to determine the potential for hazardous exposure of Employees. Assessment shall include, but not limited to:
  - Ambient temperature.
  - Amount of sunshine (cloudy, clear). Refer to *S3AM-121-PR1 Non-Ionizing Radiation* additional direction concerning ultraviolet radiation exposures.
  - Other radiant heat sources (e.g. motor, fire, etc.).
  - Humidity.
  - Air flow.
  - Amount or type of physical labor being performed,
  - Physical condition of the Employees (e.g., acclimated/not)
  - Protective clothing in use.
  - Referral to *S3AM-113-ATT1 Temperature Thresholds* to assist in determining whether hazardous heat exposures may exist.
- If potential for hazardous exposure is identified, the Supervisor shall develop and implement a heat stress exposure control plan within the Safe Work Plan and/or Task Hazard Analysis. Refer to *S3AM-209-PR1 Risk Assessment & Management.*

4.3.2 If Employees are or may be exposed, the Supervisor shall implement engineering controls (e.g., shelters, cooling devises, etc.) to reduce the exposure of Employees to levels below those specified for the given work level and work-rest regimen as listed in *S3AM-113-ATT1 Temperature Thresholds*.

4.3.3 If engineering controls are not practicable, the Supervisor shall reduce the exposure of Employees to levels below those listed in *S3AM-113-ATT1 Temperature Thresholds* by providing administrative controls, including a work-rest cycle or personal protective equipment, if the equipment provides protection equally effective as administrative controls.

4.3.4 If Employees are or may be exposed, the Supervisor shall provide and maintain an adequate supply of cool, fresh, potable water close to the work area for the use of a heat exposed Employee. Water shall be provided (paid) by the project or program; if Employees purchase their own drinking water because water is not otherwise available on site, they shall be reimbursed.

4.3.5 If an Employee shows signs or reports symptoms of heat stress or strain, they shall be removed from the hot environment and treated by an appropriate first aid attendant on site, if available, or by a physician, refer to *S3AM-113-ATT2 Symptoms & Treatment* for more specifics.

4.4 Heat Stress Planning

4.4.1 Heat stress can be a significant site hazard, especially for Employees wearing CPC. To prepare for emergency response planning, refer to *S3AM-010-PR1 Emergency Response Planning* procedure.

4.4.2 The project and site specific risks need to be planned using the SH&E Plan and the Task Hazard Assessments (THA). Refer to the *S3AM-209-PR1 Risk Assessment & Management* procedure.

4.4.3 The heat a worker is exposed to may be a combination of air temperature, radiant heat, and humidity. The WBGT (wet-bulb globe thermometer) is a useful index of the environmental contribution to heat stress. Because WBGT is only an index of the environment, the contributions of

work demands, clothing, and state of acclimatization shall also be accounted for, as described in the following steps.

- Monitor ambient temperatures and conduct heat stress monitoring in accordance with the location specific SH&E Plan. Revise the heat stress monitoring and controls if there are any reports of discomfort due to heat stress.
- Monitor temperatures in each unique environment in which workers perform work (e.g., take WBGT measurements inside truck cabs for truck drivers, and take separate WBGT measurements in the outdoor area where field employees work, etc.). Follow manufacturer's instructions on proper use of the WBGT.
- Determine if individual workers are acclimatized or un-acclimatized. Full heat acclimatization requires up to 3 weeks of continued physical activity under heat-stress conditions similar to those anticipated for the work. Its loss begins when the activity under those heat-stress conditions is discontinued, or when there is a sustained increase in temperatures of 10 °F (5.6 °C) or more, and a noticeable loss occurs after 4 days. A worker can be considered acclimatized for the purpose of this procedure when they have been exposed to the site conditions (including level of activity) for 5 of the last 7 days.
- Determine the approximate workload of each worker or group of workers. The following examples (Table 1) can be used for comparison:

Table 1
Examples of Activities within Workload Categories

Categories	Example Activities
Resting	Sitting quietly
	Sitting with moderate arm movements
Light	Sitting with moderate arm and leg movements
	Standing with light work at machine or bench while using mostly arms
	Using a table saw
	Standing with light or moderate work at machine or bench and some walking about
Moderate	Scrubbing in a standing position
	Walking about with moderate lifting or pushing
	Walking on level at 3.5 miles/hr (6 km/hr) while carrying 6.6 lbs (3kg) weight load
Heavy	Carpenter sawing by hand
	Shoveling dry sand
	Heavy assembly work on a non-continuous basis
	Intermittent heavy lifting with pushing or pulling (e.g., pick-and-shovel work)
Very Heavy	Shoveling wet sand

- Determine the approximate proportion of work within an hour during a typical shift. Typically, the initial work schedule will be 60 minutes of work per hour (100 percent work) with a small break in the morning and afternoon, as appropriate, and a 30-minute lunch break mid-day.
- For workers wearing cloth coveralls (e.g., Nomex fire resistant clothing), add 3 to the measured WBGT. For impermeable clothing, such as Tyvek or Saranex, the WBGT procedures cannot be used. For these situations, workers should begin physiological monitoring as soon as the temperature in the work area exceeds 70ºF (21°C).
- Use the collected information to develop appropriate work to rest schedules as detailed in *S3AM-113-ATT1 Temperature Threshold*.

4.4.4 Given the work demands (light, moderate, heavy or very heavy), heat of the work environment, and such aspects as PPE in use, workload will be adjusted appropriately to allow for proper acclimation.

- This is the process by which the body "gets used to" hot work environments. This is achieved by slowly increasing workloads.
- New and returning Employees (absent one week or more) who have not had time to acclimatize may be more susceptible to heat related illnesses, even in seemingly low risk heat exposures.
- All Employees shall be allowed time to acclimatize in the event of a heat wave. All Employees assigned to a new process with additional heat exposures shall be allowed to acclimatize.
- Minimize workload and gradually increase as tolerance is built up. Allow for more frequent breaks.
- While acclimatization normally takes approximately 5 to 7 days, heightened monitoring of these Employees will be maintained for the first 14 days.

4.4.5 Employees shall be instructed in the recognition of heat stress symptoms, the first aid treatment procedures for severe heat stress, and the prevention of heat stress injuries. Employees shall be encouraged to immediately report any heat stress that they may experience or observe in fellow Employees. Supervisors shall use such information to adjust the work-rest schedule to accommodate such problems.

4.4.6 Wherever possible, a designated break area should be established in an air conditioned space, or in shaded areas where air conditioning is impractical. The break area should be equipped to allow Employees to loosen or remove protective clothing, and sufficient seating should be available for all Employees. During breaks, Employees shall be encouraged to drink plenty of water or other liquids, even if not thirsty, to replace lost fluids and to help cool off. Cool water should be available at all times in the break area, and in the work area itself unless hygiene/chemical exposure issues prevent it.

4.5 Symptoms and Treatment

4.5.1 Refer to *S3AM-113-ATT2 Symptoms & Treatment*.

4.5.2 Employees who exhibit ANY signs of significant heat stress (e.g., profuse sweating, confusion and irritability, pale, clammy skin) shall be relieved of all duties at once, made to rest in a cool location, and provided with large amounts of cool water.

4.5.3 Anyone exhibiting symptoms of heat stroke (red dry skin, or unconsciousness) shall be taken immediately to the nearest medical facility. Steps shall be taken to cool the person during transportation (clothing removal, wet the skin, air conditioning, etc.).

4.5.4 Severe heat stress (heat stroke) is a life-threatening condition that shall be treated by a competent medical authority.

4.6 Prevention

4.6.1 Requirements for working in extreme heat may be triggered by a regulatory established criteria (e.g. CAL/OSHA requires high heat procedures when temperature equals or exceeds 95°F) or as a result of a hazard analysis assessing various contributory factors (refer to *S3AM-113-ATT1 Temperature Thresholds*). Employees working in extreme heat or sun should understand and apply the following guidelines for preventing and detecting heat exhaustion and heat stroke.

- When possible, begin hydrating at least three days prior to working in high heat conditions.
- Review the heat stress exposure control plan within the Safe Work Plan and/or Task Hazard Analysis.
- If the supervisor is not immediately available confirm a reliable method of communication is in place to allow for contact with supervision. In the absence of cellular reception a satellite phone or similar device may be required.

- Take frequent short breaks in areas sheltered from direct sunlight; eat and drink small amounts frequently.
- Try to schedule work for the coolest part of the day, early morning and evening.
- Avoid strenuous physical activity outdoors during the hottest part of the day.
- Avoid sudden changes of temperature. Refer *to S3AM-113-ATT1 Temperature Thresholds*.
- Air out a hot vehicle before getting into it.
- Obtain medical direction if taking diuretics during hot weather (a lower dose may be necessary).
- When working in heat, drink 1 quart of water per hour of work.
- Avoid caffeine and alcohol as they increase dehydration.
- Monitor urine frequency and color to detect dehydration. Refer to the *S3AM-113-ATT3 Dehydration Chart.*
- The Buddy System is required when working in high heat conditions to enable effective communication and cross-observation for indications of heat stress.
- Initiate emergency response procedures when necessary, including contacting emergency medical services as appropriate and in accordance with the Emergency Response Plan.

4.6.2 Personal Protective Equipment

- Review the *S3AM-208-PR1 Personal Protective Equipment* procedure.
- Wear a hat and light-colored, loose-fitting clothing to reflect the sun.
- Apply sunscreen to exposed skin (SPF 30 or greater, follow directions on label).
- Wear sunglasses with UV protection.
- Pack extra water to avoid dehydration (try freezing water in bottles overnight to help keep the water cooler for longer during the day).

4.7 Work-Rest Schedule Practices

4.7.1 Intake of fluid will be increased beyond that which satisfies thirst, and it is important to avoid "fluid debt," which will not be made up as long as the individual is sweating.

- Two 8-ounce glasses of water should be taken prior to beginning work, then up to 32 ounces (1 quart) per hour during the work shift; fluid replacement at frequent intervals is most effective.
- The best fluid to drink is water; liquids like coffee or soda do not provide efficient hydration and may increase loss of water.
- If commercial electrolyte drinks (e.g., Gatorade) are used, the drink should be diluted with water, or 8 ounces of water should be taken with each 8 ounces of electrolyte beverage.

4.7.2 Additional salt is usually not needed and salt tablets should not be taken.

4.7.3 Replacement fluids should be cool and fresh, but not cold.

4.7.4 Breaks will be taken in a cool, shaded location, and any impermeable clothing should be opened or removed.

- A relatively cool, shaded area shall be provided for breaks when working in hot environments. For hazardous waste sites, the rest area should be located in the support zone adjacent to the contamination reduction zone, situated so that part of it is in the decontamination area so workers can take breaks without going through full decontamination.

- If shade is not available, shaded areas shall be constructed. This same type of canopy can be set up to shade personnel performing various types of work in hot weather.
- Cooling measures other than shade (e.g., misting, air conditioned break areas, air conditioned vehicles, etc.) can be used in lieu of shade provided it can be demonstrated that they are at least as effective in cooling employees.
- Employees should have access to these rest areas at break times and at any other time when suffering from heat illness or believing a preventive recovery period is needed.

4.7.5 Dry clothing or towels will be available to minimize chills when taking breaks.

4.7.6 Manual labor will not be performed during breaks, other than paperwork or similar light tasks.

4.7.7 Other controls that may be used include:

- Scheduling work at night or during the cooler parts of the day (6 am–10 am, 3 pm–7 pm).
- Erecting a cover or partition to shade the work area.
- Auxiliary cooling - wearing cooling devices beneath protective garments, but over any underclothing.
  - If cooling devices are worn, only physiological monitoring will be used to determine work activity.
  - These vests typically provide cooling via one of two methods: the use of ice or other frozen media, or the use of a vortex cooler. Each method has its advantages and disadvantages.
  - The frozen media vest requires a means for freezing the media, and the media (usually water or "blue ice") will melt, requiring replacement.
  - The vortex cooler tends to cool more uniformly. Instead of frozen media, this vest uses the expansion of compressed air to cool the wearer. The drawback is the compressed air requirement, but this is negated when the wearer is already using an airline respirator supplied by a compressor. A vortex cooler should not be supplied from air cylinders, as this will draw down the cylinders rapidly.
- Auxiliary cooling should be considered when the following conditions exist:
  - Ambient temperature over 80°F (26°C).
  - Workers are wearing impermeable garments (i.e., Tyvek, Saranex, Chemrel, etc.).
  - It is desirable to have long work shifts with minimum interruption.

4.8 Evaluating the Work-Rest Schedule's Effectiveness

4.8.1 Once a work-rest schedule is established, the Supervisor shall continually evaluate its effectiveness through observation of Employees for signs/symptoms of heat stress. Have workers assess themselves and their body's reaction to the heat and work conditions (self-assessment), and report any signs or symptoms of heat illness. These can include nausea or dizziness, heat cramps, extreme thirst, or very dark urine.

4.8.2 Measurement or physiological monitoring of each Employee's vitals (e.g., pulse, blood pressure, and temperature) can provide additional information in determining if the schedule is adequate. Refer to *S3AM-113-ATT1 Temperature Thresholds* for additional guidance on when physiological monitoring should be conducted.

4.8.3 Frequency of physiological monitoring is increased or decreased depending upon such factors as worker fitness, acclimatization, temperature of the work environment, type of PPE, etc.

Based on the results of the physiological monitoring and on the workers' self-assessments, the work period may be adjusted as follows:

- The work period may be increased (generally, by 5- to 10-minutes intervals, up to a maximum of 4 hours) if the results of the first 2 hours of the physiological monitoring and the workers' self-assessments indicate that workers are recovering adequately (see below), and on the judgment of the SH&E Manager.
- The work period shall be decreased if the results of the physiological monitoring and the workers' self-assessment indicate that workers are NOT recovering adequately (see below).

4.8.4 If physiological monitoring is conducted, the Employee and/or the SH&E Manager (or appropriate designate) shall measure and record body temperature and pulse rate as described below.

4.8.5 Monitor body temperature to determine if Employees are adequately dissipating heat build-up. Ear probe thermometers which are adjusted to oral temperature (aural temperature) are convenient and the preferred method of measurement. Determine work/rest regimen as follows:

- Measure oral body temperature at the end of the work period. Oral body temperatures are to be obtained prior to the employee drinking water or other fluids.
- If temperature exceeds 99.6°F (37.5°C), shorten the following work period by 1/3 without changing the rest period.
- If, at the next rest period, temperature still exceeds 99.6°F (37.5°C), the worker should not be allowed to continue work until repeated temperature measurements are in the acceptable range (i.e., less than 99.6°F). Do not leave the worker alone during the recovery time. Watch for signs of heat illness and be prepared to implement emergency response as necessary.
- Do not allow a worker to wear impermeable PPE when his/her oral temperature exceeds 100.6°F (38.1°C).

4.8.6 At the start of the workday each Employee's baseline pulse rate (in beats per minute [bpm]) is determined by taking a pulse count for 15 seconds and multiplying the result by four or by using an automated pulse count device. Pulse rates can then be measured at the beginning of each break period and two minutes thereafter to determine if the rest period allows for adequate recovery.

- Take the radial (wrist) pulse as early as possible in the rest period and determine the worker's heart rate in beats per minute. The heart rate is determined by counting the pulse for ten seconds and multiplying the number by 6 to get the beats per minute. Record this as P1.
- Wait 2 minutes and repeat the pulse measurement. Record this as P2.
- If P1 is greater than or equal to 110 beats per minute (bpm) and if (P1 – P2) is less than or equal to 10 bpm (indicating that workers are not recovering adequately), shorten the next work cycle by 1/3 without changing the rest period.
- At the next rest period, if P1 is still equal to or greater than 110 bpm, and if (P1 – P2) is still less than or equal to 10 bpm, shorten the following work cycle by 1/3 without changing the rest period.
- At the third rest period, if P1 is still equal to or greater than 110 bpm and (P1 – P2) is still less than or equal to 10 bpm, the worker should not be allowed to continue work until repeated pulse measurements are in the acceptable range (i.e., P1 is less than 110 bpm and (P1 – P2) is greater than 10 bpm). Do not leave the worker alone during the recovery time. Watch for signs of heat illness and be prepared to implement emergency response as necessary.

4.8.7 Use of an automated or similar blood pressure device will be used to assess each Employee's blood pressure at the beginning and end of each break period to determine if the rest period allows adequate cooling by applying the following criteria:

- If the blood pressure of an Employee is outside of 90/60 to 150/90, then the Employee will not be allowed to begin or resume work; extend the break period by at least five minutes, at the end of which blood pressure rates will be re-measured and the end-of-break criteria again applied.

4.8.8 All physiological monitoring of heat stress will be documented using *S3AM-113-FM1 Heat Stress Monitoring Log.*

4.9 Training

4.9.1 Employees and their Supervisors that may be exposed to the hazard will be trained and oriented to the hazard and the controls prior to work commencing.

4.9.2 Those Employees, including Supervisors, potentially exposed to heat stress will receive training, refer to the *S3AM-003-PR1 SH&E Training* procedure. Training will include, but is not limited to:

- Sources of heat stress (environmental and personal), influence of protective clothing, and importance of acclimatization;
- How the body handles heat and acclimatization;
- Recognition of heat-related illness symptoms;
- Preventative/corrective measures including, but not limited to;
  - Employees will be informed of the harmful effects of excessive alcohol consumption in the prevention of heat stress.
  - All Employees will be informed of the importance of adequate rest and proper diet in the prevention of heat stress.
- First aid procedures for heat stress-related illnesses; and
- Immediate reporting of any heat-related incident (injury, illness, near-miss), refer to the *S3AM-004-PR1 Incident Reporting, Notifications & Investigation* procedure.

5.0 Records

5.1 None

6.0 Attachments

6.1 S3AM-113-ATT1 Temperature Thresholds

6.2 S3AM-113-ATT2 Symptoms & Treatment

6.3 S3AM-113-ATT3 Dehydration Chart

6.4 S3AM-113-FM1 Heat Stress Monitoring Log

Americas

Temperature Thresholds

S3AM-113-ATT1

1.0 Work-Rest Schedule

The prevention of heat stress is best performed through Supervisor observation of Employees and routine heat stress awareness training activities. However, it is also necessary to implement a work routine that incorporates adequate rest periods to allow Employees to remove protective clothing, drink fluids (vital when extreme sweating is occurring), rest and recover. The frequency and length of work breaks shall be determined by the Supervisor based upon the ambient temperature, amount of sunshine, humidity, the amount of physical labor being performed, the physical condition of the Employees (e.g., acclimated/not), and protective clothing being used.

1.1 Establishing a Work-Rest Schedule:

1.1.1 AECOM permits the use of either of two techniques to initially determine an appropriate daily work-rest schedule. These methods are:

- Wet Bulb Globe Thermometer (WBGT) Method: This method is preferred if a WBGT meter is available.
- Adjusted Temperature Method: This method should be used only if WBGT data is not available.

1.1.2 Either procedure will provide the Supervisor with a recommended routine; however, adjustments to this routine may be required to accommodate the specific daily conditions at the work site.

1.2 WBGT Work-Rest Schedule Guidelines:

1.2.1 If the measured WBGT is less than the action limit value, there is little risk of excessive exposure to heat stress, and work can continue.

- Continue to monitor ambient conditions with the WBGT. However, if there are reports of the symptoms of heat-related disorders, then the analysis of little risk should be reconsidered.
- If the measured WBGT is greater than the values in the following two tables, institute heat stress controls, including the associated work-rest cycle, and perform physiological monitoring as described in *S3AM-113-PR1 Heat Stress*.
- Because of the physiological strain associated with very heavy work among less fit workers regardless of WBGT, values are not provided in Table 1 or 2 for continuous work or 75% work – 25% rest regimen. Physiological monitoring should always be implemented under these conditions.

1.2.2 Table 1, the Non-CPC Activities WBGT Chart, is intended for use where personnel are not utilizing Chemical Protective Clothing (CPC). Where workers are required to utilize CPC, Table 2, the CPC Activities WBGT Chart, will be used.

1.2.3 WBGT readings are compared directly with the values of the applicable WBGT Chart for the applicable work rate (where light work corresponds to minimal physical activity besides standing/watching; very heavy work corresponds to significant, continuous physical labor) to determine the work-rest frequency.

Table 1. Non-CPC Activities WBGT Chart

Work-Rest Regimen	WBGT			
	Light Work	Moderate Work	Heavy Work	Very Heavy Work
Continuous Work	85°F (29.4°C)	81°F (27.2°C)	78°F (25.6°C)	
75% Work – 25% Rest	86°F (30°C)	83°F (28.3°C)	81°F (27.2°C)	
50% Work – 50% Rest	88°F (31.1°C)	85°F (29.4°C)	83°F (28.3°C)	81°F (27.2°C)
25% Work – 75% Rest	90°F (32.2°C)	87°F (30.6°C)	86°F (30°C)	85°F (29.4°C)

Modified from ACGIH's 2014 *Threshold Limit Values for Chemical Substances and Physical Agents*, for acclimatized workers.

Table 2. CPC Activities WBGT Chart

Work-Rest Regimen	WBGT			
	Light Work	Moderate Work	Heavy Work	Very Heavy Work
Continuous Work	74°F (23.3°C)	70°F (21.1°C)	67°F (19.4°C)	
75% Work – 25% Rest	75°F (23.9°C)	72°F (22.2°C)	70°F (21.1°C)	
50% Work – 50% Rest	77°F (25°C)	74°F (23.3°C)	72°F (22.2°C)	70°F (21.1°C)
25% Work – 75% Rest	79°F (26.1°C)	76°F (24.4°C)	75°F (23.9°C)	74°F (23.3°C)

Modified from ACGIH's 2014 *Threshold Limit Values for Chemical Substances and Physical Agents*, for acclimatized workers.

1.3 Humidex Based Work-Rest Schedule Guidelines

1.3.1 The Humidex method is a simplified way of protecting workers from heat stress. It is an equivalent scale intended to express the combined effects of warm temperatures and humidity. Humidex is used as a measure of perceived heat that results from the combined effect of excessive humidity and high temperature.

1.3.2 This method requires only a local air temperature and relative humidity value. Monitoring shall continue throughout the day for changing conditions. Identify a representative location where measurements can be taken. Measurements should be recorded at least hourly when ambient temperatures and 90°F (32°C) for personnel wearing normal permeable work clothes.

- Step 1: On the Humidex table below, look up the temperature on the left (Celsius is located below RH>) and the relative humidity (RH) on the top. Determine the Humidex value.

F	RH>	100%	95%	90%	85%	80%	75%	70%	65%	60%	55%	50%	45%	40%	35%	30%	25%	20%
108	42													55	52	50	48	46
106	41												55	53	51	48	46	44
104	40											55	53	51	49	47	45	43
102	39										55	53	51	49	47	45	43	41
100	38		Step 1 - Determine HUMIDEX VALUE							54	53	51	49	47	45	43	42	40
99	37								54	52	51	49	47	45	44	42	40	38
97	36					57	55	53	52	50	49	47	45	44	42	40	39	37
95	35				56	54	53	51	50	48	47	45	43	42	40	39	37	36
93	34		56	55	53	52	51	49	48	46	45	43	42	40	39	37	36	34
91	33	55	54	53	51	50	48	47	46	44	43	41	40	39	37	36	34	33
90	32	53	51	50	49	48	46	45	44	42	41	40	38	37	36	34	33	32
88	31	50	49	48	47	45	44	43	42	40	39	38	37	35	34	33	32	30
86	30	48	47	46	44	43	42	41	40	39	37	36	35	34	33	31	30	29
84	29	46	45	43	42	41	40	39	38	37	36	35	33	32	31	30	29	28
82	28	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27
81	27	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25
79	26	39	38	37	36	35	34	33	33	32	31	30	29	28	27	26	25	24
77	25	37	36	35	34	33	33	32	31	30	29	28	27	26	26	25	24	23

- Step 2: Place the Humidex value into the Heat Index Adjustment Table below. Determine the applicable adjustments based on the given work or task.

Heat Index Adjustment Table

	Step 2 - Risk Factor Adjustment	
Write in value	What is the HUMIDEX value from the table in Step 1?	
	Radiant Heat	**Adjustment**
	Working in full-sun	Add 2
	Working in ½ or partial sun or weak radiant heat source	Add 1
	Working near very hot equipment surfaces or processes	Add 2
	Clothing: Pick One Only	
	Short/long sleeve shirt and pants – no overalls	None
	Overalls (e.g., Nomex suit)	Add 3
	Double layer overalls	Add 5
Stop	Impermeable clothing	Perform Physiological Monitoring
	Acclimatization	
	Have been working at least 5 of last 7 days in heat stress conditions.	Subtract 4
	Work Load & Miscellaneous Factors	
	Light Work (Standing, slow walking)	Subtract 2
	Medium Work (Walking about with moderate lifting or pushing)	None
	Heavy Work (Shoveling dry sand, carrying 50 lbs)	Add 2
	Very Heavy Work (Shoveling wet sand)	Add 3
	TOTAL – Compare to Heat Index Response Plan	

- Step 3: Compare adjusted Heat Index Total to the Heat Index Response Plan table to obtain guidance for work/rest.

Heat Index Response Plan*

TOTAL NUMBER	Final Step 3 - HEAT INDEX Response
30-33	alert & information & water
34-37	warning & increase water
38-39	75% work - 25% rest & monitor for signs of heat stress
40-41	50% work - 50% rest & monitor for signs of heat stress
42-44	25% work - 75% rest & monitor for signs of heat stress
45+	Perform Physiological Monitoring

*** Percent work and rest/recovery are on a per hour basis. Adjustments and subsequent work/rest cycle recommendations are rough guidelines only. No heat stress prediction scheme can replace monitoring of symptoms or a health care practitioners advice in the case of individuals with special medical conditions or predisposing circumstances for heat related illness. Always pay attention to the way workers are feeling. Recuperate if fatigued, nauseated, dizzy or thirsty,**

1.4 Adjusted Temperature Work-Rest Schedule Guidelines:

This method can be utilized where WBGT data is not available, and requires only that the ambient temperature be known. Adjustment factors are applied to the ambient temperature to account for departures from ideal conditions (sunny conditions, light winds, moderate humidity and a fully acclimated work force). The adjustments will be made by addition or subtraction to the ambient temperature reading, or changes in table position, as indicated in Table 3. Adjustments are independent and cumulative, all applicable adjustments should be applied. The result is the Adjusted Temperature, which can be compared with the values in Table 4 for the applicable work rate (where light work corresponds to minimal physical activity besides standing/watching; very heavy work corresponds to significant, continuous physical labor) to determine the work-rest schedule.

Table 3. Temperature Adjustment Factors

Time of Day	
Before daily temperature peak[1]	+2°F (+1.11°C)
10 am – 2 pm (peak sunshine)	+2°F (+1.11°C)
Sunshine	
No clouds	+1°F (+0.56°C)
Partly Cloudy (3/8 – 5/8 cloud cover)	-3°F (-1.67°C)
Mostly Cloudy (5/8 – 7/8 cloud cover)	-5°F (-2.78°C)
Cloudy (>7/8 cloud cover)	-7°F (-3.89°C)
Indoor or nighttime work	-7°F (-3.89°C)
Wind (*ignore if indoors or wearing CPC*)	
Gusts greater than 5 miles per hour at least once per minute	-1°F (-0.56°C)
Gusts greater than 10 miles per hour at least once per minute	+2°F (+1.11°C)
Sustained greater than 5 miles per hour	-3°F (-1.67°C)
Sustained greater than 10 miles per hour	-5°F (-2.78°C)
Humidity (*ignore if wearing CPC*)	
Relative Humidity greater than 90%	+5°F (+2.78°C)
Relative Humidity greater than 80%	+2°F (+1.11°C)
Relative Humidity less than 50%	-4°F (-2.23°C)
Chemical Protective Clothing (CPC)	
Modified Level D (coveralls, no respirator)	+5°F (+2.78°C)
Level C (coveralls w/o hood, full-face respirator)	+8°F (+4.45°C)
Level C (coveralls with hood, full-face respirator)	+10°F (+5°C)
Level B with airline system (hooded chemical resistant clothing)	+9°F (+5.56°C)
Level B with SCBA (hooded chemical resistant clothing)	+9°F (+5.56°C) and right one column[2]
Level A (totally encapsulating chemical protective suit)	+14°F (+7.78°C) and right one column
Other	Specified in the HASP
Miscellaneous	
Unacclimated work force	+5°F (+2.78°C)
Partially acclimated work force	+2°F (+1.11°C)
Working in shade	-3°F (-1.67°C)
Breaks taken in air conditioned space	-3°F (-1.67°C)

For complete descriptions of Level A through D Protective Clothing refer to Unites States 29 CFR 1910.120 Appendix B

[1] This adjustment accounts for temperature rise during the day. If the temperature has already reached its daytime peak it can be ignored.

[2] Locate the proper column based on work rate, then move one column to the right (next higher work rate) before locating the corresponding adjusted temperature.

Table 4. Work-Rest Schedule Based on Adjusted Temperature

Work-Rest Regimen	Adjusted Temperature			
	Light Work	**Moderate Work**	**Heavy Work**	**Very Heavy Work**
No specified requirements	< 80°F (22.67°C)	< 75 (23.88°C)	< 70 (21.11°C)	< 65 (18.33°C)
15 minute break every 90 minutes of work	80°F – 90°F (22.67°C) - (32.22°C)	75 – 85 (23.88°C) - (29.44°C)	70 – 80 (21.11°C) - (22.67°C)	65 – 75 (37.77°C) - (23.88°C)
15 minute break every 60 minutes of work	>90 – 100 (32.22°C) - (37.77°C)	> 85 – 95 (23.88°C) - (35°C)	>80 – 85 (22.67°C) - (23.88°C)	>75 – 80 (23.88°C) - (22.67°C)
15 minute break every 45 minutes of work	>100 – 110 (37.77°C) - (43.33°C)	>95 – 100 (35°C) - (37.77°C)	>85 – 90 (23.88°C) - (32.22°C)	>80 – 85 (22.67°C) - (23.88°C)
15 minute break every 30 minutes of work	>110 – 115 (43.33°C) - (46.11°C)	>100 – 105 (37.77°C) – (40.55°C)	>90 – 95 (32.22°C) - (35°C)	>85 – 90 (23.88°C) - (32.22°C)
15 minute break every 15 minutes of work	>115 – 120 (46.11°C) - (48.88°C)	>105 – 110 (40.55°C) - (43.33°C)	>95 -100 (35°C) - (37.77°C)	>90 – 95 (32.22°C) - (35°C)
Stop Work	**>120** (48.88°C)	**>110** (43.33°C)	**>100** (37.77°C)	**>95** (35°C)

Note: Time spent performing decontamination or donning/doffing CPC should not be included in calculating work or break time lengths.

Americas

Symptoms & Treatment

S3AM-113-ATT2

1.0 Heat Illness Symptoms

1.1 The following are four stages of heat-related illness:

1.1.1 Heat Rash

Heat rash (prickly heat) may result from continuous exposure to heat or humid air. It appears as red papules (elevated skin lesion), usually in areas where the clothing is restrictive, and gives rise to a prickly sensation, particularly as sweating increases. It occurs in skin that is persistently wetted by un-evaporated sweat. The papules may become infected unless treated.

1.1.2 Heat Cramps

Heat cramps are painful muscle cramps caused by heavy sweating and inadequate electrolyte replacement due to over-exertion in extreme heat. Symtpoms include:

- Muscle spasms; and
- Pain in the hands, feet, and abdomen.

1.1.3 Heat Exhaustion

Heat exhaustion is the next stage. Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Symptoms include:

- Cool, moist, pale, flushed or red skin;
- Heavy sweating;
- Headache;
- Nausea or vomiting;
- Dizziness;
- Exhaustion;
- Mood changes (irritable, or confused/can't think straight), and
- Fainting

The key here is that the victim is still sweating, so the cooling system is still working; it's just under severe stress. The body core temperature may be elevated, but not higher than 104ºF (40ºC). It is important to recognize and treat these symptoms as soon as possible, as the transition from heat exhaustion to the very hazardous heat stroke can be quite rapid.

1.1.4 Heat Stroke

Heat exhaustion can sometimes lead to heat stroke, the most serious form of heat stress, which can be fatal and requires emergency treatment. Heat stroke happens when body temperature regulation fails and body temperature continues to rise to critical levels, often to 105 degrees Fahrenheit (°F) (40.5 degrees Celsius [° C]) or higher. Immediate action must be taken to cool the body before serious injury and death occurs. Competent medical help must be obtained. Symptoms of heat stroke:

- Vomiting;
- Decreased alertness level or complete loss of consciousness;
- High body temperature (sometimes as high as 105°F [40.5°C]);
- Red, hot, usually dry skin;
- Lack of or reduced perspiration;
- Skin may still be moist or the victim may stop sweating and the skin may be red, hot, and dry;

- Rapid, weak pulse or rapid, strong pulse;
- Rapid, shallow breathing;
- Nausea;
- Dizziness and confusion; and
- Coma.

2.0 Recommended Treatment for Heat Stress-related Illnesses

2.1 Heat Rash

2.1.1 Treatment for heat rash includes:

- Shower after work, dry off thoroughly, and put on clean, dry underwear and clothes;
- Try to stay in a cool place after work;
- If, in spite of this, you develop heat rash, contact WorkCare.

2.2 Heat Cramps

2.2.1 Treatment for heat cramps includes:

- Gently stretch the cramped muscle and hold the stretch for about 20 seconds, then gently massage the muscle. Repeat these steps if necessary;
- Take more frequent breaks and drink more water;
- Move victim to a cool place;
- Administer drinks of cool water;
- Apply manual pressure to cramped muscles;
- Once spasms disappear, you may return to work;
- Seek medical attention if symptoms are not alleviated or if more serious problems are indicated.

2.3 Heat Exhaustion

2.3.1 Treatment of heat exhaustion includes:

- Get out of the sun to a cool location and drink cool water, a little at a time;
- Remove or loosen tight clothing and elevate the feet;
- If you are nauseated or dizzy, lie down;
- Move the victim to a cool place, administer drinks of cool water and fan to cool;
- Seek medical attention immediately.

2.4 Heat Stroke

2.4.1 Treatment of heat stroke, or if a person's temperature exceeds 102°F (38.9 °C) includes:

- Call for immediate medical help and then try to lower the temperature as quickly as possible:
  - Apply cool (not cold) water the person's whole body, then fan the person;
  - Wrap in wet sheet;
  - If available, use cold packs under arms, neck, and ankles;
  - Body temperature is measured frequently, often constantly. To avoid overcooling, cooling is stopped when the body temperature is reduced to about 102°F (38ºC);
- Do not give aspirin or acetaminophen to reduce the temperature;
- Treat as a true medical emergency. Seek medical help immediately;
- Protect from injury during convulsion;
- Ensure that the person's airway is open;
- Transfer to a medical facility immediately.

Americas

Dehydration Chart

S3AM-113-ATT3

GUIDANCE TOOL FOR MONITORING DEHYDRATION

URINE COLORATION CHART



1 2	3 4	5 6
Target	**Dehydration**	**Severe Dehydration**
CONTINUE DRINKING WATER TO MAINTAIN CURRENT HYDRATION LEVELS.	INCREASE WATER CONSUMPTION TO IMPROVE HYDRATION LEVELS, INCREASE BREAKS FREQUENCY, TAKE BREAKS IN A COOL SHADED AREA.	STOP WORK! FIND A SHADED AREA AND BEGIN TO DRINK COOL TO ROOM TEMPERATURE WATER SLOWLY AND STEADILY.

PREVENTING DEHYDRATION

- Start hydrating at least 3 days prior to working in high heat conditions
- Always bring enough water to maintain hydration. CalOSHA requires consuming 1 quart per hour of your work shift - more may be needed

Note: This information is guidance only and should not supersede the recommendation or instruction of a personal physician or medical professional. Contact your physician or medical professional if you have a personal medical condition or take medication for a personal condition which may be adversely affected by dehydration. Urine color can be affected by medications, vitamins and or other personal health conditions.

Americas

Heat Stress Monitoring Log

S3AM-113-FM1

The purpose of this form is to monitor employees for heat illness when applicable. It is the responsibility of the Foreman or Supervisor-in-Charge to ensure that each person completes the required information.

Project Name:			**Foreman/Supervisor:**								**Work/Rest Schedule1:** IN *(min)* OUT *(min)*					
Date:	**Water Provided[1]**		**Acclimated[2]**		**Initial Vitals[3]**	**Vital Signs and Time In/Out[3]**					**Celcius ☐ / Farenheit ☐** (select one)					
Employee Name	Yes	No	Yes	No	**Vitals**	In (P_1)	Out (P_1)	**Vitals**	In (P_1)	Out (P_1)	**Vitals**	In (P_1)	Out (P_1)	**Vitals**	In (P_1)	Out (P_1)
					P			**P**			**P**			**P**		
					BP			**BP**			**BP**			**BP**		
					Temp			**Temp**			**Temp**			**Temp**		
					P			**P**			**P**			**P**		
					BP			**BP**			**BP**			**BP**		
					Temp			**Temp**			**Temp**			**Temp**		
					P			**P**			**P**			**P**		
					BP			**BP**			**BP**			**BP**		
					Temp			**Temp**			**Temp**			**Temp**		
					P			**P**			**P**			**P**		
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					Temp			**Temp**			**Temp**			**Temp**		
					P			**P**			**P**			**P**		
					BP			**BP**			**BP**			**BP**		
					Temp			**Temp**			**Temp**			**Temp**		

1. Each Employee should be provided a sufficient amount of water or sports drink before entering the hot zone. Drinks such as coffee and cola should be discouraged.
2. An Employee is "acclimated" if he/she has worked in a hot environment for at least 5 - 7 consecutive days. If an Employee is acclimated, check "Yes." If an Employee is not acclimated, check "No" and reduce the "Min In" by 50 percent for that Employee until the 5 – 7 -day period is reached.
3. "Vitals" refers to Employee vital signs (e.g., pulse [P], blood pressure [BP], body temperature [Temp], etc.). Initial vitals must be taken and recorded before the start of work and at each break period, or as specified in the Heat Stress Exposure Control Plan.

Americas

Compressed Gases

S3AM-114-PR1

1.0 Purpose and Scope

1.1 This procedure provides the requirements for using, handling, storing, transporting, disposition and/or decommissioning compressed gas cylinders.

1.2 This procedure applies to all AECOM Americas based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

2.1 **Compressed Air (Non-Breathable)** – Air that is at a pressure greater than that of the atmosphere. Compressed air shall not be used for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment. Utilized for tools, equipment, and mechanical machinery and cleaning purposes as described in this procedure.

2.2 **Compressed Gas** – Any material or mixture in a pressure vessel having:

- An absolute pressure exceeding 40 pounds per square inch (PSI) at 70°F (25 pounds per square inch gauge); or
- An absolute pressure exceeding 104 Psia at 130°F, regardless of the pressure at 70°F.

2.3 **Cylinder –** Pressure vessel designed for pressures higher than 40 Psia and having a circular cross section.

2.4 **Decommission** – The removal of a compressed gas cylinder from service by rendering it permanently unusable.

2.5 **Disposition** – Recycling, treatment, or disposal of a compressed gas cylinder and/or its contents.

2.6 **Pneumatics –** The use of pressurized air to affect mechanical motion for machinery, equipment and tools.

2.7 **Psi** – Pounds per square inch.

2.8 **Psia –** Pounds per square inch absolute (i.e., pressure in a container that would appear on an ordinary gauge plus the local atmospheric pressure [14.696 psi at sea level]), psig- pounds per square inch gauge.

2.9 **Psig** – Pounds per square inch gauge. The pressure in a vessel or container as registered on a gauge attached to the container. This reading does not include the pressure of the atmosphere outside the container.

2.10 **Pressure Relief Valve** – A device installed on most cylinders to prevent the rupture of a normally pressurized cylinder when it is inadvertently exposed to fire or high temperatures.

3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-116-PR1 Hazardous Materials Shipping

3.3 S3AM-127-PR1 Exposure Monitoring

3.4 S3AM-208-PR1 Personal Protective Equipment

3.5 S3AM-209-PR1 Risk Assessment & Management

3.6 S3AM-332-PR1 Hot Work

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Manager**

- Ensuring the safety of employees on their project sites.
- Implement these procedures during all activities involving compressed gases.
- Seek consultation with the SH&E Manager when unknown compressed gas cylinders are encountered.
- Confirm employees have received the appropriate training as it relates to compressed gases/compressed gas cylinders.
- Confirm a hazard assessment/evaluation of the activities involving compressed gases has been completed.
- Contact the SH&E Manager prior to any compressed gas cylinder operation.
- Immediately report any leaking/suspected leaking compressed gas cylinder(s) to the SH&E Manager and implement the appropriate emergency action(s).
- Immediately report the discovery of any unknown compressed gas cylinder(s) to the SH&E Manager and cordon off the area in all directions a minimum of 50 feet (15.24 meters).
- Confirm that all compressed gas cylinders are properly inspected, stored, and, secured.
- Confirm that all compressed gas cylinders are handled in a safe manner, protecting both the person and cylinder.
- Confirm that all compressed gas cylinder manifolds and connections are properly made and inspected.
- Confirm an appropriate emergency response plan is established prior to the start of any compressed gas cylinder operation.

4.1.2 **SH&E Manager**

- Review and authorize all compressed gas cylinder operations.
- Conduct/support compressed gas hazard assessments/evaluations.
- Provide awareness training to project teams regarding hazards of encountered compressed gases.
- Support the identification/disposition of unknown compressed gas cylinders.
- Support the development of a site-specific cylinder plan.

4.1.3 **Employee**

- Immediately report any leaking/suspected leaking compressed gas cylinder(s) to a Manager.
- Immediately report the discovery of any unknown compressed gas cylinders to Project Manager.
- Properly handle all compressed gas cylinders.
- Shall be supervised by employees experienced in the operation of compressed gas tools and equipment.

4.2 Training

4.2.1 On-site orientation to the hazards of the equipment and the proper use, handling, and storage shall be completed for all employees handling or coming into contact with compressed air tools and equipment or compressed gas cylinders. Refer to *S3AM-003-PR1 SH&E Training* and *S3AM-114-ATT1 Compressor Safety*.

4.2.2 Employees shall be instructed on the PPE requirements for the applicable tasks. Refer to *S3AM-208-PR1 Personal Protective Equipment*.

4.3 General Use of Compressed Air or Gas

4.3.1 Compressed air or other compressed gases are not to be used to blow dirt, chips, or dust from clothing while it is being worn. Compressed air used for other types of cleaning (other than clothing/persons) is to be limited to 30 psig.

4.3.2 The use of blown compressed air is to be controlled, and proper personal protective equipment or safeguards utilized, to protect against the possibility of eye injury to the operator or other persons.

4.3.3 Compressed air or gases are not to be used to empty containers of liquids.

4.3.4 Compressed gases are not to be used to elevate or otherwise transfer any hazardous substance from one container to another unless the containers are designed to withstand the operating gas pressure with a safety factor of at least four.

4.3.5 Compressed cylinders of unknown content will not be opened, but will be returned to the supplier, manufacturer or equivalent.

4.4 Air Compressor Operations

4.4.1 Air compressor equipment should be operated only by authorized and trained employees.

4.4.2 The air intake should be from a clean, outside, fresh air source. Screens or filters can be used to clean the air.

4.4.3 Air compressors should never be operated at speeds faster than the manufacturer’s recommendation.

4.4.4 Equipment should not become overheated.

4.4.5 Moving parts, such as compressor flywheels, pulleys, and belts that could be hazardous should be effectively guarded.

4.4.6 Keep the air supplied tools clean and dry. Dust, moisture, and corrosive fumes can damage tools.

4.4.7 Keep tools clean, lubricated, and maintained according to manufacturer’s instructions.

4.4.8 Only use attachments and accessories recommended by the manufacturer.

4.4.9 Review the manufacturer's instruction before using a tool.

4.4.10 Post warning signs where pneumatic tools are used.

4.4.11 Set up screens or shields in areas where nearby workers may be exposed to flying fragments, chips, dust, and excessive noise.

4.4.12 Be aware of proper handling and ergonomics while using the tool.

4.4.13 Reduce physical fatigue by supporting heavy tools with a counter-balance wherever possible

4.4.14 Refer to *S3AM-114-ATT1 Compressor Safety* for additional information.

4.5 Air Hoses

4.5.1 Use the proper hose and fittings of the correct diameter.

4.5.2 Use hoses specifically designed to resist abrasion, cutting, crushing and failure from continuous flexing.

4.5.3 Choose air-supply hoses that have a minimum working pressure rating of 1035 kPa (150 psig) or 150% of the maximum pressure produced in the system, whichever is higher.

4.5.4 Check hoses regularly for cuts, bulges and abrasions. Tag and replace, if defective.

4.5.5 Blow out the air line before connecting a tool. Hold hose firmly and blow away from yourself and others.

4.5.6 Make sure that hose connections fit properly and are equipped with a mechanical means of securing the connection (e.g., chain, wire, or positive locking device).

4.5.7 Install quick disconnects of a pressure-release type rather than a disengagement type. Attach the male end of the connector to the tool, NOT the hose.

4.5.8 Do not operate the tool at a pressure above the manufacturer's rating.

4.5.9 Turn off the air pressure to hose when not in use or when changing power tools.

4.5.10 Do not carry a pneumatic tool by its hose.

4.5.11 Do not use compressed air to blow debris or to clean dirt from clothes.

4.5.12 All pipes, hoses, and fittings shall have a rating of the maximum pressure of the compressor. Compressed air pipelines should be identified (psi) as to maximum working pressure.

4.5.13 Air supply shutoff valves should be located (as near as possible) at the point-of-operation.

4.5.14 Air hoses should be kept free of grease and oil to reduce the possibility of deterioration.

4.5.15 Avoid trip hazards. Hoses should not be strung across floors or aisles where they are liable to cause employees to trip and fall. When possible, air supply hoses should be suspended overhead, or otherwise located to afford efficient access and protection against damage.

4.5.16 Hose ends shall be secured to prevent whipping if an accidental cut or break occurs.

4.5.17 Pneumatic impact tools, such as riveting guns, should never be pointed at a person.

4.5.18 Before a pneumatic tool is disconnected (unless it has quick disconnect plugs), the air supply shall be turned off at the control valve and the tool bled.

4.5.19 Shop air used for cleaning should be regulated to15 psi unless equipped with diffuser nozzles to provide lesser pressure.

4.5.20 Goggles, face shields or other eye protection shall be worn by employees using compressed air for cleaning equipment.

4.5.21 Static electricity can be generated through the use of pneumatic tools. This type of equipment shall be grounded or bonded if it is used where fuel, flammable vapors or explosive atmospheres are present.

4.5.22 The following are hazards associated with the use of compressed air tools and equipment:

- Poorly designed tool (wrist strain);
- Vibration (vibration-induced white finger);
- Noise (hearing loss); and
- Dust (respiratory problems).

4.5.23 The following hazards have the potential to cause serious bodily injury when working with compressed air:

- Incorrect tool selection;
- Use of damaged tool;
- Improper, inadequate, or no guards;
- Rotating shaft (entanglement);
- Wheel breakage (grinder);
- Flying chips;
- Whipping of the hose;
- Accidental start up;

- Air embolism (compressed air injected into the body);
- Dropped tool; and
- Tripping over hose.

4.6 Compressed Air Equipment Maintenance

4.6.1 Only authorized and trained employees should service and maintain air compressor equipment.

4.6.2 Exposed, non-current-carrying, metal parts of compressor should be effectively grounded.

4.6.3 Low Flash Point lubricants should not be used on compressors because of its high operating temperatures that could cause a fire or explosion.

4.6.4 Equipment should not be over lubricated.

4.6.5 Gasoline or diesel fuel powered compressors shall not be used indoors.

4.6.6 Equipment placed outside but near buildings should have the exhausts directed away from doors, windows and fresh air intakes.

4.6.7 Soapy water of lye solutions can be used to clean compressor parts of carbon deposits, but kerosene or other flammable substances should not be used. Frequent cleaning is necessary to keep compressors in good working condition.

4.6.8 The air systems should be completely purged after each cleaning.

4.6.9 During maintenance work, the switches of electrically operated compressors should be locked open and tagged to prevent accidental starting.

4.6.10 Portable electric compressors should be disconnected from the power supply before performing maintenance.

4.7 Compressed Gas Cylinder Requirements

4.7.1 Cylinders are not to be used unless they bear Department of Transportation (DOT) or Transportation of Dangerous Goods (TDG) markings showing that they have been tested as required by DOT or TDG regulations.

4.7.2 Cylinders shall never be dropped, struck, or permitted to strike each other violently. Cylinders may be moved by tilting and rolling them on their bottom edges.

4.7.3 Valve protection caps shall always be kept on cylinders when they are being moved or stored, and until ready for use. Caution should be exercised as insects such as spiders, wasps, and bees may be encountered in cylinder caps.

4.7.4 Do not lift cylinders by the valve protection cap.

4.7.5 Cylinder valves are to be kept closed except when gas is being used or when connected to a permanent manifold. Valves of empty cylinders shall be closed.

4.7.6 Cylinders shall never be used as rollers or supports, or for any purpose other than carrying gas.

4.7.7 Valves and regulators shall be inspected for foreign materials such as oil or dirt and deficiencies such as damaged threads or broken gauges. Deficient valves or regulators shall be removed from service and replaced.

4.7.8 Threads on regulator connections or other auxiliary equipment shall be the same as those on the cylinder valve outlet.

4.7.9 Regulators shall be specific to the gas being used and no adapters may be used to connect regulators to cylinders.

4.7.10 When withdrawing cylinder content, open the cylinder valve slowly using the appropriate tool (e.g., manufacturer supplied, non-sparking, etc.). Point the valve opening away from yourself and other persons.

4.7.11 Before a regulator is removed from a cylinder, close the cylinder valve and release all pressure from the regulator. This procedure also serves as a check to confirm that the main cylinder valve is completely closed.

4.7.12 Never hammer the valve wheel in attempting to open or close the valve.

4.7.13 No person, except the owner of the cylinder or person authorized by the owner, shall refill a cylinder (Exceptions to this includes the filling of self-contained breathing apparatus cylinders with Grade D breathing air, or the filling of the [Foxboro] Organic Vapor Analyzer (OVA) hydrogen cylinders). Disposable cylinders shall not be refilled with any material after use of the original contents.

4.7.14 Cylinders of compressed gas shall be stored in areas where they are protected from external heat sources such as flame impingement, intense radiant heat, electric arc, or high-temperature steam lines.

4.7.15 Cylinders are to be stored in an assigned, well-ventilated area, with full and empty cylinders stored separately. Empty cylinders shall be marked ‘empty’.

4.7.16 Stored fuel gases and oxygen cylinders are to be separated by at least 20 feet, or by a fire wall at least 5 feet high that has a fire-resistance rating of at least ½ hour.

4.7.17 Oxygen, nitrogen, helium, or freon cylinders shall only be stored or transported in an upright or horizontal position. Acetylene cylinders shall always be kept in an upright position. All horizontally-placed cylinders are to be secured by chocks or ties to prevent rolling.

4.7.18 Cylinders are to be secured to a fixed object by chain or equivalent fastening device whenever they are placed in an upright position. The protective cap is not to be removed or the cylinder valve opened until the cylinder is secured.

4.7.19 Repair of leaks shall never be attempted on a pressurized system. System pressure should be reduced to atmospheric pressure as rapidly as possible, and the Manager notified immediately.

4.7.20 Compressed gas cylinders shall be legibly marked for the purpose of identifying the gas content with either the chemical or the trade name of the gas. Such marking is to be done by means of stenciling, stamping or labelling, and shall not be readily removable. Whenever practical, the marking is to be located on the shoulder of the cylinder. Positive identification of the gas in any cylinder is required before connecting cylinders for use.

4.7.21 Gas cylinders moved by hoist shall be handled in suitable cradles or job-made “skip” (materials) boxes. Any slings used for this purpose shall be specifically designed for that cylinder handling.

4.7.22 Cylinders shall not be placed where they might form part of an electrical circuit.

4.7.23 Transfer of compressed gases (including acetylene) from one cylinder to another, or mixing of gases in a cylinder, is prohibited.

4.7.24 Oxygen cylinders are never to be stored near:

- Highly combustible materials, especially oil and grease;
- Reserve stocks of acetylene or other fuel gas cylinders; and
- Any other substance likely to cause or accelerate fire.

4.7.25 Compressed oxygen is never to be used:

- As breathing air;
- To purge pipelines, tanks, or any confined area;
- To supply a head-pressure tank;
- In pneumatic tools;
- In oil preheating burners;

- To start internal combustion engines;
- For ventilation;
- For cleaning clothing; and
- In any other way as a substitute for compressed air.

4.7.26 Use of a cylinder's contents for purposes other than those intended by the supplier is prohibited.

4.7.27 Cylinders of compressed natural gas or propane equipped with a pressure relief device shall always be positioned in a manner that this device remains above the liquid level (e.g., if stored or installed horizontally on a forklift, relief device is positioned at the top).

4.7.28 Storage of liquefied petroleum gas (LPG) within buildings is prohibited, and outdoor storage or LPG shall meet applicable building and fire codes.

4.8 Special Precautions for Compressed Gas Cylinders Containing Hydrogen

4.8.1 Inside buildings, cylinders of hydrogen should be separated from oxygen cylinders by a minimum distance of 20 feet (6.1 meters) or by a barrier of non-combustible material at least 5 feet (1.5 meters) high having a fire resistance rating of at least one half hour.

4.8.2 Conspicuous signs should be posted in hydrogen storage areas forbidding smoking, open flames or the use of lights or lighting not approved for use in flammable areas.

4.8.3 Hydrogen storage areas shall be labeled, "Hydrogen-Flammable Gas-No Smoking-No Open Flame" or equivalent.

4.9 Inspection of Compressed Gas Cylinders

4.9.1 Prior to formally accepting any delivered compressed gas cylinders, a visual inspection of each cylinder will be documented as specified below. In addition, all compressed gas cylinders stored at an AECOM facility will be inspected monthly.

- Visually inspect cylinders, refer to *S3AM-114-FM1 Compressed Gas Cylinder Inspection.*
- Verify that all the required markings are on the cylinders.
- If required, determine when the cylinder was last hydrostatically-tested.
- Inspect the safety relief devices, if required.
- If any defects are noted during the inspection, the cylinder should be refused on delivery and a new delivery requested (notify the Manager).

4.9.2 Where compressed gas cylinders are stored at an AECOM facility, a qualified person will be designated to confirm cylinder activities comply with the requirements in this procedure. Inspection entails the evaluation of the integrity of the cylinder as well as the serviceability of any attached manifold and valve fittings. Inspection activities of cylinders beyond visual inspection are recommended to be conducted in isolation or a remote location for worker and public safety. The inspection of any cylinder will be conducted by a qualified person, refer to *S3AM-114-FM1 Compressed Gas Cylinder Inspection*.

4.10 Cylinder Inspection Procedures

4.10.1 All cylinder inspection procedures will adhere to the applicable regulatory requirement. At a minimum, the inspection process will include the following procedures:

- Observe the cylinder from a safe distance to identify any visual markings or other information.
- Inspect the cylinder size, shape, and general condition (if visible, include the valve system/stem in the inspection process).
- If the cylinder or valve system appears to be in poor condition or has lost structural integrity, do not approach the cylinder. Observations indicating a cylinder is in poor condition may include:

- o Leaking,
- o Hissing sound,
- o Odor in vicinity of the cylinder,
- o Rusty components,
- o Bulging side wall or end, and/or
- o Corroded valve system.

4.10.2 If the cylinder is determined to be in poor condition, cordon the area off and limit access to necessary employees only.

4.10.3 Wear applicable PPE and approach the cylinder with the appropriate direct reading air monitoring instrument (do not approach from the ends of the cylinder), then determine the airborne contaminant concentrations in the immediate area.

4.10.4 Document cylinder information (e.g., visible markings, labels, placards, etc.).

4.10.5 Cylinders presenting potential deficiencies (e.g., dent, missing labels, valve protection cap cannot be removed by hand, corrosion, etc.) shall be tagged 'Do Not Use', removed from use, and returned to the supplier.

4.11 Ground Transport of Compressed Gas Cylinders

4.11.1 AECOM will transport (drive/haul) quantities of compressed gases which do not exceed Materials of Trade (MOT) quantities, whereas the transport of placardable quantities is prohibited without the proper DOT / TDG licenses/credentials and consultation with the SH&E Manager.

4.11.2 Compressed gas cylinders in portable service are to be conveyed by suitable trucks, to which they are securely fastened. All gas cylinders in service shall be securely held in substantial racks or secured to other rigid structures so that they will not fall or be knocked over.

4.12 Air/Common Carrier Transport

4.12.1 All shipping of compressed gases via air/common carrier including instrument gases, regardless of quantity, shall be conducted by a qualified and trained HazMat Shipper (Level 1-2 Shipper) or jurisdictional equivalent, and shall conducted under the oversight of a designated DOT/International Air Transport Association (IATA) shipping specialist, or jurisdictional equivalent. Refer to *S3AM-116-PR1 Hazardous Materials Shipping.*

4.12.2 No compressed gas cylinder, regardless of contents or quantity, will be shipped via an external carrier vendor (i.e., UPS, FedEx, etc.) without the authorization of:

- SH&E Manager, and
- DOT/IATA shipping specialist.

4.12.3

4.13 Cylinder Color Coding Determination

4.13.1 The color coding of compressed gas cylinders is established by the Compressed Gas Association, which has assigned specific colors to categories or classes of chemicals/substances. It is important to note there is currently not requirement to adhere to this color coding scheme.

4.13.2 While recently manufactured cylinders reflect the color coding guidance established by the CGA, older cylinders may not reflect this nomenclature. It is also possible for cylinders to have been repainted a different color from their original.

4.13.3 Cylinder contents should never be determined by the color of the cylinder alone. Colors are not uniform throughout the compressed gas industry.

4.13.4 Cylinder contents shall be identified by a decal, label, tag, or stenciling. If an identifying label is lacking or not legible, return the container to the supplier, unused.

4.14 Air Monitoring Requirements

4.14.1 Air monitoring requirements are dependent upon the specific substances contained within the cylinders and will be specified within the site-specific safety plan prepared prior to commencement of field activities. Air monitoring parameters, refer to *S3AM-127-PR1 Exposure Monitoring*, may include, but are not limited to:

- Explosivity (i.e., lower explosive limit [LEL]), and
- Chemical-specific substance (e.g., chlorine, ammonia, arsine, etc.).

4.14.2 Action levels will be identified in the site-specific safety plan.

4.15 Cylinder Staging

4.15.1 Staging involves the organization, and sometimes consolidation, of cylinders that have similar contents or characteristics.

4.15.2 The staging of cylinders will occur in a remote location at the site in order to minimize the potential injury or property damage from an accidental release or emergency decompression (if the integrity of the cylinder is in question, it should not be moved).

4.15.3 Safe distances will be based on the evacuation distances provided in DOT's Emergency Response Guidebook (most current edition).

4.15.4 When multiple cylinders containing different substances are present, the distance should be based on the greatest evacuation distance required by the substances present.

4.16 Cylinder Disposition & Decommissioning Activities

4.16.1 Disposition refers to the recycling, treatment, or disposal of a compressed gas cylinder and/or its contents.

4.16.2 Recovery and recycling of materials are preferred over any other method of disposition. Cylinder disposition activities shall be approved by the SH&E Manager.

4.16.3 An effort should be made to recover and recycle the contents of a cylinder; however, if recovering or recycling the contents is not possible, then other options include:

- Venting to the Atmosphere,
- Flaring,
- Neutralization, and
- Detonation.

4.16.4 Under no circumstances will poisonous, toxic, or ozone-depleting substances be vented to the atmosphere. Only cylinders containing flammable gases should be detonated, as the flammable contents will be consumed in the subsequent explosion.

4.16.5 If the cylinder valve has been determined to be inoperable, then the available options for disposition are limited to having an outside vendor perform the remote opening and sampling of the cylinder, or detonation of the cylinder where the cylinder contents are consumed in the subsequent explosion (flammable gases only).

4.16.6 All cylinders shall be inventoried, staged, and inspected.

4.16.7 Prior to the commencement of cylinder disposition and decommissioning activities, local emergency response agencies (i.e., Fire Department, Medical, and Emergency Response, if separate) shall be confirmed and, as applicable, activities coordinated with the local agencies.

4.16.8 Air monitoring is mandatory during cylinder disposition and decommissioning operations.

4.16.9 A SH&E Manager shall be contacted during the planning stages of a cylinder disposition and decommissioning effort in order to determine whether a site-specific cylinder plan is required.

4.17 Venting to the Atmosphere

4.17.1 Cylinders that contain non-flammable, non-toxic materials can be vented to the atmosphere. All venting activities will be performed in accordance with the following procedures:

- Atmospheric venting will be accomplished at a remote location and in compliance with all applicable environmental air regulatory requirements.
- Atmospheric venting activities will be completed in a Level B Ensemble (unless otherwise specified in the site-specific safety plan and cylinder plan).
- Venting activities will be dependent upon a wind direction that does not carry the outgas plume in the direction of an adjacent public structure.
- The cylinder will be properly grounded to confirm a static charge is not generated, potentially resulting in ignition of a flammable gas.
- All tools used on the cylinder will be non-sparking.
- Low-pressure discharging will not exceed 15 pounds per square inch gauge (psig).
- Once discharging has started, all workers will retreat to the exclusion zone (minimum 100 feet) around the remote location until the discharging process is complete.

4.18 Flaring

4.18.1 Flaring activities involve the combustion of the cylinder contents through the discharge of a low-intensity flame. Flaring activities will be performed in accordance with the following procedures:

- Flaring will be accomplished at a remote location and in compliance with all applicable environmental air regulatory requirements.
- All personnel involved with flaring activities shall be appropriately trained and wear PPE appropriate to the hazards (e.g. Nomex fire-retardant forearm-length gloves, other fire-retardant clothing, self-contained breathing apparatus, etc.).
- Flaring activities will be dependent upon a wind direction that does not carry the combustion plume in the direction of any offsite structure or activity, or into uncontrolled (public access) areas.
- The cylinder will be properly grounded to confirm a static charge is not generated, potentially resulting in ignition of a flammable gas.
- All tools used on the cylinder will be non-sparking.
- Low-pressure discharging will not exceed 15 pounds per square inch gauge (psig).
- A hot work permit shall be completed prior to the start of flaring activities, refer to *S3AM-332-PR1 Hot Work*.
- No other cylinders will be within 50 feet (15.24 meters) of the cylinder being flared.
- Flaring activities will use a low-pressure discharge and maintain a small, low-intensity flame.
- A firewatch will be established, with a worker stationed outside the exclusion zone with a fire extinguisher (20A:100B:C) during flaring activities (i.e., fire watch). During the work the worker assigned to the firewatch will have no other duties.
- The flare will be positioned so that it is not pointing toward any flammable materials, persons, or equipment in the immediate area.

4.19 Neutralization

4.19.1 Neutralization refers to the on-site neutralization of the cylinder contents through a controlled chemical reaction process. Specialized equipment may be necessary based on the chemical involved, as well as reaction by-products, catalysts, or physical conditions (i.e., temperature, acidic, basic, etc.). Neutralization activities will be performed in accordance with the following procedures:

- Neutralization is the required disposition method for cylinders containing acid gases, as well as many alkaline gases.
- The neutralization process shall be approved by a professional engineer (e.g., chemical) or based on a published chemical-specific neutralization methodology.
- Liquid levels in the reaction vessels will be maintained at least 12 inches (30.5 centimeters) below the top of the vessel.
- Based on the specific chemical reaction, the temperature of the reaction vessel and its contents will be monitored continuously and controlled accordingly.
- Pressure levels will be maintained within acceptable limits to prevent the reaction from accelerating, unwanted by-product formation, or the break-through of the chemical intended to be neutralized.
- Employees involved in neutralization activities shall be appropriately trained and wear the PPE identified within the site-specific safety plan and cylinder plan.

4.20 Detonation

4.20.1 Detonation refers to the use of explosives to open and subsequently consume the contents of the cylinder by the heat generated during the explosion. Detonation activities will be performed in accordance with the following procedures:

- All personnel involved with detonation activities shall be appropriately trained and wear PPE appropriate to the hazards (e.g. Nomex fire-retardant forearm-length gloves, other fire-retardant clothing, self-contained breathing apparatus, etc.).
- A detonation plan shall be submitted to and approved by the SH&E Manager prior to the commencement of cylinder detonation activities.
- The detonation of compressed gas cylinders will be completed under the guidance of experienced ordnance and explosives (OE) professional who is licensed in the use of explosives.
- A sufficient amount of explosives will be used to consume the entire contents of the cylinder (flammable gases only).
- A blast pit will be excavated where all detonations will take place.
- The OE professional will determine the blast hazard zone/potential debris impact zone, and this area will be evacuated prior to the detonation.
- The OE professional will sound a warning signal (e.g., horn or equivalent) three times to indicate that a detonation is imminent and confirm all persons have evacuated the blast hazard zone prior to detonation.
- Employees will be on standby outside the blast hazard zone with fire extinguishers (minimum rating of 20A:100B:C).

4.21 Cylinder Decommissioning Operations

4.21.1 Decommissioning refers to the removal of a compressed gas cylinder from service by rendering it permanently unusable.

4.21.2 Prior to decommissioning, cylinder contents will be verified, removed from the cylinder, and the cylinder purged with an inert gas (e.g., nitrogen, carbon dioxide, etc.).

4.21.3 All identifying marks or decals will be removed from the cylinder.

4.21.4 The SH&E Manager shall be contacted prior to the decommissioning of compressed gas cylinders that contain or previously contained:

- Ethylene oxide,

- Arsine,
- Diborane,
- Hydrogen selenide,
- Cyanogen chloride,
- Amines,
- Hydrogen sulfide,
- Acetylene, or
- Methyl mercaptan.

4.21.5 Additional safety precautions may be necessary due to highly reactive residues left behind by these substances.

4.21.6 The recommended methods of decommissioning include:

- Burning/torch-cutting an elongated hole into the side of the cylinder, refer to *S3AM-332-PR1 Hot Work;*
- Torch-cutting the cylinder in half; and
- Crushing the cylinder.

5.0 Records

5.1 None

6.0 Attachments

6.1 S3AM-114-ATT1 Compressor Safety

6.2 S3AM-114-FM1 Compressed Gas Cylinder Inspection

Americas

Compressor Safety

S3AM-114-ATT1

1.0 Objective / Overview

1.1 Compressors should be used with extreme caution in order to prevent personal injury.

1.2 When using a compressor it's important to follow the manufacturer's instructions to avoid injuring someone or damaging your compressor.

1.3 Allow only trained, authorized personnel to operate the compressor. Along with training, other safety measures include: proper maintenance of equipment and personal protective equipment.

2.0 Safe Operating Guidelines

2.1 Follow manufactures recommended operating instructions, every compressor is not the same. Maintain adequate ventilation.

2.2 Gas and diesel powered generators emit carbon monoxide (CO). Never operate a fuel-powered compressor in an enclosed building without proper ventilation.

2.3 Turn the compressor off to refuel. Gasoline and its vapors may ignite if they come into contact with hot components or an electrical spark, store fuel in a properly designed container in a secure location.

2.4 Operators shall perform a pre-operational check of all air hoses, couplings, and connections to determine if leakage or other damage exists. Tag unsafe equipment and take out of service immediately.

2.5 Decompress air from the compressor prior to removing any caps or air equipment attachments such as jackhammers, drills, etc.

2.6 Keep oil and flammable material clear of air fittings and joints.

2.7 Make sure connections are secure to avoid a hose coming loose during use.

2.8 To avoid a shock, make sure that your hands are dry and you're standing in a dry place whenever you operate an electrically powered compressor.

2.9 Use only UL-listed, three-prong extension cords. Be sure the extension cord is the proper size (wire-gauge) to handle the electric load that will be plugged into it.

2.10 Have a Class A:B:C fire extinguisher readily available at all times.

3.0 Potential Hazards

3.1 Burns from contact with the hot muffler or engine

3.2 Shocks/electrocution

3.3 Noise exposure

3.4 Inhaling exhaust gases, CO

3.5 Contact with pressurized air

4.0 Training Requirements

4.1 Review of applicable procedures.

4.2 Demonstrated knowledge on the use of the compressor.

4.3 Review of manufacturers operating guidelines.

5.0 Personal Protective Equipment

5.1 Leather Gloves

5.2 Hearing Protection

5.3 Long Sleeve Shirt (e.g., to shield from burns, etc.)

5.4 Refer to *S3AM-208-PR1 Personal Protective Equipment*

Americas

Compressed Gas Cylinder Inspection

S3AM-114-FM1

Location Inspected: _____ **Job No.:** _____

Date Inspected: _____ **Name of Inspector:** _____

1.	DOT / TDG container specification number present on cylinders.	☐ Yes	☐ No	☐ NA
2.	Proper DOT / TDG shipping name, ID # and hazard class on cylinders.	☐ Yes	☐ No	☐ NA
3.	Manufacturer's name and appropriate hazard warnings present.	☐ Yes	☐ No	☐ NA
4.	Serial number of cylinders and inspectors official mark present.	☐ Yes	☐ No	☐ NA
5.	Most recent hydrostatic test date marked and within 5 years.	☐ Yes	☐ No	☐ NA
6.	Cylinder valve and neck ring free of oil, grease or other foreign matter.	☐ Yes	☐ No	☐ NA
7.	Valve threads clean and in good condition.	☐ Yes	☐ No	☐ NA
8.	Pressure rating of cylinder not exceeded.	☐ Yes	☐ No	☐ NA
9.	Cylinder surface is free of cracks, and dents, gouges, weld defects, etc.	☐ Yes	☐ No	☐ NA
10.	Cylinder surface is free of arc burns and fire burns.	☐ Yes	☐ No	☐ NA
11.	Cylinder cap is present and threaded in place.	☐ Yes	☐ No	☐ NA
12.	Cylinder surface, particularly bottom, is free of excessive corrosion, and pitting.	☐ Yes	☐ No	☐ NA
13.	Cylinders must be capped when regulators are removed.	☐ Yes	☐ No	☐ NA
14.	Oxygen and fuel cylinders are stowed in designated well-ventilated areas.	☐ Yes	☐ No	☐ NA
15.	Storage areas have temperatures less than 125º F (52º C).	☐ Yes	☐ No	☐ NA
16.	Cylinders are stored upright and secured from falling over.	☐ Yes	☐ No	☐ NA
17.	Cylinders are in segregated groups by gas type and not intermingled with other cylinders.	☐ Yes	☐ No	☐ NA
18.	Oxygen cylinders are stored at least 20 feet (6.1 meters) away from flammables. (A fire-resistive partition of at least 1-hour fire-resistance rating of at least 5-foot (1.52 meters) height may be used in lieu of 20 foot [6.1 meter] separation.)	☐ Yes	☐ No	☐ NA
19.	Flammable or combustible materials are kept at least 20 feet (6.1 meters) away from stored cylinders.	☐ Yes	☐ No	☐ NA
20.	Gas cylinder valves are protected from snow and ice during winter months.	☐ Yes	☐ No	☐ NA
21.	Oxygen cylinders are kept free from oil and grease.	☐ Yes	☐ No	☐ NA
22.	Welding cylinders are securely fastened to ready-use racks.	☐ Yes	☐ No	☐ NA
23.	Smoking or open flames are not permitted in areas where cylinders are stored.	☐ Yes	☐ No	☐ NA
24.	Cylinder storage areas are posted with the following sign: "DANGER – NO SMOKING OR OPEN FLAME".	☐ Yes	☐ No	☐ NA
25.	Cylinders are labeled with gas contents and warning statement.	☐ Yes	☐ No	☐ NA
26.	Empty cylinders are segregated from full cylinders.	☐ Yes	☐ No	☐ NA

Americas

Hazardous Waste Operations

S3AM-117-PR1

1.0 Purpose and Scope

1.1 Provides requirements for AECOM operations pertaining to hazardous waste and emergency response (HAZWOPER) services. In Canada and South America, there is no direct counterpart to HAZWOPER; however, as due diligence and in compliance with applicable duty of care/general duty clauses, staff working in Canada and South America will comply with this procedure as far as it aligns with the location's respective legislation.

1.2 Provides a procedure intended to address small incidental spills from work related equipment and supplies. For operations with bulk quantities of fuels, chemicals, oils, and for operations where AECOM is providing emergency response services for spills, the SH&E Manager or designee shall specify spill prevention and preparedness criteria including training, equipment, and proficiency.

1.3 To define appropriate procedures to decontaminate both equipment and personnel when exposure to hazardous chemicals or physical agents has occurred.

1.4 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

2.1 **Contamination Reduction Zone (CRZ)** – The transition area between the contaminated area and the clean area where decontamination activities occur.

2.2 **Decontamination** – The process of removing or neutralizing contaminants that have accumulated on personnel or equipment.

2.3 **Emergency Response** – A response effort by employees from outside the immediate release area or by other designated responders (e.g.., mutual-aid groups, local fire departments, etc.) to an occurrence that results, or is likely to result, in an uncontrollable release of a hazardous substance or whenever a release requires that a federal, state, territorial or provincial agency be notified, such as:

- A release at or above a reportable quantity (RQ) of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substance (40 CFR 302.8) is required to be reported to the National Response Center (NRC).
- A release at or above provincial reporting thresholds, if any, or alternatively those specified under the Canadian Transportation of Dangerous Goods Act are reportable under the Canadian Environmental Protection to the respective provincial or territorial Environmental Regulatory Agency .
- A hazardous chemical release at or above an RQ under the Emergency Planning and Community Right-to-Know Act (EPCRA) (Title III under the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 350-372) is required to be reported to state and local officials.
- A release in violation of a facilities Spill Prevention, Control, and Countermeasure (SPCC) Plan (40 CFR 112).

Responses to incidental release of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area or by maintenance personnel are not considered to be emergency responses within the scope of the HAZWOPER standard. Responses to releases of hazardous substances where there is no potential safety or health hazard are not considered to be emergency responses.

2.4 **Exclusion Zone (EZ)** – The area where contamination does or could occur.

2.5 **First Responder** – First responders are individuals who are likely to witness or discover a hazardous substance release, injury, fire, or other incident and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond first aid, initial control of the incident, and notifying the authorities and others of the incident.

2.6 **Hazardous Materials** – A hazardous material is any item or agent (biological, chemical, physical) that has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Additionally a hazardous material may be defined as any substance or chemical which is a "health hazard" or "physical hazard," including chemicals that are carcinogens, toxic agents, irritants, corrosives, sensitizers; agents that act on the hematopoietic system; agents that damage the lungs, skin, eyes, or mucous membranes; chemicals that are combustible, explosive, flammable, oxidizers, pyrophoric, unstable-reactive, or water-reactive; and chemicals that in the course of normal handling, use, or storage may produce or release dusts, gases, fumes, vapor, mists, or smoke that may have any of the previously mentioned characteristics. This may be caused when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, disposing into the environment, by being transported or moved, and items or chemicals that are "special nuclear source" or by-product materials or radioactive substances.

2.7 **Hazardous Materials Specialist** – Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties parallel those of the hazardous materials technician; however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with federal, state, local, and other government authorities in regards to site activities.

2.8 **Hazardous Materials Technician** – Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder in that they will approach the point of release in order to plug, patch, or otherwise stop the release of a hazardous substance.

2.9 **Hazardous Waste** – Hazardous waste is waste that is dangerous or potentially harmful to our health or the environment. Hazardous wastes can be liquids, solids, gases, or sludge. They can be discarded commercial products, like cleaning fluids or pesticides, or the by-products of manufacturing processes. Hazardous waste are divided into:

- Listed wastes (http://www.epa.gov/osw/hazard/wastetypes/listed.htm);
- Characteristic wastes (http://www.epa.gov/osw/hazard/wastetypes/characteristic.htm);
- Universal wastes (http://www.epa.gov/osw/hazard/wastetypes/universal/index.htmwastes); and
- Mixed wastes;
- Specific procedures determine how waste is identified (http://www.epa.gov/osw/hazard/wastetypes/wasteid/index.htm), classified, listed, and delisted.

2.10 **Health and Safety Plan (SH&E PLAN)** – A document prepared for each project that contains site-specific information including the Emergency Response Plan for the project.

2.11 **Incidental Releases** - A response to a spill or release of a hazardous substance (in quantities below its RQ) where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area using equipment and materials available to them at the time or the spill or release. Any spill or release that cannot be managed with the personnel, materials, and equipment at the site shall be considered an Emergency Response.

- Responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses. Handling of incidental releases shall be in accordance with applicable standard operating procedures.

2.12 **Incident Command System (ICS)** – ICS is a standardized on-scene incident management concept designed specifically to allow responders to adopt an integrated organizational structure equal to the complexity and demands of any single incident or multiple incidents without being hindered by jurisdictional boundaries. In the ICS the first person responding to an incident becomes the Incident Commander and turns that title and duties over to more qualified responders as they arrive on scene.

2.13 **Incident Commander** – The Incident Commander (IC) is responsible for all aspects of the response, including developing incident objectives and managing all incident operations. The title and responsibilities are typically assumed by a qualified IC from the client or public sector.

2.14 **Support Zone (SZ)** – An uncontaminated zone where administrative and other support functions (e.g. first aid, equipment supply, emergency information, etc.) are located.

3.0 References

3.1 SR1-003-WI2 Disruptive Event Response Instruction

3.2 S3AM-003-PR1 SH&E Training

3.3 S3AM-004-PR1 Incident Reporting, Notifications & Investigation

3.4 S3AM-010-PR1 Emergency Response Planning

3.5 S3AM-012-PR1 First Aid

3.6 S3AM-017-PR1 Injury & Illness Recordkeeping

3.7 S3AM-127-PR1 Exposure Monitoring

3.8 S3AM-128-PR1 Medical Screening & Surveillance

3.9 S3AM-208-PR1 Personal Protective Equipment

3.10 S3AM-209-PR1 Risk Assessment & Management

3.11 S3AM-213-PR1 Subcontractor Management

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Manager**

- Enforces and supports the implementation of SH&E Plans, Location Specific Emergency Response Plans, and Spill Response Plans;
- Prepare or request a SH&E Plan for every AECOM project with Hazardous Waste Operations and Emergency Response Activities, refer to *S3AM-209-PR1 Risk Assessment & Management*;
- Verify that all personnel working on the project are qualified to perform the activities they are assigned (see HAZWOPER and Emergency Spill Response Training requirements below);
- Request client's emergency response procedures;
- Appoint a Site Safety Officer (SSO) with appropriate qualifications for the specific hazardous waste project;
- Confirm that the SSO for complex projects, such as those with complicated remediation activities, has no duties other than site safety and health of the field team;
- Confirm the communication of the location-specific emergency response plan details to all employees assigned to a field project;
- Authorize the procurement of the necessary decontamination supplies;

- Verify that the applicable decontamination steps are clearly defined in the approved SH&E Plan;
- Verify staff are appropriately trained to execute the defined decontamination procedures;
- Verify that adequate staffing is available to safely conduct the applicable decontamination steps;
- Confirm that the necessary communications equipment for the project is available;
- Confirm that incident investigations are performed as required and a report is filed. Refer to *S3AM-004-PR1 Incident Reporting, Notifications & Investigation*;
- During spill response, all AECOM emergency responders and their communications shall be coordinated and controlled through the Manager. The individual in charge shall implement the and shall be responsible for the following tasks:
    - Become the individual in charge at the incident until relieved by more qualified personnel;
    - Notify the appropriate agency, the AECOM incident Reporting line, and operations. Refer to *S3AM-117-ATT1 Spill Notification Numbers North America* for US and Canadian required notifications;
    - Designate a safety supervisor who is knowledgeable about the operations being implemented at the emergency response site and who will have specific responsibility to identify and evaluate hazards and to provide direction on the safety of operations for the emergency at hand. If the safety supervisor judges activities to be an Immediately Dangerous to Life or Health (IDLH) and/or to involve an imminent danger condition, the safety supervisor shall have the authority to alter, suspend, or terminate those activities. The safety official shall immediately inform the individual in charge of the ICS of any actions needed to be taken to correct these hazards at the emergency scene;
    - Identify all hazardous substances or conditions present and address as appropriate site analysis, use of engineering controls, maximum exposure limits, hazardous substance, and handling procedures;
    - Implement appropriate emergency operations. Refer to *S3AM-010-Emergency Response Planning*;
    - Limit the number of emergency response personnel at the emergency site;
    - Implement the buddy system in groups of two or more;
    - Confirm that the PPE worn is appropriate for the hazards to be encountered;
    - Implement appropriate decontamination procedures after emergency operations have terminated.
- Responsibility for the emergency response shall be transferred upon arrival of a more qualified AECOM Incident Commander or a Public Service Incident Commander.
- Confirm appropriate communications concerning an emergency event are initiated as per *S3AM-010-PR1 Emergency Response Planning* and *SR1-003-WI2 Disruptive Event Response Instruction*.

4.1.2 SH&E Manager or designee

- Provide technical guidance for:
    - The development and implementation of SH&E Plans and Emergency Response Plans;
    - The Incident Commander regarding the correct way to respond to the spill;
    - Project-specific Spill Response Plans when required;

- Prepare emergency action plans as part of project SH&E Plans and emergency reference sheets;
- Interface with the local emergency responders when necessary;
- Interface with clients regarding facility emergency response procedures;
- Decide whether AECOM or an outside emergency response company will clean up the spill;
- Report spills, as necessary, to state/provincial environmental agencies;
- Review the incident report and facilitate the post-response discussion;
- Review and revise this procedure as necessary based on recommendations from post-response discussions;
- Advise Managers and Supervisors on the necessary decontamination procedures for the known or reasonably anticipated chemical hazards and physical agents associated with the planned scope of work;
- Support the project team to verify that adequate protective measures are in-place (e.g. Engineering Controls, Administrative Controls, Personal Protective Equipment, etc.).

4.1.3 **Site Safety Officer (SSO)**

- Verify that a SH&E PLAN is available for the project and is reviewed prior to the commencement of site activities;
- Conduct pre-entry briefing and daily tailgate meetings and review facility, site-specific emergency procedures, and site specific decontamination procedures;
- Communicate the site-specific emergency response details to all employees assigned to a field project;
- Establish the designated site work zones (e.g., EZ, CRZ, SZ, etc.);
- Enforce the applicable decontamination steps as defined in the approved SH&E Plan;
- Initiate Stop Work and emergency response procedures as required;
- Account for all AECOM and subcontractor employees after site evacuation;
- Brief on-site and off-site responders in the event of an emergency;
- Conduct site-specific training on the applicable decontamination steps/procedures;
- Procure the necessary decontamination supplies and establishing the decontamination line;

4.1.4 **Employees**

- Maintain HAZWOPER training, or equivalent training as it relates to the given jurisdiction;
- Follow the SH&E Plan and emergency procedures prepared for the project;
- Initiate Stop Work if necessary;
- Initiate emergency response via verbal communications or the alarm system if first to encounter an emergency;
- Follow the defined decontamination steps as stated in the approved SH&E Plan;
- Follow precautions and safe handling practices to avoid spills;
- Alert Manager to any deteriorating hazardous materials containers within the office or project area;
- Report all spills and leaks to the Manager immediately;
- Secure the spill area as quickly as possible and prevent the migration of exterior spilled materials or substances to drains or other openings; and

4.1.5 **All personnel** (e.g., AECOM employees, general laborers, equipment operators, chemists, supervisors, etc.) performing activities at hazardous waste sites that expose or potentially expose them to hazardous wastes and health hazards are considered HAZWOPER site workers and shall meet the training and medical surveillance requirements specified in 29 CFR 1910.120(e) and (f), respectively. Additional training may be required based on site activities including related exposures and risks (e.g., confined space entry, excavations, fall protection, other materials [lead], etc.). These additional training requirements are to be outlined in the project- or site-specific SH&E Plan.

4.2 Project SH&E Documentation—SH&E Plan

4.2.1 The project SH&E documentation prepared for HAZWOPER activities is referred to as a site-specific SH&E Plan, and shall meet the requirements presented in 29 CFR 1910.120(b)(4).

4.2.2 A safety and health risk or hazard analysis for each on-site task that will be performed.

4.2.3 The required SH&E Plan elements include:

- A description of the work location, the site history, and a summary of any information available concerning site hazards (including both physical hazards and contamination conditions);
- A summary of the work activities to be performed under AECOM's scope of activities;
- Identified risks shall include both chemical and physical hazards to which personnel may be exposed during the conduct of the work task;
- Protective measures for each work task to prevent or mitigate the potential hazards identified in the hazard analyses;
- Personal protective equipment (PPE) requirements for each work task**.** Refer to *S3AM-208-PR1 Personal Protective Equipment*;
- Frequency and types of air monitoring, personal monitoring, and environmental sampling techniques and instrumentation to be used;
- Site control measures;
- Decontamination procedures;
- An emergency response plan, *S3AM-010-PR1 Emergency Response Planning*, addressing actions to be taken in the event of each type of credible incident that might result during the performance of planned work activities, including minor and major injuries, and chemical release and fire. Response plans shall address the means for coordinating the evacuation of all on-site personnel in the event of a catastrophic incident.

4.2.4 Responsibility for development of each AECOM SH&E Plan will be coordinated between the Manager and the SH&E Manager or SH&E Department designee as part of project initiation. Regardless of where the SH&E Plan is developed, it will be reviewed and approved by the SH&E Manager prior to submission to any agency outside of AECOM.

4.2.5 Contractors and Subcontractors

- The health and safety of the employees of any contractor or subcontractor who does not have a contract directly with AECOM, and for whom AECOM does not have contractual safety oversight, is the responsibility of that contractor or subcontractor. The contractor or subcontractor shall evaluate the hazards and potential hazards to their own employees and shall adhere to their own Health and Safety Plan;
- Subcontractors who maintain a contract directly with AECOM shall comply with AECOM SH&E program requirements. Refer to *S3AM-213-PR1 Subcontractor Management*;
- In addition, all AECOM subcontractors' Health and Safety Plans shall, at a minimum conform to the requirements of the AECOM SH&E Plan. The AECOM SH&E Plan does not, nor is it intended to, address procedures of contractors or subcontractors during their site activities.

4.3 Personnel Qualifications— Training and Medical Surveillance

4.3.1 HAZWOPER-qualified employees shall participate in the following medical surveillance and training requirements. Medical surveillance and SH&E training requirements are further described in *S3AM-128-PR1 Medical Screening & Surveillance* and *S3AM-003-PR1 SH&E Training* respectively.

4.3.2 Employees receiving initial and refresher responder training shall be issued a certificate indicating training competency. Copies of all training records shall be maintained in accordance with the *S3AM-003-PR1 SH&E Training*.

4.3.3 Medical Surveillance

- Specific HAZWOPER medical examination protocols have been developed by AECOM's Corporate Medical Provider (CMP) to meet the requirements of 29 CFR 1910.120(f). To be medically qualified to perform HAZWOPER work, employees receive the following medical examinations:
    - Initial (Baseline) Examination — The initial examination is part of pre-employment requirements and shall be completed (with results received) prior to the employee's start of work date;
    - Annual Examination — HAZWOPER-qualified employees will complete a medical examination once each year. Medical qualification expires on the anniversary date of the last examination completed. There will be no "grace period" exemptions beyond this date without the express approval of the Region SH&E Manager. At the recommendation of the SH&E Department, the CMP may approve an alternate examination frequency at periods of up to two years (biennial) in cases in which the worker's exposures to environmental contaminants are infrequent and typically well below any occupational exposure limits (e.g., senior management personnel);
    - Termination Examination — When reassigned to non-HAZWOPER duties or at the conclusion of employment at AECOM, HAZWOPER-qualified personnel will be provided with the opportunity to receive a termination medical examination;
    - Special Examinations — The SH&E Department and the CMP will jointly determine the need for special examinations because of:
        - Unusual exposure conditions; and
        - In response to possible overexposures.
- The CMP will determine the medical protocol elements for each of these examinations based on exposure information provided by the SH&E Department. The CMP will evaluate the results of each Employee's examination and will provide a written statement of medical clearance clearly stating medical compliance with the HAZWOPER regulatory standard (29 CFR 1910.120(f)) and approval of the Employee to perform unrestricted HAZWOPER activities. For initial and annual examinations, the CMP will also evaluate the Employee for the use of air purifying and supplied air respiratory protection. The written evaluation from these examinations will indicate the CMP's approval/limitations on the Employee's use of respiratory protection;
- If an Employee does not wish to participate in part or in the complete medical surveillance program, and is permitted by the given jurisdiction, the employee shall provide a written statement of refusal. Refer to *S3AM-128-PR1 Medical Screening & Surveillance*;

4.3.4 Training - HAZWOPER

All personnel assigned to work at a hazardous waste site, sampling at Treatment, Storage and/or Disposal Facilities (TSDFs), or are performing Remediation and Investigation Activities, shall participate in training meeting the requirements of 29 CFR 1910.120(e), or equivalent training as it relates to the given jurisdiction. All personnel shall have the following training:

- 40-hour initial Training — Before being assigned to a HAZWOPER site, AECOM Employees shall complete 40 hours of off-site training meeting the requirements of 29 CFR 1910.120(e)(3)(i). At the conclusion of training, personnel will receive a written certification of course completion, signed by the instructor, that indicates the course of instruction (40-hour HAZWOPER) and training dates. A copy of this certification shall be provided to the employee's SH&E Manager. Employees are responsible for maintaining their own copy of this certificate and for presenting it to the SSO when working on any HAZWOPER site;
- 3 days of on-the-job training — The Employee shall receive 3 days of actual supervision by a trained experienced supervisor;
- Refresher 8-Hour Training — To remain qualified to perform on-site HAZWOPER work activities, each AECOM Employee will complete 8 hours of HAZWOPER refresher training meeting the requirements of 29 CFR 1910.120(e)(8) at yearly intervals following completion of Initial 40-hour training. At the conclusion of training, personnel will receive a written certification of course completion, signed by the instructor, that indicates the course of instruction (8-hour HAZWOPER Refresher) and the training date. A copy of this certification shall be provided to the employee's SH&E Manager. Employees are responsible for maintaining their own copy of this certificate and for presenting it to the SSO when working on any HAZWOPER site;
- 8-hour Supervisor 8-Hour Training - any AECOM Employee acting in a management capacity for HAZWOPER activities (e.g., project manager, site safety officers, etc.), including oversight of subcontractor HAZWOPER activities, shall complete an additional 8 hours of HAZWOPER Supervisor training meeting the requirements of 29 CFR 1910.120(e)(4). Although this training is required only once, supervisors shall maintain their overall HAZWOPER qualification through annual completion of refresher training. At the conclusion of Supervisor 8-Hour Training personnel will receive a written certification of course completion, signed by the instructor that indicates the course of instruction and the training date. A copy of this certification shall be provided to the SH&E Manager. Employees are responsible for maintaining their own copy of this certificate and for presenting it to the SSO when working on any HAZWOPER site;
- 24-Hour HAZWOPER Training — Site support contractors and site visitors may qualify to substitute 24-hour HAZWOPER training in place of 40-hour training, as specified in 29 CFR 1910.120(e)(3)(ii). Personnel potentially qualifying for this alternative training include:
    - Site support personnel who will not work in any Exclusion Zone areas;
    - Subcontractors and site visitors whose duties will not entail significant exposure to site contaminants defined as not working in any areas where airborne contaminant concentrations exceed one-half of any applicable occupational exposure limit, and no contact or exposure to materials with site contaminant concentrations exceeding natural background levels. The SH&E Manager shall approve the substitution of 24-hour training for initial 40-hour training. Persons qualifying for 24-hour training shall provide written certification of course completion prior to beginning work on site. Persons completing 24-hour training shall complete 8 hours of annual refresher training at the required interval to maintain eligibility for on-site work and shall provide proof of this training (as necessary to demonstrate retraining) prior to beginning work on site.

Available Training Sources:

- On-site training provided by the SH&E Department;
- Outsourced training providers approved by the SH&E Department;

4.3.5 Training – Emergency Response

On an as-needed basis, if a project requires AECOM to provide a HAZMAT emergency response team, the following training requirements shall be met:

- Operations Level – a minimum of 8 hours of initial and refresher training for those responsible for acting defensively in the case of a release, attempting to contain the release from a safe distance;
- HAZMAT Technician – at least 24 hours of initial training and 8 hours of refresher training. They will participate in operations-level training and know how to implement the emergency response plan for the facility/site/project location;
- HAZMAT Specialist – at least 24 hours of initial training and 8 hours of refresher training. They will be trained in the same content as the HAZMAT Technician, as well as in how to develop a site safety and control plan;
- Incident Commander – will have at least 40 hours of training covering the Operations Level training and techniques for implementing the emergency response plan and directing the incident. They will be knowledgeable in relevant regulations. The Incident Commander will become the individual in charge of a site-specific incident command system and will coordinate and control communications with external agencies;

4.3.6 Subcontractor Personnel Training Records

Any subcontractor organization whose employees will support AECOM operations at a HAZWOPER site will:

- Provide the Manager with a copy of their written HAZWOPER medical surveillance and training program requirements. The elements of the program(s) shall be similar to those for AECOM's own program, as detailed above. Refer to *S3AM-213-PR1 Subcontractor Management*;
- Provide the Manager with written certification of a physician's approved medical clearance for each employee who will work on the site. Certification can be demonstrated by:
  - A copy of the physician's signed medical clearance for each employee (preferred); or
  - A letter identifying the medical status and clearance expiration date of every employee, signed by the company's safety director or an officer of the company.
  - A copy of the each employee's training certifications, which will include:
    - The initial 40-hour training certificate (24-hour training may be substituted with SH&E Manager approval);
    - The most current Refresher training certificate (shall be current within the previous one-year period);
    - A copy of the Supervisor training certificate for each person serving in a site supervisory capacity (e.g., project manager, site safety officers, etc.).

4.4 HAZWOPER and Spill Response Equipment

4.4.1 Specific HAZWOPER activity and spill response equipment shall be identified in the site specific SH&E PLAN. All AECOM offices and project sites that store chemicals at their location shall have the appropriate spill response equipment. Such equipment may include the following:

- Over-pack containers of varying capacities;
- Absorbent material such as vermiculite or commercially prepared, absorbent containing pillows, rolls, sheets, or booms;
- Acid and base neutralizing agents;
- Chemically resistant gloves for solvents, alcohols, and acids;
- Poly-coated Tyvek coveralls;
- Safety goggles;
- Respiratory protection;

4.4.2 Spill response equipment shall be placed adjacent to areas where chemicals are routinely handled, stored, and/or where shipments are received. Similar types of spill response equipment shall also be available in any AECOM vehicle or rented vehicle in which chemicals are being transported. Location of spill response equipment shall be selected to permit access outside of likely spill locations.

4.4.3 Spill Response Equipment for Field Programs

- The amount of chemicals being used during a field program will dictate the types and quantity of spill response equipment that is brought to the site;
- If several squirt bottles of decontamination solution are all that is being brought to a site, a few spill pillows and a one-gallon bucket (3.8 liters) may be sufficient to respond to a spill of these materials;
- If gallons of chemicals are being delivered to the site in drums or bulk tanks, a greater variety of spill response equipment will be needed. As indicated previously, during these types of field programs, a separate spill plan will be incorporated into the project or site specific SH&E Plan, and will provide a greater level of detail regarding the specific spill response effort for that field program. Refer to *S3AM-209-PR1 Risk Assessment & Management*;

4.5 Personal Protective Equipment (PPE) Ensembles

4.5.1 Defined HAZWOPER PPE ensembles are specified for general use on all AECOM HAZWOPER operations. The project SH&E Plan may specify modifications to these requirements to meet site-specific conditions. Refer also to *S3AM-208-PR1 Personal Protective Equipment* for additional information concerning PPE requirements.

4.5.2 Level D Ensemble

The Level D ensemble provides a minimal level of skin protection (primarily against physical rather than chemical hazards) and no respiratory protection. Level D PPE is the minimum work uniform to be used on HAZWOPER sites. Its use is appropriate when there is no significant potential for encountering hazardous substances or health hazards while working in controlled work areas.

Level D Equipment List:

- Hard hat;
- Eye protection;
- Safety-toe work boots;
- Shirts with sleeves and long pants (shorts are unacceptable for use); and
- Hearing protection (as required).

4.5.3 Modified Level D Ensemble

The Modified Level D ensemble provides moderate skin protection against contact with hazardous substances, but no respiratory protection. Its use is appropriate where there is a moderate-to-low potential for skin contact with known hazardous substances and health hazards, but no significant inhalation hazard is anticipated. The Modified Level D ensemble will consist of the Level D ensemble, supplemented by the addition of one or more of the following items:

Modified Level D Equipment List:

- Full faceshield;
- Plain (uncoated) disposable coveralls;
- Chemical-resistant disposable outer coveralls;

- Chemical-resistant outer gloves taped to outer coveralls;[1]
- Chemical-resistant inner gloves; and[1]
- Chemical-resistant safety-toe boots (taped to outer coveralls).

4.5.4 Level C Ensemble

The Level C ensemble provides moderate skin protection against contact with hazardous substances and moderate respiratory protection. Its use is appropriate where there is the potential for skin contact with known hazardous substances and health hazards, together with a limited and well-defined potential for exposure via inhalation.

Level C Equipment List:

- Full-face air-purifying respirator (APR) equipped with cartridge types as designated in the project SH&E PLAN;[2]
- Plaind (uncoated) disposable coveralls;
- Chemical-resistant disposable outer coveralls;
- Chemical-resistant outer gloves taped to outer coveralls;[3]
- Chemical-resistant inner gloves;
- Hard hat;
- Safety-toe boots taped to coveralls; the use of boot covers (e.g., booties) or chemical-resistant boots may be specified; and
- Hearing protection (as required).

4.5.5 Level B Ensemble

The Level B ensemble provides both the highest level of inhalation exposure protection and considerable skin contact protection. Its use is appropriate where there are significant known or suspected hazardous substances and health hazards, involving both skin and inhalation exposure (up to and including Immediately Dangerous to Life or Health [IDLH] conditions) or where adverse atmospheric conditions cannot be mitigated by use of air purifying respirators (e.g. oxygen deficient atmospheres or chemicals with poor warning properties). The use of Level B PPE requires prior approval by the SH&E Manager.

Level B Equipment List:

- Supplied air respirator (SCBA or airline system with Grade D or better breathing air);
- Chemical-resistant disposable outer coveralls;
- Chemical-resistant outer glove taped to outer coveralls;[3]
- Chemical-resistant inner gloves;[3]
- Hard hat;
- Chemical resistant safety-toe boots taped to coveralls; and
- Hearing protection (as required).

1 Selection of specific glove types/materials will be provided in the project SH&E Plan based on consideration of the contaminants and the physical conditions of the work.

2 Selection of specific cartridges will be made by the SH&E Department (or Competent Person – Respiratory Protection as designated by the SH&E manager) based on contaminants present. A cartridge change-out frequency will also be specified in the SH&E based on the manufacturer's cartridge performance data.

3 Selection of specific glove types/materials will be provided in the project SH&E based on consideration of the contaminants and the physical conditions of the work.

4.5.6 Level A Ensemble

The Level A ensemble provides the highest level of both respiratory and skin protection, up to and including protection against skin contact with vapor-phase contaminants. The use of Level A PPE requires prior approval by the Americas SH&E Director.

Specific Level A ensemble components will be determined on a case-by-case basis by the SH&E Department.

4.6 Emergency Response Plans

4.6.1 A Location Specific Emergency Response Plan shall be developed and implemented to handle anticipated emergencies prior to performing emergency response operations. The plan shall be in writing and available for inspection and copying by employees, their representatives, and OSHA personnel. The plan shall be reviewed and approved by the SH&E Manager prior to issue.

4.6.2 AECOM'S *S3AM-010-PR1 Emergency Response Planning* shall apply and employees shall evacuate from the danger area whenever an emergency occurs, provided the associated contract does not require AECOM to provide emergency response services

4.6.3 AECOM Employees are not expected to take action or to participate in rescues or responses to chemical releases beyond the initial discovery of the release and immediate mitigation actions such as closing a valve, placing absorbents, and notifying the client and or public emergency response system (911).

- If AECOM Employees are to participate in the response to a chemical release beyond the initial reaction, there shall be a contractual provision for this response and the Employees shall be specifically trained for this response;
- This document is designed to provide guidelines on how to prepare a written plan that will confirm prompt and proper response to an emergency situation that arises during field investigations and to outline the duties of AECOM Employees during a field emergency and the associated training requirements.

4.6.4 Site specific SH&E plans that are prepared to comply with the HAZWOPER standard (29 CFR 1910.120) shall address emergency response. This standard specifically outlines the elements that shall be contained in an emergency response plan. However, the definition of emergency response, as written in 29 CFR 1910.120, focuses on emergencies involving the uncontrolled release of hazardous substances. Under 29 CFR 1910.120, an employer can opt to evacuate employees from the danger area when such an emergency occurs. AECOM does not expect its Employees to actively assist in the handling of uncontrollable chemical releases that may occur during the implementation of field programs. As such, and as provided by the HAZWOPER standard, AECOM is exempt from the emergency response plan requirements of the standard as long as it provides an emergency action plan within the SH&E PLAN that complies with 29 CFR 1910.38 (a). Therefore, all emergency response plans required under 29 CFR 1910.120 will be written to comply with 29 CFR 1910.38 (a).

- There are two types of emergency situations that AECOM personnel shall be prepared for and that shall be addressed in the emergency response plan. These include:
  - Emergencies related to the operations of our clients at the facility where AECOM is working;
  - Emergencies related to our own on-site activities/investigations.
- Employees are not to accept the role of Incident Commander without specific authority from the SH&E Manager and the Manager responsible for the project. Assuming the role of the Incident Commander requires training beyond the scope of this Procedure.

4.6.5 The HAZWOPER standard does not prohibit AECOM Employees from performing limited response activities.

- Appropriately trained AECOM Employees can provide voluntary First Aid services;
- AECOM Employees can provide response assistance by placing absorbent pillows or vermiculite around a small, contained spill that occurs during sampling efforts;
- Refer to Spill Response, Incidental procedures contained herein which describes the specific procedures that AECOM will follow when responding to an incidental chemical spill.

4.6.6 Field Project Preparation

- Every SH&E Plan that is prepared by AECOM will contain a Location Specific Emergency Response Plan in which the required elements of an emergency action plan will be addressed. Refer to *S3AM-010-PR1 Emergency Response Planning*;
- When AECOM is working at an operating facility, the emergency response procedures of the facility will be appended to the SH&E Plan or the Location Specific Emergency Response Plan;
- As a minimum, each emergency response plan shall contain the following topics as required by 29 CFR 1910.38 (a):
    - Procedures and contact information for reporting emergencies to public service responders and on-site (client or host employer) emergency control centers;
    - Pre-emergency planning and coordination with outside parties;
    - Emergency escape procedures and emergency escape route assignments;
    - Procedures to be followed by employees who remain to operate critical site operations before they evacuate;
    - Procedures to account for all employees after emergency evacuation is complete;
    - Rescue and medical duties for those employees who are trained to perform them;
    - Preferred means of reporting fires and other emergencies;
    - PPE to protect employees from expected exposures and potential exposures during an emergency;
    - Names of persons or departments who can be contacted for further information (i.e. emergency reference sheet);
    - Site security and control;
    - Availability of medical surveillance for workers who might have been exposed to chemicals, bloodborne pathogens, or other biological agents as a result of project work or emergency response;
    - Emergency medical treatment and first aid;
    - Emergency alerting and response procedures;
    - Critique of response and follow-up.
- In addition, each plan shall establish the specific alarm system that will be used on site to warn employees of an AECOM emergency. The chosen alarm signals should not conflict with alarm signals already in place at the facility.

4.6.7 Client Facility Emergency Response Procedures

- AECOM implements field programs on active properties, including manufacturing facilities. These facilities have typically developed an emergency response plan that is specific to facility-related emergencies. If AECOM is working at an operating facility, emergency procedures established by the facility shall be followed in the event of a facility catastrophe.

AECOM personnel shall be aware of and familiar with the alarm signals used at the facility to alert personnel to an emergency. AECOM personnel shall also know where to assemble in the event of a facility evacuation as the facility shall be able to account for all personnel, including subcontractors such as AECOM in the event of an evacuation.

- The first priority in AECOM's preparation of a project emergency action plan is to confirm that the responsibilities under the client's emergency response plan are fully understood. Because of the nature of their business, many of our clients have in-house fire brigades, medical staff, and hazardous materials teams that can assist AECOM in the event of an emergency related to our field activities. In many instances, our clients prefer or require that subcontractors seek emergency assistance through their facility first before calling outside responders to the site.
- A copy of the facility's procedures shall be made available to AECOM so that the information can be incorporated into the SH&E Plan or attached to the Location Specific Emergency Response Plan. If this information is not available to AECOM prior to arriving on site, the SSO shall meet with client representatives upon arrival to the facility to review procedures in the event of an emergency related to plant operations.

4.6.8 Escape Routes and Procedures

Although emergency evacuation procedures are included in AECOM's initial 40-hour HAZWOPER training, emergency procedures at each site will be different. Employees shall be instructed about the location specific emergency response plan. Updating training is required anytime escape routes or procedures change. An evacuation drill will be conducted for projects that are scheduled for one month or longer. Visitors and untrained employees shall not be allowed into the project area until they receive a safety briefing including evacuation alarms and procedures.

Prior to the commencement of on-site activities, the SSO shall determine how AECOM employees will evacuate each AECOM work area of the site:

- Two or more routes that are separate or remote from each other for each work area shall be identified. Multiple routes are necessary in case one is blocked by fire or chemical spill. These routes shall not overlap because, if a common point were obstructed, all intersecting routes would be blocked;
- Prominent wind direction should also be considered when designating escape routes and assembly areas. Escape routes and assembly areas should be upwind of the site whenever possible;
- Upon arrival to the site, the SSO shall verify that the selected routes are appropriate for evacuation. During an emergency, the quickest and most direct route should be selected. However, when working at an operating facility, the established escape routes of the facility should be used whenever possible;
- In the event of a facility-related emergency, all AECOM employees shall meet at the facility's assembly area so that the client can verify that AECOM has evacuated the property.

4.6.9 Alarm Signals

An emergency communication system shall be in effect at all sites.

- The most simple and effective emergency communication system in many situations will be direct verbal communications. However, verbal communications shall be supplemented any time voices cannot be clearly perceived above ambient noise levels and any time a clear line of sight cannot be easily maintained among all AECOM personnel because of distance, terrain, or other obstructions;
- Portable two-way radio communications may be used when employees shall work out of the line of sight of other workers;
- When it is necessary to supplement verbal communications, Employees shall be informed of the established emergency signals. The following emergency signals, or other appropriate signals, shall be implemented using handheld portable air horns, whistles, or similar devices.

Signals shall be capable of being perceived above ambient noise by all employees in the affected portions of the workplace:

- One Blast: General Warning—A relatively minor and localized, yet important, on-site event. An example of this type of an event would be a minor chemical spill where there is no immediate danger to life or health yet personnel working on the site should be aware of the situation so that unnecessary problems can be avoided. If one horn blast is sounded, personnel shall stop all activity and equipment on-site and await further instructions from the SSO;
- Three Blasts: Medical Emergency—A medical emergency for which immediate first aid or emergency medical care is required. If three horn blasts are sounded, all First Aid Providers should respond as appropriate. All other activity and equipment should stop and personnel should await further instructions from the SSO;
- Three Blasts Followed by One Continuous Blast: Immediate Threat to Life and Health — A situation that could present an immediate danger to life and health of personnel onsite. Examples include fires, explosions, large hazardous chemical release, severe weather-related emergencies, or security threats. If three horn blasts followed by a continuous blast are sounded, all activity and equipment shall stop. All personnel shall evacuate the site and meet in the designated assembly area where the SSO will account for all employees. The SSO will arrange for other emergency response actions if necessary. Information concerning the need to follow decontamination procedures during an emergency evacuation will be addressed in the Location Specific Emergency Response Plan;

- The SSO or his designate will acknowledge the distress signal with two short blasts on the air-horn or whistle;
- One Continuous Blast Following Any of the Above: All Clear/Return to Work — Personnel who sound the initial alarm are required to send an all clear signal when the emergency is over.

4.6.10 Accounting Method for All Employees after Evacuation

The SSO is responsible for determining that all AECOM employees have been successfully evacuated from the work area(s):

- It is the responsibility of each AECOM subcontractor to verify that all of its employees evacuated the site and to report this information to the SSO. All employees shall meet at the designated assembly area;
- A headcount is an acceptable way to determine complete evacuation when the field team is of a small size. The site log-in book or equivalent should be referenced when attempting to account for more than 10 people. In the event of a facility-related emergency, the SSO shall notify facility representatives that all AECOM employees and AECOM subcontract employees have successfully evacuated the work area(s);
- The SSO shall notify emergency responders if any employee is unaccounted for and where on the site they were last seen;
- In the event of a project-related emergency, the SSO will provide off-site emergency responders or on-site HAZMAT teams or fire brigades (Incident Commander) with all available knowledge about the emergency situation upon their arrival to the scene.

4.6.11 Employees Who Remain to Operate Critical Site Operations Before They Evacuate

All equipment and operations are required to cease in accordance with the established alarm signal procedures. The only exception will be related to health and safety:

- The SSO shall determine at the time of the emergency if health and safety will be jeopardized by immediate stoppage of any particular piece of equipment;

- If such a determination is made, personnel involved in critical operations shall be minimized. Once it is determined that the operation is no longer needed or the threat to the operators is imminent, operations will cease and the operators will immediately evacuate.

4.6.12 Rescue and Medical Response

- Only currently trained individuals will administer first aid, CPR or an AED. Refer to *S3AM-012-PR1 First Aid*.
- In the event of an incident, refer to material's SDS labels to confirm proper first aid is administered for the hazardous material and call the nearest Poison Centre or 911. Refer to *S3AM-012-PR1 First Aid*.
    - The American National Standards Institute (ANSI) Standard for Emergency Eyewash and Shower Equipment (ANSI Z358.1-1998) recommends that the affected body part shall be flushed immediately and thoroughly for at least 15 minutes using a large supply of clean fluid under low pressure. However, other references recommend a minimum 20-minute flushing period if the nature of the contaminant is not known. The flushing or rinsing time can be modified if the identity and properties of the chemical are known. For example, at least:
        - 5 minutes flushing time for mild irritants;
        - 20 minutes for moderate to severe irritants;
        - 20 minutes for non-penetrating corrosives;
        - 60 minutes for penetrating corrosives;
        - If irritation persists, repeat the flushing procedure.
- It is important to note that ingestion of any chemical is not likely to occur in the workplace. If ingestion does occur, evidence indicates that inducing vomiting is not necessary in most situations where there has been an occupational chemical ingestion.
    - Induction of vomiting should only be recommended if the chemical has very high, short-term (acute) toxicity, and medical follow-up is not readily available;
    - In these cases, first aiders should receive special training on how to safely and effectively induce vomiting in the appropriate circumstances.
- If the injury is life threatening, the Emergency Medical System (EMS) should be called (911). Depending on the procedures established for the project, the SSO would contact an emergency responder directly or notify the facility representatives for medical assistance;
- If the employee needs medical attention that cannot be provided on-site, the SSO shall escort the individual to the local hospital identified on the emergency reference sheet and shall remain with the person until release or admittance is determined. The escort will relay all appropriate medical information to the Manager and SH&E Manager.

4.6.13 On-site and Off-site Communications

Regardless of the size or location of AECOM's field projects, it is extremely important that both on-site and off-site communications be maintained so that in the event of an emergency employees can contact each other or place a phone call immediately with the appropriate responder(s).

A reliable and approved form of communication (e.g. two way radio, cell phone, etc.) is required when members of the field team are working in separate areas of the site and verbal communications are no longer effective because of distance. A communication device shall be available for each team that is working in a separate area of the site.

When AECOM is working at an occupied facility, a telephone may be accessible. When AECOM is working on abandoned properties or when there is no access to a phone, as appropriate, a cellular telephone, two-way radio, or satellite telephone shall be brought to the work location.

4.6.14 Preferred Means of Reporting

Employees shall immediately notify the Supervisor of incidents and emergencies, and report in accordance with *S3AM-004-PR1 Incident Reporting, Notification & Investigation*:

- Unless facility representatives specifically indicate that they prefer AECOM personnel to notify them first of an emergency, the SSO will directly contact the appropriate emergency responders listed on the Location Specific Emergency Response Plan;
- Additional communications within AECOM concerning an emergency event may be required as per *S3AM-010-PR1 Emergency Response Planning* and *SR1-003-WI2 Disruptive Event Response Instruction*;
- "Dangerous occurrences" shall be reported immediately to the police, employer, vehicle owner/leaser and the dangerous goods owner. Such events would include spills, bulk container damage, fire, explosion, and transportation accidents involving dangerous goods;
- Confirm and seek direction on external reporting requirements. Each jurisdiction has regulations governing the minimum quantities for reporting based on the type of product spilled or release refer to *S3AM-117-ATT1 Spill Notification Numbers for North America*;

Individuals who have knowledge of a spill, release, or unlawful discharge, shall notify authorities immediately. Reporting does not imply guilt or assign blame. The following details are to be reported:

- Location and time of spill;
- Description of circumstances leading to spill;
- Type and quantity of material or substance spilled;
- Details of any action taken at the site of the spill;
- Description of location of spill and immediately surrounding the area;
- Any additional information in respect of the spill that the Minister, Environmental Protection Officer or person designated by regulations requires.

4.6.15 First Responder

First responders shall have sufficient training or have had sufficient experience to objectively demonstrate competency in the following areas:

- An understanding of what hazardous substances are, and the risks associated with them in an incident;
- An understanding of the potential outcomes associated with an emergency;
- The ability to recognize the presence of hazardous substances and physical hazards in an emergency;
- An understanding of the role of the first responder;
- The ability to realize the need for additional resources and to make appropriate notifications to the communication center.

4.6.16 First Responder HAZWOPER Operations Level

First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release:

- They are trained to respond in a defensive fashion without actually trying to stop the release; Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures;

- First responders at the operational level shall have received at least eight hours of training or have had sufficient experience to objectively demonstrate competency in the following areas in addition to those listed for the awareness level and the employer shall so certify:
    - Knowledge of the basic hazard and risk assessment techniques;
    - Know how to select and use proper personal protective equipment provided to the first responder operational level;
    - An understanding of basic hazardous materials terms;
    - Know how to perform basic control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with their unit;
    - Know how to implement basic decontamination procedures;
    - An understanding of the relevant standard operating procedures and termination procedures;

4.6.17 Hazardous Materials Technician

Hazardous materials technicians shall have received at least 24 hours of training equal to the first responder operations level and in addition have competency in the following areas and the employer shall so certify:

- Know how to implement the employer's emergency response plan;
- Know the classification, identification, and verification of known and unknown materials by using field survey instruments and equipment;
- Be able to function within an assigned role in the Incident Command System, refer to *Federal Emergency Management Agency—FEMA: Incident Command System*;
- Know how to select and use proper specialized chemical PPE provided to the hazardous materials technician;
- Understand hazard and risk assessment techniques;
- Be able to perform advance control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available with the unit;
- Understand and implement decontamination procedures;
- Understand termination procedures;
- Understand basic chemical and toxicological terminology and behavior.

4.6.18 Hazardous Materials Specialist

Hazardous materials specialists shall have received at least 24 hours of training equal to the technician level and in addition have competency in the following areas and the employer shall so certify:

- Know how to implement the local emergency response plan;
- Understand classification, identification, and verification of known and unknown materials by using advanced survey instruments and equipment;
- Know the state or applicable jurisdictional emergency response plan;
- Be able to select and use proper specialized chemical PPE provided to the hazardous materials specialist;
- Understand in-depth hazard and risk techniques;
- Be able to perform specialized control, containment, and/or confinement operations within the capabilities of the resources and personal protective equipment available;

- Be able to determine and implement decontamination procedures;
- Have the ability to develop a site safety and control plan;
- Understand chemical, radiological, and toxicological terminology and behavior.

4.7 Decontamination Procedures

4.7.1 When possible, all necessary steps shall be taken to reduce or minimize contact with chemicals and impacted materials while performing field activities (e.g., avoid sitting or leaning on, walking through, dragging equipment over, tracking, or splashing potential or known impacted materials).

4.7.2 All personal decontamination activities shall be performed with an attendant (buddy) to provide assistance to personnel that are performing decontamination activities. An attendant may not be required for Level D equipment removal and decontamination. Depending on specific site hazards, attendants may be required to wear a level of protection that is equal to the required level in the exclusion zone.

4.7.3 All persons and equipment entering the EZ shall be considered contaminated, and thus, shall be properly decontaminated prior to entering the SZ. No equipment, including personal protective equipment or contaminated clothing shall be taken or worn into the SZ.

4.7.4 Decontamination procedures may vary based on site conditions and nature of the contaminant. If chemicals or decontamination solutions are used, care should be taken to minimize reactions between the solutions and contaminated materials. In addition, personnel shall assess the potential exposures created by the decontamination chemical(s) or solutions. The safety data sheets shall be reviewed, implemented, and filed by personnel contacting the chemicals/solutions.

4.7.5 All contaminated personal protective equipment (PPE) and decontamination materials shall be stored and disposed of in accordance with site-specific requirements identified in the approved work plan.

4.7.6 For all Level A and B ensembles, adequate supplied air shall be available to allow the employee to safely complete all necessary decontamination steps.

4.7.7 Where decontamination procedures involving radioactive materials are required, the removable limits for both personnel and equipment will be specified by a Certified Health Physicist or Certified Industrial Hygienist in the project's approved Radiation Protection Plan or approved safety planning document.

4.7.8 Materials Needed to Decontaminate Personnel and/or Equipment

- The equipment required to perform decontamination may vary based on site-specific conditions and nature of the contaminant(s). The following equipment is commonly used for decontamination purposes:
  - Soft-bristle scrub brushes or long-handled brushes to remove contaminants;
  - Hoses, buckets of water or garden sprayers for rinsing;
  - Large plastic/galvanized wash tubs or children's wading pools for washing and rinsing solutions;
  - Large plastic garbage cans or similar containers lined with plastic bags for the storage of contaminated clothing and equipment;
  - Metal or plastic cans or drums for the temporary storage of contaminated liquids;
  - Paper or cloth towels for drying protective clothing and equipment; and
  - Poly or plastic sheeting to lay down and form the base for the CRZ, as well as to contain contaminants and decontamination fluids.

4.7.9 Personal Decontamination Steps

- The decontamination plan shall be in writing and shall specify the exact steps in either wet or dry decontamination or personnel exiting the EZ to the SZ. The decontamination plan shall also address respirator cartridge change out, SCBA bottle changes and equipment decontamination.

4.7.10 Decontamination Steps during a Medical Emergency

- If decontamination can be done:
  - Wash, rinse and/or cut off protective clothing and equipment.
- If decontamination cannot be done:
  - Wrap the victim in blankets, plastic sheeting, or rubber to reduce contamination of other personnel;
  - Alert emergency and offsite medical personnel to potential contamination;
  - Instruct them about specific decontamination procedures if necessary;

4.7.11 Equipment Decontamination Steps

- All equipment leaving the EZ shall be considered contaminated and shall be properly decontaminated to minimize the potential for exposure and off-site migration of impacted materials. Such equipment may include, but is not limited to: sampling tools, heavy equipment, vehicles, PPE (hoses, cylinders, etc.), and various handheld tools;
- All Employees performing equipment decontamination shall wear the appropriate PPE to protect against exposure to contaminated materials. The level of PPE may be equivalent to the level of protection required in the EZ. Other PPE may include splash protection, such as face-shields and splash suits, and knee protectors. Following equipment decontamination, Employees may be required to follow the proper personal decontamination procedures above;
- For larger equipment, a high-pressure washer may need to be used. Some contaminants require the use of a detergent or chemical solution and scrub brushes to confirm proper decontamination. Personnel operating a high pressure washer will be trained in the operation of the equipment and follow the manufacturer's operational instructions;
- For smaller equipment, use the following steps for decontamination:
  - Remove majority of visible gross contamination in EZ;
  - Wash equipment in decontamination solution with a scrub brush and/or power wash heavy equipment;
  - Rinse equipment;
  - Visually inspect for remaining contamination;
  - Follow appropriate personal decontamination steps outlined above.
- All decontaminated equipment shall be visually inspected for contamination prior to leaving the CRZ. Signs of visible contamination may include an oily sheen, residue or contaminated soils left on the equipment. All equipment with visible signs of contamination shall be discarded or re-decontaminated until clean. Depending on the nature of the contaminant, equipment may have to be analyzed using a wipe method or other means.

4.8 Employee Exposure Monitoring

4.8.1 Explosive levels, oxygen levels, and airborne contaminants may present potential hazards to HAZWOPER personnel working within controlled work areas and to non-HAZWOPER workers and the general public present outside the controlled work areas.

4.8.2 As appropriate, exposure monitoring at HAZWOPER sites will be conducted to determine explosive and oxygen levels, monitor and control employee exposures to airborne contaminants, and to determine and regulate controlled work area boundaries (e.g., support zone, contamination reduction zone, and exclusion zone) for the protection of non-HAZWOPER workers and the general public.

4.8.3 Specific exposure monitoring requirements will be established in individual SH&E Plans. Refer to *S3AM-127-PR1 Exposure Monitoring*. All monitoring efforts using direct reading instruments and will remain part of the project file.

4.8.4 Work Area Exposure Monitoring

- Work area exposure monitoring will include breathing zone readings for the maximum exposed worker(s);
- Results will be used to determine adequacy of PPE (especially respiratory protection). Specific criteria for upgrade/downgrade will be established in the SH&E Plan.

4.8.5 Perimeter Exposure Monitoring

- Perimeter air samples will be collected when the potential exists for airborne contaminants to migrate off-site and will be collected near the work zones when performing work at an active client facility. Refer to *S3AM-127-PR1 Exposure Monitoring*;
- Perimeter exposure monitoring will be conducted at locations downwind from the project activities at a minimum (also upwind if the potential exists for offsite contamination to migrate onto the site).

4.8.6 Exposure results will be posted on site and explained in a safety briefing.

4.8.7 Employees will receive a written statement of results within 15 days of receipt from the laboratory.

4.8.8 Results of all personal exposure monitoring will be provided to the SH&E department for inclusion in the employee medical records, refer to *S3AM-017-PR1 Injury & Illness Recordkeeping*.

5.0 Records

5.1 All forms and documents generated during a HAZWOPER project will be maintained in the project file.

5.2 All medical screening and surveillance documentation shall be retained for 30 years.

6.0 Attachments

6.1 S3AM-117-ATT1 Spill Notification Number for North America

Americas

Spill Notification Numbers for North America

S3AM-117-ATT1

Jurisdiction	Name	Phone
Within the United States		
National Response Center		1-800-424-8802
AECOM Incident Reporting Number		1-800-348-5046
Within Canada		
AECOM Incident Reporting Number		1-800-348-5046
Alberta	Environmental Service Response Centre	1-800-222-6514
British Columbia	Provincial Emergency Program	1-800-663-3456
Manitoba	Conservation Emergency Response Program	1-204-944-4888
New Brunswick	Canadian Coast Guard	1-800-565-1633
Newfoundland & Labrador	Canadian Coast Guard	1-800-563-9089
NWT & Nunavut	Spill Report Line	1-867-920-8130
Nova Scotia	Canadian Coast Guard	1-800-565-1633
Ontario	Spill Action Centre	1-800-268-6060
Prince Edward Island	Canadian Coast Guard	1-800-565-1633
Quebec	National Environmental Emergencies Center	1-866-283-2333
Saskatchewan	Spill Report Centre	1-800-667-7525
Yukon Territory	Spill Report Centre	1-867-667-7244

Americas

Respiratory Protection

S3AM-123-PR1

1.0 Purpose and Scope

1.1 This procedure establishes a written respiratory protection program with the required elements and work site-specific procedures for respirator selection, use, and maintenance for any workplace where respirators are necessary to protect the health of an Employee.

1.2 The primary objective shall be to prevent exposure to atmospheric contaminants as far as feasible by accepted engineering control measures (e.g. enclosure or confinement of the operation, general and local exhaust ventilation [LEV], and substitution of less toxic materials). If respiratory hazards remain, suitable administrative controls and respiratory protective equipment requirements shall be established.

1.3 This procedure applies to all AECOM Americas-based employees and operations, and any other entity and its personnel contractually required to comply with this document's content, except where local or governmental regulations are more stringent**.**

2.0 Terms and Definitions

2.1 **Action Level (AL)** – An airborne concentration of a potentially toxic or hazardous substance, measured in parts per million by volume (ppm), microgram per cubic meter (µg/m3) milligram per cubic meter (mg/m3) or fibres per cubic centimetre (f/cc), that triggers certain provisions as required by the applicable jurisdictional legislation. In many cases the action level is 50% of the established exposure limit.

2.2 **Air-purifying respirator** – A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

2.3 **Approved** – Equipment tested and listed by the Bureau of Mines, jointly by the Mining Enforcement and Safety Administration (MESA), and the National Institute for Occupational Safety and Health (NIOSH), or jointly by the Mine Safety and Health Administration (MSHA) and NIOSH. Please note Canadian Standards Association (CSA) bases respirator selection on NIOSH criteria for the testing and certification of respirators.

2.4 **Assigned protection factor (APF)** – The ratio of the ambient concentration of an airborne substance (outside the respirator) to the concentration of the substance inside the respirator.

2.5 **Atmosphere-supplying respirator** – A respirator that supplies the user with breathing air from a source independent of the ambient atmosphere, including supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

2.6 **Breakthrough** – The first perception of an odor, taste or irritation experienced while wearing an air-purifying respirator. Breakthrough is generally an indication that the cartridges are saturated and are no longer filtering out the contaminant. Breakthrough can also be an indication of an improperly functioning respirator.

2.7 **Established Exposure Limit** – The maximum regulatory exposure concentration to which an individual may be exposed to for an 8- hour time weighted average (TWA).

- This limit is referred to by different terminology depending upon the given jurisdiction (e.g. Permissible Exposure Limit (PEL), Contamination Limit, Occupational Exposure Limit (OEL), Threshold Limit Value (TLV), etc.).
- Acceptable methods of adjusting this limit to correspond to a different exposure period (e.g. 10 hours) vary by jurisdiction and substance.

2.8 **Filtering facepiece (dust mask)** – A negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

2.9 **Fit factor** – A quantitative estimate of the fit of a particular respirator to a specific individual, typically estimating the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

2.10 **Fit test** – The use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test [QLFT] and Quantitative fit test [QNFT].)

2.11 **Hazardous atmosphere** – Any atmosphere, either immediately or not immediately dangerous to life or health, that is oxygen-deficient or that contains a toxic or disease-producing contaminant exceeding the legally established permissible exposure limit or, where applicable, the Threshold Limit Value established by the American Conference of Governmental Industrial Hygienists.

2.12 **Immediately dangerous to life or health (IDLH)** – An atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

2.13 **Maximum use concentration (MUC)** – The maximum concentration of an airborne contaminant from which an employee is expected to be protected when wearing a respirator, determined by the assigned protection factor of the respirator or class of respirators and the occupational exposure limit for that contaminant. The MUC is usually determined mathematically by multiplying the assigned protection factor (APF) specified for a respirator by the established exposure limit, which can include a short-term exposure limit and a ceiling limit or any other exposure limit used for that chemical agent, as defined by the authority having jurisdiction.

MUC = APF x established exposure limit

2.14 **Negative pressure respirator (tight fitting)** – A respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

2.15 **Oxygen-deficient atmosphere –** An atmosphere with oxygen content below 19.5 percent by volume.

2.16 **Physician or other licensed health care professional (PLHCP)** – An individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide or be delegated the responsibility to provide some or all of the health care services required by local or governmental respiratory protection standards.

2.17 **Positive pressure respirator** – A respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

2.18 **Powered air-purifying respirator (PAPR)** – An air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

2.19 **Pressure demand respirator** – A positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

2.20 **Qualitative fit test (QLFT)** – A pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

2.21 **Quantitative fit test (QNFT)** – An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

2.22 **Self-contained breathing apparatus (SCBA)** – An atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

2.23 **Supplied-air respirator (SAR) or airline respirator** – An atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

2.24 **Tight-fitting facepiece** – A respiratory inlet covering that forms a complete seal with the face.

2.25 **User seal check** – An action conducted by the respirator user to determine if the respirator is properly sealed to the face.

3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-114-PR1 Compressed Gases

3.3 S3AM-128-PR1 Medical Screening & Surveillance

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Respiratory Protection Program Administrator**

The Respiratory Protection Program Administrator will be established at each project/location where employees are required to wear respirators. The Respiratory Protection Program Administrator will:

- Verify full compliance with this procedure.
- Assist with the arranging of any required medical evaluations or any other additional medical attention related to the use of a respirator.
- Perform or arrange suitable providers to perform the program evaluations described in this procedure.
- Maintain required inspections and testing/certifications of SCBA units

4.1.2 **Manager /Supervisor**

- Verify compliance with the respiratory protection program set forth in this procedure.
- Verify that only those employees who are medically qualified, properly trained, and fit tested are assigned to respirator work.
- Verify that respirators are provided, repaired, or replaced as may be required due to wear and deterioration.
- Confirm that the emergency rescue service is available to respond prior to any employees entering the IDLH area.

4.1.3 **SH&E Manager (or designee)**

- Monitor compliance with the various aspects of this program.
- Provide technical assistance regarding respirator selection and use, evaluate the effectiveness of this program, and support respirator training and fit testing (e.g. determine cartridge change out schedule for negative air respirators).
- Audit company compliance with this procedure.

4.1.4 **Employee**

- Use respiratory protection in accordance with instructions and training received.
- Maintain the respirator in accordance with this procedure and the manufacturer's instructions.
- Immediately report any malfunction of the respirator to the Supervisor or Manager or other responsible person.
- For employees who wish to wear respirators on a voluntary basis when not required to by AECOM or a regulatory agency, the employee shall complete *S3AM-123-FM2 – Voluntary Use of Respirators* or an equivalent form.

4.2 Training

4.2.1 Employees who wear respiratory protection shall receive training before they are assigned to a task that requires the use of respiratory protection.

4.2.2 Employees that may be exposed to a respiratory hazard will be instructed on the hazard and the controls prior to beginning work.

4.2.3 Atmospheric testing will be carried out by qualified personnel trained in the use, calibration, and interpretation of the test equipment.

4.2.4 Retraining shall be administered annually, and when the following situations occur:

- Changes in the workplace or the type of respirator render previous training obsolete;
- Inadequacies in the Employee's knowledge or use of the respirator indicate that the Employee has not retained the requisite understanding or skill; or
- Any other situation arises in which retraining appears necessary to verify safe respirator use.

4.2.5 Basic Respirator Training Program

Respirator training classes will include, at a minimum, the following**:**

- Instruction in the nature of the respiratory hazards, whether acute, chronic, or both, and a description of potential health effects if the respirators are not used;
- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- The limitations and capabilities of the respirator;
- Proper fitting, including demonstrations and practice in wearing, adjusting, determining the fit of, and performing a user seal check each time respirator is donned. Refer to *S3AM-123-ATT1 Fit Testing Protocol*, *S3AM-123-FM1 Respiratory Equipment Fit Test* and *S3AM-123-ATT2 User Seal Check*;
- How to inspect, put on, use and remove the respirator;
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- The procedures for maintenance and storage of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators; and
- The general requirements of local or governmental Respiratory Protection Standards.

4.3 Medical Surveillance

4.3.1 No Employee shall be assigned to a task that requires the use of a respirator unless it has been determined that he/she is physically able to perform the work while using the required respirator.

4.3.2 Prior to wearing a respirator and in accordance with the applicable jurisdictional requirements, Employees shall complete medical screening to identify any relevant psychological or physiological impediments to respiratory protection use. Screening may require an initial baseline medical surveillance examination, based on jurisdictional requirements or screening results, performed by a PLHCP in accordance with the requirements of *S3AM-128-PR1 Medical Screening & Surveillance Program.*

4.3.3 Additional medical examinations will be provided to employees who wear respirators when:

- An Employee reports medical signs or symptoms that are related to ability to use a respirator;
- A PLHCP, Supervisor, or the Respiratory Protection Program Administrator determines that an Employee needs to be reevaluated;
- Information from the Respiratory Protection Program, including observations made during fit testing and program evaluation, indicates a need for Employee reevaluation; or

- A change occurs in workplace conditions (e.g., physical work effort, protective clothing, temperature, etc.) that may result in a substantial increase in the physiological burden placed on an Employee.

4.3.4 All medical surveillance examinations shall be at no cost to the employee and occur during normal working hours; shall be convenient, understandable, and confidential; and the Employee will be given the chance to discuss results with examining physician.

4.4 Respirator Selection

4.4.1 The location or project specific SH&E Plan shall identify applicable respiratory hazards and develop appropriate controls, which may include respiratory protection. If respiratory protection is necessary the SH&E Plan shall detail the requirements.

4.4.2 SH&E Managers or his/her designated representative shall select and provide an appropriate respirator based on:

- The respiratory hazard(s) to which the employee may be exposed, including oxygen deficiency. Identify potential contaminants, concentrations, and the physical state of airborne contaminants:
  - Particulates (dust, fibers, micro-organisms, smoke, fumes).
    - Indicate the presence of any oil in particulate hazards. (may be produced by motor vehicles, air compressor systems using oil lubricators) If unknown, oil shall be assumed to be present.
  - Vapor and gases
    - Gases which may produce an oxygen deficiency (i.e. helium, argon, carbon monoxide and nitrogen).
    - Gases which are acids or produce acids when in contact with moisture (i.e. sulphur oxides, carbon dioxide, hydrogen chloride).
    - Gases which are alkaline or produce alkalis in reaction with moisture (i.e. ammonia, amines, phosphine).
    - True gases or vapors from evaporation of organic liquids (i.e. acetone, toluene, benzene).
    - Metal reacted with an organic compound (i.e. tetra-ethyl lead: was used in leaded fuel and still in aviation fuel, organic phosphates).
    - Mercury vapor.
    - Radon.
- The eye and face hazards to which the employee may be exposed (absorption, irritant, impact).
- Workplace or user factors that may affect respirator performance and reliability.

4.4.3 SH&E Managers or his/her designated representative shall identify and evaluate the respiratory hazard(s) in the workplace. Evaluations shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form.

4.4.4 Respiratory protection is required for those operations in which engineering controls or work practice controls are not feasible to reduce toxic or hazardous substance exposure at or below the AL (or if applicable, established exposure limit).

4.4.5 Where the employee exposure cannot be identified or reasonably estimated, the atmosphere shall be considered IDLH.

4.4.6 Only approved respirators shall be selected and they shall be used in compliance with the conditions of their certification.

4.4.7 Respirators shall be selected from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

4.5 Fit Testing Procedures

4.5.1 After the medical assessment is complete, employees using a tight-fitting respirator shall pass an appropriate QLFT or QNFT prior to initial use of the respirator, whenever a different respirator facepiece (size, style, model or make) is used, and at least annually (or as required by the applicable jurisdiction) thereafter. Refer to *S3AM-123-ATT1 Fit Testing Protocol*.

4.5.2 Fit testing shall be performed using the same make, model, style and size of respirator the user would be expected to use.

4.5.3 Should the fit test fail, alternative makes, models, styles and sizes shall be tested to find a correct fit for the user.

4.5.4 Respiratory protective equipment shall not be used unless a satisfactory fit test has been achieved for that particular equipment.

4.5.5 Fit testing shall also verify user competency in donning, doffing, inspecting and performing of seal checks.

4.5.6 Additional fit tests will be performed:

- Whenever there is an indication that changes in the Employee's physical condition might have an effect on respirator fit (such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight);
- If the Employee notifies his/her Supervisor or SH&E Manager that the fit of his/her respirator is unacceptable.

4.6 Interference with Facepiece Seal

4.6.1 AECOM shall not permit respirators with tight-fitting facepieces to be worn by Employees who have:

- Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or
- Any condition that interferes with the face-to-facepiece seal or valve function.

4.6.2 If an employee wears corrective glasses or goggles or other personal protective equipment, the Supervisor or Manager shall confirm that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

4.6.3 Employees shall perform a user seal check each time they don the respirator. Refer to *S3AM-123-ATT2 User Seal Check Procedures*.

4.7 Specification of Proper Level of Respiratory Protection

4.7.1 The SH&E Manager or his/her designated and qualified representative shall provide guidance on the proper selection and use of all respiratory protective devices, including half-face and full-face air purifying respirators, airline respirators, and self-contained breathing apparatus. This information is generally specified as part of the written site-specific SH&E plan and Task Hazard Assessment (THA).

4.7.2 Employees engaged in activities not covered by a THA or SH&E plan shall stop work and consult with the SH&E Manager or his/her designated representative to determine the proper equipment to use prior to resuming activities. Whenever appropriate, exposure levels will be measured to verify that the actual use conditions are within the limitations of the approvals specified by NIOSH/MSHA for the selected respirator.

4.8 Cartridges

4.8.1 NIOSH certifies three classes of filters*:

Three categories of resistance to filter efficiency degradation:	Three levels of filter efficiency:
N (**N**ot resistant to oil)	95% (called “95”)
R (**R**esistant to oil)	99% (called “99”)
P (oil **P**roof)	99.97% (called “100”)

*Filters are available in any combination of the above.

4.8.2 Generally cartridge color denotes the type of contaminant the cartridge was designed to filter:

Olive:	Multi-contaminant
White:	Acid gas
Black:	Organic vapors
Green:	Ammonia gas
Yellow:	Acid gas and organic vapors
Blue:	Carbon Monoxide
Purple (Magenta):	Radioactive material, except tritium & noble gases
Purple:	Any particulates - P100
Orange:	Any particulates - P95, P99, R95, R99, R100
Teal:	Any particulates free of oil - N95, N99, or N100

Please note; this is only a basic listing and should only be used as a reference. Combinations, deviations or additional types may be encountered. To ensure proper cartridge selection consult the cartridge supplier to ensure applicability to the contaminant(s) anticipated

4.8.3 Filter cartridges shall be changed out whenever an increase in breathing resistance is detected by the user.

4.8.4 When available, chemical cartridges that are equipped with end-of-service life indicators (ESLI) shall be utilized. In those cases, cartridges should be changed when indicated by the ESLI. A buddy system should be used so coworkers can monitor each other’s cartridge color condition.

4.8.5 In the absence of cartridges equipped with an ESLI, employees shall change chemical cartridges on the following schedule:

- Immediately if breakthrough is perceived or if resistance to breathing is detected by the user; and
- In accordance with the change out schedule based upon the anticipated contaminant concentration, environmental conditions, employee work rate, and the specific data provided by manufacturer.

4.8.6 When PAPRs are worn, the same rules apply with the exception that filter cartridges should be changed when airflow through the filter elements decreases to an unacceptable level, as indicated by the manufacturer’s test device.

4.9 Air-Supplying Respirator Use

4.9.1 Air-supplying respirators will be specified for use when it has been determined that any of the following conditions exist:

- The oxygen concentration is less than 19.5 percent;
- The contaminant is unknown or its concentration cannot be quantified;
- The airborne contaminant concentration is above its IDLH;
- An air-purifying respirator canister or cartridge that removes the contaminant is not available;
- The contaminant concentration is above the concentration for which an air-purifying canister or cartridge is approved; or
- The contaminant concentration is above the MUC of a full-face air-purifying respirator.

4.9.2 No Employee may engage in an operation requiring the use of an air-supplied respirator unless the SH&E Manager or his/her designated representative has reviewed the operation and approved its use.

4.9.3 The determination of the type of air-supplying respirator (i.e., SCBA, airline, demand, pressure demand, etc.) appropriate for the job, outside standby persons, communication, proper training and equipment, notification procedures, and necessary action should be part of the THA or SH&E Plan. Mandatory equipment including SCBA or SAR with auxiliary air supply and emergency appropriate retrieval equipment or equivalent rescue means shall be made by the SH&E Manager or his/her designated representative at the time of the THA or SH&E Plan review. The need for any additional precautions (i.e., equipment specific training, on-site health and safety support, etc.) shall also be determined by the SH&E Manager or his/her designated representative.

4.10 Minimum Procedures for IDLH Atmospheres

4.10.1 One Employee or, when needed, more than one Employee shall be located outside the IDLH atmosphere. This employee shall be responsible for communicating with the Employees in the IDLH atmosphere, alerting rescue services if needed, and restricting entrance to the IDLH area by untrained and unapproved persons.

4.10.2 Visual, voice, or signal line communication shall be maintained between the Employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere.

4.10.3 The Employee(s) located outside the IDLH atmosphere shall be trained and equipped to provide effective emergency rescue or to initiate on-site rescue services.

4.10.4 If on-site rescue services are to be used, the Manager or Supervisor shall confirm that the service is available to respond prior to any employees entering the IDLH area.

4.10.5 Employee(s) located outside the IDLH area and/or on-site rescue services shall be equipped with:

- Pressure demand or other positive pressure SCBAs, or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA; and either
- Appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry; or
- Equivalent means for rescue where retrieval equipment would create a hazard to the Employees in the IDLH area.

4.11 Breathing Air

4.11.1 Compressed air used for respiration shall be of high purity and shall meet, as a minimum, the requirements of the specification for Grade D breathing air as described in Compressed Gas Association Specification G-7.1 (ANSI Z86.1).

4.11.2 Oxygen shall NOT be used as a source of breathing air at any time in open-circuit SCBAs or airline respirators.

4.11.3 Compressor Supplied Breathing Air

- All compressors used for filling SCBA air cylinders or for supplying airline respirators shall be equipped with the following safety and standby devices:
  - The compressor intake shall be located to verify that only respirable (uncontaminated) air is admitted. This requires attention to the location of the compressor intake with respect to compressor engine exhaust, chemical storage or use areas, and suitable intake screening or filtration.
  - Alarms to indicate compressor failure (such as low-pressure air horns, etc.) shall be installed in the system.
  - A receiver of sufficient capacity to enable the respirator wearer to exit from a contaminated atmosphere shall be provided.
- If an oil-lubricated compressor is used to supply breathing air, it shall be equipped with both of the following devices:
  - A continuous reading carbon monoxide monitoring system set to alarm should the carbon monoxide concentration exceed 10 parts per million; and,
  - A high temperature alarm which will activate when the discharge air exceeds 110 percent of the normal operating temperature in degrees Fahrenheit.
- An in-line purifying filter assembly to remove oil, condensed water, particulates, odors, and organic vapors shall be used in conjunction with the air compressor.

4.11.4 Compressed Air Cylinder Systems for Airline Respirators

- Compressed air cylinders shall meet the requirements of *S3AM-114-PR1 Compressed Gases*.
- Compressed air cylinder systems used to supply airline respirators shall be equipped with low pressure warning bells (e.g., Scott Pak-Alarm) or similar warning devices to indicate air pressure in the manifold below 500 pounds per square inch (psi). When such systems are used, one employee shall be assigned as safety standby within audible range of the low pressure alarm.
- Airline hose couplings shall be incompatible with outlets for other gas systems to prevent inadvertently supplying airline respirators with non-respirable gases or oxygen.
- The air pressure at the hose connection to airline respiratory equipment shall be within the range specified in the approval of the equipment by the manufacturer.
- Routine inspection and maintenance of the air compressor shall be performed.

4.11.5 Compressed Air Cylinder Systems for Recharging SCBAs

- When a cascade system is used to recharge SCBA air cylinders, it shall be equipped with a high-pressure supply hose and coupling rated at a capacity of at least 3,000 psi.

4.11.6 Escape/Egress Units

- Escape/egress unit respirators are intended for use in areas where escape with a short-term (minimum 5 minutes) air supply is necessary. It is important that escape bottle size be provided that will allow the employee to get to a safe location considering breathing rate and distance.
- Escape bottles are required on air-line respirators used in IDLH and high hazard work conditions.
- They may be used as adjuncts to airline pressure demand respirators as a backup air supply or as independent emergency devices in areas where respiratory protection is not normally required.

- Appropriate training shall be conducted and documented prior to assigning Employees to tasks or locations subject to the use of these respirators.
- Escape/egress units (minimum 5 minutes) shall never be used to enter a hazardous atmosphere or as primary standby respirators for confined space entry.

4.12 Respirator Inspection, Cleaning, Maintenance, and Storage

When respirator use is required, only properly cleaned and maintained NIOSH/MSHA approved respirators shall be used.

4.12.1 Inspection

- Respirators should be inspected before and after use using *S3AM-123-FM3 Respiratory Equipment Inspection*, or equivalent. The respirator should not be used and removed and marked out of service if any item on the checklist fails inspection.
- Respirators for emergency use should be inspected once per month.
- Defects shall be reported to their Supervisor or Manager. No defective respirator shall be issued or worn.

4.12.2 Cleaning and Maintenance

- Respirator facepiece assemblies shall be cleaned and sanitized minimally after each day of use in accordance with the requirements specified in *S3AM-123-ATT3 Respirator Cleaning*.
- The respirator should also be inspected for any damaged parts (repair should only be done by trained personnel with the proper tools).
- Respiratory equipment shall not be passed from one person to another until it has been cleaned and sanitized.
- Respiratory equipment shall be maintained according to manufacturer's instructions.
- In field situations, a pre-moistened towelette (e.g., baby wipes) can be used. The mask should then be rinsed with clean warm water and dried. Towelettes or wipes shall be compatible with the respirator materials.
- Alcohol should never be used to clean masks as it can damage the facepieces and rubber parts.
- Where respirators are assigned to individual employees, management shall verify compliance with cleaning and maintenance requirements by periodic inspection and field audits of respiratory equipment.

4.12.3 Storage

- Store clean respirators so that they are protected from dust, excessive moisture, damaging chemicals, temperature extremes and direct sunlight or UV light. They should be placed in a sealed plastic bag and stored in the original box or similar container which blocks light.

4.13 Hygiene

4.13.1 Employees shall leave the work area to wash, change cartridges, or if they detect breakthrough or resistance.

4.14 Costs

4.14.1 The costs for training, medical examinations, fit testing, respirators, spectacle kits, and cleaning materials should be considered as operational costs.

4.15 Program Evaluation

4.15.1 The SH&E Manager or his/her designated representative shall conduct evaluations of the workplace as necessary to verify that the provisions of the current written program are being effectively implemented and that it continues to be effective.

4.15.2 The SH&E Manager shall regularly (i.e., during annual training) consult Employees required to use respirators to assess their views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include but are not limited to:

- Respirator fit (including the ability to use the respirator without interfering with effective workplace performance);
- Appropriate respirator selection for the hazards to which the Employee is exposed;
- Proper respirator use under the workplace conditions the Employee encounters; and
- Proper respirator maintenance.

5.0 Records

5.1 Medical records under this section shall be maintained at a minimum in accordance with *S3AM-128-PR1 Medical Screening & Surveillance.*

5.2 Fit Test Records shall be maintained in the Employee's health and safety records. *S3AM-123-FM1 Respiratory Equipment Fit Test*, or equivalent, will be used to document each fit test.

5.3 Training Records shall be maintained in accordance with *S3AM-003-PR1 SH&E Training***.**

6.0 Attachments

6.1 S3AM-123-ATT1 Fit Testing Protocol

6.2 S3AM-123-ATT2 User Seal Check

6.3 S3AM-123-ATT3 Respirator Cleaning

6.4 S3AM-123-FM1 Respiratory Equipment Fit Test

6.5 S3AM-123-FM2 Voluntary Use of Respirators

6.6 S3AM-123-FM3 Respiratory Equipment Inspection

Americas

Fit Testing Protocol

S3AM-123-ATT1

1.0 Selection

1.1 Fit testing shall not be conducted until after the medical screening and any medical examination is concluded, to confirm there are no relevant psychological or physiological impediments or restrictions to respiratory protection use. A medical examination may result in clearance to use any type of respirator, total restriction for respiratory equipment use, or specific respiratory use restrictions (e.g. powered air-purifying respirator (PAPR) only).

1.2 Employees are expected to present themselves for a fit test in the same condition as when using the respiratory protective equipment in their job. These conditions include hair style and whether or not make-up, face creams, glasses, contact lenses, and/or dentures would be used.

1.3 Employees shall confirm that no jewelry, head-coverings or other items could interfere with the fit and the face is clean shaven where a tight-fitting respirator is required to seal. Any PPE required to be used concurrently with the RPE that could affect the fit of a tight-fitting facepiece shall be utilized during the fit test.

1.4 The Employee shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the Employee.

1.5 Prior to the selection process, the Employee shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension, and how to determine an acceptable fit. A mirror shall be available to assist the Employee in evaluating the fit and positioning of the respirator. This instruction may not constitute the Employee's formal training on respirator use, because it is only a review.

2.0 Comfort

2.1 The Employee shall be instructed to hold each chosen face piece up to the face and to eliminate those that obviously do not give an acceptable fit.

2.2 The more acceptable face pieces are noted in case the one selected proves unacceptable; the most comfortable mask is donned and worn at least 5 minutes to assess comfort.

2.3 If the Employee is not familiar with using a particular respirator, he/she shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

2.4 Assessment of comfort shall include a review of the following points with the Employee and allowing he/she adequate time to determine the comfort of the respirator:

- Position of the mask on the nose;
- Room for eye protection;
- Room to talk; and
- Position of mask on face and cheeks.

3.0 Fit Test Criteria

3.1 The following criteria shall be used to help determine the adequacy of the respirator fit:

- Chin properly placed;
- Adequate strap tension, not overly tightened;
- Fit across nose bridge;
- Respirator of proper size to span distance from nose to chin;

- Tendency of respirator to slip; and
- Self-observation in mirror to evaluate fit and respirator position.

3.2 The test shall not be conducted if there is any hair growth between the skin and the face piece sealing surface, such as stubble beard growth, beard, moustache, or sideburns that cross the respirator sealing surface. Any type of apparel that interferes with a satisfactory fit shall be altered or removed.

3.3 Before conducting the negative and positive pressure checks, the Employee shall be told to seat the mask on the face by moving the head from side to side and up and down slowly while taking in a few slow deep breaths. Another face piece shall be selected and retested if the Employee is unable to seat the mask.

3.4 The Employee shall conduct a user seal check, either the negative and positive pressure seal checks described in *S3AM-123-ATT2 User Seal Check* or as recommended by the respirator manufacturer that provide equivalent protection to the procedures in *S3AM-123-ATT2 User Seal Check*.

3.5 If an Employee exhibits difficulty in breathing or signs of claustrophobia or anxiety during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the Employee can wear a respirator while performing her or his duties.

3.6 If the Employee finds the fit of the respirator unacceptable, the Employee shall be given the opportunity to select a different respirator and to be retested.

4.0 Test Exercise Regimen

4.1 Prior to the commencement of the fit test, the Employee shall be given a description of the fit test and their responsibilities during the test procedure. The description of the process shall include a description of the test exercises that will be performed. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

4.2 The fit test shall be performed while the Employee is wearing any applicable safety equipment that may be worn during actual respirator use and that could interfere with respirator fit.

5.0 General Test Exercises

5.1 The following test exercises are to be performed for all fit testing methods prescribed in this procedure, except for the Controlled Negative Pressure (CNP REDON) method. A separate fit testing exercise regimen is contained in the CNP protocol. The Employee shall perform exercises, in the test environment, in the following manner:

5.1.1 **Normal breathing**. In a normal standing position, without talking, the Employee shall breathe normally.

5.1.2 **Deep breathing.** In a normal standing position, the Employee shall breathe slowly and deeply, taking caution so as not to hyperventilate.

5.1.3 **Turning head side to side.** Standing in place, the Employee shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the Employee can inhale at each side.

5.1.4 **Moving head up and down.** Standing in place, the Employee shall slowly move his/her head up and down. The Employee shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

5.1.5 **Talking.** The Employee shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The Employee can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.

- Rainbow Passage. “When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch with its path high above and its two ends apparently beyond the

horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow."

5.1.6 **Grimace.** The Employee shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT.)

5.1.7 **Bending over.** The Employee shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT or QLFT units that do not permit bending over at the waist.

5.1.8 **Normal breathing**. In a normal standing position, without talking, the Employee shall breathe normally (this is the same as the first test).

5.2 Each test exercise shall be performed for one minute except for the grimace exercise, which shall be performed for 15 seconds.

5.3 The Employee shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

5.4 The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test and the fit test shallt be repeated.

6.0 Qualitative Fit Test (QLFT) Protocols

6.1 General

6.1.1 QLFT test methods have been validated only for a fit factor of 100. A tight-fitting respirator operated in air-purifying (negative-pressure) mode can be tested by QLFT methods to validate a maximum APF of 10.

6.1.2 The maximum APF that can be applied for all tight-fitting respirators operated in air-purifying (negative-pressure) mode is 10 when fit tested using a QLFT method.

6.1.3 AECOM will confirm that persons administering QLFT are able to calibrate equipment and perform tests properly, recognize invalid tests, and confirm that test equipment is in proper working order.

6.1.4 AECOM will confirm that that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

6.2 Irritant Smoke (Stannic Chloride) Protocol

6.2.1 This QLFT uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

6.2.2 **General Requirements and Precautions**

- The test conductor has the option of donning an air purifying respirator to protect himself/herself from the test agent.
- The respirator to be tested shall be equipped with high-efficiency particulate air (HEPA) or P100 series filter(s).
- Only stannic chloride smoke tubes shall be used for this protocol.
- No form of test enclosure or hood for the Employee shall be used.
- The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the Employee's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the Employee can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the Employee.

- The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

6.2.3 **Sensitivity Screening Check**

- The Employee to be tested shall demonstrate his or her ability to detect a weak concentration of the irritant smoke.
- The test operator shall break both ends of a ventilation smoke tube containing stannic chloride and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute or to an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.
- The test operator shall advise the Employee that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the Employee to keep his/her eyes closed while the test is performed.
- The Employee shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the Employee's direction to determine that he/she can detect it.

6.2.4 **Irritant Smoke Fit Test Procedure**

- The Employee being fit tested shall don the respirator without assistance, and perform the required user seal check(s).
- The Employee shall be instructed to keep his/her eyes closed.
- The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the Employee, using the low-flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within 6 inches of the respirator.
- If the Employee being tested has not had an involuntary response and/or has not detected the irritant smoke, proceed with the test exercises.
- The General Test Exercises shall be performed by the Employee while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of 6 inches.
- If the Employee being fit tested reports detecting the irritant smoke at any time, the test is failed. The Employee being retested shall repeat the entire sensitivity check and fit test procedure.
- Each Employee passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.
- If a response is produced during this second sensitivity check, then the fit test is passed.

6.3 **Isoamyl Acetate (IAA, Banana oil) Protocol**

6.3.1 This protocol is not not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator shall be equipped with an organic vapor filter.

6.3.2 **General Requirements and Precautions**

- As smoke can be irritating to some employees, this test method is preferred to reduce risk of irritation to the employee tested and the person conducting the fit test.

- The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.
- The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.
- The respirator to be tested shall be equipped with a P100 series filter (for organic vapors).

6.3.3 **Sensitivity (Odor threshold) Screening Check**

- Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of IAA at low levels.
- Obtain the following supplies required to complete the screening:
    - Three 1 liter glass jars with metal lids
    - Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions
- The isoamyl acetate (IAA) (also known at isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1 liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.
- The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.
- A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.
- The odor test and test blank jar lids shall be labeled (e.g., 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.
- The employee shall then be asked to sniff each bottle and indicate which bottle contains an odor.
- If the employee is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

6.3.4 **Isoamyl Acetate (IAA, banana oil) Fit Test Procedure**

- The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.
- After successfully completing the odor threshold test and the positive and negative pressure checks, the employee shall don their respirator prior to moving to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.
- A copy of the prepared text from which the subject is to read may be taped to the inside of the test chamber or should be provided to the employee to hold.
- Upon entering the test chamber, the employee shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.
- Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.

- If at any time during the test, the employee detects the banana-like odor of IAA, the test is failed. The employee shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.
- If the test is failed, the employee shall return to the selection room and remove the respirator. The employee shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the employee shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.
- If the employee passes the test, the efficiency of the test procedure shall be demonstrated by having the subject break the respirator face seal and take a breath before exiting the chamber.
- When the employee leaves the chamber, they shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.

6.3.5 **Other**

- Additional Qualitative fit testing methods may be used provided they adequately test breakthrough or leakage of the respirator and testing is conducted according to manufacturer specifications.
- Qualitative fit testing may be conducted using manufacturer supplied hoods or equivalent test enclosures, and nebulizers using suitable fit testing solutions (e.g. sodium saccharin, Bitrex®, etc.).

7.0 Quantitative Fit Test (QNFT) Protocols

7.1 **General**

7.1.1 A quantitative fit test measures the adequacy of a respirator's fit by numerically measuring the amount of leakage into the respirator. A minimum fit factor of 500, and in some cases 1000, is required for a successful quantitative fit test.

7.1.2 AECOM will confirm that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly, and confirm that test equipment is in proper working order.

7.1.3 Quantitative fit testing is applicable to all tight fitting respirators. Quantitative fit tests (QNFT) are required for all full-face masks and SCBA and multi-functional SCBA air-line configurations.

7.1.4 AECOM will confirm that QNFT equipment is kept clean and is maintained and calibrated according to the manufacturer's instructions so as to operate at the parameters for which it was designed.

7.2 **Ambient Aerosol Condensation Nuclei Counter (CNC) Quantitative Fit Testing Protocol**

7.2.1 The ambient aerosol CNC quantitative fit testing (PortacountTM) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for QNFTs. A probed respirator has a special sampling device installed on the respirator to allow the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an Employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator, and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the Employee prior to the conduct of the screening test.

7.2.2 **Portacount Fit Test Requirements**

- Check the respirator to make sure the sampling probe and line are properly attached to the face piece and that the respirator is fitted with a particulate filter capable of preventing

significant penetration by the ambient particles used for the fit test (e.g., National Institute for Occupational Safety and Health, Title 42 Code of Federal Regulations 84 series 100, series 99, or series 95 particulate filter) according to the manufacturer's instructions.

- Instruct the Employee to be tested to don the respirator for 5 minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This Employee shall already have been trained on how to wear the respirator properly.
- Check the following conditions for the adequacy of the respirator fit: chin properly placed; adequate strap tension, not overly tightened; fit across nose bridge; respirator of proper size to span distance from nose to chin; tendency of the respirator to slip; self-observation in a mirror to evaluate fit and respirator position.
- Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting face piece, try another size of the same model respirator, or another model of respirator.
- Follow the manufacturer's instructions for operating the Portacount and proceed with the test.
- The Employee shall be instructed to perform the exercises in General Test Exercises.
- After the test exercises, the Employee shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.

7.2.3 **Portacount Test Instrument**

- The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.
- Since the pass or fail criterion of the Portacount is Employee programmable, the test operator shall confirm that the pass or fail criterion meet the requirements for minimum respirator performance.
- A record of the test needs to be kept on file, assuming the fit test was successful. The record shall contain the Employee's name; overall fit factor; make, model, style, and size of respirator used; and date tested.

Americas

User Seal Check

S3AM-123-ATT2

1.0 Requirements

1.1 The Employee who uses a tight-fitting respirator is to perform a user seal check to confirm that an adequate seal is achieved each time the respirator is put on.

1.2 Either the positive and negative pressure checks listed here or the respirator manufacturer's recommended user seal check method shall be used.

1.3 User seal checks are not substitutes for qualitative or quantitative fit tests.

1.4 If either the positive or negative pressure checks fail, do not use the respirator and mark it as out of service.

2.0 Facepiece Positive and/or Negative Pressure Checks

2.1 **Positive pressure check**

- Close off the exhalation valve and exhale gently into the facepiece.
- If a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal, the face fit is considered satisfactory
- For some respirators, this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

2.2 **Negative pressure check**

- Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold your breath for 10 seconds.
- The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. If this is the case, the test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove.
- If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

3.0 Manufacturer's Recommended User Seal Check Procedures

3.1 The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures, provided that the employer demonstrates that the manufacturer's procedures are equally effective.

Americas

Respirator Cleaning

S3AM-123-ATT3

1.0 Requirements

1.1 These procedures are general in nature. The cleaning recommendations provided by the manufacturer for a respirator may be used, provided such procedures are as effective as those listed here.

1.2 Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth (e.g., confirm that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user).

2.0 Procedures for Cleaning Respirators

2.1 Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

2.2 Wash components in warm (110 degree Fahrenheit [°F]; 43 degree Celsius [°C] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

2.3 Rinse components thoroughly in clean, warm (110°F [43°C] maximum), preferably running water. Drain.

2.4 When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for 2 minutes in one of the following:

- Hypochlorite solution (50 parts per million [ppm] of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 110°F (43°C); or,
- Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45 percent alcohol) to one liter of water at 110°F (43°C); or,
- Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

2.5 Rinse components thoroughly in clean, warm (110°F [43°C] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

2.6 Components should be hand dried with a clean, lint-free cloth or air dried.

2.7 Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.

2.8 Test the respirator to ensure that all components work properly.

2.9 After the fit test, wipe down the respirator with a sanitary swab.

2.10 Store the respirator according to manufacturer recommendations (e.g., away from direct sunlight, in a proper container to maintain cleanliness, etc.).

Americas

Respiratory Equipment Fit Test

S3AM-123-FM1

Date of Testing:	**Respirator Type(s):**
Employee Name:	**Respirator Model & Size:**
Method & Testing Agent:	
Corrective lenses needed: ☐ **Yes** ☐ **No**	
Is the employee medically qualified to wear a respirator? ☐ **Yes** ☐ **No** **Date of last medical exam (if applicable):**	
Is the employee trained on the fundamental principles of respiratory protection, use, selection, inspection, cleaning, maintenance, and storage of equipment? ☐ **Yes** ☐ **No**	

Test Exercise		**Test Exercise**	
Sensitivity Check	☐ **Pass** ☐ **Fail**	Normal Breathing	☐ **Pass** ☐ **Fail**
Deep Breathing	☐ **Pass** ☐ **Fail**	Turning Head (side to side)	☐ **Pass** ☐ **Fail**
Moving Head (up/down)	☐ **Pass** ☐ **Fail**	Rainbow Passage*	☐ **Pass** ☐ **Fail**
Bending Over	☐ **Pass** ☐ **Fail**	Normal Breathing	☐ **Pass** ☐ **Fail**

Successful Respirator Fit Determined: ☐ **Yes** ☐ **No**

I certify that I have been tested with the respirator(s) listed above. I have also had the opportunity to ask questions and those questions have been answered to my satisfaction. I also understand that the above fit test is voided if respirator limitations are not followed or the respirator is not worn or if conditions (e.g., facial hair) prevent a good face seal.

Employee Signature:	Date:
Signature of Tester:	Date:

Rainbow Passage. *"When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch with its path high above and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow."*

Americas

Voluntary Use of Respirators

S3AM-123-FM2

Instructions: An employee that is opting to use a respirator for non-overexposure conditions shall read this page, and then sign on the bottom of the page. A copy shall be maintained in the employee's training file.

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for employees. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the employee.

Sometimes employees may wear respirators to avoid exposures to hazards, even if the amount of the hazardous substance does not exceed the limits set by regulatory standards. Voluntary masks may be used for nuisance dust, pollen, and sometimes noxious odors. If your employer provides respirators for your own voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not pose a hazard.

1. Read and follow all instructions provided by the manufacture on use, maintenance, cleaning, and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. A label or statement of certification should appear on the respirator or respirator packaging; it will tell you what the respirator is designed for and how it will protect you. “The National Institute for Occupational Safety and Health (NIOSH) certifies respirators in the U.S and Canada.”
3. Do not wear your respirator into atmospheres containing contaminants against which your respirator is not designed to protect. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, fumes, smoke, or very small solid particles.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.
5. If you have any health conditions (e.g., asthma; high blood pressure; emphysema; heart disease, etc.) that could be aggravated by using a respirator, you should check with your doctor before using one.

I have read and understand this information: Date: _____

Employee’s Name (Please Print):

Employee’s Signature:

Americas

Respiratory Equipment Inspection

S3AM-123-FM3

Date:		**Inspected by:**		
Serial #:				
Examine Face Piece for:		N/A	Pass	Fail
Excessive dirt		☐	☐	☐
Cracks, tears, holes, or distortion from improper storage		☐	☐	☐
Inflexibility (stretch and massage to restore flexibility)		☐	☐	☐
Cracked or badly scratched lenses in full facepieces		☐	☐	☐
Incorrectly mounted full facepiece lens or broken or missing mounting clips		☐	☐	☐
Lens sealed properly in receptacle, retaining clamp secured		☐	☐	☐
Cracked / broken air-purifying element holder(s), badly worn threads, missing gasket(s)		☐	☐	☐
Examine the Head Straps or Head Harness for:				
Breaks		☐	☐	☐
Loss of elasticity		☐	☐	☐
Broken or malfunctioning buckles and attachments		☐	☐	☐
Excessively worn serrations on head harness that might permit slippage (full facepieces only)		☐	☐	☐
Tears in headband at cradle attachment		☐	☐	☐
Examine the Inhalation and Exhalation Valves for:				
Foreign material, such as detergent residue, dust particles, or human hair under the valve seat		☐	☐	☐
Cracks, tears, or distortion in the valve material		☐	☐	☐
Proper insertion of the valve body in the facepiece		☐	☐	☐
Cracks, breaks, or chips in the valve body, particularly in the sealing surface		☐	☐	☐
Proper installation of the valve in the valve body		☐	☐	☐
Missing or defective valve cover		☐	☐	☐
Examine the Air Purifying Elements for:				
Incorrect cartridge, canister, or filter for the hazard		☐	☐	☐
Incorrect installation, loose connection, missing / worn gaskets, cross-threading in the holder		☐	☐	☐
Cracks or dents on the outside case of the filter, cartridges or canister, indicated by the absence of sealing material, tape, foil, etc. over the inlet		☐	☐	☐
Expired shelf life date on cartridge or canister		☐	☐	☐
Examine PAPR, SCBA and Escape Bottles for:				
Damage or wear evident on the regulator or hoses				
Cylinder pitted, dented or otherwise damaged				
Cylinder / tank certified to the standard of applicable jurisdiction, hydrostatic test current				
Defects Noted:				
Unit Deemed Suitable for Use		☐ Yes	☐ No	

Americas

Corrosive & Reactive Materials

S3AM-125-PR1

1.0 Purpose and Scope

1.1 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content where corrosive and/or reactive materials are used or stored.

1.2 The purpose of this procedure is to protect employees from the hazards of corrosive and reactive materials. This procedure considers a corrosive material as one that has a pH less than 2.0 (acid), or greater than 12.5 (base). A reactive material is a chemical that may be sensitive to shock, or may react with air or water depending upon its makeup.

2.0 Terms and Definitions

2.1 None

3.0 References

3.1 S3AM-115-PR1 Hazardous Materials Communication

3.2 S3AM-116-PR1 Hazardous Materials Shipping

3.3 S3AM-123-PR1 Respiratory Protection

3.4 S3AM-208-PR1 Personal Protective Equipment

4.0 Procedure

4.1 Implementation of this procedure is the responsibility of the Manager directing activities of the facility, site, or project location.

4.2 Appoint a responsible person who will:

4.2.1 Inspect storage areas periodically.

4.2.2 Monitor the quantity of corrosive and reactive materials on site, as well as that of incoming materials.

4.2.3 Review work practices that involve corrosive and reactive materials.

4.3 Require that all employees working with corrosive or reactive materials, or who may be exposed to such materials, are trained in accordance with *S3AM-115-PR1 – Hazardous Materials Communication*.

4.4 Control the use of corrosive and reactive materials by AECOM personnel.

4.4.1 Order only those materials and quantities that are needed to complete a job.

4.4.2 Check incoming corrosive and reactive materials for proper labeling in accordance with *S3AM-115-PR1 Hazardous Materials Communication*.

- Label materials, if needed, as they arrive on site.
- Mark reactive materials containers with the date of receipt of the chemical.

4.4.3 Check incoming corrosive and reactive materials for safety data sheets (SDS). If SDSs are not provided or are already on file, order them from the manufacturer, distributor, or vendor.

4.4.4 Add incoming corrosive and reactive chemicals to the hazardous materials inventory, if not already present, following procedures set forth in *S3AM-115-PR1 Hazardous Materials Communication.*

4.4.5 Do not store any quantity of corrosive or reactive materials in an office (with the exception of limited quantities of consumer products). These materials are to be stored off site, or at an on-site laboratory or storage area.

4.5 Store corrosive and reactive materials as indicted in the MSDS:

4.5.1 In a cool, dry environment, free from extremes of temperature and humidity.

4.5.2 In a manner that separates them from other materials (including flammables and oxidizers) and from each other.

- Separate acids and bases.
- Separate reactive materials from acids and bases, and protect from contact with water.

4.5.3 On materials that are acid-resistant (Teflon-coated, plastic, etc.) for small containers.

4.5.4 Covered, not stacked on one another, on acid-resistant material for carboys (approximately 5 gallons/22 liters).

4.5.5 On individual racks or securely blocked on skids, with closure (plug) facing upward to prevent leakage from drums.

4.6 Require that labeling and signage are in place.

4.6.1 Label containers with the appropriate warning word to indicate the hazard, such as: DANGER; WARNING; CAUTION; CORROSIVE; OXIDIZER.

4.7 Use corrosive and reactive materials appropriately.

4.7.1 Prior to use and in accordance with MSDS, safe-handling procedures shall be developed for each operation, and type and concentration of the chemical. In all cases, review the MSDS and product information before use.

4.7.2 Follow *S3AM-208-PR1 Personal Protective Equipment* when working with or around corrosive and reactive materials. Review the MSDS for the chemical used to determine the specific type of PPE needed, to include at a minimum:

- Chemical-splash goggles
- Chemical-resistant gloves
- Chemical-resistant apron

4.7.3 Obtain medical care immediately in the event of:

- Skin or eye exposure (e.g., splash) to corrosive liquids
- Inhalation of vapors of corrosive liquids that cause respiratory discomfort.

4.7.4 Require an eyewash station to be located in all areas where acids or bases are used. Safety showers shall be nearby if significant acid or base quantities are involved.

- Place emergency eyewashes and showers in accessible locations that require no more than 10 seconds to reach, and are in a travel distance no greater than 25 feet (7.5 meters) from the hazard.
- Keep the areas surrounding eyewashes and safety showers free of stored materials or debris at all times.
- Mark emergency eyewashes and showers with a highly visible sign.
- Require the area around emergency eyewashes and showers to be well lighted and visible.
- Where portable eyewash units are used, a process shall be in place to change the water and clean the unit, as required by the manufacturer's instructions.
- Require emergency showers and shower/eyewash combinations connected to a self-contained water supply to deliver a minimum 20 gallons (85 liters) per minute for 15 minutes.

- Require emergency showers and shower/eyewash combinations permanently connected to a potable water supply to deliver at least 30 gallons (127.5 liters) per minute continuously.
- Require emergency eyewashes to be capable of delivering to the eyes not less than 0.4 gallon (1.5 liters) per minute for 15 minutes.

4.8 Be prepared to clean up spills of corrosive and reactive materials.

4.8.1 Have a written spill response plan in place before materials are stored on site.

4.8.2 Have commercial spill kits available for cleanup of small quantities of materials. At a minimum, kits should contain appropriate protective clothing (including full-body suits, gloves, and boots) and spill control equipment (including absorbents, pillows, shovels, containers, etc.).

4.8.3 Where necessary, confirm that appropriate respiratory protection equipment is provided to spill responders. For additional information, see *S3AM-123-PR1 Respiratory Protection*.

4.8.4 Clean up or respond to spills promptly.

4.8.5 Confirm that personnel responding to a spill have been trained in the hazards associated with the spilled material, as well as use of the spill control equipment, including PPE required for the task.

4.8.6 Do not use combustible organic materials such as sawdust, excelsior, wood chips and shavings, paper, rags, or burlap bags to absorb or clean up spills.

4.9 Develop a waste management plan and procedures, including procedures for collection, storage, labeling, pick-up and transport, and final disposal.

4.10 Dispose of corrosive and reactive materials appropriately.

4.10.1 Segregate organic acids, inorganic acids, and basic wastes.

4.10.2 Contract hazardous waste disposal services should be obtained, as necessary, to dispose of waste materials. All waste shall be appropriately packaged for off-site transportation, if applicable.

4.10.3 Wastes shall be marked, labeled, and shipped in accordance with regulatory requirements. For additional information, see *S3AM-116-PR1 Hazardous Materials Shipping*.

4.11 Inspect corrosive and reactive storage and use areas periodically.

4.11.1 Inspect office, laboratory, and project settings quarterly.

4.11.2 Use the inspection sheet provided as *S3AM-125-FM1 Corrosive & Reactive Materials Inspection* or equivalent, to inspect sites.

5.0 Records

The following information will be maintained in the location or project file:

5.1 Completed Corrosive and Reactive Material Inspection Sheets.

5.2 Worker Right-to-Know training documentation.

5.3 Written Spill Response Plan.

5.4 Waste Management Plan.

5.5 Documentation of training for spill response personnel.

5.6 Documentation of hazard communication training for personnel exposed to corrosive and/or reactive materials.

6.0 Attachments

6.1 S3AM-125-FM1 Corrosive & Reactive Materials Inspection

AECOM

Americas

Corrosive & Reactive Materials Inspection

S3NA-125-FM1

Location: _____

Name of Inspector: _____ **Date Inspected:** _____

Labeling		
1.	Original containers are labeled with:	☐ Yes ☐ No ☐ NA
	• Name of chemical	
	• Signal word (e.g., DANGER; WARNING; CAUTION, etc.)	
	• Manufacturer	
Pre-Job Activities		
2.	Corrosives and reactives are stored in a cool, dry environment, free from temperature extremes	☐ Yes ☐ No ☐ NA
3.	Corrosives and reactives are stored in their properly labeled original containers, cushioned against shock, and stored to prevent leaks	☐ Yes ☐ No ☐ NA
4.	Corrosives are not stored in the vicinity of oxidizers	☐ Yes ☐ No ☐ NA
5.	Hydrofluoric acid is stored only in acid-proof polyethylene- or ceresin-lined containers	☐ Yes ☐ No ☐ NA
6.	Corrosives are stored on acid-resistant material	☐ Yes ☐ No ☐ NA
7.	Chromic acid, nitric acid, perchloric acid, and potassium permanganate (all oxidizers) are stored separately from other corrosives and flammables	☐ Yes ☐ No ☐ NA
Handling		
8.	The following minimum required PPE is used when working with corrosives:	☐ Yes ☐ No ☐ NA
	• Chemical splash goggles	
	• Chemical resistant gloves	
	• Chemical resistant apron	
9.	Bottles or carboys are opened slowly to guard from splashes.	☐ Yes ☐ No ☐ NA
10.	The outside of the container is washed off with water after use to clean off any droplets of material.	☐ Yes ☐ No ☐ NA
11.	An eyewash is located in all areas where corrosives are used.	☐ Yes ☐ No ☐ NA
12.	An eyewash is:	
	• Within 25 feet (7.62 meters) or 10 seconds of travel	☐ Yes ☐ No ☐ NA
	• Marked with a highly visible sign	☐ Yes ☐ No ☐ NA
	• Well lit and visible	☐ Yes ☐ No ☐ NA
	• Working and delivering a minimum of 1.5 liters of water per minute for 15 minutes	☐ Yes ☐ No ☐ NA
13.	Where substantial quantities of corrosives and/or reactives are stored, access to an emergency shower is available.	☐ Yes ☐ No ☐ NA
14.	Spill control materials compatible with chemicals are available for emergency use.	☐ Yes ☐ No ☐ NA
Waste Disposal		
15.	Organic acid, inorganic acid, and basic waste are kept segregated.	☐ Yes ☐ No ☐ NA
16.	Corrosive waste is disposed in accordance with regulatory and client requirements.	☐ Yes ☐ No ☐ NA
17.	A waste management plan or procedure is in place.	☐ Yes ☐ No ☐ NA
18.	Arrangements for waste collection, transport, and disposal are in place.	☐ Yes ☐ No ☐ NA

Comments:

Americas

Flammable & Combustible Liquids

S3AM-126-PR1

1.0 Purpose and Scope

1.1 This procedure applies to all AECOM Americas based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

1.2 The purpose of this procedure is to provide information regarding the proper storage, handling, and work practices associated with flammable and combustible liquids.

2.0 Terms and Definitions

2.1 **Flashpoint** – The minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. The flash point is normally an indication of susceptibility to ignition.

2.2 **Safety can** – Safety can: an approved container, of not more than 5 gallons (18.9 liters) capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure

3.0 References

3.1 S3AM-011-PR1 Fire Protection

3.2 S3AM-115-PR1 Hazardous Material Communication

3.3 S3AM-208-PR1 Personal Protective Equipment

3.4 S3AM-332-PR1 Hot Work

4.0 Procedure

4.1 Implementation of this standard is the responsibility of the AECOM manager directing activities of the facility, site, or project location.

4.2 Appoint a Responsible Person who will:

4.2.1 Determine if flammable or combustible liquids are stored on-site. Flammable liquids and combustible liquids are classified or categorized differently by jurisdiction. As a general definition that aligns the different classifications or categories, flammable and combustible liquids are any liquid that has a flashpoint at or below 199.4°F (93°C). Refer to *S3AM-126-ATT1 Flammable & Combustible Liquid Classifications.*

4.2.2 Inspect storage areas monthly.

4.2.3 Monitor the quantity of flammable and combustible liquids on the site.

4.2.4 Review work practices involving flammable and combustible liquids.

4.2.5 Safety data sheets (SDS) for all hazardous substances, including flammable and combustible liquids, must be provided by vendors or subcontractors, and maintained on site. For more information, see *S3AM-115-PR1 Hazardous Material Communication*.

4.2.6 Furnish portable fire extinguishers in such quantities, sizes, and types as needed for the special hazards of operation and storage. For more information, see *S3AM-011-PR1 Fire Protection*.

4.3 Control flammable and combustible liquids entering the site by ordering only those materials and quantities needed to complete a job.

4.4 Cylinders – General Use & Transport

4.4.1 Open and close cylinder valves using the appropriate tools provided by the cylinder supplier.

4.4.2 Remove regulators and replace caps before transporting cylinders.

4.4.3 Do not roll or drop cylinders. Transport cylinders in a vertical and secured positing using a cylinder basket, cylinder cart or other secure equipment.

4.4.4 Do not use cylinders if the cap cannot be removed by hand. Do not use tools (e.g., hammer) to loosen caps. Tag the cylinder “Do Not Use” and return the cylinder to a designated storage area to be returned to the cylinder supplier.

4.5 General Storage

4.5.1 Use only approved containers, tanks, and pumping equipment for storage and handling of flammable and combustible liquids. Use approved (UL or FM) metal safety cans (with spring-closing lid and spout cover, and optional flash-arresting screen) for the handling and use of flammable liquids in 1- to 5-gallon (3.8- to 18.9-liter) quantities. For additional information, see *S3AM-126-ATT1 Flammable & Combustible Liquid Classifications.*

4.5.2 Place all rags, waste, etc., soiled by combustible or flammable materials in tightly closed metal containers for daily disposal.

4.5.3 Take precautions, including proper ventilation, to prevent the ignition of flammable vapors. Sources of ignition include, but are not limited to: open flames; lightning; smoking; cutting and welding; hot surfaces; frictional heat; static, electrical, and mechanical sparks; spontaneous ignition; chemical reactions; and radiant heat.

4.5.4 Require approved personal protective equipment for all persons handling flammable or combustible liquids, as outlined by the appropriate SDS.

4.5.5 Train employees exposed to flammable or combustible liquids in the hazards of these materials; in their safe handling, use and disposal; in their protection from ignition sources; in the type, use, and placement of containers and cabinets; in the location of fire extinguishers; in the protection against toxic vapors; and in the procedures to follow in case of spill or fire.

4.6 Indoor Storage

4.6.1 Keep indoor storage of flammable liquids to a minimum. Do not store more than 25 gallons (95 liters) of flammable or combustible liquids outside of an approved storage cabinet.

4.6.2 Do not store flammable or combustible liquids in areas used for exits, stairways, or normally used for the safe passage of people.

4.6.3 Do not store more than of flammable and combustible liquids in a single flammable storage cabinet in excess of that specified by the applicable jurisdiction. Refer to *S3AM-126-ATT1 Flammable & Combustible Liquid Classifications*.

4.6.4 Do not store oxidizers and other reactive chemicals in flammable cabinets.

4.6.5 Up to three cabinets may be grouped together. Groups of cabinets must be separated by at least 100 feet (30.5 meters).

4.6.6 Conspicuously label all cabinets “Flammable — Keep Fire Away.”

4.6.7 Indoor flammable liquid storage rooms must conform to NFPA codes, including requirements regarding fire ratings, spill containment, maximum capacity, electrical classifications, and ventilation requirements.

4.7 Outside Storage

4.7.1 Maintain a minimum of 20 feet (6.1 meters) between flammable and combustible storage areas and any building.

4.7.2 Maintain a minimum distance of 50 feet (15.2 meters) between flammable and combustible storage areas and hot work activities. Refer to *S3AM-332-PR1 Hot Work*.

4.7.3 Grade the storage area in a manner to divert possible spills away from buildings, and curb or dike so as to contain entire volume of liquids and prevent spills from impacting soil or groundwater.

4.7.4 Keep the entire storage site free from accumulation of unnecessary combustible materials. Closely cut weeds and grass, and establish a regularly scheduled cleanup procedure for the whole area.

4.7.5 Maintain adequate access-ways to open-yard storage to allow access by fire-fighting equipment. Equipment that is blocking access must be manned at all times so that it may be readily moved if necessary.

4.8 Labeling and Signage

4.8.1 Post a "NO SMOKING OR OPEN FLAME" sign in all areas where flammable and combustible materials are stored, handled, and processed.

4.8.2 Require all containers and cylinders to be labeled with the contents and adequate hazard warnings per *S3AM-115-PR1 Hazardous Materials Communication.*

4.9 Use of Materials on Site

4.9.1 Use flammable and combustible liquids in a manner that is consistent with the label and SDS for the product.

4.9.2 Use only those amounts of materials needed for the job. Transfer of these materials to ready-to-use containers is encouraged.

4.9.3 Use personal protective equipment stated on the product label and SDS. For additional information, consult *S3AM-208-PR1 Personal Protective Equipment*.

4.9.4 For dispensing and/or fueling operations, ensure:

- Signs are posted with instructions on the dispensing or fueling process.
- Operators have been trained in the dispensing or fueling process.
- Equipment being refueled has the engine shut off prior to fueling.
- Smoking is prohibited in vehicle and equipment refueling areas.
- Adequate protection is provided to safeguard dispensing pumps from physical damage from vehicles.
- Dispensing nozzles have auto shut-off or self-closing valves and provisions for containing or controlling over-spillage.
- Heating equipment installed in lubrication or service areas, where flammable liquids are dispensed, is of an approved type, and where feasible, is installed at least 8 feet (2.4 meters) above the floor.
- Tank cars and trucks being loaded or unloaded and flammable storage tanks and systems are properly bonded and grounded.
- Transfer of flammable liquids from one container to another is done only when containers are electrically interconnected (bonded).
- Proper PPE is required during the dispensing or fueling process. For additional information, see *S3AM-208-PR1 Personal Protective Equipment*; and *S3AM-126-FM1 Flammable and Combustibles Inspection.*

4.10 Spill Control

4.10.1 Have a written spill response plan in place before materials are stored or used on site.

4.10.2 Have spill clean-up materials in the vicinity of the materials being stored.

4.10.3 Clean up or respond to spills promptly according to applicable local, state, and federal regulations. This may require notification of authorities if a Reportable Quantity (RQ) is exceeded.

4.10.4 Move leaking cylinder to a ventilated area away from ignition sources. Do not attempt to repair a leaking cylinder. Contact the cylinder supplier to determine proper response methods.

4.11 Disposal

4.11.1 Keep solvent waste and flammable liquids in fire-resistant, covered containers until they are removed from the worksite.

4.11.2 Do not place flammable or combustible waste in municipal garbage.

4.11.3 Do not pour flammable or combustible liquids down drains or onto the ground.

4.11.4 Dispose of flammable or combustible hazardous materials with a licensed and approved hazardous material disposal company.

4.12 Inspection

4.12.1 Inspect flammable and combustible storage and use areas on a monthly basis.

4.12.2 Use *S3AM-126-FM1 Flammable & Combustibles Inspection* or equivalent to inspect the storage areas.

4.12.3 Inspect cylinder regulators, gauges, valves, hoses and connections before use. Any damaged equipment shall be tagged out-of-service.

4.13 Training

4.13.1 Require that hazard communication training includes specific hazard information for the flammables and combustibles used.

4.14 Compliance

4.14.1 Review and comply with country and client/customer-specific requirements.

5.0 Records

5.1 The following information will be maintained in the project file.

5.1.1 Location of the SDS inventory.

5.1.2 Completed *S3AM-126-FM1 Flammable & Combustibles Inspection* or equivalent.

6.0 Attachments

6.1 S3AM-126-ATT1 Flammable & Combustible Liquid Classifications

6.2 S3AM-126-FM1 Flammable & Combustibles Inspection

Americas

Flammable & Combustible Liquid Classifications

S3AM-126-ATT1

NFPA 30, WHMIS Canada

Flammable Liquid	Flash Point	Boiling Point
Class 1A	< 73° F (22.8°C)	< 100° F (37.8°C)
Class 1B	< 73° F (22.8°C)	> 100° F (37.8°C)
Class 1C	> 73° F (22.8°C) < 100° F (37.8°C)	
Combustible Liquid		
Class 2	> 100° F (37.8°C) < 140° F (60°C)	
Class 3A	≥ 140° F (60°C) <200°F (93.3°C)	
Class 3B	>200°F (93.3°C)	

Do not store more than 25 gallons (95 liters) of Class IA liquids in containers of" flammable or combustible liquids outside of an approved storage cabinet.

Do not store more than 120 gallons (454 liters) of Class IB, IC, II, or III liquids in containers of flammable and combustible liquids in a single flammable storage cabinet.

Maximum Allowable Size of Containers and Portable Tanks

Container Type	Flammable Liquids			Combustible Liquids	
	Class 1A	Class 1B	Class 1C	Class II	Class III
Glass or approved plastic	1 pint (0.5 liter)	1 quart (1 liter)	1.3 gallons (5 liters)	1.3 gallons (5 liters)	1.3 gallons (5 liters)
Metal (other than drums) or approved plastic	1.3 gallons (5 liters)	5.3 gallons (20 liters)	5.3 gallons (20 liters)	5.3 gallons (20 liters)	5.3 gallons (20 liters)
Safety cans	2.6 gallons (10 liters)	5.3 gallons (20 liters)	5.3 gallons (20 liters)	5.3 gallons (20 liters)	5.3 gallons (20 liters)
Metal drums (DOT specifications)	119 gallons (450 liters)	119 gallons (450 liters)	119 gallons (450 liters)	119 gallons (450 liters))	119 gallons (450 liters)
Approved metal portable tanks	793 gallons (3,002 liters)	793 gallons (3,002 liters)	793 gallons (3,002 liters)	793 gallons (3,002 liters)	793 gallons (3,00 liters)

OSHA 29 CFR 1910.106

Flammable Liquid	Flash Point	Boiling Point
Category 1	< 73.4° F (23°C)	< 95° F (35°C)
Category 2	< 73.4° F (23°C)	> 95° F (35°C)
Category 3*	> 73.4° F (23°C) < 140° F (60°C)	
Category 4**	>140°F (60°C) ≤199.4°F (37.8°C)	

* When a Category 3 liquid with a flashpoint at or above 100 °F (37.8 °C) is heated for use to within 30 °F (16.7 °C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint below 100 °F (37.8 °C).

** When a Category 4 flammable liquid is heated for use to within 30 °F (16.7 °C) of its flashpoint, it shall be handled in accordance with the requirements for a Category 3 liquid with a flashpoint at or above 100 °F (37.8 °C).

Maximum Allowable Size of Containers and Portable Tanks

Container Type	Flammable Liquids			
	Category 1	Category 2	Category 3	Category 4
Glass or approved plastic	1 pint (0.5 liter)	1 quart (1 liter)	1 gallons (3.8 liters)	1 gallons (3.8 liters)
Metal (other than drums) or approved plastic	1 gallons (3.8 liters)	5 gallons (18.9 liters)	5 gallons (18.9 liters)	5 gallons (18.9 liters)
Safety cans	2 gallons (7.6 liters)	5 gallons (18.9 liters)	5 gallons (18.9 liters)	5 gallons (18.9 liters)
Metal drums (DOT specifications)	60 gallons (227 liters)	60 gallons (227 liters)	60 gallons (227 liters)	60 gallons (227 liters)
Approved metal portable tanks	660 gallons (2498 liters)	660 gallons (2498 liters)	660 gallons (2498 liters)	660 gallons (2498liters)

Not more than 60 gallons (227 liters) of Category 1, 2 and/or 3 flammable liquids or 120 gallons (454 liters) of Category 4 flammable liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area. Quantities in excess of this shall be stored in an inside storage room.

Storage of containers (not more than 60 gallons [227 liters] each) shall not exceed 1,100 gallons (4164 liters) in any one pile or area. Piles or groups of containers shall be separated by a 5-foot clearance. Piles or groups of containers shall not be nearer than 20 feet (6.1 meters) to a building.

Americas

Flammable & Combustibles Inspection

S3AM-126-FM1

Location Inspected: _____ **Job No.:** _____ **Date:** _____

Inspector Name: _____ **Inspector Signature:** _____

Fillable fields in the item description shall be completed with the applicable jurisdictional requirement.			
Storage Cabinets			
1. Flammable cabinets do not obstruct room exits.	☐ Yes	☐ No	☐ NA
2. No more than gallons (liters) of flammable or gallons (liters) of combustible liquid are stored in a cabinet.	☐ Yes	☐ No	☐ NA
3. No more than three cabinets are located in a storage area.	☐ Yes	☐ No	☐ NA
4. Metal storage cabinets have self-closing doors.	☐ Yes	☐ No	☐ NA
5. Cabinets are labeled "FLAMMABLE – KEEP FIRE AWAY"	☐ Yes	☐ No	☐ NA
Safety Cans			
6. Safety cans are constructed of stainless steel, Monel, or tin.	☐ Yes	☐ No	☐ NA
7. Safety cans have a flame arrestor and spring-loaded cap on both the filling and pouring spouts.	☐ Yes	☐ No	☐ NA
8. Safety cans have a flame arrestor and spring-loaded cap on both the filling and pouring spouts.	☐ Yes	☐ No	☐ NA
Drum & Drum Storage Areas			
9. Drums are stored in a vertical position.	☐ Yes	☐ No	☐ NA
10. Bungs are closed when liquid is not being transferred.	☐ Yes	☐ No	☐ NA
11. Drums are shielded from the sun.	☐ Yes	☐ No	☐ NA
12. Funnels with installed flash arrestor are used when transferring flammable liquids into drums.	☐ Yes	☐ No	☐ NA
13. A minimum distance of 25 feet (7.6 meters) between a drum storage area and buildings is present.	☐ Yes	☐ No	☐ NA
14. A "NO SMOKING" sign is posted in the area.	☐ Yes	☐ No	☐ NA
15. An emergency spill kit is located near the drum storage area.	☐ Yes	☐ No	☐ NA
16. A 20-pound dry-chemical fire extinguisher is located no less than 10 feet (3 meters) or more than 50 feet (15 meters) from the storage area.	☐ Yes	☐ No	☐ NA
Waste Cans			
17. Combustible scrap, debris, and waste materials (oily rags, etc.) are stored in covered metal cans.	☐ Yes	☐ No	☐ NA
18. Waste cans are removed from the work area daily.	☐ Yes	☐ No	☐ NA
19. Waste cans have spring-loaded self-closing lids.	☐ Yes	☐ No	☐ NA

Storage Rooms Designed Specifically For Flammable Materials			
20. Room construction meets NFPA fire-resistance requirements.	☐ Yes	☐ No	☐ NA
21. A NO SMOKING sign is posted in the room.	☐ Yes	☐ No	☐ NA
22. An emergency spill kit is located in the room.	☐ Yes	☐ No	☐ NA
23. Rooms with automatic extinguishing systems have the following:			
• Noncombustible liquid-tight raised sills or ramps at least 4 inches (0.36 meters) in height.	☐ Yes	☐ No	☐ NA
• Flooring at least 4 inches (0.36 meters) below the surrounding floor, or an open-grated trench that drains to a safe location.	☐ Yes	☐ No	☐ NA
• Openings with approved self-closing fire doors.	☐ Yes	☐ No	☐ NA
• Liquid-tight construction where the walls join the floors.	☐ Yes	☐ No	☐ NA
• Shelving, racks, dunnage floor overlay, and other interiors with 1-inch wood.	☐ Yes	☐ No	☐ NA
24. Rooms are ventilated by a gravity or mechanical exhaust system that:			
• Commences not more than 1 foot (0.3 meter) above the floor.	☐ Yes	☐ No	☐ NA
• Is designed to provide for a complete change of air within the room at least six times per hour.	☐ Yes	☐ No	☐ NA
• Is controlled by a switch located outside the door, with ventilating equipment and any light fixtures operated from the same switch.	☐ Yes	☐ No	☐ NA
Flammable & Combustible Storage Areas Within Buildings			
25. At least one portable fire extinguisher rated not less than 20-B is located outside of but not more than 10 feet (3 meters) from the door opening into any room used for the storage of more than gallons (liters) of flammable or combustible liquids.	☐ Yes	☐ No	☐ NA
26. Buildings or rooms are locked when not occupied.	☐ Yes	☐ No	☐ NA
27. Exits, stairways, or passageways are not used for storing flammables and combustibles.	☐ Yes	☐ No	☐ NA
28. No more than gallons (liters) of liquids or gallons (liters) of liquids are located in a room outside of a flammable storage locker or flammable storeroom.	☐ Yes	☐ No	☐ NA
29. An aisle at least 3 feet (0.91meters) wide is maintained in storage areas.	☐ Yes	☐ No	☐ NA
30. No more than those amounts needed for one day's use are stored in buildings under construction.	☐ Yes	☐ No	☐ NA
Outside Storage of Flammable and Combustible Liquids			
31. At least one portable fire extinguisher having a rating of not less than 20-B is located not less than 25 feet (7.6 meters) or more than 75 feet (22.8 meters) from any outside flammable liquid storage area.	☐ Yes	☐ No	☐ NA
32. For containers not more than gallons each (liters), no more than gallons (liters) in any one group are stored.	☐ Yes	☐ No	☐ NA
33. Groups of containers are separated by 5-foot (1.52 meters) clearances.	☐ Yes	☐ No	☐ NA
34. Groups of containers are more than 50 feet (15 meters) from buildings.	☐ Yes	☐ No	☐ NA
35. Portable tanks (not exceeding gallons [liters] in capacity) are provided with emergency venting devices as specified by NFPA 30.	☐ Yes	☐ No	☐ NA

36. Storage areas are free of accumulation of weeds, debris, and other combustible materials not necessary to the storage.	☐ Yes ☐ No ☐ NA
Storage Tanks	
37. Tanks have relief vents.	☐ Yes ☐ No ☐ NA
38. Tank vents are not close to open flames, stacks, heating apparatus, or any other source of ignition.	☐ Yes ☐ No ☐ NA
39. Tanks are double-walled or a dike, curb, or other suitable means is present to prevent the spread of leakage from tanks.	☐ Yes ☐ No ☐ NA
40. Diked areas have a capacity equal in volume to at least that of the largest tank plus 10 percent of all other tanks in the enclosure.	☐ Yes ☐ No ☐ NA
41. Provisions to drain off accumulations of ground- or rainwater or spills in diked areas.	☐ Yes ☐ No ☐ NA
42. Tanks are vented outdoors and away from air intakes and windows.	☐ Yes ☐ No ☐ NA
43. Impact protection, such as bollards are guard rails, is present for tanks located in areas susceptible to impacts from vehicles or other moving equipment.	☐ Yes ☐ No ☐ NA
Dispensing of Flammable and Combustible Liquids	
44. Dispensing outlets for above-ground tanks with nationally listed automatic-closing valve, without a latch-open device.	☐ Yes ☐ No ☐ NA
45. Dispensing systems are electrically bonded and grounded.	☐ Yes ☐ No ☐ NA
46. Tanks, hoses, and containers of 5 gallons (19 liters) or less in metallic contact while transferring flammable liquids (grounding).	☐ Yes ☐ No ☐ NA
47. Electrically bonded systems are used for transferring flammable liquids in containers in excess of 5 gallons (19 liters).	☐ Yes ☐ No ☐ NA
48. Closed piping systems are used for drawing flammable liquids during transfer.	☐ Yes ☐ No ☐ NA
49. Flammables and combustibles are drawn from a container or portable tank by use of gravity or through a pump using an approved self-closing valve.	☐ Yes ☐ No ☐ NA
Liquefied Petroleum Gas – Refueling	
50. Equipment is shut down during refueling operations.	☐ Yes ☐ No ☐ NA
51. Leather gloves and safety glasses are worn during refueling operations.	☐ Yes ☐ No ☐ NA
52. Smoking and hot work is prohibited during refueling.	☐ Yes ☐ No ☐ NA
53. Refueling occurs at least 25 feet (7.6 meters) from buildings.	☐ Yes ☐ No ☐ NA
Oxidizers	
54. Oxidizers are stored separately from flammables.	☐ Yes ☐ No ☐ NA
55. When oxidizers are shifted to a second container, the container is labeled with the appropriate warning labels.	☐ Yes ☐ No ☐ NA
56. Secondary containers are compatible with oxidizers.	☐ Yes ☐ No ☐ NA
57. Oxidizers are stored away from heat sources where the maximum temperature exceeds 100º F (37.8º C).	☐ Yes ☐ No ☐ NA
58. Chromic acid, nitric acid, perchloric acid, and potassium permanganate (all oxidizers) are stored separately from other corrosives and flammables.	☐ Yes ☐ No ☐ NA

Americas

Electrical Safety

S3AM-302-PR1

1.0 Purpose and Scope

1.1 Outline the safe working requirements for working with and near electric equipment and installations to minimize and control electrical hazards such as electrical shock, arc flash, and electrical fires in the workplace.

1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

1.3 As a general rule, AECOM employees shall not work on exposed, energized systems with a potential greater than 50 volts. This work should be performed by a qualified electrician.

2.0 Terms and Definitions

2.1 **Arc Flash –** A dangerous condition associated with the release of energy during an electrical arc.

2.2 **Arc Flash Analysis –** A mathematical determination of the energy released by an electric arc and the distance from the source that a flash hazard exists. The process for an Arc Flash Analysis is defined in National Fire Protection Act 70E of the National Electric Code and Canadian Standards Association Z462.

2.3 **Arc Rating** – The maximum incident energy resistance demonstrated by a material prior to breakdown or at the onset of a second-degree skin burn (expressed in cal/cm2).

2.4 **Circuit Protective Device –** A load-rated switch, circuit breaker, or other device specifically designed as a disconnecting means for opening, reversing, or closing of live circuits.

2.5 **Energized Electrical Equipment –** Electrically connected to or having a source of voltage.

2.6 **Flash Hazard –** A dangerous situation associated with the release of energy caused by an electric arc.

2.7 **Ground Fault Circuit Interrupter (GFCI) –** An electrical device that protects the users of all devices connected to it from electrical shock. The GFCI is part of the circuit or device in use and continuously measures the current in that circuit. If a leakage of current is detected, as in the case of an electrical short circuit, the circuit is opened at the GFCI and current cannot flow beyond the GFCI.

2.8 **Licensed Electrician –** A person who possesses the local licenses and certifications to work on electrical circuitry, panels or equipment if full compliance with local legislation.

2.9 **Portable Electric Equipment –** Cord- and plug-connected equipment and extension cords.

2.10 **Qualified Persons** – Individuals who have specific and documented training and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations to avoid the hazards of working on or near energized electrical equipment. Qualified Persons shall have been specifically permitted to near exposed energized and parts. Even an experienced electrician is unqualified unless he or she knows the particular equipment and has received specific safety training on the potential hazards involved.

2.11 **Shock Hazard –** A dangerous situation associated with the possible release of energy caused by contact or approach to live parts**.**

3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-202-PR1 Competent Person Designation

3.3 S3AM-208-PR1 Personal Protective Equipment

3.4 S3AM-209-PR1 Risk Asssessment & Management

3.5 S3AM-218-PR1 Permit to Work

3.6 S3AM-305-PR1 Hand & Power Tools

3.7 S3AM-322-PR1 Overhead Lines

3.8 S3AM-325-PR1 Lockout Tagout

3.9 S3AM-410-PR1 Hazardous Energy Control

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Manager / Supervisor**

- Approve all Energized Electrical Work Permits.
- Confirm that all projects under their direct control or authority have a written SH&E Plan prepared for the activity.
- Confirm communication with client / owner of hazards presented by the work conducted by AECOM and controls measures in place.
- Provide technical guidance in support of this procedure.
- Confirming employees are informed of and comply with the provisions of this procedure.
- Supporting employees in the reporting of incidents per *S3AM-004-PR1 Incident Reporting, Notifications & Investigations,* including the entry of the incident into the on-line incident management system (e.g. IndustrySafe).

4.1.2 **SH&E Manager**

- Provide technical guidance and support to the Manager or Supervisor.
- Assist the Manager or Supervisor in compliance with the requirements of this procedure.
- Assist in the incident investigation and review process

4.1.3 **Employees**

- Comply with requirements of this procedure.
- Stop work if workers, other than Qualified Persons, are exposed to live electrical systems at unknown voltages or potentials greater than 50 volts.
- Only open electrical panels only if they are a Qualified Person.
- Employees designated as a Qualified Person, conduct work on or near energized electrical equipment in accordance with applicable training and jurisdictional requirements.
- Employees designated as a competent person in relation to the Assured Equipment Grounding Conductor Program, administer testing and recording in accordance with jurisdictional requirements.
- Immediately report incidents per *S3AM-004-PR1 Incident Reporting, Notifications & Investigations*, including the entry of the incident into the on-line incident management system (e.g., IndustrySafe).

4.2 Training

4.2.1 Employees who have potential exposures to electrical hazards shall be trained in and be familiar with the electrical safety-related work practices required by the applicable regulations. Refer to the *S3AM-003-PR1 SH&E Training* for specific required training.

4.2.2 Employees shall have reviewed and acknowledged the applicable SH&E plan specific to the project or location.

4.2.3 Refer to *S3AM-302-ATT1 Live Electrical Work* for qualifications if working on or near exposed electric conductors or circuit parts that can be energized.

4.3 General Requirements

4.3.1 Electrical equipment installed to provide electric power and light at worksites (both temporary and permanent) shall contain markings durable to the expected environment to inform workers of the equipment's:

- Manufacturer, trademark, or party responsible for the equipment.
- Voltage, current, or wattage.
- Any other ratings as necessary.
- Equipment / installations not appropriately marked shall not be used.

4.3.2 Electrical outlets utilized to supply power for electrical equipment during field operations shall be of the three-wire grounding type. They should be tested for correct polarity and adequacy of the ground with a circuit analyzer. If it is determined that the outlet is incorrectly wired or inadequately grounded, it must not be used until serviced by a licensed electrician.

4.3.3 GFCI devices will be in place between the equipment and power source for all temporary circuits unless protected by an assured equipment grounding program as defined in this procedure (i.e., circuits that are not part of a permanently installed facility electrical system, such as on a construction site or temporary field installation).

4.3.4 Unqualified personnel are not permitted to work on electrical equipment unless it has been de-energized, verified as being free of hazardous energy and locked and tagged out in accordance with *S3AM-325-PR1 Lockout Tagout*.

- Electrical equipment that has been de-energized but not locked and tagged out shall be treated as energized.

4.3.5 After a circuit is de-energized by a circuit protective device, the circuit may not be repeatedly manually reenergized until it has been determined that the equipment and circuit can be safely energized.

4.3.6 Temporary or permanent light fixtures that present a shock or burn hazard shall be guarded.

4.3.7 Confirm power switches are properly labeled to identify what they control, unless this is clearly confirmed through switch proximity or location. Electric conductors shall be protected from damage.

4.4 Classified Locations

Electrical equipment and wiring may be installed in locations where any of the following may be present: flammable vapors, liquids, or gases; combustible dusts or fibers; or a concentration or quantity of flammable or combustible material. Below is a list of each type of location and the associated hazards.

4.4.1 Class I Locations

Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:

A. Class I, Division 1 location is a location:

1. In which ignitable concentrations of flammable gases or vapors may exist under normal operating conditions; or
2. In which ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

3. In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

B. Class I, Division 2 location is a location:

1. In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

2. In which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or

3. That is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

4.4.2 Class II Locations

Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

A. Class II, Division 1 location is a location:

1. In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures; or

2. There mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes, or

3. In which combustible dusts of an electrically conductive nature may be present.

B. B. Class II, Division 2 location is a location in which:

1. Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures, and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

2. Dust may be in suspension in the air as a result of infrequent malfunction of handling or processing equipment, and dust accumulations resulting therefrom may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

4.4.3 Class III Locations

Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:

A. Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

B. Class III, Division 2 location is a location in which easily ignitable fibers are stored or handled, except in process of manufacture.

4.5 Distribution System Setup

4.5.1 Under no circumstances shall electrical lines be routed through doorways, hatches, windows, or other openings.

4.5.2 Electric lines crossing work areas, personnel, or vehicular traffic areas shall be either fastened securely overhead (at a height that provides safe clearance for work operations), or protected by a cover capable of withstanding the imposed loads without creating a trip hazard.

4.5.3 Circuit breakers shall be labeled to indicate their use.

4.5.4 All circuit breaker panels shall have no openings or uncovered knockouts and shall be kept covered when not in use.

4.5.5 All live parts of electrical equipment operating at 50 volts or more shall be properly guarded against accidental contact.

4.5.6 Extension Cord Use

- Extension cords and electrical connections on handheld and other power tools will be inspected prior to use for cuts, kinks, frayed wires, etc. If any deficiency is noted, the equipment will be tagged “OUT OF SERVICE” and removed from service. Manufacturer-installed insulated electrical cords will not be repaired except by a licensed electrician.
- Extension cords are not to be placed across aisles, through doors, through holes in a wall, or in areas where the cord may be damaged or create a tripping hazard.
- Extension cord sets for use in field operations should be of the three-wire grounding type and will be rated for the intended load.
- Use of extension cords is allowed only for temporary installations not to exceed 90 days.
- “Daisy chaining” or connecting a series of extension cords together is not permitted.
- Extension cords shall be provided with a plug cap that is either molded to the cord or equipped with a cord clamp to prevent strain on the terminal screws.
- Extension cords shall not be fastened with staples or otherwise hung in a manner that could damage the outer jacket or insulation.
- Ground fault circuit interrupters shall be used or, if permitted by legislation, an “assured equipment grounding conductor program” is to be established for all nonpermanent wiring needed for construction purposes or when working outdoors, in wet or moist areas or elsewhere as required by legislation.

4.5.7 Temporary Lights/Task Lights

- A temporary light shall not be suspended by the cord unless the cord and light are designed for suspension.
- Temporary lights shall be equipped with bulb protectors unless they are installed at least 7 or more feet overhead.

4.6 Working on or Near Energized Parts

4.6.1 Working on or near energized parts covers either potential direct physical contact or contact by means of tools or equipment and working close enough to the energized part to draw an arc.

4.6.2 Any work on exposed, live electrical systems above 50 volts shall be conducted by a licensed electrician who is a Qualified Person.

4.6.3 Refer to *S3AM-302-ATT1 Live Electrical Work*.

4.6.4 Prior to performing any work near exposed, energized systems, the Qualified Person shall:

- Confirm with the Licensed Electrician that it is safe to do so.
- Perform a Shock Hazard Analysis.
- Perform an Arc Flash Analysis.
- Establish emergency contacts.

- Complete and have approved the Energized Electrical Work Permit. Refer also to *S3AM-218-PR1 Permit to Work* for additional guidance related to Safe Work Permits.
- Have all required personal protective equipment (PPE), insulated tools, and test equipment tested and ready to use.
- Know and understand the procedures to be followed.
- Ensure that adequate lighting and clearance space is available.
- Remove all conductive clothing and jewelry.

4.6.5 Working Near Overhead Power Lines

- Personnel working in the vicinity of overhead power lines, either on the ground or elevated, shall comply with *S3AM-322-PR1 Overhead Lines.*
- All workers and equipment including cranes and drill rigs shall maintain a clearance distance of at least 50 feet (15.24m meters) from overhead power lines unless a detailed assessment has been completed demonstrating that a smaller clearance distance provides protection.

4.7 Grounding

4.7.1 “Ground fault protection” is required on construction sites. To provide this protection, either “ground fault circuit interrupters” (GFCI) are to be used with temporary receptacles, or if permitted by legislation an “assured equipment grounding conductor program” is to be established in which plug-connected electrical equipment, extension cords, and temporary receptacles are tested on a periodic basis.

4.7.2 Ground Fault Circuit Interrupters

- A GFCI is an electrical device that is designed to prevent electrocution from electrical leakage. It is designed to measure the difference in amperage between the “hot” wire and the “neutral” wire in a circuit. Under ideal conditions, the amperage should be the same in both wires. If there is electrical leakage (a ground-fault), the amperages will be different. If the difference is more than a predetermined amount, the GFCI “trips” and stops the flow of electricity.
- GFCIs may trip from many causes including but not limited to:
  - Electrical leakage in the tool from internal defects, damaged insulation or from normal leakage in long runs of cords.
  - Moisture in the air or cords lying in water or on moist dirt.
  - Too many tools on one GFCI circuit.
  - Faulty wiring of the GFCI into the circuit.
  - Defective GFCI.
  - Any such tripping will require the problem to be corrected before the protected circuit can be re-set.

4.7.3 All 120-volt, single-phase, 15- and 20-ampere temporary receptacles shall be protected with “approved” GFCIs. “Approved” means listed by Underwriters Laboratories.

4.7.4 There are several types of GFCIs.

- A combination circuit breaker and GFCI that is installed in place of the ordinary circuit breaker.
- A receptacle containing a built-in GFCI.
- A portable GFCI that plugs into a receptacle and allows the extension cord or tool to be plugged into the GFCI.
- A portable unit containing several GFCI protected receptacles.

4.7.5 GFCIs contain a test button and a reset button. Each GFCI needs to be tested prior to use and on a periodic basis depending upon the manufacturer's recommendations (at a minimum monthly).

4.7.6 Assured Equipment Grounding Conductor Program

- If allowed by local legislation, assured equipment grounding conductor program is to be used instead of GFCIs to provide ground fault protection, the program shall be governed by the following requirements.
- Temporary receptacles shall be electrically grounded in accordance with the temporary wiring requirements of the National Electrical Code (United States)/Canadian Electrical Code.
- Extension cords shall be three-wire cords containing an equipment grounding conductor (ground wire).
- Electrical equipment that is plugged into a receptacle or extension cord (portable electrical tools, bench grinders, electric heaters, etc.) shall have a ground wire properly attached to the non-current-carrying metal parts of the equipment. (Double-insulated tools have no ground wire and are therefore exempt from these testing and recording requirements but still need to be inspected for defects.)
- The Manager or Supervisor is required to designate one or more competent persons to administer this testing and recording program. Refer to S3AM-202-PR1 Competent Person Designation.
- Periodic testing of all plug connected equipment, all extension cords, and all temporary receptacles is to be conducted at the following times:
    - Before a new item (equipment, cord, or receptacle) is put into use.
    - After any repairs to the item.
    - After any incident in which the item may have been damaged.
    - Within three months of the last test. (An exception is allowed in the Standard in which extension cords, and temporary receptacles, which are fixed in place and are not exposed to damage, may be tested every months months.)
- The purpose of the test is to determine the following:
    - Temporary receptacles—to be sure that the receptacle is grounded.
    - Extension Cords—to be sure that the ground wire is connected to the proper terminal at each end and that the ground wire is continuous throughout the length of the cord.
    - Plug Connected Equipment—to be sure that the ground wire is connected to the proper terminal and to the non-current carrying metal parts of the equipment and that the ground wire is continuous from the equipment to the plug.
- The tests may be conducted using the following instruments:
    - A receptacle tester may be used to test receptacles and to test extension cords when plugged into a receptacle.
    - A continuity tester, or a volt-ohm meter, may be used to test equipment and to test extension cords when not plugged into a receptacle.
- Records must be kept to show which items have passed the test and when the test was conducted. These records may be either written inspection logs, a color-coding system using colored tape attached to the item, or some other effective means.
- Color coding shall be used in the following manner:
    - After a plug-connected piece of equipment or an extension cord has been inspected and passed the test, colored tape is to be placed around the cord near the plug. After a temporary receptacle has passed the test, colored tape is to be placed on the cover plate.

- Any set of colors may be used, with the exception of white, black, or silver.
- If there has been no overall site requirements established by the general contractor, use the following colors for the test periods.

January, February, March	Red
April, May, June	Blue
July, August, September	Orange
October, November, December	Green

- The tests administered every three months are to begin on the first working day of each quarter. Testing and color coding are to be continued until all items covered by this program have been tested. The test administered every six months, for those receptacles and extension cords needing only semi-annual testing, are to be color coded using the quarterly color current at the time of the semi-annual test.
- A visual inspection of plug-connected equipment, extension cords, and temporary receptacles is to be made by the user before each use. The purpose of the visual inspection is to look for damage or defects that could affect the safe use of the item. (Exception: extension cords and temporary receptacles that are fixed in place and not exposed to damage are not required to be given a daily visual inspection, but it is a good idea to do the daily visual inspection anyway.)
- Equipment, cords, or receptacles showing damage or defects that could affect its safe operation are not to be used. This applies not only to the visual inspection before each use but also applies to any evidence of damage observed any time during use. Damaged items are to be taken out of service and are not to be used until properly repaired and retested.
- Equipment covered by this program is not to be used until the equipment has been tested and color coded according to the requirements of this program.
- A copy of this program is to be kept at the worksite.

4.8 PPE/Work Practices

4.8.1 PPE requirements shall be determined based on the results of each of the following: Task Hazard Analysis, Shock Hazard Analysis, and Arc Flash Analysis. Refer to the *S3AM-208-PR1 Personal Protective Equipment* and *S3AM-302-ATT1 Live Electrical Work*.

4.8.2 PPE

2 – Required PPE (range based on maximum voltage)	
50 to 240 volts	• **Eye/Face: Safety glasses with side shields or goggles and Arc-Flash Face Shield *or* Arc-Flash Suit Hood (4 cal/cm^2)** • **Body: Flame-Retardant long-sleeved shirt/pants or coverall (4 cal/cm^2)** • **Hand: Electrical Hazard (EH) gloves (Class 00 with leather protectors)** • **Foot: EH-rated footwear** • **Head/Ears: Class E hard hat, hearing protection (ear canal inserts)** • **Tools: ANSI/CSA-approved, voltage-rated**
Above 240 to 480 volts	• **Eye/Face: Safety glasses with side shields or goggles and Arc-Flash Face Shield and Sock Hood (8 cal/cm^2) *or* Arc-Flash Suit Hood (8 cal/cm^2)** • **Body: Flame-Retardant long-sleeved shirt/pants or coverall (8 cal/cm^2)** • **Hand: EH gloves (Class 00 with leather protectors)** • **Foot: EH-rated footwear** • **Head/Ears: Class E Hard hat, hearing protection (ear canal inserts** • **Tools: ANSI/CSA-approved, voltage-rated**

480 to 600 volts	• **Eye/Face: Safety glasses with side shields or goggles and Arc-Flash Suit Hood (8 cal/cm^2)** • **Body: Flame-Retardant long-sleeved shirt/pants or coverall (8 cal/cm^2)** • **Hand: EH gloves (Class 0 or higher with leather protectors)** • **Foot: EH-rated footwear (carbon fiber recommended)** • **Head/Ears: Class E Hard hat, hearing protection (ear canal inserts)** • **Tools: ANSI/CSA-approved, voltage-rated**

4.9 Portable Electrical Equipment

4.9.1 Refer to *S3AM-305-PR1 Hand & Power Tools*.

5.0 Records

5.1 The Shock Hazard Analysis and the Arc Flash Analysis forms shall be retained in the project file.

5.2 The completed *S3AM-302-FM1 Energized Electrical Work Permit* or equivalent shall be retained in the project file.

6.0 Attachments

6.1 S3AM-302-FM1 Energized Electrical Work Permit

6.2 S3AM-302-FM2 Electrical Hazard Checklist

6.3 S3AM-302-ATT1 Live Electrical Work

6.4 S3AM-302-ATT2 Generator Safety

Americas

Energized Electrical Work Permit

S3AM-302-FM1

PART 1: To be completed by the requester

Job Work Number

(1) Description of circuit/equipment/job location:

(2) Description of work to be done:

(3) Justification of why the circuit/equipment cannot be de-energized or the work cannot be deferred until the next scheduled outage:

Requester/Title _____ Date/Time _____

PART II: To be completed by the electrically qualified persons *doing* the work:

	Check When Complete
(1) Detailed job description procedure to be used in performing the above detailed work:	☐
(2) Description of the Safe Work Practices to be employed:	☐
(3) Results of the Shock Hazard Analysis:	☐
(4) Determination of Shock Protection Boundaries:	☐
(5) Results of Flash Hazard Analysis:	☐
(6) Determination of the Flash Protection Boundary:	☐
(7) Necessary personal protective equipment to safely perform the job:	☐
(8) Means employed to restrict the access of unqualified persons from the work area:	☐
(9) Evidence of completion of a Job Briefing including discussion of any job-related hazards:	☐
(10) Do you agree that the above described work can be done safely? (If *no*, return to requester)	☐ Yes ☐ No

Electrically Qualified Persons(s) _____ Date/Time _____ Electrically Qualified Persons(s) _____ Date/Time _____

Electrically Qualified Persons(s) _____ Date/Time _____ Electrically Qualified Persons(s) _____ Date/Time _____

Authorized by: _____ _____

Authorized Supervisor Date/Time

Notes:

Americas

Electrical Hazard Checklist

S3AM-302-FM2

Location Inspected: _____ **Job No.:** _____

Date Inspected: _____ **Name of Inspector:** _____

Check Yes, No, or NA for Not Applicable. If a comment is required, circle the number, and see Page 3.

Electrical Equipment Markings

1.	Disconnecting switches and circuit breakers are labeled to indicate their use or equipment served.	☐ Yes	☐ No	☐ NA
2.	The necessary voltage, wattage, or current ratings are labeled.	☐ Yes	☐ No	☐ NA
3.	Circuit breakers clearly indicate whether they are in the “on” or “off” position.	☐ Yes	☐ No	☐ NA
4.	Markings for arc flash hazards per NFPA 70E or CSA Z462 are on each panel or distribution box.	☐ Yes	☐ No	☐ NA

Electrical Grounding

5.	Extension cords used have a grounding conductor (third plug).	☐ Yes	☐ No	☐ NA
6.	Ground-fault circuit interrupters (GFCIs) are installed as required or an assured equipment grounding conductor program is in use.	☐ Yes	☐ No	☐ NA
7.	Portable electrical tools and equipment are of the double-insulated type.	☐ Yes	☐ No	☐ NA
8.	GFCIs open the circuit on a ground current of 5 milliamperes or greater, and are equipped with an integral push-button test circuit.	☐ Yes	☐ No	☐ NA
9.	GFCIs are installed in accordance with the manufacturer’s instructions.	☐ Yes	☐ No	☐ NA
10.	Ground-fault circuit interrupters are tested prior to initial use, and periodically thereafter.	☐ Yes	☐ No	☐ NA
11.	Grounding rods are at least 5/8-inch- (0.625-centimeter)-diameter steel or iron rods, ½-inch- (1.27-centimeter)-diameter copper-clad steel, or ¾-inch-(1.9-centimeter)-diameter galvanized pipe.	☐ Yes	☐ No	☐ NA
12.	Grounding rods are in 8-foot (2.5-meter) lengths and driven to full depth.	☐ Yes	☐ No	☐ NA
13.	The paths from circuits, equipment, structures, and conduits or enclosures to ground are:			
	• Permanent and continuous.	☐ Yes	☐ No	☐ NA
	• Have ample carrying capacity for current likely to be imposed on them.	☐ Yes	☐ No	☐ NA
	• Have resistance sufficiently low to permit current flow to operate circuit breakers and similar overcurrent devices on the circuit.	☐ Yes	☐ No	☐ NA
14.	Driven ground-rod electrodes have a resistance to ground not exceeding 25 ohms.	☐ Yes	☐ No	☐ NA
15.	Upon installation of the driven ground-rod electrode, the resistance was tested and recorded.	☐ Yes	☐ No	☐ NA
16.	Conductors, used for bonding and grounding circuits, are of sufficient size to carry the anticipated current.	☐ Yes	☐ No	☐ NA
17.	Grounds are not removed until all work is complete.	☐ Yes	☐ No	☐ NA

Electrical Guarding

18.	Switches, receptacles, etc., are provided with tight-fitting covers or plates.	☐ Yes	☐ No	☐ NA
19.	All energized parts of electrical circuits and equipment are guarded against accidental contact by approved cabinets or enclosure.	☐ Yes	☐ No	☐ NA
20.	All unused openings (including conduit knockouts) in electrical enclosures and fittings are enclosed with appropriate covers, plugs, or plates.	☐ Yes	☐ No	☐ NA
21.	Ground-fault circuit interrupters are installed on each temporary 15- or 20-ampere, 120-volt AC circuit at locations where construction, demolition, modifications, alterations, or excavations are being performed.	☐ Yes	☐ No	☐ NA
22.	Electrical switches and breakers (rated 440 volts or greater) are provided with a means for locking them out in the OFF position.	☐ Yes	☐ No	☐ NA

Electrical Systems

23.	Circuit breakers accessible to personnel are protected from physical damage, and located away from ignitable material.	☐ Yes	☐ No	☐ NA
24.	Weatherproof cabinets or enclosures are used when switches, circuit breakers, fuse panels, and motor controllers are in a wet or outside location.	☐ Yes	☐ No	☐ NA
25.	A readily accessible, manually operated switch is provided for each incoming service or supply circuit rated less than 5 kilovolts.	☐ Yes	☐ No	☐ NA
26.	Electrical raceways and enclosures are securely fastened in place.	☐ Yes	☐ No	☐ NA
27.	Overcurrent protection is provided for fuses or circuit breakers for each feeder and branch circuit.	☐ Yes	☐ No	☐ NA
28.	Insulting fuse tongs or extractors are used when removing fuses from circuits rated 50 to 600 volts.	☐ Yes	☐ No	☐ NA
29.	Fuse cabinets have close-fitting doors that can be locked.	☐ Yes	☐ No	☐ NA

Extension Cords

30.	Clamps or other securing means are provided on flexible cords or cables at plug receptacles, tools, equipment, etc., and the cord jackets are securely held in place.	☐ Yes	☐ No	☐ NA
31.	Flexible cords and cables are free of splices and taps.	☐ Yes	☐ No	☐ NA
32.	Only 3-wire grounded-type extension cords, designated for hard or extra-hard service, are used.	☐ Yes	☐ No	☐ NA
33.	Extension cords are listed by Underwriters Laboratories, Inc.	☐ Yes	☐ No	☐ NA
34.	Extension cords are checked for damage before use.	☐ Yes	☐ No	☐ NA
35.	The rated load on extension cords is not exceeded.	☐ Yes	☐ No	☐ NA
36.	Extension cords are of adequate length and multiple cords are not connected together.	☐ Yes	☐ No	☐ NA
36.	Extension cords are not fastened with staples, hung by nails, or suspended by wire.	☐ Yes	☐ No	☐ NA

Temporary Wiring

37.	Temporary wiring is guarded, buried, or isolated by elevation to prevent accidental contact by workers and equipment.	☐ Yes	☐ No	☐ NA
38.	A vertical clearance above walkways for temporary wiring is not less than 10 feet (3 meters) from circuits carrying 600 volts or less.	☐ Yes	☐ No	☐ NA

39.	All exposed temporary wiring is supported on insulators.	☐ Yes	☐ No	☐ NA
40.	Temporary wiring is protected from accidental damage.	☐ Yes	☐ No	☐ NA
41.	Nonconductive lamp sockets and connections are permanently molded to the conductor insulation on lighting strings.	☐ Yes	☐ No	☐ NA
42.	Lighting strings have lamp guards.	☐ Yes	☐ No	☐ NA
43.	Broken or defective bulbs are replaced promptly.	☐ Yes	☐ No	☐ NA
44.	Lights are protected from accidental contact or breakage.	☐ Yes	☐ No	☐ NA
45.	Wiring installed in conduit is equipped with bushings at outlets and terminals.	☐ Yes	☐ No	☐ NA
46.	Receptacles are of the grounding type, and electrically connected to the equipment-grounding conductor.	☐ Yes	☐ No	☐ NA
	Worker Practices			
47.	Personnel performing electrical repairs are properly trained and qualified.	☐ Yes	☐ No	☐ NA
48.	Workers de-energize, ground, or guard electrical circuits before working in close proximity to them.	☐ Yes	☐ No	☐ NA
49.	Workers consider all electrical systems as live until verified de-energized and grounded.	☐ Yes	☐ No	☐ NA
50.	Proper lockout/tag-out procedures are used for de-energizing electric circuits.	☐ Yes	☐ No	☐ NA
51.	Arc flash protection protocols are in place for work on circuits of 50 volts or higher.	☐ Yes	☐ No	☐ NA
	Equipment			
52.	Only fiberglass or wood ladders are used when working near electrical hazards.	☐ Yes	☐ No	☐ NA
53.	Insulation mats are placed on floors and on frames of equipment when working on energized equipment.	☐ Yes	☐ No	☐ NA
54.	Only voltage-rated tools are used on or near live circuits. Voltage rating is appropriate for the work being performed.	☐ Yes	☐ No	☐ NA
	Personal Protective Equipment			
55.	Rubber matting, blankets, insulated sleeves, and rubber gloves are inspected before use.	☐ Yes	☐ No	☐ NA
56.	Workers use safety glasses and face shields during work activities where there is a reasonable probability of eye injury (and on systems with 50 or more volts).	☐ Yes	☐ No	☐ NA
57.	Workers wear arc flash protective clothing, hoods, face shields, and gloves when working on live circuits greater than 50 volts (per NFPA 70E or CSA Z462).	☐ Yes	☐ No	☐ NA

COMMENTS:

Live Electrical Work

1.0 Purpose

1.1 The purpose of this attachment to *S3AM-302-PR1 Electrical Safety* is to confirm that all live electrical work conducted under the control of AECOM personnel is carried out in accordance with legislation and recognized best practices in order to provide adequate protection to workers from potential arc flash and / or electrical shock.

2.0 Definitions

2.1 **Arc Rating** – The maximum incident energy resistance demonstrated by a material prior to breakdown or at the onset of a second-degree skin burn (expressed in cal / cm2).

2.2 **Flash Hazard** – A dangerous situation associated with the release of energy caused by an electric arc.

2.3 **Energized Electrical Equipment** – Electrically connected to or having a source of voltage.

2.4 **Shock Hazard** – A dangerous situation associated with the possible release of energy caused by contact or approach to live parts.

3.0 Responsibilities

3.1 **Manager**

3.1.1 Be familiar with all precautions and Federal and State / Provincial regulations and Best Practices.

3.1.2 Provide training on this Work Instruction to Qualified Persons covering:

- Nature and control of known shock and arc flash hazards.
- Means of eliminating and controlling shock and arc flash hazards.
- Special electrical personal protective equipment (PPE) requirements (task specific).
- Procedure for reporting any deviations to this Work Instruction.

3.1.3 Confirm employees are provided with safe access to the work area.

3.1.4 Control access to energized electrical equipment with potential of shock or arc flash to Qualified Persons only.

3.1.5 Confirm availability of proper tools for the operation and maintenance of electrical equipment.

3.1.6 Proper identification and guarding of potentially hazardous electrical equipment.

3.1.7 Providing available electrical one-line diagrams.

3.1.8 Confirm proper housekeeping around energized electrical equipment at all times.

3.1.9 Provide proper working conditions, including adequate lighting, to facilitate work in a safe environment.

3.1.10 Provide proper supervision of employees.

3.1.11 Maintaining a list of authorized electrical supervisor, Qualified Person(s), and attendant.

3.1.12 Implementation an ongoing evaluation of this Best Management Practice.

3.1.13 Terminate the work and cancel the permit when live work has been completed or any new electrical hazard arises.

3.1.14 Verify that communication modes are available and have been tested.

3.1.15 Remove unauthorized individuals who enter or who attempt to enter the approach boundaries during live work.

3.1.16 Confirm that live work remains consistent with terms of the live work permit and that acceptable working conditions are maintained.

3.1.17 Withdraw the live work permit and stop all work if unsafe conditions are reported during any live work (e.g. sparking, smoldering etc.). Do not permit work on that equipment until the cause of any unsafe condition is thoroughly investigated and the live work procedure has been reviewed to prevent reoccurrence.

3.2 Authorized Electrical Attendant

3.2.1 Practice all precautions and Federal and State / Provincial regulations and Best Practices.

3.2.2 Understand the hazards that may be faced during live work, including the potential for arc flash, shock hazard, and other related hazards.

3.2.3 Be aware of the potential of arc flash or shock possible to the Qualified Persons.

3.2.4 Maintain an accurate count of Qualified Persons working near the live equipment or inside approach boundaries.

3.2.5 Remain near the approach boundary until relieved by another authorized electrical attendant.

3.2.6 Communicate with Qualified Persons as necessary to confirm maintenance of safe conditions at all times.

3.2.7 Monitor activities inside and outside the approach zone to determine if it is safe for the worker to continue to remain in the approach zone. Order the Qualified Persons to stop live work under any of the following conditions:

- The attendant detects a problem;
- The attendant detects the signs of short-circuiting, such as electrical sparking, smoldering, or any other abnormality;
- The attendant detects a situation outside the approach zone that could endanger the worker; and
- If the attendant cannot effectively and safely perform all assigned duties.

3.2.8 Perform no other duties that might interfere with the attendant's primary duty to monitor and protect the Qualified Persons.

3.3 Qualified Persons (Authorized Electrical Worker)

3.3.1 Perform all work in accordance with Federal and State / Provincial regulations, AECOM policies and procedures, and this work instruction.

3.3.2 Be continuously alert, focused, and aware of the hazards of performing the task.

3.3.3 Understand AECOM Safety, Health and Environmental policies and standards as well as site-specific electrical safe work practices.

3.3.4 Examine and understand all the documents provided by AECOM and manufacturers, including all specific hazards, advisories, cautions, etc.

3.3.5 Be knowledgeable of the use and selection of the proper tools to safely perform the electrical task safely.

3.3.6 Complete a Safe Work Plan prior to the start of a task and during work, if conditions change.

3.3.7 Maintain good housekeeping around work areas. Remove all debris, materials, etc., at the completion of tasks.

3.3.8 Report any hazardous (uncontrolled) conditions to AECOM's authorized supervisor.

3.3.9 Understand the hazards that may be faced during live work, including arc flash, shock, or other electrical hazards.

3.3.10 Properly inspect prior to use, and properly use required PPE and electrical tools as specified in this work instruction and the applicable SH&E Plan.

3.3.11 Communicate with the authorized electrical attendant as necessary.

3.3.12 Alert the attendant whenever any abnormality occurs (e.g., sparking, minor shock, burning smell, etc.) or symptoms of unsafe conditions are observed.

3.3.13 Stop all work and exit from the approach zone whenever:

- An order to evacuate is given by the authorized electrical attendant or the authorized supervisor; or
- When the worker observes any warning sign or symptom of short circuiting or a dangerous situation; or
- When the supervisor gives an order to stop work.

4.0 Multi-employer Live Electrical Work Coordination

4.1 AECOM will:

- Inform the client / owner / controlling authority, or if applicable, the host employer, of hazards presented by the work conducted by AECOM, hazards identified during the course of work not previously identified, and measures in place to control hazards identified by AECOM, client / owner or host employer.
- Inform the contractor that the workplace contains shock and / or arc flash potential and that live work is allowed only through compliance with a live work permit program meeting the requirements of the applicable Federal and State / Provincial legislation.
- Appraise the contractor of the elements of the work, including the hazards identified and all past experiences with the live work that make the live work hazardous.
- Appraise the contractor of any precautions or procedures that have been implemented for the protection of employees in the approach zone where contractor personnel will be working.
- Prior to work commencing, coordinate live work operations with the contractor when both AECOM employees and contractor employees will be working in or near approach zone, so that employees of AECOM and the contractor do not endanger each other.
- Debrief the contractor at the conclusion of the live work operations.

4.2 **Contractor Requirements** – In addition to complying with the live work permit requirements, each contractor who is retained to perform live electrical work will:

- Obtain any available information regarding live work from the Manager.
- Coordinate live work operations with the Manager when both AECOM personnel and contractor personnel will be jointly working in or near the approach zone.
- Practice work in accordance with Federal and State / Provincial regulations and industry best practices.
- Inform AECOM's Manager of the live work permit that the contractor will be using and of any hazards confronted or created during live work, either through debriefing or during live work.

5.0 Required Minimum Qualifications

5.1 All electrical work including instrumentation, installations, maintenance, troubleshooting, calibration, operation of stringing equipment, and operation of breakers will only be conducted by qualified, trained, and skilled personnel (this includes AECOM personnel and contractors / subcontractors). These personnel will

meet all qualification requirements mandated by the Federal / State / Provincial regulations as well as applicable electrical associations and trade bodies (e.g., NFPA 70E – refresher training in safety related practices and any changes to the NFPA standard shall be completed at intervals not exceeding three years).

5.2 When permitted by regulatory requirements and as applicable to the work conducted, unauthorized workers may perform specific tasks associated with electrical work (e.g., operating stringing equipment) while under the supervision of a qualified person / authorized electrical worker and according to established procedures).

5.3 The Manager, in consultation with the Safety, Health and Environment (SH&E) Department, will determine the minimum qualifications requirements for any work with the potential for arc flash.

6.0 Working on or Near Electrical Conductors of Circuit Parts

6.1 Safe work practices shall be used to safeguard employees from injury when working on or near exposed electric conductors or circuit parts that can be energized.

- Live Parts – Safe Work Conditions: Live parts to which an employee might be exposed shall be put into an electrically safe work condition before an employee works on or near them.
- Live Parts – Unsafe Work Conditions: Only qualified persons shall be permitted to work on electrical conductors or circuit parts that have not been put into electrically safe conditions.

6.2 Working on or near exposed electrical conductors OR circuit parts that are, or might become, energized – Prior to working on or near exposed electrical conductors and circuit parts operating at 50 volts or more, lockout / tagout devices shall be applied in accordance with AECOM and site-specific policies. Temporary grounding / bonding of the lines or equipment shall be conducted in accordance with regulatory requirements and in a manner that will prevent employee exposure to hazardous differences in electric potential.

6.3 Electrical Hazard Analysis – If the live parts operating at 50 volts or more are not placed in electrically safe condition, other safety-related work practices shall be used to protect employees who might be exposed to electrical hazards. Safe work practices mentioned below shall be established before any person approaches exposed live parts within limited approach boundary:

6.3.1 Shock Hazard Analysis – A shock hazard analysis shall determine the voltage to which personnel will be exposed, boundary requirements, and the PPE necessary in order to minimize the possibility of electrical shock.

6.3.2 Flash Hazard Analysis – A flash hazard analysis shall be done in order to protect personnel from the possibility of being injured by an arc flash. The analysis shall determine the flash protection boundary and the PPE that people within the flash protection boundary shall use.

7.0 Shock Hazard Analysis and Approach Boundaries

7.1 A comprehensive Shock Hazard Analysis Survey is the method used to:

7.1.1 Systematically analyze shock hazards,

7.1.2 Identify approach boundaries, and

7.1.3 Identify appropriate PPE.

7.2 Before permitting live work on electrical equipment, each project site having electrical equipment operating at more than 50 volts is required to conduct a Shock Hazard Analysis Survey. Upon completion of the survey, the applicable electrical areas / spaces will be labeled in accordance with survey results. As applicable, temporary barriers, or barricades, shall be installed when access to opened enclosures containing exposed energized electrical equipment is not controlled by authorized personnel.

7.3 Shock hazard analysis for individual equipment is not required if a facility-wide shock hazard analysis has been conducted and if conditions (including labels and signage) are maintained at all times.

NOTE: Only authorized personnel are allowed to work within the approach boundaries.

7.4 No qualified person shall approach or take any conductive object closer to exposed live parts operating at 50 volts or more than the restricted approach boundary set forth in National Fire Protection Act (NFPA) 70-E.

7.5 In the absence of a facility-wide survey, a Shock Hazard Analysis (including the identification of approach boundaries) shall be conducted (see Appendix A-1 of this procedure) for all electrical equipment operating at over 50 volts.

7.6 Results of both facility-wide as well as individual Shock Hazard Analysis Survey shall be made available to all authorized employees, including Qualified Persons and Authorized Attendants. Additionally, any recommendations given by the survey generated from the survey shall be reviewed by the Manager and shall be addressed in a timely manner.

8.0 Arc Flash Hazard Analysis and Approach Boundaries

8.1 Arc flash safety requirements apply to all electrical equipment operating at 50 volts or more.

8.2 A comprehensive Arc Flash Hazard Analysis Survey is the method used to:

8.2.1 Systematically analyze the potential for arc flash,

8.2.2 Identify the limits of the approach, and

8.2.3 Identify appropriate PPE (refer to appendix A-2).

8.3 Prior to performing any work on energized electrical systems, an Arc Flash Hazard Analysis (including the identification of approach boundaries) will be conducted and documented by a qualified person, and reviewed with affected personnel.

8.4 Once a comprehensive facility Arc Flash Hazard Analysis Survey has been conducted and electrical work areas / spaces are labeled in accordance with survey results, an individual Arc Flash Hazard Analysis is not required, provided that qualified personnel confirm that the conditions, as indicated on the labels and signs, are maintained.

NOTE: Only authorized personnel are allowed to work within the limits of approach.

8.5 Reviews of the Arc Flash Hazard Analysis shall be undertaken by a qualified person as appropriate (e.g., when changes are made to the electrical system, minimum every 5 years to confirm accuracy of labelling, etc.)

8.6 Please refer to NFPA 70-E for details.

9.0 Required PPE Categorized by Exposure

9.1 Employees shall be provided specialized PPE appropriate to the voltage that may be encountered.

9.2 The following specialized PPE requirements will be used while working on energized electrical systems. PPE appropriate to the voltage that may be encountered:

9.2.1 As prescribed by the shock hazard analysis and arc flash analysis; or

9.2.2 As identified in the location or project specific SH&E Plan.

9.3 All PPE (e.g. eye protection, flame resistant and arc rated clothing, insulated gloves, leather covers, etc.) shall be visually inspected prior to issue, prior to each use, according to manufacturer specifications, and if suspected of damage.

9.4 Damaged or defective PPE shall be immediately removed from service.

10.0 Required Tools and Equipment

10.1 Employees shall be provided tools and testing or protective equipment approved to the applicable standard (ANSI / ASTM / CSA) for the relevant voltage rating to be used when working on energized electrical systems.

10.2 All tools and testing or protective equipment (e.g. sleeves, blankets, hot sticks, etc.) shall be visually inspected and tested prior to use, and as appropriate, according to regulatory requirements (e.g., as per NFPA 70E sleeves / blankets every 12 months, gloves every 6 months, etc.), according to manufacturer's specifications, specific to task (e.g., testing for absence of voltage, equipment function must be verified using a known voltage source before and after absence of voltage test), and if suspected of damage (e.g., after an incident), to confirm that the protection systems associated with the tool or equipment are not damaged or impaired and that diagnostic meters and tools are configured properly.

10.3 Tested equipment shall be marked in a manner to identify either the most current test date or the next date testing is due.

10.4 Any tool or testing or protective equipment suspected of being compromised will be immediately taken out of service and will be tagged for disposal.

11.0 Work on Energized Electrical Systems

11.1 Electrical testing device's voltage shall be certified and operated in accordance with manufacturer's specifications and according to approved procedures appropriate to the electrical systems being tested.

11.2 High-voltage testing (in laboratories, shops, and substations, and in the field and on electric transmission and distribution lines and equipment) shall be conducted according to approved procedures appropriate to the electrical system and according to applicable regulatory requirements.

11.3 When systems are considered energized, appropriate procedures shall be established to protect workers from hazardous differences in electric potential (e.g., the use of adequate jumpers when working on a neutral conductor, neutral bus or skywire [cutting, splicing, repairing, etc.]).

11.4 All electrical maintenance or troubleshooting will be done on de-energized circuits, to the extent practical. Work on energized circuits can only be done under special circumstances using a "Live Work Permit" issued by an authorized electrical supervisor. This permit takes into consideration the voltage levels, known electrical hazards, communication requirements, insulated tool requirements, and need for watch persons, etc. The following procedure will be observed for a live work permit:

11.4.1 The person requesting the work (Qualified Person) will complete the permit and will retain the original with him or her during the work. Copy of the permit will be displayed at a prominent location in the control room as a notice that live work has been authorized in certain part of the plant / project.

11.4.2 Permit will be reviewed for correctness, proper safety precautions, and adequacy of controls by the authorized electrical supervisor. Consideration must also be given to any specific jurisdictional requirements (e.g., Ontario – equipment protection through the use of Hold-Off tags restricting device operation to previously agreed limits). After satisfying all safety requirements, an authorized electrical supervisor will sign the permit and will give the original copy to the Qualified Person.

11.4.3 Upon work completion, the Qualified Person will note any observation on the permit and will return the original to the authorized supervisor.

11.4.4 Authorized supervisor will keep both copies of the permit as a controlled record for a period of 12 months.

11.5 The following conditions will be met for live electrical work:

11.5.1 If a qualified person is working in the vicinity of live electrical line, including overhead lines, whether in an elevated position or on the ground, the person may not approach or take any conductive object without an approved insulating handle closer to exposed energized parts than shown in the below table (or as specified by the applicable jurisdiction) unless:

- The qualified person is insulated from the energized part (gloves, with sleeves if necessary, rated for the voltage involved are considered to be insulation of the person from the energized part on which work is performed), or

- The energized part is insulated both from all other conductive objects at a different potential and from the person, or
- The person is insulated from all conductive objects at a potential different from that of the energized part.

APPROACH DISTANCES FOR QUALIFIED EMPLOYEES - ALTERNATING CURRENT

300V and less	Avoid Contact
Over 300V, not over 750V	1 ft. 0 in. (30.5 cm)
Over 750V, not over 2kV	1 ft. 6 in. (46 cm)
Over 2kV, not over 15kV	2 ft. 0 in. (61 cm)
Over 15kV, not over 37kV	3 ft. 0 in. (91 cm)
Over 37kV, not over 87.5kV	3 ft. 6 in. (107 cm)
Over 87.5kV, not over 121kV	4 ft. 0 in. (122 cm)
Over 121kV, not over 140kV	4 ft. 6 in. (137 cm)

11.5.2 If any equipment or instrumentation is to be disabled while other related components or systems are still functioning, the Live Work Permit should record how process safety of the remaining systems will be maintained.

11.5.3 All electrical and instrumentation work conducted will be recorded in the applicable MCC log. The documentation will include a reference to the permit number where appropriate.

11.5.4 The worker will inform the operations supervisor that he or she intends to de-energize a circuit. He or she will also inform the operations supervisor when the work is complete and that the system can be returned to service.

11.6 See *S3AM-302-FM1 Energized Electrical Work Permit* for a suggested template for a “Live Work Permit.”

12.0 Lockout / Tagout Policy and Procedures

12.1 All equipment will be locked out prior to any work commencing in accordance with AECOM’s procedure *S3AM-325-PR1 Lockout Tagout* and applicable site-specific lockout / tagout program.

13.0 Troubleshooting Procedure

13.1 Guards and safety interlocks are not to be removed or bypassed except when testing or troubleshooting.

13.2 The troubleshooting of electrical equipment often requires working with live circuits. Where possible, work will be done on de-energized circuits following the relevant AECOM and site-specific lockout / tagout policy. However, troubleshooting may require limited work on live circuits; if such work is required it will be done using the “Live Work Permit” .Troubleshooting procedures specific to the site or electrical equipment shall be established and followed for the protection of all involved workers.

14.0 Housekeeping

14.1 All areas containing electrical equipment will:

14.1.1 Be maintained and kept clean.

14.1.2 Be well illuminated.

14.1.3 Not be used for storage of supplies.

14.1.4 Not be used for the storage of any flammable materials.

14.1.5 Be assessed for safety hazards.

14.1.6 Be suitably ventilated to control dust, temperature, and humidity.

15.0 Communication

15.1 Notifications will be provided to appropriate parties (e.g., owner, client, electrical equipment controlling authority) as necessary and required (e.g., Ontario – notification of controlling authority of duration and location of work on or in proximity of equipment energized above 750 V).

15.2 Personnel working in or around equipment with electrical hazards will employ a suitable means of communication to confirm their safety.

15.3 The means of communication may include:

15.3.1 Authorized attendant (required for ALL live work conducted on 600 volts and above).

15.3.2 Permits.

15.3.3 Two-way radios.

16.0 Signage and Labels

16.1 Motor Control Center (MCC), Electric Contact Relay (ECR) battery rooms, and electrical panels are required to have the following labeling to identify arc flash and shock hazards. The information on the label will include:

16.1.1 Flash Hazard Boundary (Arc Flash Current);

16.1.2 Flash Hazard at 18 inches in cal / cm^2 or joules;

16.1.3 PPE Category;

16.1.4 Shock Hazards;

16.1.5 Limited Approach Boundaries;

16.1.6 Restricted Approach;

16.1.7 Prohibited Approach; and

16.1.8 Log book to record all electrically related activities.

16.2 All doorways to buildings and enclosures containing energized electrical equipment will be signed to indicate that:

16.2.1 Access is restricted to authorized personnel only; and

16.2.2 Electrical hazards exist beyond this (boundary, door, etc.).

APPENDIX A-1

NFPA 70-E Approach Boundaries to Live Parts for Shock Protection

(All dimensions are distance from live part to employee.)

Nominal Voltage Range (Phase to Phase)	Limited Approach Boundary	Exposed Fixed Circuit Parts	Restricted Approach Boundary; includes inadvertent movement adder	Prohibited Approach Boundary
	Exposed Moveable Conductor			
Up to 50 Volts	Not Specified	Not Specified	Not Specified	Not Specified
50-300	10 feet	3.5 feet	Avoid Contact	Avoid Contact
300-750	10 feet	3.5 feet	1 feet	1 inch

More than 750 volts	Consult a Master Electrician, High Voltage Electrician or other authorized electrician.

APPENDIX A-2

NFPA 70-E Protective Clothing and Personal Protective Equipment (PPE) Matrix

Protective Clothing Characteristics

PPE Category	Clothing Description (Typical number of clothing layers is given in parentheses)	Required Minimum Arc Rating of PPE [(J/cm2 (cal/cm2)]
1	Arc rated shirt and pants or coverall (1)	16.74 (4)
2	Cotton underwear – conventional short sleeve and brief / shorts, plus FR shirt and FR pants (1 or 2)	33.47 (8)
3	Cotton underwear plus FR shirt and FR pants plus FR coverall, or cotton underwear plus two FR coveralls (2 or 3)	104.6 (25)
4	Cotton underwear plus FR shirt and FR pants plus multilayer flash suit (3 or more)	167.36 (40)

NOTE:

Arc rating: Arc rating is defined in Article 100 and can be either ATPV or E_{BT}.

ATPV: ATPV is defined in ASTM F 1959-99 as the incident energy on a fabric or material that results in sufficient heat transfer through the fabric or material to cause the onset of a second-degree burn based on the Stoll curve.

E_{BT}: E_{BT} is defined in ASTM F 1959-99 as the average of the five highest incident energy exposure values below the Stoll curve where the specimens do not exhibit breakopen. E_{BT} is reported when ATPV cannot be measured due to FR fabric breakopen.

When working on energized electrical systems, workers shall wear insulated rubber gloves of the class rated to the voltage to which the worker may be exposed. In addition to live electrical work, the following are examples of potential exposures that would require rubber glove use:

- controlling poles by using tools and/or ropes in the proximity of energized overhead lines.
- stringing or sagging conductors in the proximity of energized overhead lines.
- workers on the ground are guiding lifted materials where the "Safe Limits of Approach" for non-insulated booms cannot be maintained.

Americas

Generator Safety

S3AM-302-ATT2

1.0 Objective/Overview

1.1 Portable generators should be used with extreme caution in order to prevent personal injury. When using a portable generator it is important to follow the manufacturer's instructions to avoid injuring someone or damaging your generator or appliances.

1.2 Allow only trained, authorized personnel to operate the generator. Along with training, consider the need for other safety measures, including proper maintenance of equipment and personal protective equipment (PPE). It is important to note that muscle strains are the most common injury associated with portable generators.

2.0 Safe Operating Guidelines

2.1 Follow manufacturer's recommended operating instructions; every generator is not the same.

2.2 Routinely inspect all areas where generators are positioned for hazards to the operation of the generator (e.g., site congestion, rainy or wet conditions, etc.), and hazards the operation of the generator can present (e.g., flammable materials, exhaust proximity to an occupied confined space / HVAC fresh air intake, etc.).

2.3 Verify ongoing inspection and scheduled maintenance for owned and leased equipment.

2.4 Maintain adequate ventilation. Generators emit carbon monoxide (CO). Never operate a generator in an enclosed building without proper ventilation.

2.5 Turn the generator off and allow it to cool prior to re-fueling. Gasoline and its vapors may ignite if they come into contact with hot components or an electrical spark.

2.6 Gasoline shall only be stored and dispensed to portable generators using a UL/FM approved safety can of 5 gallons (19 liters) or less. No smoking or open flames within 50 feet (15.24 meters) of the refueling area is permitted.

2.7 To avoid a shock, make sure that your hands are dry and that you are standing in a dry place whenever you operate the generator.

2.8 Turn off equipment and lights supplied by the generator until it is running.

2.9 Use the right extension cord. Use only UL-listed, three-prong extension cords. Be sure the extension cord is the proper size (wire-gauge) to handle the electric load that will be plugged into it.

2.10 Ensure the generator is properly grounded prior to each use.

2.11 Position generators away from flammable / combustible materials.

2.12 When long term power is needed, evaluate alternative sources for sustainability.

2.13 Using a portable generator to tie into the wiring of an existing structure shall be done only by a licensed electrician.

2.13.1 Potential Hazards include:

- Lifting, carrying, and pulling starter cords;
- Burns from contact with the hot muffler or engine;
- Shocks/electrocution;
- Noise exposure; and
- Inhaling exhaust gases, CO.

2.13.2 Training Requirements include:

- Review of applicable standard operating procedures;
- Back Injury Prevention;
- Demonstrated knowledge on the use of a generator; and
- Review of manufacturers operating guidelines.

2.13.3 Level D PPE include:

- Leather Gloves;
- Hearing Protection; and
- FR or non-synthetic clothing when a fire hazard is present.

2.13.4 Other Safety Tips include:

- Have a Class A:B:C fire extinguisher readily available at all times.

2.14

Americas

Hand & Power Tools

S3AM-305-PR1

1.0 Purpose and Scope

1.1 This procedure provides the AECOM requirements for all manually operated hand and power tools and associated use, handling and storage. These requirements apply to tools provided by AECOM for employee use as well as tools provided by employees for use on AECOM work sites.

1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

2.1 None

3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-118-PR1 Hearing Conservation

3.3 S3AM-208-PR1 Personal Protective Equipment

3.4 S3AM-302-PR1 Electrical Safety

3.5 S3AM-325-PR1 Lockout Tagout

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Managers/Supervisors**

- Ensure that all aspects of this procedure are followed and adhered to on all AECOM projects, sites and locations.
- If a specific tool is not included in the work instructions related to this procedure, appropriate guidelines shall be established prior to work associated with that tool, including following manufacturer's recommendations.
- Ensure compliance with applicable client requirements and restrictions regarding hand or power tools.

4.1.2 **Safety, Health and Environment (SH&E) Manager**

- Provide technical guidance and support as to this procedure and associated work instructions.

4.1.3 **Employees**

- Work only with tools for which they are appropriately trained and familiar with.
- Follow manufacturer's recommendations for its use and never modify the equipment without first obtaining authorization from the manufacturer.
- Comply with applicable client requirements and restrictions regarding hand or power tools.

4.2 Requirements

4.2.1 Always conduct a task hazard assessment (THA) prior to work commencing and include the identified hazards associated with the anticipated tool use.

4.2.2 No employee shall use any hand or power tool, unless they are familiar with the use and operation of the equipment or have received specific instruction on its use and operation.

4.2.3 All tools will be used for which they were designed and in accordance with manufacturer's specifications. Do not use tools for jobs they are not intended for. For example, do not use a slot screw driver as a chisel, pry bar, wedge or punch or wrenches as hammers.

4.2.4 Use approved tools only. Never modify or use makeshift tools.

4.2.5 Do not apply excessive force or pressure on tools unless permitted by the manufacturer's specifications. This includes additional force by hammering with body weight, foot or other tools.

4.2.6 Keep surfaces and handles clean and free of excess oil and grease to prevent slipping.

4.2.7 Do not carry sharp tools (e.g. knife, chisel, screwdriver, etc.) in pockets; this practice may cause puncture wounds.

4.2.8 All tools shall be properly maintained. Clean, dry, lubricate and repair tools as applicable, and return to a suitable toolbox, room, rack, or other storage area upon completion of a job.

4.2.9 Ensure proper ergonomics principles are observed when using hand and power tools, such as but not limited to:

- Avoid static and awkward positions when possible.
    - Move at intervals to reduce muscle fatigue.
    - Consider tools with a trigger strip, rather than a trigger button. This strip will allow the exertion of more force over a greater area of the hand that, in turn, will reduce muscle fatigue
- Do not apply excessive force or pressure on tools.
- If possible use tools with comfortable grips that are designed to allow the wrist to stay straight. Avoid using a bent wrist.
- Choose hand tools that have a centre of gravity within or close to the handle.
- Frequently used tools that weigh more than 1 pound (0.45 kilograms) should be counter-balanced.
- Ensure proper body positioning when using a tool to prevent slips or falls in the event of unanticipated tool behaviour (slip, kickback, etc.). Avoid over-reaching.
- Pull on tools such as a wrench or pliers whenever possible. Loss of balance is more likely when pushing if the tool slips. If pushing is necessary, hold the tool with an open palm.
- Hand-arm vibration exposure is associated with the use of hand tools.
    - Reduce power to the lowest setting that can complete the job safely. This action reduces tool vibration at the source.
    - Consider the need for controls such as limiting time of use.
    - If safe to do so, adjust to a looser but stable grip, and use anti-vibration gloves.
- Use of heavy tools such as jackhammers can cause fatigue and strains. Heavy rubber grips can reduce these effects by providing a secure handhold.
- Do not increase a tool's leverage by adding sleeved additions (e.g. a pipe or snipe) to increase tool handle length.

4.2.10 Avoid placing fingers and hands in danger zones:

- Ensure hands and fingers have sufficient clearance in the event the tool slips.
- Ensure stability of the work-piece. Use work-piece holders (e.g. vise, chisel holder, etc.) whenever possible to prevent injury to hands or deflection of tool or work-piece.

- Use push sticks or guides when cutting or machining smaller material.

4.2.11 Secure tools when working from heights to prevent them from falling. Never leave tools on ladders, scaffolds, or overhead work areas when they are not in use.

4.2.12 Utilize good housekeeping practices to ensure tools do not present a tripping hazard.

4.2.13 Ensure no part of a tool extends over the edge of the bench top. Place sharp tools (e.g., saws, chisels, knives) on benches so that sharp points or edges face away from the edge.

4.2.14 When using saw blades, knives, or other tools, if possible direct the tools away from aisle areas and away from other employees working in close proximity.

4.2.15 Do not throw tools from place to place or from person to person, or drop tools from heights. Hand them, handle first, directly to other workers.

4.2.16 Use non-sparking and intrinsically safe tools in atmospheres with flammable or explosive characteristics and where highly volatile liquids, and other explosive substances are stored or used.

- Iron or steel hand tools may produce sparks that can be an ignition source around flammable substances. Where this hazard exists, spark-resistant tools made of non-ferrous materials shall be used.
- Electrical tools shall be identified as intrinsically safe.

4.2.17 If the task presents electrical hazards, worker must be competent and use the appropriate insulated tools to perform work that includes the risk of electrical shock. Cushioned grip handles do not protect against electrical shock.

4.2.18 The fluid used in hydraulic power tools must be an approved fire-resistant fluid and must retain its operating characteristics at the most extreme temperatures to which it will be exposed. The exception to fire-resistant fluid involves all hydraulic fluids used for the insulated sections of derrick trucks, aerial lifts, and hydraulic tools that are used on or around energized lines. This hydraulic fluid shall be of the insulating type.

4.2.19 All tools designed to accommodate guards must have the guard(s) in place when the tool is in use. Do not modify, remove, or disable any machine guards.

4.2.20 Do not allow loose clothing, long hair, loose jewelry, rings, and chains to be worn while working with power tools.

4.2.21 Make provisions to prevent tools from automatically restarting upon restoration of power. Refer to *S3AM-325-PR Lockout Tagout*.

4.3 Training

4.3.1 Instruction in the proper use, safe handling, and maintenance of tools will be provided to employees unfamiliar with the tool.

- Assess the employee's training needs as per *S3AM-003-PR1 SH&E Training* procedure.
- Refer to the applicable work instructions associated with this procedure for any additional training specifics.
- Training shall include applicable manufacturer's recommendations and guidelines.

4.3.2 Employees shall demonstrate knowledge and competency in the use, safe handling and maintenance of the applicable tool prior to operation.

4.4 Personal Protective Equipment (PPE)

4.4.1 Utilize basic PPE appropriate to the task; gloves, safety-toed boots, hard hats and safety glasses with side shields. Refer to *S3AM-208-PR1 Personal Protective Equipment*.

4.4.2 Ensure lockout devices (padlocks, multiple lock hasps, tags) are utilized as necessary. Refer to *S3AM-325-PR Lockout Tagout*.

4.4.3 Ensure PPE is appropriate to the work and use additional PPE as required (e.g. mono-goggles, hearing protection, respiratory protection, etc.).

- Dual eye protection is required to be worn by any employee undertaking or within 3 ½ feet (1 meter) of a task that produces projected particles or material.
- Head and face protection is recommended for employees working with pneumatic tools.
- Noise hazard is associated with pneumatic and many other tools. Working with noisy tools such as jackhammers requires proper, effective use of appropriate hearing protection.

4.4.4 Screens shall also be set up to protect nearby workers from being struck by flying fragments around chippers, riveting guns, staplers, or air drills.

4.4.5 Refer to the applicable work instructions associated with this procedure for any additional specialized PPE.

4.5 Inspections

4.5.1 All tools must be inspected prior to each use.

- Any tool that is defective or has missing parts must not be used.
- Every broken or defective tool must be tagged ‘out of service’ or ‘do not use’ and immediately removed from service.
- Tagged tools will be returned to the supervisor for repair or replacement.

4.5.2 All tools must be inspected to manufacture’s specifications and according to tool rests and guard adjustment tolerances. All tools will be inspected to ascertain that all safety devices are present and functioning properly. Refer to *S3AM-305-FM1 Hand & Power Tool Maintenance Inventory* and *S3AM-305-FM2 Hand & Power Tool Inspection Report*.

5.0 Records

5.1 None

6.0 Attachments

6.1 S3AM-305-ATT1 Chainsaw

6.2 S3AM-305-ATT2 Circular Saw

6.3 S3AM-305-ATT3 Cut Off Saw

6.4 S3AM-305-ATT4 Handheld Grinder

6.5 S3AM-305-ATT5 Impact Wrench

6.6 S3AM-305-ATT6 Nail Gun

6.7 S3AM-305-ATT7 Dustless Vacuum

6.8 S3AM-305-ATT8 Power Drill

6.9 S3AM-305-ATT9 Pressure Washer

6.10 S3AM-305-ATT10 Reciprocating Saw

6.11 S3AM-305-ATT11 Sander

6.12 S3AM-305-ATT12 Knives

6.13 S3AM-305-ATT13 Clearing & Grubbing Equipment

6.14 S3AM-305-ATT14 Pneumatic Tools

6.15 S3AM-305-ATT15 Manual Hand Tools

6.16 S3AM-305-ATT16 Small Engines

6.17 S3AM-305-ATT17 Electric & Battery Hand Tools

6.18 S3AM-305-FM1 Hand & Power Tool Maintenance Inventory

6.19 S3AM-305-FM2 Hand & Power Tool Inspection Report

Americas

Pressure Washer

S3AM-305-ATT9

1.0 Objective / Overview

1.1 Pressure washing can be divided into three categories based on the water pressure the equipment is capable of producing:

- Ultra high pressure jetting – greater than 30,000 psi
- High pressure washing – 5,000 to 30,000 psi
- Pressure washing – less than 5,000 psi

1.2 Generally, light duty portable pressure washing equipment and car washes produce less than 5,000 psi. High pressure washing equipment is often used for such tasks as cleaning vessels and process piping. Ultra high pressure jetting is also often employed to clean vessels and to remove coatings and scaling of production equipment. If not used correctly and safely, pressure washers can be dangerous piece of work equipment.

1.3 AECOM only allows trained, authorized personnel to operate the high pressure washers. Along with training, other safety measures include: reviewing the manufacturers instructional booklet, proper maintenance of equipment, and personal protective equipment.

2.0 Hazards

2.1 Kickback – Sudden and violent reverse movement of the gun

2.2 Flying debris

2.3 Slips and trips on wet surfaces and hoses

2.4 Noise

2.5 Manual handling

2.6 Exhaust fumes/carbon monoxide (CO) in enclosed spaces

2.7 Contact with high pressure / high temperature fluids

3.0 Safe Operating Guidelines

3.1 Review manufacturer's operating manual, *S3AM-305-PR1 Hand & Power Tools*, *S3AM-305-ATT17 Electric & Battery Hand Tools* or *S3AM-305-ATT16 Small Engines* for additional guidelines.

3.2 Ensure area is properly flagged with tags identifying work being performed and hazards. Keep all unauthorized workers out of area while job in progress.

3.3 Inspect all hoses, fittings, wands, cords and hose reel for damage or defects.

3.3.1 Equipment is complete and assembled correctly (i.e. nozzle tip correctly connected to the wand and not directly to hose).

3.3.2 Ensure trigger mechanism is functioning properly.

3.3.3 Fittings are securely attached.

3.3.4 Insulated components are in place.

3.4 Check fuel connections and hoses for signs of leaks, defects or damage.

3.5 Confirm nozzle / jets are clear by turning on water, without pump pressure.

3.6 Check pressure pump oil level before use. Hold the wand firmly with the trigger released when turning the pump on.

3.7 Recheck hoses once the system is pressurized.

3.8 Never service equipment while energized or pressurized.

3.9 Ensure other personnel are clear of area while pressure washer is pressurized. Non-operators must remain a minimum of 25 feet (7.6m) from the operator.

3.10 Do not wash at a 90 degree angle to minimize spray and flying debris.

3.11 Never point a pressure washer at yourself or others. Contact with high pressure fluid can result in serious cut or injection injuries.

3.12 Increase pressure slowly during operation to prevent hose kick-back.

3.13 Do not drive over, pull on, or kink the high pressure hose. Damage to the hose may compromise the wire braiding inside and cause the hose to burst.

3.14 Whip checks must be used for all high pressure connections.

3.15 High-pressure washing equipment should be cleaned often to avoid dirt buildup, especially around the trigger and guard area.

3.16 Always set the trigger safety lock when the gun valve is not in use.

3.17 Relieve the pressure in the system before coupling and uncoupling hoses.

3.18 Visually inspect the full length of high pressure discharge hose and inspect other high pressure fluid-handling components for abrasions or cuts, damage caused by exposure to chemicals and for damage caused by kinks in the hose.

3.19 High pressure washers shall be used to clean or decontaminate equipment, surfaces or structures only.

3.20 High pressure washers WILL NOT be used to clean or decontaminate workers or personal protective equipment while it is being worn.

3.21 Maintain a distance from the spray contact point to reduce noise exposure and risk of being struck by flying debris. Avoid overreaching and maintain a stable stance.

3.22 When shutting down a pressure washer, turn the pump off before turning the water supply off.

3.23 After turning off pressure washer, ensure all residual pressure is released from system by squeezing the trigger. Consult the operator’s manual for any other procedures specific to the equipment for shut-down.

3.24 Protect unit from freezing, when applicable.

4.0 Personal Protective Equipment

4.1 Hardhat.

4.2 Safety glasses with side shields and a face shield.

4.3 Gloves providing appropriate protection (rubber, chemical).

4.4 Hearing protection.

4.5 PVC (or equivalent) rain suit.

4.6 Safety toed boots with metatarsal protection.

Americas

Knives

S3AM-305-ATT12

1.0 Objective / Overview

1.1 Knives serve a variety of purposes at work sites, and can be a useful tool, when used safely and correctly.

1.2 Learning proper positioning and correct usafe of a knife will drastically reduce the potential of cut-related injuries.

2.0 Hazards

2.1 Improper body positioning

2.2 Improper knife selection

2.3 Defective knife

2.4 Improper knife operation (including storage)

3.0 Safe Operating Guidelines

3.1 Select the appropriate knife for the task. Consider using a rounded tip blade if the task allows.

3.2 Always be sure that knives are sharp and not dull. A dull blade will require more force to cut, increasing the likelihood injury (e.g. hand slipping, knife breaking, etc.). Replace dull blades – A knife that tears rather than cuts, generally indicates the blade is dull.

3.3 Be sure the blade is seated in the frame of the knife correctly, closed, and fastened together properly.

3.4 Always direct the cut away from yourself and others

- 3.4.1 Keep body parts away from the cut line, (e.g., fingers, leg, etc.)
- 3.4.2 Ensure that the material being cut is stabilized and not against a body part (e.g. cutting rope against your leg).
- 3.4.3 Always pull the knife, never push the knife (the blade may break, and momentum could cause the body to come into contact with broken blade).

3.5 Ensure knife blades are protected or retracted when not in use.

- 3.5.1 Never carry a knife with an exposed blade in your pocket.

3.6 Use of razor and break away utility knives is prohibited.

- 3.6.1 Purchase safety-equipped utility knives with guarding or automatically retracting blades.

3.7 When using a knife to cut thicker materials, use several passes. Increased force on the blade can cause it to stray from the intended cut path, or break the blade.

3.8 When changing blades, always handle from the non-sharp side. Cover blade with duct tape and dispose.

3.9 Use an alternate tool when possible (scissors, wire cutters, etc.).

3.10 Let a falling knife fall.

4.0 Personal Protective Equipment

4.1 Cut resistant gloves are mandatory when using knives (Kevlar, thick leather, etc.).

Americas

Pneumatic Tools

S3AM-305-ATT14

1.0 Objective / Overview

1.1 Pneumatic tools utilize air pressure to perform the tool's task.

1.2 Safe measures for use include proper training, good body mechanics and operating technique, well-maintained equipment, and protective equipment.

1.3 There are several dangers associated with the use of pneumatic tools. First and foremost is the danger of getting hit by one of the tool's attachments or by some kind of fastener the worker is using with the tool.

2.0 Hazards

2.1 Improperly secured air hoses

2.2 Noise

2.3 Flying debris

2.4 Defective tool

2.5 Improper operation

3.0 Safe Operating Guidelines

3.1 Review the manufacturer's operating manual, *S3AM-305-PR1 Hand & Power Tools*, and *S3AM-305-ATT17 Electric & Battery Hand Tools* for additional guidelines.

3.2 Never use bottled gas as a power source for pneumatic tools.

3.3 Drain water from air compressor tank and condensation from air lines.

3.3.1 Blow out the air line before connecting a tool. Hold hose firmly and blow away from yourself and others.

3.4 Pneumatic tools must be checked to see that the tools are fastened securely to the air hose to prevent them from becoming disconnected. Pneumatic tools must have the air supply controlled according to manufacturer's specifications.

3.5 Make sure that hose connections fit properly and are equipped with a mechanical means of securing the connection between tool/hose/compressor to prevent whipping in case of disconnection or failure (e.g. chains, tie wires, whip checks or equivalent retaining devices).

3.6 Safety clips or tool retainers must be in place on pneumatic impact tools to prevent accessories (e.g. chisel on a chipping hammer) or attachments from being ejected.

3.7 If an air hose is more than 1/2-inch (12.7 mm) in diameter, a safety excess flow valve must be installed at the source of the air supply to reduce pressure in case of hose failure.

3.8 In general, the same precautions should be taken with an air hose that are recommended for electric cords, as the hose is subject to the same kind of damage or accidental striking, and because it also presents tripping hazards. Avoid creating trip hazards caused by hoses laid across walkways, curled underfoot, on ladders.

3.9 Airless spray guns that atomize paints and fluids at pressures of 1,000 pounds or more per square inch (6,890 kPa) must be equipped with automatic or visible manual safety devices that will prevent pulling the trigger until the safety device is manually released.

3.10 Ensure that the compressed air supplied to the tool is clean and dry. Dust, moisture, and corrosive fumes can damage a tool. An in-line regulator filter and lubricator increases tool life.

3.11 Keep tools clean and lubricated, and maintain them according to the manufacturers' instructions.

3.12 Use only the attachments that the manufacturer recommends for the tools in use.

3.13 Use the proper hose and fittings of the correct diameter and type for the pneumatic or hydraulic application.

3.13.1 The manufacturer’s recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings must not be exceeded.

3.13.2 Use hoses specifically designed to resist abrasion, cutting, crushing and failure from continuous flexing.

3.13.3 Choose air supply hoses that have a minimum working pressure rating of 150 pounds per square inch gauge or 150 percent of the maximum pressure produced in the system, whichever is higher.

3.13.4 Check hoses regularly for cuts, bulges and abrasions. Tag and replace, if defective.

3.14 Install quick disconnects of a pressure-release type rather than a disengagement type. Attach the male end of the connector to the tool, NOT the hose.

3.15 Reduce physical fatigue by supporting heavy tools with a counter-balance wherever possible.

3.16 Do not operate the tool at a pressure above the manufacturer's rating.

3.17 Turn off the air pressure to the hose, exhaust the airliine and disconnect the tool from the air supply when not in use, before servicing or when changing power tools or attachments.

3.18 Do not carry a pneumatic tool by its hose.

3.19 Do not use compressed air for cleaning purposes unless the pressure is reduced to 30 pounds per square inch (psi) or less. This rule does not apply for concrete form, mill scale, green cutting, and similar cleaning operations. Proper respiratory, hand, eye, and ear protection must be worn.

3.20 Compressed air guns shall never be pointed toward anyone.

3.20.1 Employees shall never “dead-end” them against themselves or anyone else.

3.20.2 A chip guard shall be used when compressed air is used for cleaning.

3.20.3 Never use compressed air to blow debris or to clean dirt from clothes or body.

4.0 Personal Protective Equipment

4.1 Gloves providing appropriate protection to the task (e.g. impact, puncture, chemical, etc.)

4.2 Safety toed boots

4.3 Use hearing protection, where required.

4.4 Wear safety glasses with side shields at all times and face shield if flying debris may be encountered.

Americas

Manual Hand Tools

S3AM-305-ATT15

1.0 General

1.1 Review manufacturer's operating manual and *S3AM-305-PR1 Hand & Power Tools* for additional guidelines.

1.2 Carry tools using a heavy belt or apron and hang tools at your sides.

1.3 Never carry tools in your pockets or hanging behind your back.

2.0 Hammers

2.1 Hammers are designed according to the intended purpose. Select a hammer that is comfortable for you and that is the proper size and weight for the job. Misuse can cause the striking face to chip, possibly causing a serious injury.

2.2 Choose a hammer with a striking face diameter approximately ½ inch (1.3 centimeters) larger than the face of the tool being struck (e.g., chisels, punches, wedges, etc.).

2.3 Strike a hammer blow squarely with the striking face parallel to the surface being struck. Always avoid glancing blows and over and under strikes. (Hammers with beveled faces are less likely to chip or spall).

2.4 Look behind and above you before swinging the hammer.

2.5 Watch the object you are hitting.

2.6 Hold the hammer with your wrist straight and your hand firmly wrapped around the handle.

2.7 Do not use handles that are rough, cracked, broken, splintered, sharp-edged or loosely attached to the head. Remove from service and replace the handle if possible.

2.8 Do not use any hammer head with dents, cracks, chips, mushrooming, or excessive wear.

2.9 Do not use a hammer for any purpose for which it was not designed or intended.

2.10 Do not use one hammer to strike another hammer, other hard metal objects, stones or concrete.

2.11 Do not redress, grind, weld or reheat-treat a hammer head.

2.12 Do not strike with the side or cheek of the hammer.

3.0 Pipe Cutters, Reamers, Taps and Threaders

3.1 Replace pipe cutter wheels which are nicked or otherwise damaged.

3.2 Use a three- or four-wheeled cutter, if there is not enough space to swing the single wheel pipe cutter completely around the pipe.

3.3 Choose a cutting wheel suitable for cutting the type of pipe material required:

- 3.3.1 Thin wheel for cutting ordinary steel pipe.
- 3.3.2 Stout wheel for cutting cast iron.
- 3.3.3 Other wheels for cutting stainless steel, plastic and other materials.

3.4 Select the proper hole diameter and correct tap size to tap a hole. The hole should be sized so that the thread cut by the tap will be about 75 percent as deep as the thread on the tap.

3.5 Use a proper tap wrench (with a "T" handle) for turning a tap.

3.6 Use lubricant or machine cutting fluid with metals other than cast iron.

3.7 Do not permit chips to clog flutes (groves in the tap that allow metal chips to escape from the hole). The chips may prevent the tap from turning – this may result in the tap breaking if you continue to apply pressure.

3.8 Do not attempt to thread hardened steel. This can chip or damage the die.

3.9 Do not thread any rod or other cylindrical object that is larger in diameter than the major diameter of the die thread.

3.10 Do not use a spiral reamer on a rotating pipe. The reamer may snag and cause serious injury.

4.0 Pliers and Wire Cutters

4.1 Pliers are made in various shapes and sizes and for many uses. Use the correct pliers or wire cutters for the job.

4.2 Choose pliers or wire cutters that have a grip span of 2½ – 3½ inches (6.4 – 8.9 centimeters) to prevent palm or fingers from being pinched when the tools are closed.

4.3 Use adjustable pliers that allow for a firm grip of the work piece while maintaining a comfortable handgrip (i.e., hand grasp is not too wide).

4.4 Use tools only if they are in good condition.

4.4.1 Make sure that the cutting edges are sharp. Dull and worn-down cutting edges require many times more force for cutting.

4.4.2 Make sure that the toothed jaws are clean and sharp. Greasy or worn-down jaws can result in compromised safety. Such tools also require increased force to hold the work piece which, in turn, increases the risk of muscular fatigue and repetitive strain injuries.

4.5 Oil pliers and wire cutters regularly. A drop of oil on the hinge will make the tools easier to use.

4.6 Pull on the pliers; do not push away from you when applying pressure. If the tool slips unexpectedly, you may lose your balance or injure your hand.

4.7 Cut at right angles. Never rock the cutting tool from side to side or bend wire back and forth against the cutting edges.

4.8 Do not cut hardened wire unless the pliers or wire cutters are specifically manufactured for this purpose.

4.9 Do not expose pliers or wire cutters to excessive heat.

4.10 Do not bend stiff wire with light pliers. Needle-nose pliers can be damaged by using the tips to bend large wire. Use a sturdier tool.

4.11 Do not use pliers as a hammer.

4.12 Do not hammer on pliers or wire cutters to cut wires or bolts.

4.13 Do not extend the length of handles to gain greater leverage. Use a larger pair of pliers for gripping or a bolt cutter for cutting.

4.14 Do not use cushion grip handles for jobs requiring tools with electrically insulated handles. Cushion grips are for comfort primarily and do not protect against electric shock.

4.15 Do not use pliers on nuts and bolts; use a wrench.

5.0 Screwdrivers

5.1 Screwdrivers are made in various shapes and sizes and for many uses. Use the correct screwdriver for the job.

5.2 Choose contoured handles that fit the shank tightly, with a flange to keep the hand from slipping off the tool.

5.3 Use a slot screwdriver with a blade tip width that is the same as the width of the slotted screw head.

5.4 For cross-head screws, use the correct size and type of screwdriver; a Phillips screwdriver may slip out of a screw head designed for use with the slightly flatter-tipped Pozidriv screwdriver.

5.5 Use a vise or clamp to hold the stock if the piece is small or moves easily.

5.6 Keep the screwdriver handle clean. A greasy handle could cause an injury or damage from unexpected slippage.

5.7 If work must be carried out on “live” electrical equipment, use screwdrivers that have insulated handles designed for electrical work and a non-conducting shaft. Remember, most plastic handles are designed for grip and comfort.

5.8 Use non-magnetic tools when working near strong magnets (e.g., in some laboratories).

5.9 Use a screw-holding screwdriver (with screw-holding clips or magnetic blades) to get screws started in awkward, hard-to-reach areas. Square-tipped screwdrivers (e.g., Robertson) that hold screws with recessed square holes are also useful in such situations.

5.10 Use an offset screwdriver in close quarters where a conventional screwdriver cannot be used.

5.11 Use a screwdriver that incorporates the following features when continuous work is needed:

- 5.11.1 Use a pistol grip to provide for a straighter wrist and better leverage.
- 5.11.2 Use a "Yankee drill" mechanism (spiral ratchet screwdriver or push screwdriver) which rotates the blade when the tool is pushed forward.
- 5.11.3 Use a ratchet device to drive hard-to-move screws efficiently, or use a powered screwdriver.

5.12 File a rounded tip square making sure the edges are straight. A dull or rounded tip can slip out of the slot and cause hand injury or damage to materials.

5.13 Store screwdrivers in a rack or partitioned pouch so that the proper screwdriver can be selected quickly.

5.14 Do not lean or push on a screwdriver with any more force than necessary to keep contact with the screw. A screw properly piloted and fitted will draw itself into the right position when turned. Keep the shank directly over the screw being driven.

5.15 Do not hold the stock in one hand while using the screwdriver with the other as an injury may result if the screwdriver slips out of the slot.

5.16 Do not hammer screws that cannot be turned.

5.17 Do not grind the screwdriver tip to fit another size screw head.

5.18 Do not try to use screwdrivers on screw heads for which they are not designed (e.g., straight blade screwdrivers on Phillips, clutch head, Torx or multi-fluted spline screw heads).

5.19 Do not use defective screwdrivers (e.g. rounded or damaged edges or tips; split or broken handles; bent shafts).

5.20 Do not use a screwdriver for prying, punching, chiseling, scoring, scraping or stirring paint.

5.21 Do not use pliers on the handle of a screwdriver for extra turning power. A wrench should be used only on the square screwdriver shank designed for that purpose.

5.22 Do not expose a screwdriver blade to excessive heat. Heat can affect the temper of the metal and weaken the tool.

5.23 Do not use a screwdriver to check if an electrical circuit is live. Use a suitable meter or other circuit testing device.

5.24 Do not carry screwdrivers in clothing pockets.

6.0 Snips

6.1 Wear safety glasses and protective gloves when working with snips. Small pieces of metal may go flying in the air and cut edges of metal are sharp.

6.2 Snips are made in various shapes and sizes for various tasks. The handle can be like those on scissors with finger and thumb holes or like plier handles. Models are available for cutting in straight lines and in curves to the left or right.

6.3 Select the right size and type of snips for the job; check the manufacturer's specifications about the intended use of the snips (e.g., type of cut - straight, wide curve, tight curve, right or left, and maximum thickness and kind of metal or other material that can be cut).

6.3.1 Universal snips can cut in both straight and wide curves.

6.3.2 Straight snips and duckbill snips (flat blade, "perpendicular" to the handle, with pointed tips) are generally designed to cut in straight lines; some duckbill snips are designed for cutting curved lines.

6.3.3 Hawk's bill snips (with crescent-shaped jaws) are used for cutting tight circles.

6.3.4 Aviation snips have compound leverage that reduces the effort required for cutting.

6.3.5 Offset snips have jaws that are set at an angle from the handle.

6.4 Use only snips that are sharp and in good condition.

6.5 Use snips for cutting soft metal only. Hard or hardened metal should be cut with tools designed for that purpose.

6.6 Use ordinary hand pressure for cutting. If extra force is needed, use a larger tool.

6.7 Cut so that the waste is on the right if you are right-handed or on the left if you are left-handed.

6.8 Avoid springing the blades. This results from trying to cut metal that is too thick or heavy for the snips you are using.

6.9 Keep the nut and the pivot bolt properly adjusted at all times.

6.10 Oil the pivot bolt on the snips occasionally.

6.11 Do not try to cut sharp curves with straight cut snips.

6.12 Do not cut sheet metal thicker than the manufacturer's recommended upper limit (e.g., cuts up to 16-gauge cold, rolled steel or 18-gauge stainless steel). Do not extend the length of handles to gain greater leverage.

6.13 Do not hammer or use your foot to exert extra pressure on the cutting edges.

6.14 Do not use cushion grip handles for tasks requiring insulated handles. They are for comfort primarily and not for protection against electric shocks.

6.15 Do not attempt to re-sharpen snips in a sharpening device designed for scissors, garden tools, or cutlery.

7.0 Wrenches

7.1 Use the correct wrench for the job - pipe wrenches for pipes and plumbing fittings, and general-use wrenches for nuts and bolts.

7.1.1 Do not use pipe wrenches on nuts and bolts.

7.1.2 Use a box or socket wrench with a straight handle, rather than an off-set handle, when possible.

7.1.3 Do not use a conventional adjustable wrench for turning a tap – it will cause uneven pressure on the tap that may cause it to break.

7.1.4 Do not use a makeshift wrench.

7.2 Inspect pipe wrenches periodically for worn or unsafe parts and replace them:

7.2.1 Wrenches must not be used when jaws are sprung to the point that slippage occurs.

7.2.2 Ensure that the teeth of a pipe wrench are sharp, clean and free of oil and debris.

7.2.3 Do not use worn adjustable wrenches. Inspect the threads, knurl, jaw and pin for wear.

7.2.4 Discard any bent or damaged wrenches (e.g., open-ended wrenches with spread jaws or box wrenches with broken or damaged points).

7.3 Select the correct jaw size to avoid slippage.

7.3.1 Ensure that the jaw of an open-ended wrench is in full contact (fully seated, “flat,” not tilted) with the nut or bolt before applying pressure.

7.3.2 Face a pipe wrench or adjustable wrench “forward,” adjust tightly and turn the wrench so pressure is against the permanent or fixed jaw. Do not pull on a wrench that is loosely adjusted.

7.3.3 Adjust the pipe wrench grip to maintain a gap between the back of the hook jaw and the pipe. This concentrates the pressure at the jaw teeth, producing the maximum gripping force. It also aids the ratcheting action.

7.3.4 Do not insert a shim in a wrench for better fit.

7.3.5 Before applying pressure, ensure that the jaws have a good bite.

7.3.6 Make sure adjustable wrenches do not "slide" open during use.

7.3.7 Do not increase the leverage by adding sleeved additions (e.g., a pipe) to increase tool handle length. Use a larger wrench as necessary.

7.4 Ensure that the pipe or fitting is clean to prevent unexpected slippage and possible injury.

7.5 Maintain a proper stance with feet firmly placed to maintain balance.

7.5.1 Position the body in a way that will prevent loss of balance and injury if the wrench slips or something (e.g., a bolt) suddenly breaks.

7.5.2 Pull, rather than push on the wrench handle as body balance is more likely to be maintained if the wrench slips.

7.5.3 Pull using a slow, steady pull; do not use fast, jerky movements.

7.6 Apply a small amount of pressure to a ratchet wrench initially to ensure that the ratchet wheel (or gear) is engaged with the pawl (a catch fitting in the gear) for the direction you are applying pressure.

7.7 Support the head of the ratchet wrench when socket extensions are used.

7.8 Stand aside when work is done with wrenches overhead.

7.9 Do not use a wrench on moving machinery.

7.10 Do not use the wrong tools for the job. For example: Do not use pliers instead of a wrench or a wrench as a hammer. Do not use pipe wrenches for lifting or bending pipes.

7.11 Do not strike a wrench (except a "strike face" wrench) with a hammer or similar object to gain more force.

7.12 Do not expose a wrench to excessive heat (like from a blow torch) that could affect the temper of the metal and ruin the tool.

8.0 Files/Rasps

8.1 Do not use a file as a pry bar, hammer, screwdriver, or chisel.

8.2 When using a file or a rasp, grasp the handle in one hand and the toe of the file in the other.

8.3 Do not hammer on a file.

9.0 Chisels and Punches

9.1 Use the right size and type of chisel (metal or wood) or punch (drift pin, centre, pin) for the job.

9.2 Use tools only if they are good condition (i.e., cutting edges are sharp, struck head is not mushroomed or chipped).

9.2.1 Do not use chisels or punches if the cutting edge is dull, mushroomed or chipped, or if the point of a punch is slanted or damaged.

9.2.2 Choose smooth, rectangular handles that have no sharp edges and are attached firmly to the chisel. Replace broken or splintered handles.

9.2.3 Redress striking tools with burred or mushroomed heads.

- Redress the point or cutting edge to its original shape.
- Do not use a grinder to redress heat-treated tools. Use a whetstone.
- Grind to a slightly convex cutting edge.
- The point angle of the chisel should be 70° for hard metals, 60° for soft.
- Do not apply too much pressure to the head when grinding a chisel. The heat generated can remove the temper. Immerse the chisel in cold water periodically when grinding.

9.2.4 Replace any chisel or punch that is bent, cracked, shows excessive wear or cannot successfully be redressed.

9.3 Check stock thoroughly for knots, staples, nails, screws, or other foreign objects before chiseling or punching.

9.4 Hold the chisel, for shearing and chipping, at an angle which permits the bevel of the cutting edge to lie flat against the shearing plane.

9.5 Use the appropriate type and size of hammer for the chisel or punch, such as:

9.5.1 A wooden or plastic mallet with a large striking face on chisels.

9.5.2 Heavy-duty or framing chisels made of a solid or molded handle can be struck with a steel hammer.

9.5.3 Ball-peen hammers are generally chosen for use with punches.

9.5.4 Refer to the ‘Hammers’ section of this document for further guidance.

9.6 Chip or cut away from the body. Keep hands and body behind the cutting edge.

9.7 Make finishing or paring cuts with hand pressure alone.

9.8 Provide hand protection if possible:

9.8.1 Use a sponge rubber shield, punch or chisel holder.

9.8.2 Clamp small work pieces in a vise and chip towards the stationary jaw when working with a chisel.

9.8.3 Do not allow bull point chisels to be hand-held by one employee and struck by another. Use tongs or a chisel holder to guide the chisel so that the holder's hand will not be injured.

9.9 Do not use cold chisels for cutting or splitting stone or concrete.

9.10 Do not use a drift pin punch (also called an aligning punch) as a pin punch intended for driving, removing, or loosening pins, keys, and rivets.

9.11 Do not use a wood chisel on metal.

9.12 Do not use a wood chisel as a pry or a wedge.

9.13 Place chisels safely within the plastic protective caps to cover cutting edges when not in use.

9.14 Store chisels in a “storage roll,” a cloth or plastic bag with slots for each chisel, and keep them in a drawer or tray.

10.0 Hacksaws

10.1 Select correct blade for material being cut.

10.2 Keep saw blades clean and lightly oiled using light machine oil on the blade to keep it from overheating and breaking.

10.3 Secure blade with the teeth pointing forward. Tighten the nut until the blade is under tension.

10.4 Keep blade rigid, and frame properly aligned.

10.5 Cut using steady strokes, directed away from you.

10.6 Use entire length of blade in each cutting stroke.

10.7 Cut harder materials more slowly than soft materials.

10.8 Clamp thin, flat pieces requiring edge cutting.

10.9 Do not apply too much pressure on the blade as the blade may break.

10.10 Do not twist when applying pressure.

10.11 Do not use when the blade becomes loose in the frame.

11.0 Vises

11.1 When clamping a long work piece in a vise, support the far end of the work piece by using an adjustable pipe stand, saw horse or box.

11.2 Position the work piece in the vise so that the entire face of the jaw supports the work piece.

11.3 Do not use a vise that has worn or broken jaw inserts, or has cracks or fractures in the body of the vise.

11.4 Do not slip a pipe over the handle of a vise to gain extra leverage.

12.0 Clamps

12.1 Do not use a C-clamp for hoisting materials.

12.2 Do not use a C-clamp as a permanent fastening device.

13.0 Pry Bars

13.1 Establish balance and stable footing when using a bar for prying.

13.2 Pry bars must be appropriate to the task to prevent slipping or tool breakage.

14.0 Jacks

14.1 All jacks—including lever and ratchet jacks, screw jacks, and hydraulic jacks—must have a stop indicator, and the stop limit must not be exceeded.

14.2 The manufacturer’s load limit must be permanently marked in a prominent place on the jack, and the load limit must not be exceeded.

14.3 A jack should never be used to support a lifted load. Once the load has been lifted, it must immediately be blocked up. Put a block under the base of the jack when the foundation is not firm, and place a block between the jack cap and load if the cap might slip.

14.4 To set up a jack, make certain of the following:

14.4.1 The base of the jack rests on a firm, level surface;

14.4.2 The jack is correctly centered;

14.4.3 The jack head bears against a level surface; and

14.4.4 The lift force is applied evenly.

14.5 Clear all tools, equipment and any other obstructions from under the load before lowering the jack.

14.6 Proper maintenance of jacks is essential for safety. All jacks must be lubricated regularly. In addition, each jack must be inspected according to the following schedule:

14.6.1 For jacks used continuously or intermittently at one site—inspected at least once every 6 months;

14.6.2 For jacks sent out of the shop for special work—inspected when sent out and inspected when returned; and

14.6.3 For jacks subjected to abnormal loads or shock—inspected before use and immediately thereafter.

Americas

Small Engines

S3AM-305-ATT16

1.0 Objective / Overview

1.1 Operate small engine machines (liquid fuel tools), such as push mowers, weed trimmers, pumps and leaf blowers, in a safe manner.

1.2 Workers must be trained and competent in the safe operation and maintenance of the tool.

2.0 Potential Hazards

2.1 Flying debris

2.2 Noise

2.3 Moving and sharp parts

2.4 Hot surfaces

3.0 Safe Operating Guidelines

3.1 Review *S3AM-305-PR1 Hand & Power Tools* and the manufacturer's operating manual for further guidance.

3.2 Do not wear loose or baggy clothing around tools with rotating parts.

3.3 Never run the engine indoors, in poorly ventilated areas, or in a location where the exhaust could be drawn into a building through an opening.

- 3.3.1 When an engine must be operated in an enclosed space, effective ventilation and/or proper respirators such as atmosphere-supplying respirators must be utilized to avoid breathing carbon monoxide.

3.4 Never store engine with fuel in fuel tank inside a building with potential sources of ignition such as hot water and space heaters, clothes dryers, electric motors, etc.

3.5 Ensure the fuel cap is in place. Never start or operate the engine with the fuel fill cap removed.

3.6 Refuelling:

- 3.6.1 Never remove fuel cap or add fuel when engine is running.
- 3.6.2 Shut down the engine and allow it to cool prior to refueling to prevent accidental ignition of hazardous vapors.
- 3.6.3 Never pour gasoline on hot surfaces.
- 3.6.4 Fill in well-ventilated area.
- 3.6.5 Do not re-fuel around an open flame or while smoking.

3.7 Use only properly labelled, American National Standards Institute/Canadian Standards Association-approved red gasoline containers to store and dispense fuel.

3.8 The worker must be careful to handle, transport, and store gas or fuel only in approved flammable liquid containers, according to proper procedures for flammable liquids.

3.9 Noise hazards associated with gasoline engines must be mitigated by the use of proper hearing protection. Ear plugs, ear muffs or a combination of the two must be used to protect workers from excessive noise levels.

3.10 Appropriate fire extinguishers must also be available in the area.

3.11 Do not pour fuel from engine or siphon fuel by mouth.

3.12 Never leave the engine unattended while it is running.

3.13 Never operate the engine with an unguarded engine shaft.

3.14 Do not modify the engine or tamper with the factory setting of the engine governor.

3.15 Never operate the engine without a muffler guard in place and avoid touching hot areas of the engine.

3.16 Keep all flammable materials away from the muffler and the rest of the engine; do not idle or park the engine in dry grass or ground cover.

3.17 When working on the equipment, avoid accidental starts by removing the ignition key, turn off all engine switches, disconnect the battery and disconnect the spark plug, keeping it away from metal part.

4.0 Personal Protective Equipment

4.1 Always wear safety glasses with shields. Add face shield if potential for flying debris.

4.2 Gloves providing the appropriate protection (e.g. impact, abrasion, chemical, etc.).

4.3 Wear proper apparel for the task. Long hair, loose or baggy clothing, ties, or jewellery can become caught in moving parts. Long pants and long sleeve shirt.

4.4 Safety toe work boots.

4.5 Hearing protection (earmuffs or earplugs).

Americas

Electric & Battery Hand Tools

S3AM-305-ATT17

1.0 Objective / Overview

1.1 Electric and battery hand tools, also known as power tools, allow the user to perform their task more easily by providing more torque, speed, etc.

2.0 Hazards

2.1 Electricity

3.0 Safe Work Practices (General)

3.1 Review manufacturer's operating manual and *S3AM-305-PR1 Hand & Power Tools* for additional guidelines.

3.2 All electrical tools and equipment must be operated in accordance with the requirements of *S3AM-302-PR1 Electrical Safety*.

3.3 Keep all people not involved with the work at a safe distance from the work area.

3.4 Inspect power tools prior to each use.

- 3.4.1 Ensure that the power tool has the correct guard, shield or other attachment that the manufacturer recommends.
- 3.4.2 Ensure that the tools are properly grounded using a three-prong plug (no loose or faulty prongs), are double insulated (and are labeled as such), or are powered by a low-voltage isolation transformer; this will protect users from an electrical shock.
- 3.4.3 Check the handle and body casing of the tool for cracks or other damage.
- 3.4.4 If the tool has auxiliary or double handles, check to see that they installed securely.
- 3.4.5 Inspect cords for defects: check the plug and power cord for cracking, fraying, and other signs of wear or faults in the cord insulation.
- 3.4.6 Ensure power tool switches and triggers are fully functional.
- 3.4.7 If equipped with a trigger-lock, ensure it is disabled.
- 3.4.8 If a power tool is defective, remove it from service, and tag it clearly "Out of service for repair" or "Do Not Use". Replace damaged equipment immediately – do not use defective tools "temporarily." DO NOT ATTEMPT FIELD REPAIRS.

3.5 Maintain tools with care; keep them sharp and clean for best performance.

3.6 Follow instructions in the user's manual for lubricating and changing accessories.

3.7 Do not over-reach. Be sure to keep good footing and maintain good balance when operating power tools.

3.8 If they are available, choose tools with double handles to permit easier holding and better manipulation of the tool.

3.9 Do not brush away sawdust, shavings or turnings while the power tool is running. Never use compressed air for cleaning surfaces or removing sawdust, metal turnings, etc.

3.10 Do not operate power tools that are not specified as intrinsically safe in an area containing explosive vapors or gases.

3.11 Do not clean tools with flammable or toxic solvents.

3.12 Do not surprise or touch anyone who is operating a power tool. Startling an operator could result in injury or

property damage.

3.13 Hand-held power tools must be equipped with a constant-pressure switch or control that shuts off the power when pressure is released.

3.13.1 Powered hand tools shall not be capable of being locked in the ON position. Trigger locks are not permitted.

3.13.2 All power tools should be ordered without trigger locks; if a tool is found with a trigger lock intact it must be disabled.

3.14 Avoid accidental starting. Do not hold fingers on the switch button, and ensure it is in the OFF position while plugging the tool in or while carrying an energized (plugged-in, battery in place) tool.

3.15 Do not leave a running tool unattended and ensure the power tool will not re-energize when not in use and when servicing, cleaning, making adjustments, applying flammable solutions or changing accessories:

3.15.1 Ensure it has stopped running completely.

3.15.2 Ensure the trigger or switch is OFF.

3.15.3 Ensure the power tool is disconnected from the power supply (unplugged or battery removed).

3.16 Operate power tools within their design limitations.

3.17 Store power tools, batteries and electrical cords in a clean, dry area off the ground when not in use.

3.18 Do not use power tools in damp or wet locations unless they are approved for that purpose.

3.19 Keep work areas well lighted when operating power tools.

3.20 Equipment must have proper guards or shields and they must remain in place to protect the operator and others from the following:

3.20.1 Point of operation.

3.20.2 In-running nip points.

3.20.3 Rotating parts.

3.20.4 Flying chips and sparks.

3.21 If a guard is removed to clean or repair parts, replace it before testing the equipment and returning the machine to service

3.22 If, due to damage or deterioration, the original guard provided on a piece of equipment cannot be put in place, the tool must be removed from service.

3.23 Do not modify, remove, or disable any machine guards.

3.24 Remove any wrenches and adjusting tools before turning on a tool.

3.25 Use clamps, a vice or other devices to hold and support the piece being worked on, when practical to do so. This will allow you to use both hands for better control of the tool and will help prevent injuries if a tool jams or binds in a work piece.

4.0 Battery Powered Tools

4.1 Use only the type of battery specified by the tool manufacturer for the battery-powered tool to be used.

4.2 Recharge a battery or battery-powered tool only with a charger that specified for the battery.

4.3 Store a battery pack safely so that no metal parts, nails, screws, wrenches and so on can come in contact with the battery terminals; this could result in shorting out the battery and possibly cause sparks, fires or burns.

5.0 Safe Work Practice (Electric)

5.1 During use, keep power cords clear of tools and the path that the tool will take.

5.2 Employees' hands shall not be wet when plugging and unplugging cord and plug connected equipment and extension cords.

5.3 Portable electric equipment shall be disconnected when not in use, before servicing, and when changing accessories such as blades, bits, and cutters.

5.4 Portable electric equipment and extension cords used in potentially wet locations shall be approved for use in those locations by a nationally recognized testing laboratory, inspection agency, or other organization concerned with product evaluation (e.g., F.M., UL, etc.).

5.5 The outlet box for portable extension cords for outdoor use shall be weatherproof and shall be maintained in good condition.

5.6 Maintain electrical cords and connections in good working order:

5.6.1 Cords and connection must be American National Standards Institute/Canadian Standards Association approved and bear a standardized certification marking (e.g., CSA, ANSI, UL, CE etc.).

5.6.2 To prevent overheating, use only approved extension cords that have the proper wire size for the length of cord and power requirements of the electric tool to be used.

- Do not connect or splice extension cords together to make a longer connection.
- For outdoor work, use outdoor extension cords marked “W-A” or “W.”

5.6.3 Eliminate octopus connections: if more than one receptacle plug is needed, use a power bar or power distribution strip that has an integral power cord and a built-in overcurrent protection.

5.6.4 Portable electrical equipment shall not be carried by the cord, nor raised or lowered by the cord.

5.6.5 Electrical cords shall not be removed from a receptacle by pulling on the cord line.

5.6.6 Cords shall not be placed across walkways unless appropriate cord and worker protection is in place to prevent damage to the cord and worker tripping hazards (e.g. cable protectors, cords suspended over walkway, etc.).

5.6.7 Do not walk on or allow vehicles or other moving equipment to pass over unprotected power cords. Cords should be put in conduits or protected by placing planks on each side of them.

5.6.8 A cord should not be pulled or dragged over nails, hooks, or other sharp objects that may cause cuts in the insulation.

5.6.9 Keep cords away from heat, oil, sharp edges and moving parts.

5.6.10 Never use extension cords as permanent wiring as they are for temporary use only. Do not run behind bookshelves, or furniture if the cord cannot be monitored for severe bending or damage.

5.6.11 Inspect cords frequently for such damage such as fraying, kinks, cuts, and cracked or broken outer jackets. Any cord that exhibits damage or feels more than comfortably warm to the touch shall be removed from service, tagged “Do Not Use’ and checked by an electrician.

5.6.12 Do not tie power cords in knots. Knots can cause short circuits and shocks. Loop the cords or use a twist lock plug.

5.7 Electrical shock associated with power tool use can cause heart failure and burns, as well as injury from falls. Under certain conditions, even a small amount of electric current can result in fibrillation of the heart and death.

5.7.1 Verify that the power source is the same voltage and current as indicated on the nameplate of the tool. Using a higher voltage can cause serious injury to the operator as well as burn out the tool.

5.7.2 All electrical connections for these tools must be suitable for the type of tool and the working

conditions (wet, dusty, flammable vapors).

5.7.3 To protect the worker from shock and burns, electric tools must have a three-wire cord with a ground and be plugged into a grounded receptacle, be double insulated, or be powered by a low-voltage isolation transformer.

5.7.4 All outdoor receptacles must be protected by means of a ground fault circuit interrupter (GFCI or GFI) available in portable or fixed models. Do not use any electric power tools outdoors in a receptacle that is not properly protected.

5.7.5 Three-wire cords contain two current-carrying conductors and a grounding conductor. Any time an adapter is used to accommodate a two-hole receptacle, the adapter wire must be attached to a known ground.

5.7.6 The third prong must never be removed from the plug.

5.7.7 Double-insulated tools are available that provide protection against electrical shock without third-wire grounding. On double-insulated tools, an internal layer of protective insulation completely isolates the external housing of the tool.

5.7.8 Avoid body contact with grounded surfaces like refrigerators, pipes and radiators when using electric powered tools; this will reduce the likelihood of shock if the operator's body is grounded.

5.7.9 Report all shocks and/or sparks from electrical tools, no matter how minor. The tool in question should be tagged out and not be used until it has been checked for ground fault.

5.8 Only authorized persons are permitted to activate, de-activate or lockout electrical equipment.

5.9 Where there is or may be a danger to a worker, from the inadvertent operation of electrical equipment, then that equipment must be locked out and tagged prior to commencing work. Refer to *S3AM-325-PR1 Lockout Tagout*.

5.9.1 Switch off all appropriate devices (MCC, Distribution Panel, Disconnect).

- Stand to one side when engaging or disengaging an electrical circuit breaker to avoid electrical flash backs Lock and tag Electrical Supply devices in the “OFF” position.

5.9.2 Test to be sure the equipment cannot be operated at the STOP-START switch.

5.9.3 Test to be sure electrical equipment is de-energized.

5.9.4 After completion of task, remove padlocks and destroy tags.

6.0 Personal Protective Equipment (Level D PPE)

6.1 Wear proper apparel for the task. Long hair, loose or baggy clothing, ties, or jewellery can become caught in moving parts.

6.2 Use gloves with protection appropriate to the task (e.g. impact, abrasion, puncture, etc.).

6.3 Safety toed boots.

6.4 Use hearing protection as necessary.

6.5 Kickback aprons as necessary.

6.6 Wear safety glasses with side shields at all times (or safety goggles) and face shield if flying debris may be encountered.

7.0 Belt Sanders

7.1 Refer to *S3AM-305-ATT11 Sanders.*

8.0 Drills

8.1 Refer to *S3AM-305-ATT8 Power Drill*.

9.0 Planers and Joiners

9.1 Use blades of the same weight and set at the same height.

9.2 Ensure that the blade-locking screws are tight.

9.3 Guard planers and joiners to prevent contact with the blades throughout the full length of the cutting area.

9.4 Support the material (stock) in a comfortable position that will allow the job to be done safely and accurately.

9.5 Check stock thoroughly for staples, nails, screws, or other foreign objects before using a planer.

9.6 Start a cut with the infeed table (front shoe) resting firmly on the stock and with the cutter head slightly behind the edge of the stock.

9.7 Use two hands to operate a planer - one hand on the trigger switch and the other on a front handle.

9.8 Do not put fingers or any object in a deflector to clean out chips while a planer is running.

9.9 Disconnect the power supply when stopping to dump out chips.

9.10 Do not set a planer down until blades have stopped turning.

9.11 Keep all cords clear of cutting area.

10.0 Routers

10.1 Ensure that the bit is securely mounted in the chuck and the base is tight.

10.2 Put the base of the router on the work, template or guide. Make sure that the bit can rotate freely before switching on the motor.

10.3 Secure stock. Never hold or have another individual hold the material. Sudden torque or kickback from the router can cause damage and injury.

10.4 Before using a router, check stock thoroughly for staples, nails, screws or other foreign objects.

10.5 Keep all cords clear of cutting area.

10.6 Always hold both hands on router handles, until a motor has stopped. Do not set the router down until the exposed router bit has stopped turning.

10.7 When inside routing, start the motor with the bit above the stock. When the router reaches full power, lower the bit to two times the required depth.

10.8 When routing outside edges, guide the router counter clockwise around the work.

10.9 When routing bevels, moldings and other edge work, make sure the router bit is in contact with the stock to the left of a starting point and is pointed in the correct cutting direction.

10.10 Feed the router bit into the material at a firm, controlled speed.

10.11 Softwood may enable fast router cutting speed. With hardwood, knotty and twisted wood, or with larger bits, cutting may be very slow.

10.12 The sound of the motor can indicate safe cutting speeds. When the router is fed into the material too slowly, the motor makes a high-pitched whine. When the router is pushed too hard, the motor makes a low growling noise.

10.13 When the type of wood or size of the bit requires going slow, make two or more passes to prevent the router from burning out or kicking back.

10.14 To decide the depth of cut and how many passes to make, test the router on scrap lumber similar to the work.

11.0 Circular Saws

11.1 Refer to *S3AM-305-ATT2 Circular Saw*.

12.0 Other Saws

12.1 Use lubricants when cutting metals.

12.2 Keep all cords clear of cutting area.

12.3 Cut green or wet material slowly and with caution. Check all material being cut for nails, hard knots, etc.

12.4 Make sure guards are installed and are working properly.

12.4.1 Table saws must be fitted with blade guards and a splitter to prevent the work from squeezing the blade and kicking back on the operator.

- Exposed parts of the saw blade under the table must be properly guarded.
- All swing cutoff and radial saws that are drawn across a table with limit stops to prevent the saw from traveling beyond the edge of the table

12.4.2 Ensure band saw blades are fully enclosed except at the point of operation.

12.4.3 Ensure swing cut-off saws have a guard completely covering the upper half of the saw.

12.5 Remember sabre saws cut on the upstroke.

12.6 Position the saw beside the material before cutting and avoid entering the cut with a moving blade.

12.7 Secure and support stock as close as possible to the cutting line to avoid vibration.

12.7.1 Hold the material being cut firmly against a back guide or fence and cut with a single, steady pass.

12.7.2 Use a push stick or guide when cutting operation requires the hands of the operator to come close to the blade.

12.7.3 When cutting long stock, provide extension tables and a helper to assist the operator.

12.7.4 Keep the base or shoe of the saw in firm contact with the stock being cut.

12.7.5 Automatic feed devices should be used whenever feasible.

12.8 Select the correct blade for the material being cut and allow it to cut steadily. Do not force it. Clean and sharp blades operate best.

12.9 Set the blade to go no further than 1/8 to 1/4 inch deeper than the material being cut.

12.10 Do not start cutting until the saw reaches its full power.

12.11 Do not force a saw along or around a curve. Allow the machine to turn with ease.

12.12 Do not insert a blade into or withdraw a blade from a cut or lead hole while the blade is moving.

12.13 Do not put down a saw until the motor has stopped.

12.14 Do not reach under or around the stock being cut.

12.15 Maintain control of the saw always. Avoid cutting above shoulder height.

12.16 External Cuts

12.16.1 Make sure that the blade is not in contact with the material or the saw will stall when the motor starts.

12.16.2 Hold the saw firmly down against the material and switch the saw on.

12.16.3 Feed the blade slowly into the stock, maintaining an even forward pressure.

12.17 Internal Cuts

12.17.1 Drill a lead hole slightly larger than the saw blade. With the saw switched off, insert the blade in the hole until the shoe rests firmly on the stock.

12.17.2 Do not let the blade touch the stock until the saw has been switched on.

Americas

Hand & Power Tool Maintenance Inventory

S3AM-305-FM1

EQUIPMENT (*MAKE, MODEL, SERIAL #*)	EQUIPMENT OWNER	EQUIPMENT STATUS (*ON HIRE, ACTIVE, DECOMMISSIONED*)	FREQUENCY OF SERVICE	SERVICE TYPE	MANUFACTURER'S STANDARDS	INDUSTRY STANDARDS	LEGISLATED REQUIREMENTS	LOCATION OF EQUIPMENT

Americas

Hand & Power Tool Inspection Report

S3AM-305-FM2

TOOL	DATE	INSPECTED BY	RESULTS	ACTION REQUIRED	ACTION COMPLETED (DATE)

Americas

Heavy Equipment

S3AM-309-PR1

1.0 Purpose and Scope

1.1 Outline the safe working requirements for working with and near heavy equipment and heavy equipment operation.

1.2 Military related vehicles and equipment (e.g. tanks) are not covered under this standard.

1.3 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

2.1 **Heavy equipment** –All excavating equipment (e.g. scrapers, loaders, crawler or wheel tractors, excavators, backhoes, bulldozers, graders, agricultural and industrial tractors, etc.), cranes, lift trucks, drills, etc. This may include off-highway trucks (e.g. dump truck, heavy haul truck, etc.). For requirements related to crew trucks refer to *S3AM-005-PR1 Driving*.

2.2 **Operator** – Any person who operates the controls while the heavy equipment is in motion or the engine is running.

2.3 **Ground personnel/workers** – Personnel performing work on the ground around heavy equipment (note: operators are considered ground personnel when outside of the equipment cab).

3.0 References

3.1 S3AM-005-PR1 Driving

3.2 S3AM-202-PR1 Competent Person Designation

3.3 S3AM-213-PR1 Subcontractor Management

3.4 S3AM-303-PR1 Excavation

3.5 S3AM-322-PR1 Overhead Lines

3.6 S3AM-325-PR1 Lockout Tagout

3.7 S3AM-331-PR1 Underground Utilities & Subsurface Installation Clearance

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Managers / Supervisors**

- Responsible for confirming all equipment is in good working order and all equipment operators are verified as qualified on the piece of machinery they are assigned.
- As applicable, review as-built drawings.
- Maintain operation manuals at the site for each piece of equipment that is present on the site and in use.
- Maintain a list of operators for the project, and the specific equipment that they are authorized to operate.
- Prohibit equipment from being operated by any personnel who have not been specifically authorized to operate it.

- Confirm an equipment maintenance inventory is maintained, schedules adhered to and appropriate inspections of equipment are conducted.
- Confirm subcontractors are properly pre-qualified in accordance with *S3AM-213-PR1 Subcontractor Management.*
- Require that subcontractor employees follow established safety procedures in operation, inspection, and maintenance of vehicles and equipment.
- Inform AECOM and subcontractor machinery operators about applicable local regulations restricting the consecutive minutes of engine idling time allowed.
- Confirm subcontractor machinery and mechanized equipment is approved for use in accordance with the requirements of *S3AM-309-FM1 Approval of Machinery & Mechanized Equipment*.
- Confirm that all rented equipment bears any required current certification marks and arrives in proper working order with the manufacturer's operating manual before acceptance from the supplier.
- Confirm that AECOM and subcontractor machinery and mechanized equipment is certified, as applicable, in accordance with manufacturer specifications and/or regulatory requirements.
- Visually observe the subcontractors' vehicles and equipment, for any unsafe conditions or practices. Equipment or operation not in compliance with applicable safety standards is prohibited.

4.1.2 **Employees / Ground Personnel**

- Confirm that all rented equipment arrives in proper working order with the manufacturer's operating manual before acceptance from the supplier.
- Ground personnel when working in the vicinity of heavy equipment shall have received training, and comply with the applicable rules of engagement.

4.1.3 **Operators (of heavy equipment)**

- Operate the equipment safely, maintain full control of the equipment, and comply with manufacturer's operation manual and the laws governing the operation of the equipment.
- Inspect equipment and immediately report defects and conditions affecting the safe operation of the equipment to the appropriate Supervisor.
- Trainees may operate equipment in accordance with jurisdictional requirements and under the direct supervision of a trainer.

4.2 Communication

4.2.1 Communication between site Managers / Supervisors, heavy equipment Operators, and site Employees / Ground Personnel is a key method of preventing serious injury or death during heavy equipment operations.

4.2.2 Managers shall confirm the Industrial site or project specific SH&E Plan is developed and communicated to all affected and involved employees. Refer to *S3AM-209-PR1 Risk Assessment & Management*.

4.2.3 Task Hazard Assessments and Daily Tailgate meetings shall be conducted in accordance with *S3AM-209-PR1 Risk Assessment & Management.*

4.2.4 Concerning worksites in which other employers control concurrent operations and SH&E issues related to the worksite, the manager shall coordinate with those conducting concurrent operations to confirm appropriate control measures are in place to protect employees from the hazards associated with activities to be performed.

- Coordination shall occur prior to work commencing, periodically thereafter, and as necessary given changes in scope and/or working conditions.
- Affected employees (including managers and supervisors) shall seek to participate in all site SH&E meetings related to concurrent operations.

4.2.5 The following points outline the communication requirements during heavy equipment operations:

- Site Supervisors/t Managers shall confirm that all operators are notified/informed of when, where, and how many ground personnel will be working on site.
- Site Supervisors/ Managers shall inform all ground personnel before changes are made in the locations of designated work areas.
- Prior to work initiating on site, the Site Supervisor/ Manager is to confirm all operators and ground personnel are trained on the hand signals that will be used to communicate between operators and ground personnel.
- Ground Personnel working around heavy equipment operations are to maintain eye contact with operators to the greatest extent possible (always face equipment). Never approach equipment from a blind spot or angle.
- All heavy equipment whose backup view can be obstructed shall be equipped with reverse warning devices (e.g., backup alarms) that can be significantly heard over equipment and other background noise. Reverse signaling lights shall be in working order.
- When feasible, two-way radios shall be used to verify the location of nearby ground personnel.
- When an operator cannot adequately survey the working or traveling zone, a signal person shall use a standard set of hand signals to provide directions. Flags or other high visibility devices may be used to highlight these signals.

4.3 Ground Personnel

4.3.1 Ground clearance around heavy equipment may significantly reduce hazards posed during heavy equipment operations.

4.3.2 The following points outline the clearance requirements during heavy equipment operations:

- Ground Personnel shall always yield to heavy equipment.
- Ground Personnel shall maintain a suitable “buffer” area of clearance from all active heavy equipment.
- A task hazard assessment that identifies any special precautions shall be completed and communicated to all AECOM personnel associated with or affected by the activity.
- Site Supervisors/ Managers shall designate areas of heavy equipment operation and confirm that all ground personnel are aware of designated areas.
    - Designated areas shall include work zone boundaries and travel routes for heavy equipment.
    - Travel routes shall be set up to reduce crossing of heavy equipment paths and to keep heavy equipment away from ground personnel.
    - Work zone boundaries shall consider line of fire hazards related to the equipment and associated activities. Refer also to *S3AM-309-ATT2 Operator Line of Sight.*
    - If working near heavy equipment, Ground Personnel shall stay clear of loads to be lifted or suspended loads, and out of the travel and swing areas (excavators, all-terrain forklifts, hoists, etc.) of all heavy equipment.
    - During winch use, all swampers or other personnel will remain outside the “whip area” of the winch line or tow cable.

- At a minimum, employees shall maintain a distance of at least two pile lengths from where piles are being cut and dropped, other than in situations where cut piles are being guided to the ground utilizing mechanical means (e.g., pile driver and shackle) to control the direction and speed of fall of the cut pile.

- When feasible, Site Supervisors/ Managers shall set up physical barriers (e.g., caution tape, orange cones, concrete jersey barriers) around designated areas and confirm that unauthorized ground personnel do not enter such areas.
- Operators shall stop work whenever unauthorized personnel or equipment enter the designated area and only resume when the area has been cleared.
- Operators shall only move equipment when aware of the location of all workers and when the travel path is clear.
- Ground Personnel shall never stand between two pieces of operating heavy equipment or other objects (e.g., steel support beams, trees, buildings, etc.).
- Ground Personnel shall never stand directly below heavy equipment located on higher ground unless it can be verified ground stability is not a factor and grade of slope is such that it would not contribute to equipment tip-over.
- Ground Personnel may only enter the swing area, work area or path of travel of any operating equipment when:
  - They have attracted the operator's attention and established eye contact, and
  - The operator has idled the equipment down, placed it in neutral, grounded engaging tools, set brakes and communicated entry is permitted.
- Employees shall keep all extremities, hair, tools, and loose clothing away from pinch points and other moving parts on heavy equipment.
- Employees shall not talk, text, or otherwise use a cell phone while standing or walking on a roadway or other heavy equipment path.

4.3.3 At a minimum, all Ground Personnel and Operators outside of heavy equipment shall wear the following:

- High visibility safety vest (fluorescent background material and retro-reflective striping) meeting jurisdictional requirements that is visible from all angles.
  - Background material: should be fluorescent yellow-green, fluorescent orange-red or fluorescent red.
  - Combined-performance retro-reflective material (e.g. the stripes): should be fluorescent yellow-green, fluorescent orange-red or fluorescent red - and shall be in contrast (that is, have a distinct color difference) to the background material.
  - Hazards may require high visibility garments that cover torso, legs and arms.
  - Confirm that vest is not faded or covered with outer garments, dirt, etc.
- American National Standards Institute/Canadian Standards Association- (ANSI/CSA-) approved hard hat
- ANSI/CSA-approved safety glasses with side shields
- At a minimum, CSA or ASTM approved, high-cut (min. 6"), puncture, impact and compression resistant footwear.
- ANSI/CSA-approved hearing protection as needed
- Appropriate work clothes (e.g., full-length jeans/trousers and a sleeved shirt; no tank, crew tops or other loose clothing permitted).

4.4 Prior to work commencing

4.4.1 All heavy equipment will be inspected pre-shift and then regularly as required with the details of the inspection recorded in a log book.

- Roll-over protection systems (ROPS) and appropriate overhead protection (Fall Object Protection FOP) shall be in place given the specific equipment requirements. Utilize equipment with enclosed cabs where feasible or accessible.
    - Where use of equipment with enclosed cabs is not feasible or said equipment is not accessible, operators shall use any additional personal protective equipment determined as necessary (e.g. goggles, additional hearing protection, etc.).
- Equipment operated in hazardous atmosphere environments shall be equipped with the proper safety equipment (e.g., spark arrestors, positive air shut off, etc.).
- Operation of equipment that has or had cab glass (per the manufacturer's specifications) that is cracked/broken (obstructing the operator's view) or missing is prohibited.
- A locking device shall be provided that will prevent the accidental separation of towed and towing vehicles on every fifth-wheel mechanism and two-bar arrangement.
- Trip handles for tailgates of dump trucks and heavy equipment shall be arranged so that when dumping, the operator will be in the clear.
- The Operator will report defects and conditions affecting the safe operation of the equipment to the Site Supervisor or employer. Any repair or adjustment necessary for the safe operation of the equipment will be made before the equipment is used.
- Exposed moving parts on heavy equipment (belts, gears, shafts, pulleys, sprockets, spindles, drums, fan belts, flywheels, chains, or other reciprocating, rotating or moving parts) which are a hazard to the operator or to other workers will be guarded.
    - If a part will be exposed for proper function it will be guarded as much as is practicable consistent with the intended function of the component.

4.4.2 An approved 4A40BC fire extinguisher shall be present on all heavy equipment. An approved 4A40BC fire extinguisher of appropriate rating shall be present and readily accessible on all heavy equipment.

- Fire extinguishers shall be inspected by the operator prior to heavy equipment operation each shift. Monthly and annual inspections shall be documented.

4.4.3 All Operators shall inspect the area adjacent to the machine prior to starting.

- Evaluate ground conditions, concurrent operations and obstructions to identify approved routes of travel and work areas.
- As applicable, check that there is sufficient swing room and that the outriggers are adequately supported on solid and stable ground

4.4.4 Managers / Supervisors shall inform the operators of the equipment that AECOM employees are in the area and inquire if there are any restricted areas or specific rules or requirements. In some industrial facilities, heavy equipment has the 'right of way'.

4.4.5 Where the Operator will not have a full view of the path of travel, a signal person will be used on the ground that has a full view of the load, the operator, and the path.

4.4.6 All heavy equipment with limited visibility (operator cannot directly or by mirror or other effective device see immediately behind the machine) operated around workers or on a construction site:

- Shall have an audible back-up alarm installed that functions automatically when the vehicle or equipment is put into rear motion.

- All bi-directional equipment shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction.
- Backing up or movement in both directions for bidirectional equipment shall occur only when a signal person communicates that it is safe to do so if alarms or horns are not feasible.

4.5 Operation

4.5.1 The Operator of heavy equipment is the only worker permitted to ride the equipment unless the equipment is equipped by the manufacturer for passengers. Manufacturer operator's manual shall be complied with.

4.5.2 A person will not operate heavy equipment unless the person has received adequate instruction and training in the safe use of the equipment, and has demonstrated to a qualified supervisor or instructor competency in operating the equipment.

- Oilers, apprentices, and other operators will not be allowed to operate equipment unless authorized by the Manager.

4.5.3 The Operator of heavy equipment will operate the equipment safely, maintain full control of the equipment, and comply with the manufacturer's operator manual and the laws governing the operation of the equipment.

- Operation of company-owned, leased, or rented vehicles or equipment while under the influence of alcohol or illegal drugs or otherwise impaired is prohibited.
- Do not operate any equipment beyond its safe load or operational limits.
- Operator shall not talk on, text, or otherwise use mobile phones while operating heavy equipment.
- Never use bucket teeth or boom for lifting or moving heavy objects.

4.5.4 When heavy equipment is used for lifting or hoisting or similar operations there shall be a permanently affixed notation stating the safe working load capacity of the equipment and the notation shall be kept legible and clearly visible to the operator.

4.5.5 A Supervisor or Manager will not knowingly operate or permit a worker to operate heavy equipment which is, or could create, an undue hazard to the health or safety of any person. Where compliance is refused, the Manager or his or her designate should be notified immediately.

4.5.6 The Operator of heavy equipment will not leave the controls unattended unless the equipment has been secured against inadvertent movement.

- The Operator is not to leave suspended load, machine or part or extension unattended, unless it has been immobilized and secured against inadvertent movement.
- Turn off heavy equipment, place gear in neutral and set parking brake prior to leaving vehicle unattended.
- Buckets and blades are to be placed on the ground and with hydraulic gears in neutral when not in use.
- Brakes shall be set and, as necessary, wheels chocked or equivalent (as applicable) when not in use.

4.5.7 The Operator will maintain the cab, floor and deck of heavy equipment free of material, tools or other objects which could create a tripping hazard, interfere with the operation of controls, or be a hazard to the operator or other occupants in the event of an accident.

4.5.8 If heavy equipment has seat belts required by law or manufacturer's specifications, the Operator and passengers will use the belts whenever the equipment is in motion, or engaged in an operation which could cause the equipment to become unstable.

- Seat belts shall be maintained in functional condition, and replaced when necessary to ensure proper performance.

4.5.9 All vehicles transporting material or equipment on public roads shall comply with local laws pertaining to weight, height, length, and width. Obtain any permits required for these loads.

4.5.10 Never jump on to or off of a piece of heavy equipment, always maintain 3-points of contact at a minimum.

4.5.11 Never exit heavy equipment while it is in motion.

4.5.12 Do not ride with arms or legs outside of the truck body of equipment cab.

- Never ride on the outside of a piece of heavy equipment (e.g. in a standing position on the body, on running boards, or seated on side fenders, cabs, cab shields, rear of truck bed, on the load, bucket, etc.).

4.5.13 Have vehicle headlights on at all times when driving in the area.

4.5.14 Park motor vehicles off the haul roads, or away from the work areas.

4.5.15 Do not wear loose clothing or jewelry where there is a danger of entanglement in rotating equipment.

4.5.16 Do not enter the swing area of machines such as cranes, heavy drill rigs, or excavators, without first making eye contact with the operator, and receiving permission to do so. Refer to *S3AM-309-ATT2 Operator Line of Sight.*

4.5.17 Stay out of the blind areas around heavy equipment and never assume that the equipment operators have seen you or are aware of your presence.

4.5.18 Maintain a distance of at least 2 feet (60 centimeters) between the counterweight of swing machines and the nearest obstacle. If this distance cannot be maintained, a spotter shall observe and be in constant communication with the operator to prevent contact.

4.5.19 Vibrations from moving traffic or heavy equipment can cause excavations or spoil piles to become unstable.

- Excavation activity shall be conducted according to *SOP S3AM-303-PR1 Excavation*.
- Equipment not involved in the excavating activity or not required to be in the vicinity shall keep clear. Equipment that shall operate in the vicinity shall maintain appropriate setback distances from edges of excavations or spoil piles.

4.5.20 All heavy equipment shall be operated in a safe manner that will not endanger persons or property.

- When ascending or descending grades in excess of 5 percent, loaded equipment shall be driven with the load upgrade.
- When operating an electric-powered, remote controlled, hydraulic device used for demolishing concrete structures and refractory linings as well as excavating, refer to the *S3AM-309-ATT1 Brokk 180* for more specifics.

4.5.21 All heavy equipment shall be operated at safe speeds. Do not drive any vehicle at a speed greater than is reasonable and safe for weather conditions, traffic, intersections, width, and character of the roadway, type of motor vehicles, and any other existing condition.

4.5.22 Always move heavy equipment up and down the face of a slope. Never move equipment across the face of a slope.

4.5.23 Slow down and stay as far away as possible while operating near steep slopes, shoulders, ditches, cuts, or excavations.

4.5.24 When feasible, Operators shall travel with the “load trailing”, if the load obstructs the forward view of the operator.

4.5.25 Slow down and sound horn when approaching a blind curve or intersection. Signal people equipped with 2-way radio communications may be required to adequately control traffic.

4.5.26 All haulage equipment / trucks, whose payload is loaded by means of cranes, power shovels, loaders, or similar equipment, shall have a cable shield and/or canopy adequate to protect the operator from shifting or falling material. If protection is not available for the operator, the operator shall leave the vehicle and wait in a designated safe location until it is loaded..

4.5.27 Equipment shall be shut down prior to and during fueling.

- Confirm proper grounding/ bonding between equipment and fuel vehicle prior to fueling operations.
- During fuel operations confirm fuel nozzle remains in contact with the tank.
- Do not smoke, use electrical devices or have an open flame present while fueling.
- Fuel shall not be carried in or on heavy equipment, except in permanent fuel tanks or approved safety cans.

4.5.28 Site vehicles will be parked in a designated parking location away from heavy equipment.

4.5.29 Operators shall never push/pull “stuck” or “broken-down” equipment unless a spotter determines that the area is cleared of all personnel around and underneath the equipment.

4.5.30 If designated for work in contaminated areas/zones, equipment shall be kept in the exclusion zone until work or the shift has been completed. Equipment will be decontaminated within designated decontamination areas.

4.5.31 Equipment left unattended at night adjacent to travelled roadways shall have appropriate lights or reflectors, or barricades equipped with appropriate lights or reflectors, to identify the location of that equipment, and shall not be closer than 6 feet (1.8m) (or the regulatory requirement for the work location) to the active roadway.

4.5.32 Rubber / pneumatic-tired earthmoving haulage equipment shall be equipped with fenders on all wheels. Mud flaps may be used in lieu of fenders whenever motor vehicle equipment is not designed for fenders.

4.5.33 Lift trucks shall have the rated capacity clearly posted on the vehicle, and the ratings are not to be exceeded.

4.5.34 Steering or spinner knobs shall not be attached to steering wheels.

4.5.35 High-lift rider industrial trucks shall be equipped with overhead guards.

4.5.36 All hot surfaces of equipment, including exhaust pipes or other lines, that present a possible injury or fire hazard, shall be guarded or insulated.

4.5.37 All equipment having a charging skip shall be provided with guards on both sides and open end of the skip area to prevent persons from walking under the skip while it is elevated.

4.5.38 Platforms, foot walks, steps, handholds, guardrails, and toeboards shall be designed, constructed, and installed on machinery and equipment to provide safe footing and access ways.

4.5.39 Substantial overhead protection shall be provided for the operators of fork lifts and similar equipment.

4.5.40 In an effort to reduce air emissions, fuel costs, and run-time hours (that can impact equipment warranty), operators shall limit heavy equipment engine idling to not more than five consecutive minutes. Local regulations at the location of the vehicle operation could require less than five consecutive minutes idling time. The idling limit does not apply to:

- Idling when queuing.
- Idling to verify that the vehicle is in safe operating condition.

- Idling for testing, servicing, repairing or diagnostic purposes.
- Idling necessary to accomplish work for which the vehicle was designed (cranes, man-lifts, forklifts, etc.)
- Idling required to bring equipment/vehicle to operating temperature, as specified by the manufacturer. Engine heaters shall be used for cold weather starting to avoid engine idling where feasible.
- Idling necessary to ensure safe operation of the vehicle.
- Idling to keep equipment (including windows) clear of ice and snow.
- Idling to provide air conditioning or heat to ensure the health and safety of the operator, but only when seated inside the equipment or vehicle.

4.6 Utilities

4.6.1 When contacted by heavy equipment, aboveground and underground utilities may cause severe injuries or death as a result of electrocution, explosion, etc. Refer to the *S3AM-322-PR1 Overhead Lines* procedure for more specifics.

4.6.2 The following outline the requirements while performing heavy equipment operations that may lead to contact with aboveground or underground utilities:

- Always be aware of surrounding utilities.
- Confirm all equipment (e.g., dump trailers, loaders, excavators, etc.) is lowered prior to moving underneath aboveground utilities.
- Confirm utilities are cleared and identified prior to beginning any earthmoving operation. Contact the local utility service providers for clearance prior to performing work. Confirm documentation of the contact is made; date, number; contact name, organization, etc. Refer to *SOP S3AM-303-PR1 Excavation* and *S3AM-331-PR1 Underground Utilities & Subsurface Installation Clearance.*

4.7 Training

4.7.1 The Operator or other qualified supervisor will provide all on-site personnel with an orientation to the heavy equipment and its associated hazards and controls.

4.7.2 Only designated, qualified personnel shall operate heavy equipment.

4.7.3 Operators shall have all appropriate jurisdictional licenses or training to operate a designated piece of heavy equipment.

4.7.4 Operators shall be evaluated through documented experience and routine monitoring of activities unless the equipment is operated by an AECOM operator in which case a practical evaluation is required. Operators shall be knowledgeable and competent in the operation of a designated piece of heavy equipment.

4.8 Inspection and Maintenance

4.8.1 Maintenance records for any service, repair or modification which affects the safe performance of the equipment will be maintained and be reasonably available to the operator and maintenance personnel regulatory agencies upon request during work hours.

4.8.2 Maintenance records will be maintained on the site or project for heavy equipment.

4.8.3 Conduct maintenance as prescribed by the manufacturer in the Operation Manual for each piece of equipment.

4.8.4 Servicing, maintenance and repair of heavy equipment will not be done when the equipment is operating.

- Lockout and tagout safety procedures are followed. Refer to *S3AM-325-PR1 Lockout Tagout*.

- Motors are turned off, unless required for performing maintenance or repair.
- All ground-engaging tools are grounded or securely blocked.
- Controls are set in a neutral position and brakes are set.
- Electrically driven equipment is installed with provision for tagging and locking out the controls while under repair.
- Manufacturer's requirements for maintenance and repair are followed.
- If continued operation is essential to the process, a safe means of protection shall be provided.
- Provide and use a safety tire rack, cage, or equivalent protection when inflating, mounting, or dismounting tires installed on split rims, or rims equipped with locking rings or similar devices.

4.8.5 All heavy equipment shall have a documented inspection and if necessary, repaired prior to use.

- Operators shall not operate heavy equipment that has not been cleared for use.
- All machinery and mechanized equipment will be verified to be in safe operating condition (refer to *S3AM-309-FM1 Approval of Machinery & Mechanized Equipment*) by a competent person (refer to *S3AM-202-PR1 Competent Person Designation*) within seven days prior to operation on a new site or project. Clearance is valid for up to one year for the given site or project.
- As applicable, all machinery and mechanized equipment shall be inspected / certified and tested at appropriate intervals as required by the manufacturer and/or regulatory requirements.

4.8.6 All heavy equipment shall be inspected at a minimum to the manufacturer's recommendations prior to each work shift. All defects shall be reported to the Supervisor/ Manager immediately.

- Defective heavy equipment shall be immediately tagged and taken out of service until repaired.
- Inspection, maintenance, service and repair records shall be maintained at the site. If a manufacturer's or company-specific inspection checklist is not provided, use *S3AM-309-FM2 Heavy Machinery Pre-Operation Checklist*.
- Records shall be made available for review upon request. Note: Documents may be electronically stored in the project files.

4.9 Fueling and batteries

4.9.1 A well-ventilated area shall be used for refueling.

4.9.2 Only the type and quality of fuel recommended by the engine manufacturer shall be used.

4.9.3 Fuel tanks shall not be filled while the engine is running. All electrical switches shall be turned off.

4.9.4 If there is potential to spill fuel on hot surfaces, the surfaces shall be permitted to cool down prior to fueling. Any spillage shall be cleaned before starting engine.

4.9.5 Spilled fuel shall be cleaned with cotton rags or cloths and disposed of in the proper receptacle; do not use wool or metallic cloth.

4.9.6 Open flames, lighted smoking materials, sparking equipment or any other type of ignition source shall remain a minimum of 35' (10.7m) from the fueling area and/or fuel source. This clearance shall be increased if required or conditions warrant.

4.9.7 Heaters in carrier cabs shall be turned off when refueling the carrier or the drill rig.

4.9.8 Portable containers to be filled shall be placed directly on the ground or be properly grounded prior to filling to prevent creation of a static charge. Portable fuel containers shall not be filled completely to allow expansion of the fuel during temperature changes.

4.9.9 Control electrostatic hazards.

- Before activating fuel pump, touch some part of vehicle / equipment to de-energize any static electricity that may be present.
- The fuel nozzle shall be kept in contact with the tank being filled to prevent static sparks from igniting the fuel.
- Fuel containers and transfer hoses shall be kept in contact with a metal surface during travel to prevent build-up of a static charge.

4.9.10 Portable fuel containers shall not travel in the vehicle or carrier cab with personnel.

4.9.11 Batteries shall be serviced in a ventilated area while wearing appropriate Personal Protective Equipment.

4.9.12 When a battery is removed from a vehicle or service unit, the battery shall be disconnected ground post first. Consult the SDS applicable to the battery and/or contents for additional information including; handling, precautions, and first aid measures.

- Spilled battery acid shall be immediately flushed off the skin with a continuous supply of water. Battery storage or maintenance areas shall have readily accessible eye wash stations.
- Should battery acid get into the eyes, the eyes shall be flushed immediately with copious amounts of water and medical attention shall be sought immediately.

4.9.13 When installing a battery, the battery shall be connected ground post last.

4.9.14 When charging a battery, cell caps shall be loosened prior to charging to permit gas to escape.

4.9.15 When charging a battery, the power source shall be turned off to the battery before either connecting or disconnecting charger loads to the battery posts.

4.9.16 To avoid battery explosions, the cells shall be filled with electrolytes. A flashlight (not an open flame) shall be used to check water electrolyte levels. Avoid creating sparks around batteries by shorting across a battery terminal. Lighted smoking materials and flames shall be kept at least a minimum of 35 feet (10.7 meters) away from battery-charging stations.

5.0 Records

5.1 Inspection, maintenance, service and repair records shall be maintained with the equipment.

6.0 Attachments

6.1 S3AM-309-ATT1 Brokk180 Safety Card

6.2 S3AM-309-ATT2 Operator Line of Sight

6.3 S3AM-309-FM1 Approval of Machinery & Mechanized Equipment

6.4 S3AM-309-FM2 Heavy Machinery Pre-Operation Checklist

6.5 S3AM-309-FM3 Rubber Tire Backhoe Operator Skill Evaluation

6.6 S3AM-309-FM4 Scraper Operator Skill Evaluation

6.7 S3AM-309-FM5 Bull Dozer Operator Skill Evaluation

6.8 S3AM-309-FM6 Dump Truck Operator Skill Evaluation

6.9 S3AM-309-FM7 Roller Compactor Operator Skill Evaluation

6.10 S3AM-309-FM8 Front End Loader Operator Skill Evaluation

6.11 S3AM-309-FM9 Grader Operator Skill Evaluation

6.12 S3AM-309-FM 10 Excavator Operator Skill Evaluation

6.13 S3AM-309-FM11 Water Truck Operator Skill Evaluation

6.14 S3AM-309-FM12 Heavy Equipment Maintenance Inventory

6.15 S3AM-309-FM13 Heavy Equipment Inspection Report

Americas

Brokk 180

S3AM-309-ATT1

1.0 Objective/Overview

1.1 The Brokk 180 is an electric-powered, remote controlled, hydraulic device used for demolishing concrete structures and refractory linings as well as excavating. This machine includes attachments designed exclusively for demolishing work (e.g., grapple, bucket, hydraulic hammer, etc.). By using the remote control unit, an operator can move the machine and attachments in different directions and speeds from afar.

2.0 Potential Hazards



2.1 Flying debris

2.2 Crush/impact/pinch from extendable boom, tracks, and tipping over

2.3 Struck-by

2.4 Electricity (subsurface utilities when excavating)

2.5 Gas lines (subsurface utilities when excavating)

2.6 Noise

3.0 Safe Operating Guidelines

3.1 Prior to use, complete a pre-operation inspection to determine if the unit is in safe working condition.

3.2 Position the unit to safely perform the intended task, then deploy the outriggers to stabilize the unit.

3.3 Confirm that the operator knows what the lifting capacity is; do not exceed the lifting capacity.

3.4 Complete a subsurface utility clearance prior to excavating.

3.5 Operator should define a swing radius area and exclude workers from the area. Establish a minimum 15-foot (4.5-meter) clearance around the unit while operating.

3.6 Do not allow debris to build up around the unit. Maintain good housekeeping practices.

3.7 Prior to removing debris from under the boom, stop, disengage the unit, and position the boom so that the attachment is at rest on the ground.

3.8 Personnel operating the unit with the remote control device will be properly trained and certified by a competent person.

3.9 The operator will be able to maintain line of sight visual contact with the unit at all times to assess hazards and site security.

3.10 Maintenance in excess of preventive maintenance activities (e.g., lubrication, replenishing fluids, etc.) will be performed by manufacturer personnel ONLY.

3.11 All operations will comply with the manufacturer's recommended policies.

4.0 Training Requirements

4.1 Review of applicable Standard Operating Procedures.

4.2 Complete knowledge and understanding of remote control functions.

4.3 Review and follow manufacturers' recommended policies and practices.

5.0 Personal Protective Equipment

5.1 Class II (minimum) American National Standards Institute/Canadian Safety Association Safety Vest

5.2 Hard Hat

5.3 Safety Toe Boots

5.4 Safety glasses with side shields

5.5 Hearing protection (ear plugs and/or ear muffs)

5.6 Leather gloves

6.0 Other Safety Tips

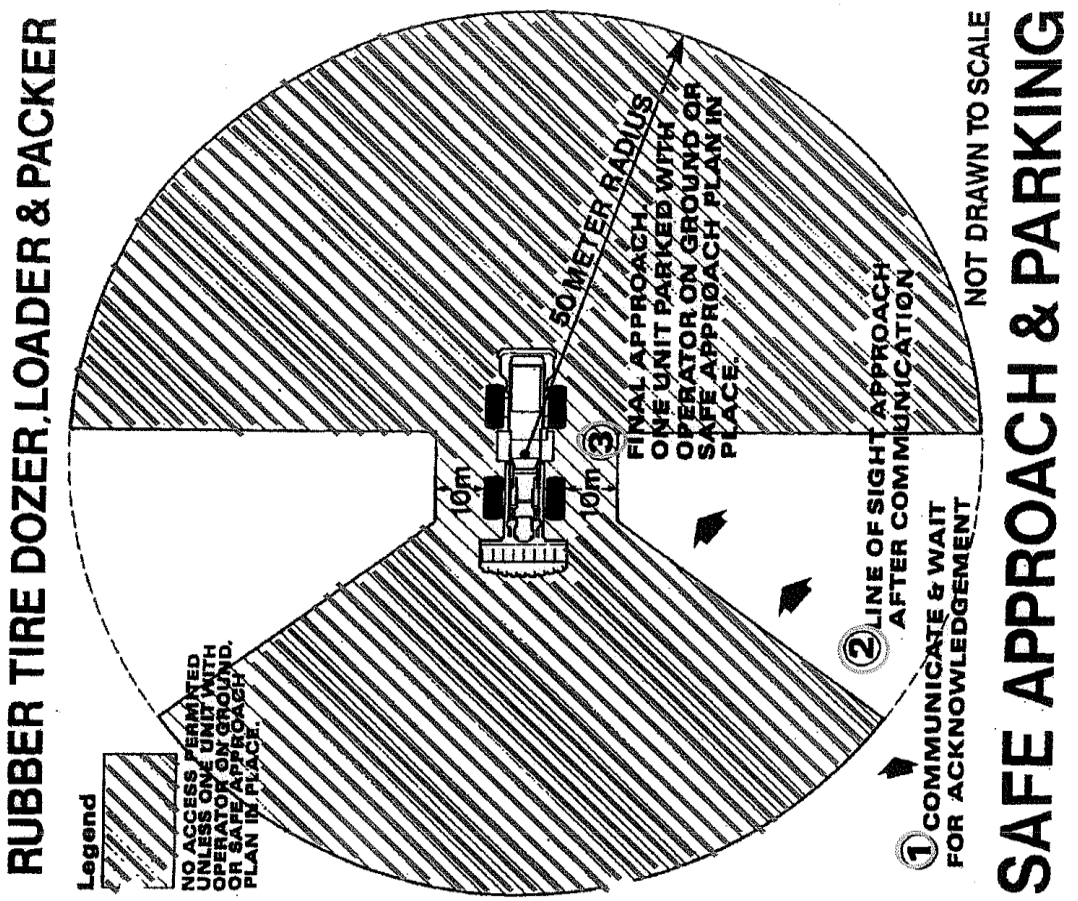
6.1 Never stand under a raised boom.

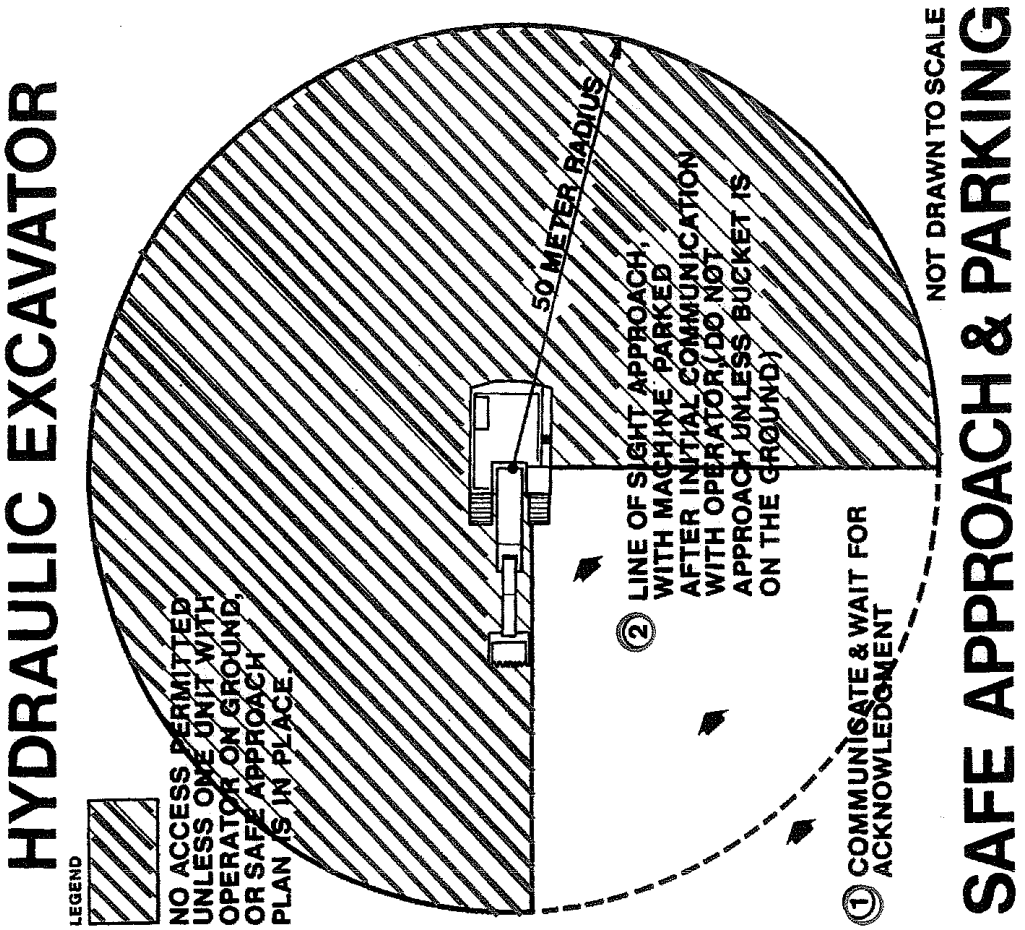
6.2 Pay close attention to power cords for potential tripping hazard and equipment entanglement.

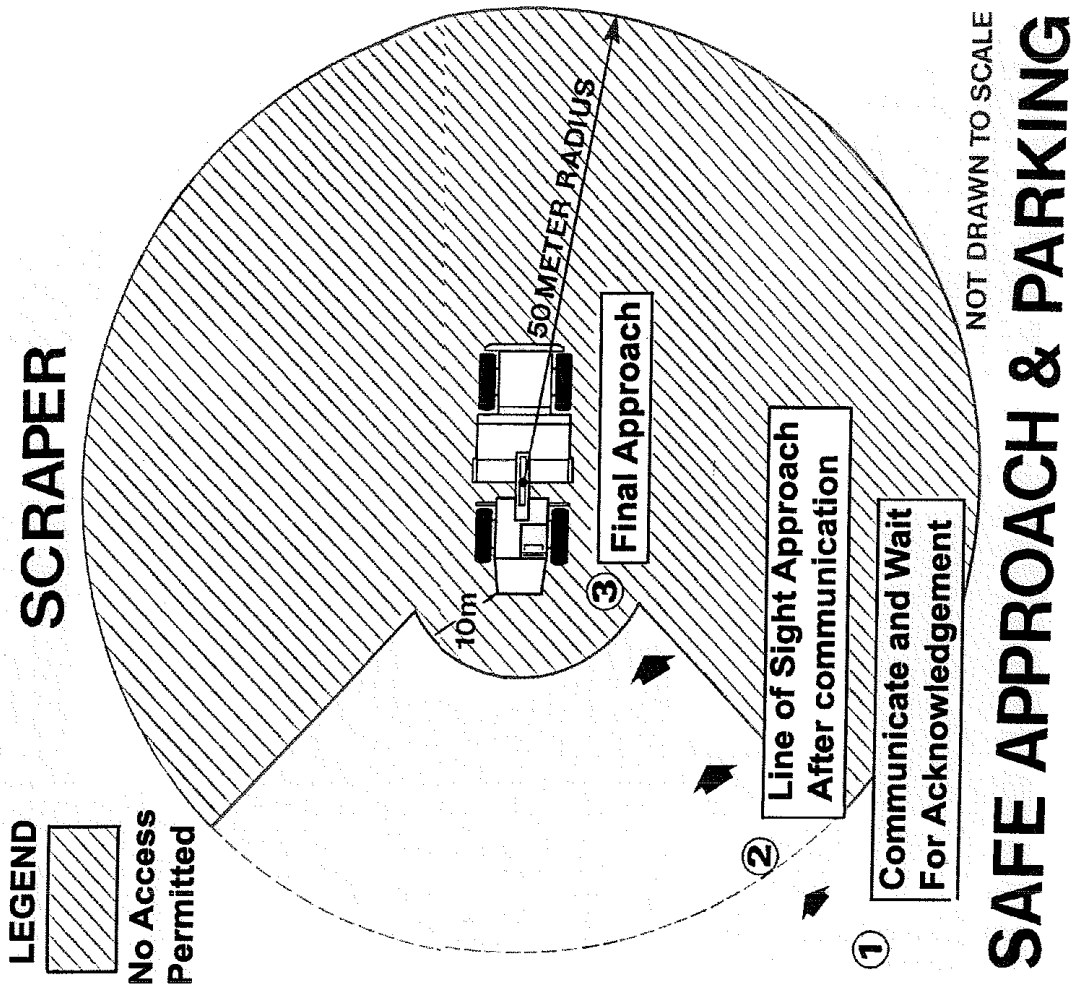
Americas

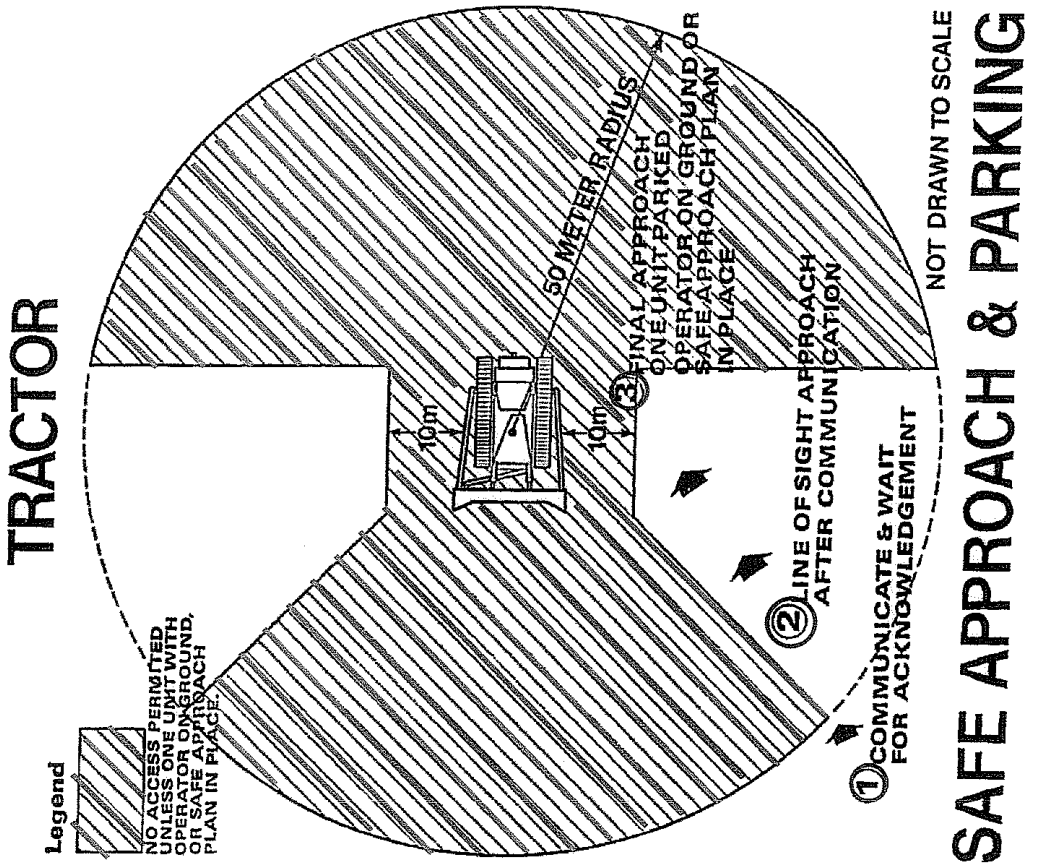
Operator Line of Sight

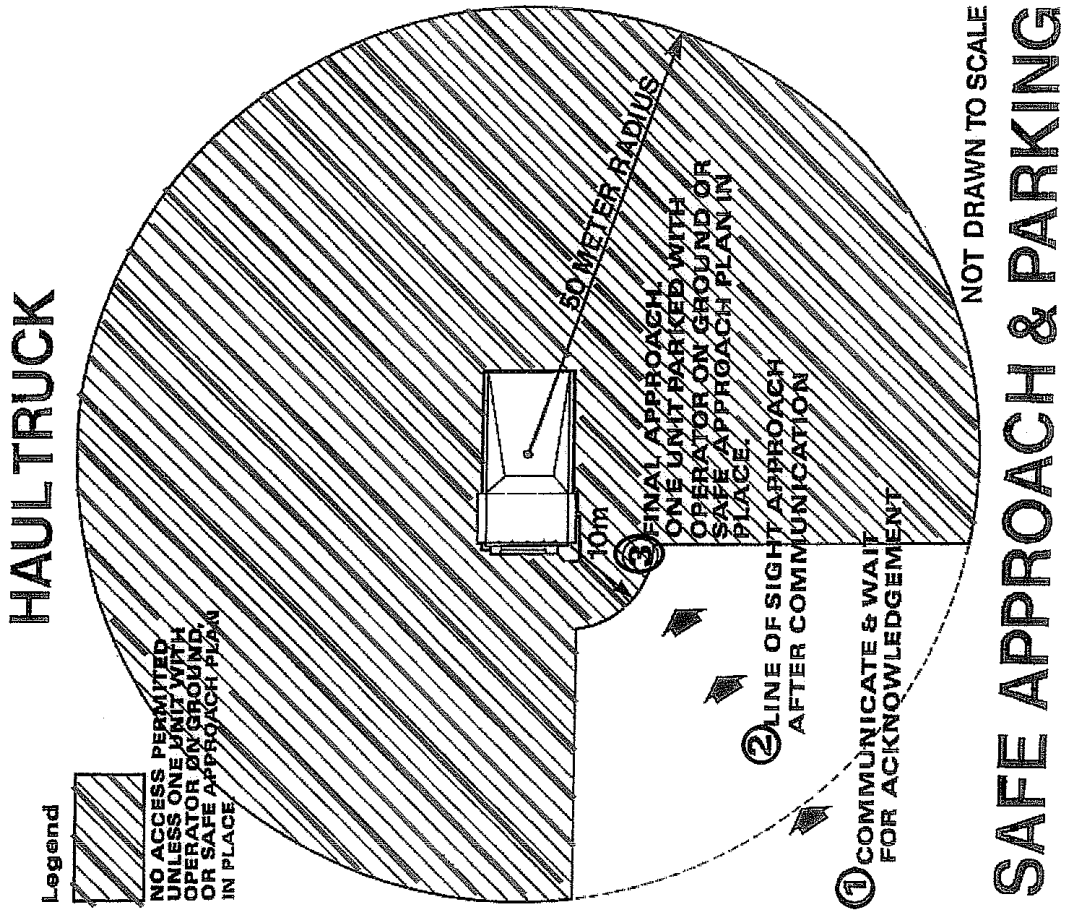
S3AM-309-ATT2

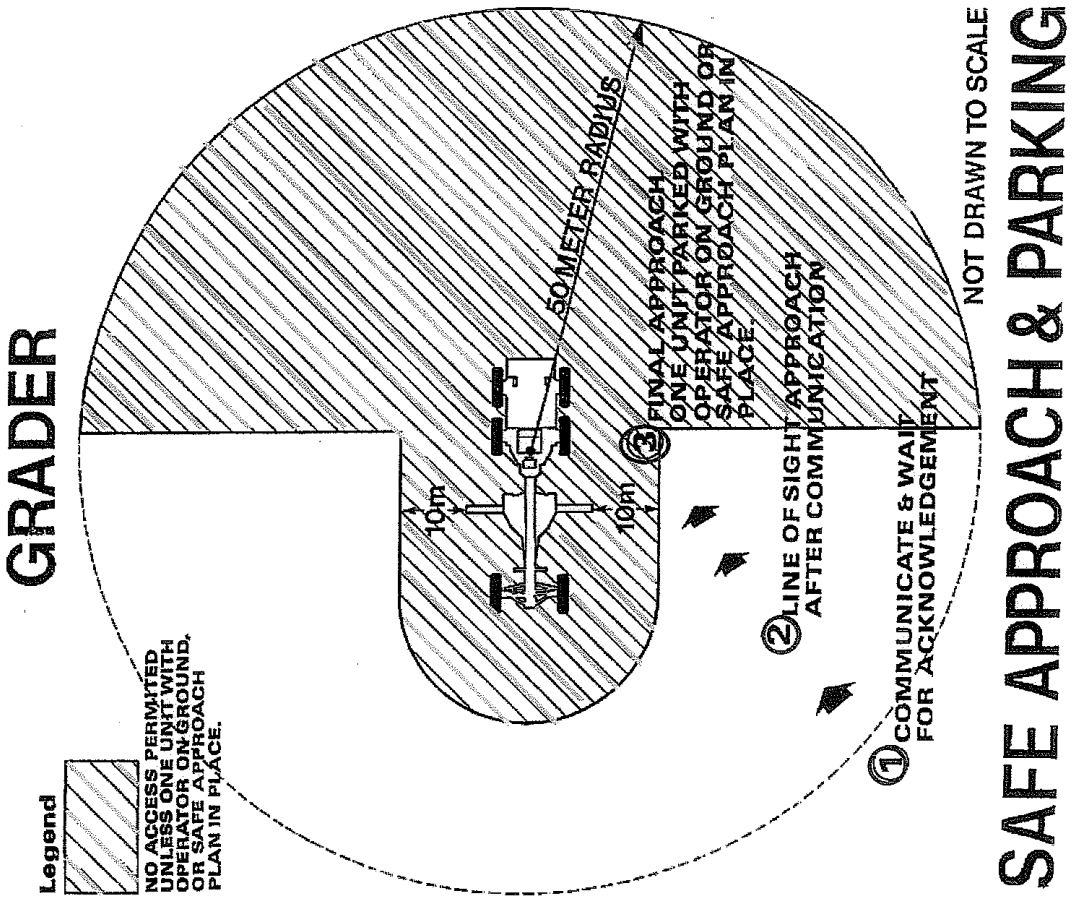



HYDRAULIC EXCAVATOR
LEGEND
NO ACCESS PERMITTED UNLESS ONE UNIT WITH OPERATOR ON GROUND, OR SAFE APPROACH PLAN IS IN PLACE.
50 METER RADIUS
② LINE OF SIGHT APPROACH, WITH MACHINE PARKED AFTER INITIAL COMMUNICATION WITH OPERATOR. DO NOT APPROACH UNLESS BUCKET IS ON THE GROUND.)
① COMMUNICATE & WAIT FOR ACKNOWLEDGMENT
NOT DRAWN TO SCALE
SAFE APPROACH & PARKING

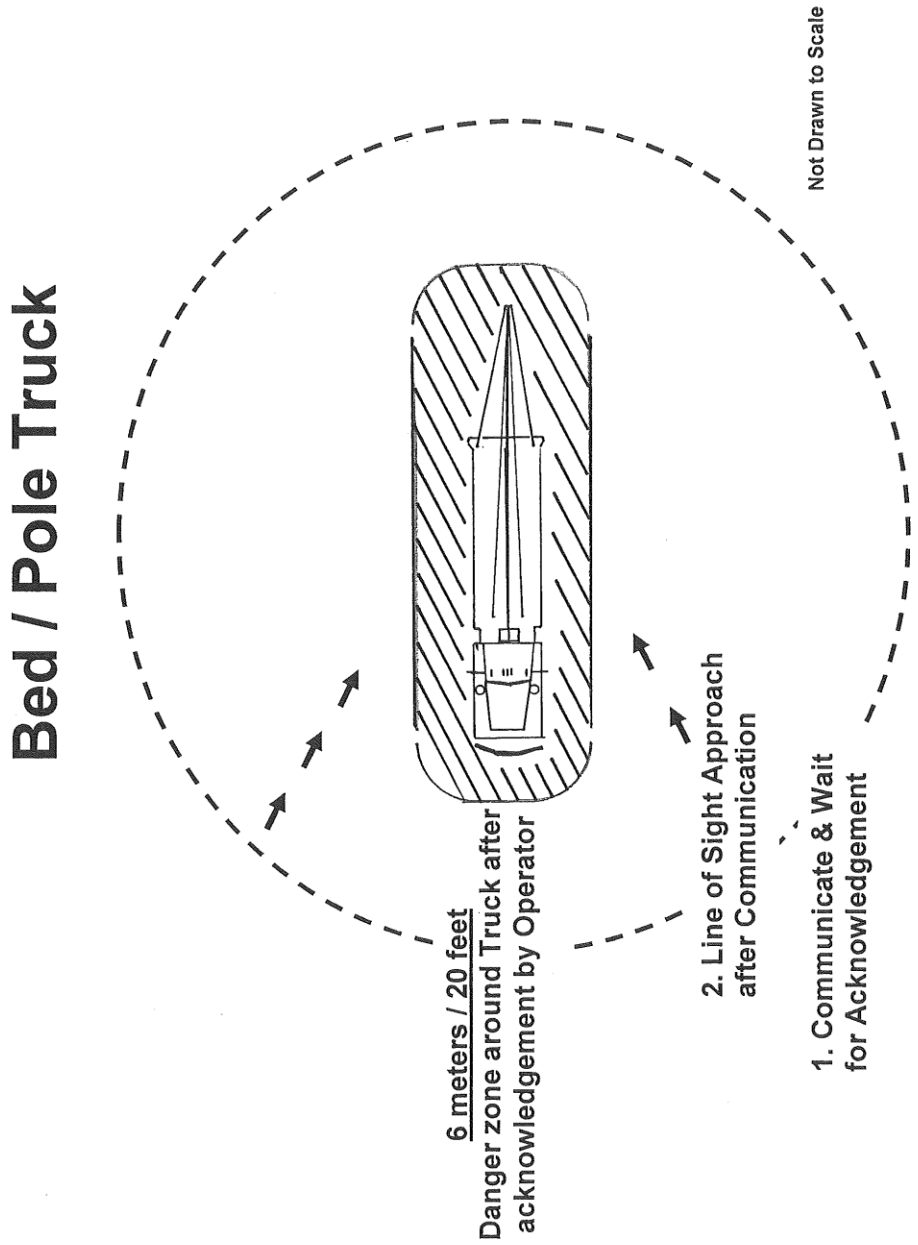

SAFE APPROACH & PARKING
NOT DRAWN TO SCALE
SCRAPER
50 METER RADIUS
10m
1 Communicate and Wait For Acknowledgement
2 Line of Sight Approach After communication
3 Final Approach
LEGEND
No Access Permitted


SAFE APPROACH & PARKING
NOT DRAWN TO SCALE
TRACTOR
50 METER RADIUS
10m
10m
3 FINAL APPROACH ONE UNIT PARKED OPERATOR ON GROUND OR SAFE APPROACH PLAN IN PLACE
2 LINE OF SIGHT APPROACH AFTER COMMUNICATION
1 COMMUNICATE & WAIT FOR ACKNOWLEDGEMENT
Legend
NO ACCESS PERMITTED UNLESS ONE UNIT WITH OPERATOR ON GROUND, OR SAFE APPROACH PLAN IN PLACE


SAFE APPROACH & PARKING
NOT DRAWN TO SCALE
HAUL TRUCK
50 METER RADIUS
10m
① COMMUNICATE & WAIT FOR ACKNOWLEDGEMENT
② LINE OF SIGHT APPROACH AFTER COMMUNICATION
③ FINAL APPROACH, ONE UNIT PARKED WITH OPERATOR ON GROUND OR SAFE APPROACH PLAN IN PLACE.
Legend
NO ACCESS PERMITTED UNLESS ONE UNIT WITH OPERATOR ON GROUND OR SAFE APPROACH PLAN IN PLACE


SAFE APPROACH & PARKING
NOT DRAWN TO SCALE
GRADER
50 METER RADIUS
10m
10m
③ FINAL APPROACH ONE UNIT PARKED WITH OPERATOR ON GROUND OR SAFE APPROACH PLAN IN PLACE
② LINE OF SIGHT APPROACH AFTER COMMUNICATION
① COMMUNICATE & WAIT FOR ACKNOWLEDGEMENT
Legend
NO ACCESS PERMITTED UNLESS ONE UNIT WITH OPERATOR ON GROUND, OR SAFE APPROACH PLAN IN PLACE.

SAFE APPROACH & PARKING



Americas

Heavy Equipment Maintenance Inventory

S3AM-309-FM12

EQUIPMENT (*MAKE, MODEL, SERIAL #*)	EQUIPMENT OWNER	EQUIPMENT STATUS (*ON HIRE, ACTIVE, DECOMMISSIONED*)	FREQUENCY OF SERVICE	SERVICE TYPE	MANUFACTURER'S STANDARDS	INDUSTRY STANDARDS	LEGISLATED REQUIREMENTS	LOCATION OF EQUIPMENT

Americas

Heavy Equipment Inspection Report

S3AM-309-FM13

TOOL	DATE	INSPECTED BY	RESULTS	ACTION REQUIRED	ACTION COMPLETED (DATE)

Wildlife, Plants & Insects

1.0 Purpose and Scope

1.1 Communicates the requirements and precautions to be taken by AECOM employees to protect against the biological hazards associated with insects, arachnids, snakes, poisonous plants, and other animals referred to herein collectively as “biological hazards”.

1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document’s content.

2.0 Terms and Definitions

2.1 **Field Work –** Any activity conducted at a site that contains brush, overgrown grass, leaf litter, poisonous plants, or is located near mosquito breeding areas and includes work in structures where animals might exist that harbor fleas or ticks or where spiders and mites could be present. Field work includes, but is not limited to, Phase I, Phase II, Operations Monitoring & Maintenance, biological surveys, and other work that meets the definition of field work.

2.2 **Poisonous** – Capable of harming or killing by or as if by poison; toxic or venomous.

2.3 **Phase I Environmental Site Assessment –** Investigation of real property to determine the possibility of contamination, based on visual observation and property history, but no physical testing. Under new Environmental Protection Agency regulations that went into effect on November 1, 2006, a Phase I, as it is called for short, will be mandatory for all investors who wish to take advantage of Comprehensive Environmental Response, Compensation, and Liability Act defenses that will shield them from liability for future cleanup, should that prove necessary. The new Phase I rules, called “All Appropriate Inquiry” or AAI, also require more investigation than previously mandated. Investors can expect to see dramatic price increases over prior experiences.

2.4 **Phase II Environmental Site Assessment** – Investigation of real property through physical samplings and analyses to determine the nature and extent of contamination and, if indicated, a description of the recommended remediation method.

3.0 References

3.1 RS2-001-PR1 Firearms Standard

3.2 S3AM-004-PR1 Incident Reporting, Notifications & Investigation

3.3 S3AM-008-PR1 Fitness for Duty

3.4 S3AM-113-PR1 Heat Stress

3.5 S3AM-208-PR1 Personal Protective Equipment

3.6 S3AM-209-PR1 Risk Assessment & Management

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Managers / Supervisors**

- Responsible for managing field work.

- Work with employees to see that a Task Hazard Analysis (THA) for the work to be conducted has been performed prior to the beginning of the field work and that it includes an assessment of potential biological hazards.
- Implement control measures at the location to reduce the potential for employees to be exposed to injuries and illnesses from biological hazards while working.
- If the exposures cannot be eliminated or managed with engineering controls, approve the use and cost of Personal Protective Equipment (PPE) and protective repellents and lotions and confirm that exposed employees have and use these products.

4.1.2 **SH&E Manager**

- Confirm training and guidance is provided to employees consistent with this procedure.
- During the performance of site visits, assess the precautions being taken against biological hazards for compliance with this procedure.
- Assist AECOM personnel in identifying hazards and selecting appropriate control measures.
- As applicable, review and approve relevant SH&E Plans for locations that have biological hazards.

4.1.3 **Employees**

- Participate in required training related this procedure.
- Participate in the development of THAs for the task, identify control measures to limit exposure and request PPE, repellents, and protective lotions identified by this procedure.
- Update the applicable THA when a new, unaccounted for biological hazard is identified. Employee shall stop work to identify appropriate elimination or control measures (and obtain any necessary guidance) before continuing work.
- Obtain approval from Managers and/or Supervisors to purchase selected PPE prior to purchasing.
- Implement the precautions appropriate to prevent exposure to the hazardous wildlife, insects and plants.
- Observe requirements for reporting (e.g. tick bites, skin irritations, etc.) as detailed within the procedure and attachments.

4.2 Training

4.2.1 Employees shall be trained to recognize organisms that represent a threat in the regions in which they work – experienced field staff shall provide on the job training to assist staff with hazard recognition.

4.2.2 Employees shall be properly trained to the anticipated tasks and the associated required PPE.

4.3 Overview

4.3.1 The procedures discussed below are detailed because these hazards have historically posed the most significant risk to AECOM employees. Note that this discussion is not a fully encompassing list of hazards. As part of the SH&E Plan and THA developed by the AECOM personnel, in accordance with *S3AM-209-PR1 Risk Assessment & Management*, additional consideration shall be given to other biological hazards.

4.3.2 Departments of Public Health local to the worksite, as well as the Centers for Disease Control (CDC) can serve as a resource for identifying biological hazards not discussed in this procedure.

4.3.3 If additional biological hazards are identified, employees should stop work and contact the SH&E Manager to discuss the hazards and identify effective control measures. Those control measures shall be implemented at the location prior to restarting work.

4.4 Employee Sensitivity

4.4.1 Sensitivity to toxins generated by plants, insects and animals varies according to dosage and the ability of the victim to process the toxin; therefore, it is difficult to predict whether a reaction will occur, or how severe the reaction will be. Employees should be aware that there are a large number of organisms capable of causing serious irritations and allergic reactions. Some reactions will only erupt if a secondary exposure to sunlight occurs. Depending on the severity of the reaction, the result can be severe scarring, blindness or even death.

4.4.2 Employees also need to consider whether they are sensitive to the use of insect repellents.

4.5 Planning and Hazard Assessment

4.5.1 AECOM personnel shall confirm that the potential for exposure to specific biological hazards are assessed prior to the commencement of work and that the procedures specified by this procedure are integrated into the THA planning process and conveyed to employees conducting the field work. This information shall be communicated in the location-specific SH&E plan, the THA, pre-project kickoff meetings, and tailgate meetings at the location.

4.5.2 It is important to note that the precautions to be taken by employees to decrease the risk of exposure to biological hazards can directly increase the risk of heat-related illness due to thermal stresses. Therefore, heat stress monitoring and precautions shall be included as a critical component of the task-specific THA in accordance with *S3AM-511-PR1 Heat Stress.*

4.5.3 During the preparation of the location-specific SH&E plan and task specific THA, Managers, Supervisors, and employees shall determine what biological hazards might be encountered during the task or operations and shall prescribe the precautions to be taken to reduce the potential for exposure and the severity of resulting illnesses. Consideration will be given to conditions such as weather, proximity to breeding areas, host animals, and published information discussing the presence of the hazards.

4.5.4 It should be assumed that at least one of the biological hazards exists whenever working on undeveloped property. This can include insect activity any time that local temperatures exceed 40 degrees Fahrenheit (4.5 degrees Celsius) for a period of more than 24 hours. The stubble and roots of poisonous plants can be a hazard any time of year, including when some plants are dormant or mown.

4.5.5 The hazard assessments shall also consider the additional hazards posed by vegetative clearing such as the increased risk of coming in contact with poison ivy, oak or sumac and hazards associated with the use of tools and equipment to remove vegetation.

4.5.6 Employees in the field where biological hazards exist shall not enter the hazard areas unless they are wearing the appropriate protective clothing, repellents, and barrier creams specified below. If the hazard is recognized in the field but was not adequately assessed during the THA, the field staff shall stop work and not proceed until the THA has been amended and approved and protective measures implemented.

4.5.7 Employees who have severe allergic reactions are strongly recommended to notify their Manager, field Supervisor and co-workers of the potential for a reaction and demonstrate what medication they might need, where they keep it and how it is administered.

4.5.8 A decision flow chart and table for determining the potential for biological hazards in the Americas has been provided in *S3AM-313-ATT1 Biological Hazard Assessment Flow Chart.*

4.5.9 Restrictions:

- No firearms or weapons are allowed to be used without express permission by the Region Executive and Chief Resilience Officer, refer to the *RS2-001-PR1 Firearms Standard*.
- No weapons related work shall occur without an assessment that includes appropriate hazard control measures and training.

- Staff with life-threatening reactions shall not undertake work in areas infested with the allergen (e.g., wasps, poison ivy), unless precautions are met which satisfy a medical practitioner's requirements. Refer to *S3AM-008-PR1 Fitness for Duty*.

4.5.10 Precautions

- Be aware of the potential irritants in your area and know how to recognize them.
- Modify activities to avoid encounters (diurnal rhythms, seasonal rhythms).
- Avoid wearing perfume and cologne and strong smelling deodorants, lotions, soaps, and shampoos.
- When working in areas where there may be small insects that "hitchhike" (e.g., ticks, spiders, scorpions), it is recommended that clothes are turned inside out and shaken at the end of day; do not wear same clothes two days in a row.
- Staff should always be aware of where they are placing their hands, or where they are sitting in order to avoid contact with potential toxins. Avoid reaching into areas where visibility is limited.

4.6 Wildlife Hazards (Wild Animals, Reptiles and Birds)

4.6.1 Employees shall not work alone in areas where the risk of an encounter with dangerous wildlife is high. Wildlife handling shall only be completed under direct supervision of an experienced individual. Refer to the following work instructions for more specifics:

- *S3AM-313-ATT13 Alligators*
- *S3AM-313-ATT9 Large Carnivores & Ungulates*
- *S3AM-313-ATT10 Bear Safety*
- *S3AM-313-ATT11 Small Mammals*
- *S3AM-313-ATT12 Snakes & Scorpions*

4.7 Ticks, Spiders and other Insects

4.7.1 Insects for which precautionary measures should be taken include but are not limited to: mosquitoes (potential carriers of disease aside from dermatitis), black flies, wasps, bees, ticks, fire ants and European fire ants.

4.7.2 Employees with known allergies to insect stings should consult their personal physician for advice on any immediate medications that they should carry with them. Epi-pens[1] shall be carried at all times in the field by employees who are aware that anaphylactic shock is a possibility for them AECOM highly recommends that employees with known allergies inform their co-workers of the allergy and the location of the medications they might carry for the allergy.

4.7.3 Habitat Avoidance, Elimination and/or Control

- The most effective method to manage worker safety and health is to eliminate, avoid and/or control hazards. Clearing the location of brush, high grass and foliage reduces the potential for exposure to biological hazards. Clearing will not eliminate the exposure to flying insects and there might be an increased exposure to ticks and spiders during the clearing process.
- Projects such as subsurface environmental assessment or remediation are often candidates for brush and overgrown grass to be cleared. In these instances, the Manager shall either request that the client eliminate vegetation, or request approval from the client to have vegetation clearing added to the scope of work.
    - o It should be noted that vegetation clearance may unintentionally serve to spread noxious and poisonous plant materials around the site.

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[1] Epi-pens must be prescribed by a personal physician. Renew epi-pens on a regular schedule to ensure effectiveness and make sure your field companions know where it is and how to use it if you cannot self-administer the dose.

- As applicable, measures should be taken to prevent spread, such as but not limited to, confirming equipment and materials are not placed on affected areas, and equipment is decontaminated after use and before removal from site.

- When work shall be conducted in areas that cannot or may not be cleared of foliage, personal precautions and protective measures shall be prescribed.
- Mosquitoes breed in stagnant water and typically only travel a quarter mile (less than half a kilometer) from their breeding site. Whenever possible, stagnant water should be drained to eliminate breeding areas. Managers and client site managers should be contacted to determine whether water can be drained and the most appropriate method for draining containers, containment areas, and other objects of standing water.
- If water cannot be drained, products similar to Mosquito Dunks® can be placed in the water to control mosquitoes. Once wet, the Mosquito Dunks® kill the immature, aquatic stage of the mosquito. The active ingredient is a beneficial organism that is lethal to mosquito larvae, but harmless to fish, humans, and other animals. Mosquito Dunks® provide long-term protection for 30 days or more.

4.7.4 Ticks

- Ticks can be encountered when walking in tall grass or shrubs. They crawl up clothing searching for exposed skin where they will attach themselves. The most serious concern is a possibility of contracting a disease.
- Data from the CDC indicates that tick-borne diseases have become increasingly prevalent. At the same time, tick repellents have become both safe and effective so it is possible to prevent the vast majority of bites and, therefore, most related illnesses. The use of permethrin is strongly advised.
- The most common and severe tick-borne illnesses in the U.S. are Lyme disease, Ehrlichiosis, and Rocky Mountain spotted fever. A summary table listing CDC informational resources for these diseases is provided in *S3AM-313-ATT2 Ticks* along with a listing of CDC information resources and maps showing the distribution of common tick-borne diseases in the U.S.
- When working in areas where ticks may occur, it is recommended that clothes are turned inside out and shaken at the end of day; do not wear the same clothes two days in a row.
- Employees should conduct a thorough full body tick check upon exiting the field. Shower within two hours of coming indoors to help wash away loose ticks. Clothes should be laundered in hot water or tumble dry clothes in a dryer on high heat for 10 minutes to kill ticks.
- To remove ticks that are embedded in skin, utilize a tick key. Alternatively use tweezers or fingers to carefully grasp the tick as close to the skin as possible and pull slowly upward, avoiding twisting or crushing the tick. Do not try to burn or smother the tick. Cleanse the bite area with soap and water, alcohol, or household antiseptic. Note the date and location of the bite and save the tick in a secure container such as an empty pill vial or film canister. A bit of moistened paper towel placed inside the container will keep ticks from drying out. Follow AECOM incident reporting guidelines to report the tick bite within 4 hours and notify the Manager or Supervisor.
- Familiarize yourself with the characteristic bulls-eye pattern of Lyme disease infection surrounding the bite. If you notice this type of pattern or rash resulting from a tick bite, immediately report the issue to your supervisor and follow the incident reporting requirements for your business group.
- If you experience symptoms such as fever, headache, fatigue, and a skin rash, you should immediately visit a medical practitioner as Lyme disease is treated easily with antibiotics in the early stages, but can spread to the heart, joints, and nervous system if left untreated.

4.7.5 Chiggers

- Chiggers are mite larvae, approximately ½ millimeter in size, and typically invisible to the naked eye. While chiggers are not known to carry infectious diseases, their bites and resulting rashes and itching can lead to dermatitis and a secondary infection.
- Chiggers are typically active from the last hard freeze in the winter or spring to the first hard freeze. They are active all year in the Gulf Coast and tropical areas.

4.7.6 Spiders

- Spiders can be found in derelict buildings, sheltered areas, basements, storage areas, well heads and even on open ground. Spiders can be found year round in sheltered areas and are often present in well heads and valve boxes.
- Most spider bites produce wounds with localized inflammation and swelling. The Black Widow and Brown Recluse spiders in the U.S. and others outside the U.S. inject a toxin that causes extensive tissue damage and intense pain.
- Additional information on spider identification can be found in attachment *S3AM-313-ATT3 Poisonous Spider Identification*.

4.7.7 Mosquitoes

- When a mosquito bites, it injects an enzyme that breaks down blood capillaries and acts as an anticoagulant. The enzymes induce an immune response in the host that results in itching and local inflammation. The tendency to scratch the bite sites can lead to secondary infections.
- CDC data indicates that mosquito-borne illnesses, including the strains of encephalitis, are a health risk. At least one of the Encephalitis strains listed below is known to exist in every area of the U.S. and in many other countries as well:
    - Eastern Equine encephalitis
    - Western Equine encephalitis
    - West Nile Virus
    - St. Louis encephalitis
    - La Crosse encephalitis
- Mosquitoes can transmit the West Nile Virus and other forms of encephalitis after becoming infected by feeding on the blood of birds which carry the virus.
- Most people infected with the virus experience no symptoms or they have flu-like symptoms. Sometimes though, the virus can cause severe illness, resulting in hospitalization and even death, so proper precautions should be taken. Consult a medical practitioner if you suspect you have West Nile Virus. Other diseases including Dengue Fever and Malaria are spread by mosquitoes in the sub-tropic and tropical parts of the world. See *S3AM-313-ATT4 Mosquito Borne Diseases* for information on the locations where mosquito borne diseases are known to be present.

4.7.8 Bees, Wasps and Hornets

- Wasps and bees will cause a painful sting to anyone if they are harassed. They are of most concern for individuals with allergic reactions who can go into anaphylactic shock. Also, instances where an individual is exposed to multiple stings can cause a serious health concern for anyone. These insects are most likely to sting when their hive or nest is threatened.
- Bees, hornets, and wasps may be found in derelict buildings, sheltered areas, behind covers or lids and even on open ground. Other protective measures are not normally effective against aggressive, flying insects. Be aware of the potential areas for these types of insects, approach these locations cautiously. Avoid reaching into areas where visibility is limited.
- If you see a nest in the area you are working in stop work. Contact the Manager or Site Supervisor for procedures to have the nest removed.

- If stung by a wasp, bee or hornet, notify a co-worker or someone who can help should you have an allergic reaction. Stay calm and treat the area with ice or cold water. Follow AECOM incident reporting guidelines to report the sting within 4 hours and notify the Manager or Supervisor immediately. Seek medical attention if you have any reactions to the sting such as developing a rash, excessive swelling or pain at the site of the bite or sting, or any swelling or numbness beyond the site of the bite or sting.

4.7.9 Fire Ants

- The fire ant (southern and western U.S.) and the European fire ant (northeastern U.S. and eastern Canada) is often very abundant where it is established. It is very aggressive and commonly climbs up clothing and stings unprovoked when it comes into contact with skin. Painful irritations will persist for an hour or more.

4.7.10 Personal Protective Equipment (PPE)

- Chemically-treated field clothing, full-length clothing, or Tyvek® coveralls.
- Gloves shall also be worn consistent with the recommendations of the site-specific SWP and/or THA to minimize hand exposure.
- Where ticks, chiggers, and spiders are presumed to exist, the Tyvek® or chemically treated clothing will be taped to the work boots.
- See *S3AM-313-ATT2 Ticks* for configuration of clothing for protection against ticks and insects.
- Application of insect repellent to clothing and/or exposed skin. Oil of lemon eucalyptus, DEET, and Permethrin have been recommended by the CDC for effective protection against mosquitoes that may carry the West Nile virus and related diseases.
- Note that DEET will reduce the effectiveness of Fire Resistance Clothing (FRC) and should not be applied to this clothing. If working in FRC, employees can use Permethrin as it has been shown not to reduce the effectiveness of FRC. Permethrin will need to be applied to FRC well in advance of the planned work. If permethrin is unavailable employees can apply DEET to their skin and let dry prior to putting FRC on.
    - Oil of Lemon Eucalyptus is a plant-based insect repellent on the market as Repel Lemon Eucalyptus. The products have been proven to be effective against mosquitoes, deer ticks, and no-see-ums for up to six hours. Derived from Oil of Lemon Eucalyptus, this non-greasy lotion or spray has a pleasant scent and is not known to be toxic to humans. The spray or lotions will be effective for approximately two to six hours and should be reapplied every two hours to sustain protection. Lemon Eucalyptus products cannot be applied to fire retardant clothing.
    - Permethrin is an insecticide with repellent properties registered with the Environmental Protection Agency and recommended by the CDC.
        - Permethrin is highly effective in preventing tick bites when applied to clothing, but is not effective when applied directly to the skin. Two options are available for Permethrin treatment of clothing worn during field work: 1) pre-treatment of fabric by the clothing manufacturer; or 2) manual treatment of their personal clothing using Permethrin spray in accordance with recommendations manufacturers recommendations. This will likely require treatment at home or the office prior to field mobilization. Caution should be used when applying Permethrin as it is highly toxic to fish and house cats. AECOM strongly recommends the first option (employees obtaining pre-treated clothing) to avoid the time required, potential risk, and housekeeping issues involved with manually treating the clothing with spray. Purchase pre-treated clothing in accordance with *S3AM-208-PR1 Personal Protective Equipment* and with the approval of your Supervisor or Manager.
        - The Permethrin pre-treatment is odorless and retains its effectiveness for approximately 25 washings. After 25 washings, the pre-treated clothing will be

considered no longer effective and removed from service. Clothing that has been manually treated by employees will be considered effective for five wash cycles.

- Also, use of clothing that has been pre-treated with Permethrin offers a reduction in the use and application of other insect repellents that shall be applied directly to the skin. Supervisor or Manager approval is required prior to purchase.
- If the employee opts not to utilize chemically pre-treated clothing while potentially exposed to insects, spiders and/or ticks, they shall either: 1) wear Tyvek® coveralls taped to the boots, or 2) wear full-length clothing consisting of long-legged pants and long-sleeved shirts treated with an insect repellent containing Permethrin, DEET, or an oil of lemon eucalyptus to their work clothing.

- Safety Data Sheets (SDS) for the repellents, lotions, and cleansers discussed in this Procedure are not required because the repellents, lotion, and clothing are consumer products used in the manner intended for the general public. Although not required, a SDS should be obtained for the products used and placed into the office SDS library and site-specific safety plan.

4.8 Poisonous Plants

4.8.1 Habitat Avoidance, Elimination and/or Control

- If poisonous plants are identified in the work area, employees will mark the plants using either flags or marking paint, and discuss what the specific indicator will be to signal to other employees to avoid the designated area. If employees decide to use ground-marking paint to identify poisonous plants, they should discuss this tactic with the Manager (and Client as appropriate) for approval.
- If removal of the plants is considered, it should be subcontracted to a professional landscaping service that is capable and experienced in removing the plant. If herbicides are considered for use, a discussion shall need to occur with the Manager (and Client as appropriate) to determine whether it is acceptable to apply herbicides at the work site. Application of herbicides may require a license.
- Employees shall not attempt to physically remove poisonous plants from the work area unless a clearing procedure, including PPE, is prepared in advance and approved by the SH&E Manager. The clearing procedure should be included in the SH&E Plan and THA and the required PPE specified.

4.8.2 Poisonous plants that employees should recognize and take precautions to avoid include: poison sumac, poison ivy (terrestrial and climbing), poison oak, giant hogweed[2] (or giant cow parsnip), wild parsnip, devil's club and stinging nettle. Many others are extremely poisonous to eat (e.g., poison hemlock; water parsnip) – do not eat anything that has not been identified. Refer to *S3AM-313-ATT5 Plants of Concern* for information on locations where some of these poisonous plants are found in the U.S.

- Of the toxic plants in the cashew family, poison ivy (*Rhus radicans*) is most widespread. It grows in a variety of forms such as a low sprawling shrub, dense ground cover, or a thick woody vine that grows high into the tree canopy. Poison oak (*Rhus diversiloba*) is typically a low shrub in drier soils. Both of these plants have leaves of three and white berries. Poison sumac (*Rhus vernix*) is a tall shrub that is less prolific in distribution. It grows in wet areas, has a compound leaf with a red leaf stem (rachis), and white berries. All of these plants possess urushiol oils in all parts of the plant. Touching the plant causes an itchy skin rash that can show up within 4-72 hours following contact. People have a wide range of reactions including swelling, itching, rash and bumps, patches or blisters.
- Uroshiol oil can also transfer onto clothing and equipment. The oil can remain active on surfaces for up to 5 years and can be transferred to your skin.

[2] Phytodermatisi producer: keep skin covered and wash well after exposure

- Wild parsnip is found throughout the U.S. and contains a poison that produces a rash similar to poison oak and ivy. Unlike poison oak and ivy, the active oil will not be present on unbroken leaves. See *S3AM-313-ATT6 Wild Parsnip Identification* for additional information and photos of wild parsnip.
- Several plants in the carrot family contain toxic sap that causes severe dermatitis if it comes into contact with skin that is then exposed to sunlight. The most serious reaction is caused by the giant hogweed (*Heracleum mantegazzianum*), a plant that is spreading in southern Ontario and is also present in southwestern British Columbia. The plant is enormous, attaining up to 16 feet (5 meters) in height, which it does in one growing season. Contact causes painful blistering that can cause permanent disfigurement. It is to be avoided. Similar but less serious reactions can be caused by meadow parsnip (*Pastinaca sativa*) and cow parsnip (*Heracleum lanatum*). Meadow parsnip can be very abundant on disturbed sites.
- Nettles, particularly stinging nettle (*Urtica dioica*) and wood nettle (*Laportea canadensis*) contain urticating hairs on the leaves and stems that cause sharp pain or itchiness on contact with skin. The irritation is immediate and normally lasts no more than an hour and there are no lasting consequences.
- Some plants contain abundant stiff spines that can present a safety hazard, particularly if one is to fall into them. These include the cactus (*Opuntia spp.*), devils club (*Oplopanax horridum*), and prickly-ash (*Zanthoxylon americanum*).

4.8.3 A large number of plants are not harmful to touch but may contain poisonous berries or foliage that could cause serious complications or death if they are ingested. It goes without saying to not eat any berries or plants if you are unsure of their identity.

- Remember that in the fall and winter the hazard still exists in the form of stubble and roots.

4.8.4 Personal Protective Equipment (PPE)

- Employees conducting clearing, grubbing, or similarly disturbing work activities in areas where poisonous plants exist shall wear long-sleeve clothing or Tyvek® coveralls, and disposable cotton, leather or synthetic gloves. Employees shall not touch exposed skin (neck and face) with potentially contaminated gloves. Tyvek® and gloves worn to protect from exposure to poisonous plants shall be treated as contaminated, removed from the body in a manner that the contamination is not spread, and placed in plastic bags for disposal.
- Personal clothing that has been exposed to poisonous plants shall be decontaminated with a poisonous plant cleanser such as Tecnu® or removed in a careful manner, bagged and washed separately from other clothing to remove urushiol.
- Work boots will be decontaminated with either soap and water or a cleansing agent such as Tecnu® cleanser.
- If foliage is being cleared and includes poisonous plants, exposed skin shall be treated with a dermal barrier cream such as Tecnu®'s Oak 'n Ivy Armor or Enviroderm's Ivy Block and either a full-face respirator or a half-face respirator (with goggles) fitted with a P-100 (HEPA) dust filter.

4.9 Bird Droppings and Biological Soil Hazards

4.9.1 Work in any area where pigeons or other flying animals (e.g. bats) may nest requires a written statement from the client which states the potential for, and extent of, accumulation of excrement on/in the structure from pigeons or other winged animals.

4.9.2 Substantial accumulations of droppings can pose physical and health risks as slippery surfaces (if wet) and if the material is disturbed and becomes airborne, it can be inhaled or ingested if personal hygiene practices are not implemented. Inhalation of airborne droppings can cause diseases such as histoplasmosis. Exposure to surfaces with bird droppings shall be safeguarded by implementing proper work practices, training employees for awareness and using PPE. See *S3AM-313-ATT8 Bird Droppings*.

4.9.3 Tularemia is a problem with contaminated soil in some locations. Tularemia is a disease of animals and humans caused by the bacterium *Francisella tularensis*. Rabbits, hares, and rodents are especially susceptible and often die in large numbers during outbreaks. Workers can contract Tularemia through tick and deer fly bites, but also through inhalation of contaminated aerosols or agricultural dusts. Check work areas for carcasses before disturbing the ground (e.g. mowing, brushing, grubbing, excavation, etc.).

4.10 Personal Hygiene and Body Checks

4.10.1 Tick-borne diseases typically require that the tick be imbedded for four hours to begin disease transfer. The oils from poisonous plants can take up to 4 hours after exposure to penetrate the skin and react with the live proteins under the skin.

4.10.2 It is recommended that exposed skin be checked frequently for the presence of ticks, insects, rashes, or discolorations. External clothing should also be checked for the presence of ticks and insects; these should be retained for identification and to determine if medical treatment is needed.

4.10.3 Employees shall shower as soon as practical after working in the field and examine their bodies for the presence of ticks, insect bites, rashes, or swollen areas. If imbedded ticks are found, they should be removed using the technique described in *S3AM-313-ATT2 Ticks*.

4.11 Employees shall immediately notify their Manager or Supervisor of the presence of an imbedded tick, bee, wasp or hornet sting, other insect bite, rash, or any abnormal reaction. Reporting shall occur within 4 hours for a significant incident and 24 hours for all other SH&E incidents, and in accordance with *S3AM-004-PR Incident Reporting, Notifications & Investigation*.

4.12 The Manager or Supervisor shall forward the report to the SH&E Manager for follow up.

5.0 Records

None

6.0 Attachments

6.1 S3AM-313-ATT1 Biological Hazard Assessment Flow Chart

6.2 S3AM-313-ATT2 Ticks

6.3 S3AM-313-ATT3 Poisonous Spider Identification

6.4 S3AM-313-ATT4 Mosquito Borne Diseases

6.5 S3AM-313-ATT5 Plants of Concern

6.6 S3AM-313-ATT6 Wild Parsnip Identification

6.7 S3AM-313-ATT7 Alligators

6.8 S3AM-313-ATT8 Bird Droppings

6.9 S3AM-313-ATT9 Large Carnivores & Ungulates

6.10 S3AM-313-ATT10 Bear Safety

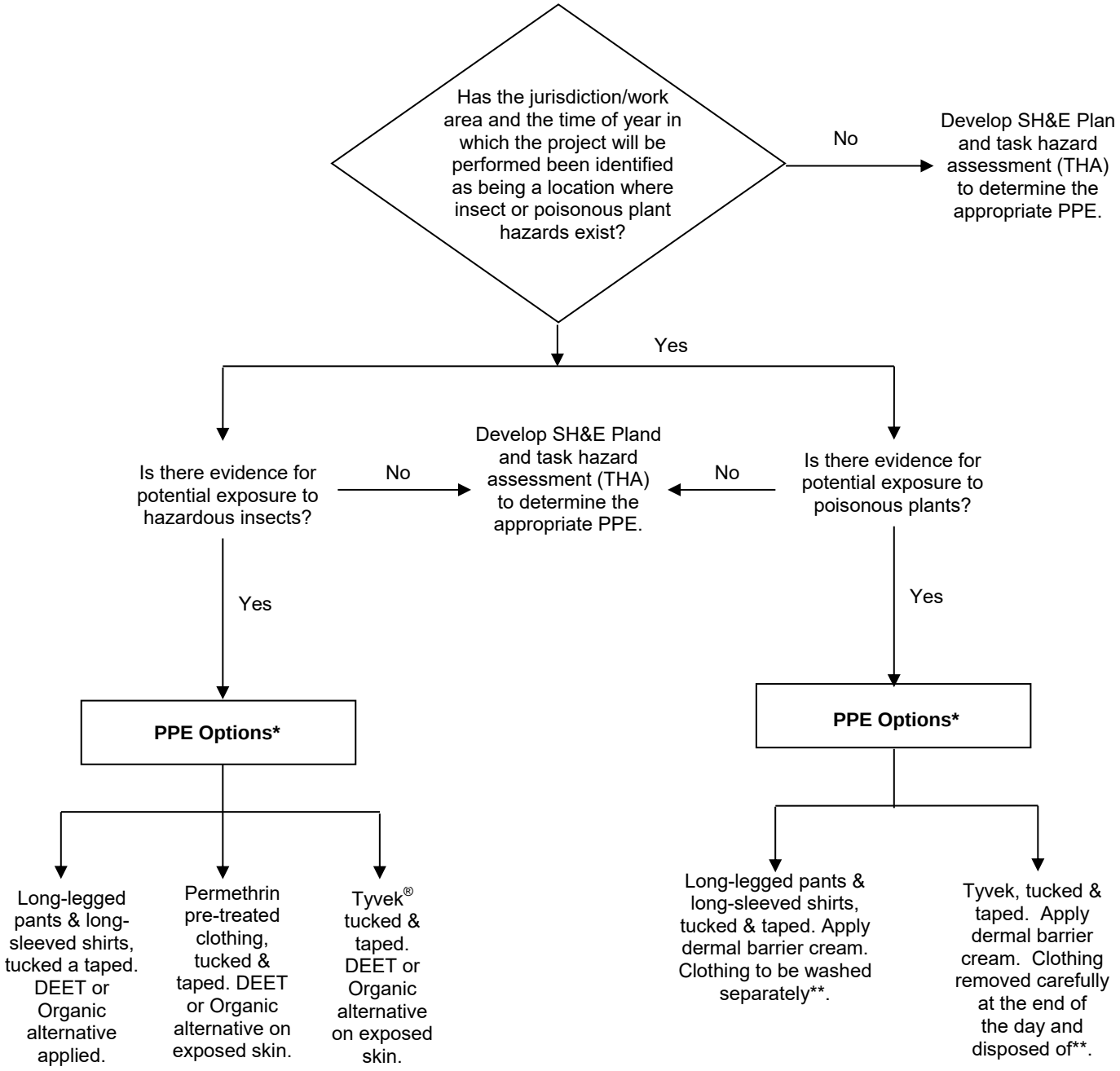
6.11 S3AM-313-ATT11 Small Mammals

6.12 S3AM-313-ATT12 Snakes & Scorpions

Americas

Biological Hazard Assessment Decision Flowchart

S3AM-313-ATT1



* indicates that when both insect and poisonous plant hazards are recognized hazards at a project site, the most conservative combination of the available PPE choices will be selected. Include the selected PPE option in the respective SH&E Plan and THA.

** indicates that clothing that has been known or suspected to have come in contact with poisonous plants must be washed before it can be worn again. Similarly, Tyvek® that has been known or suspected to have come in contact with poisonous plants will be disposed of rather than reused during a subsequent day or project.

Americas

Ticks

S3AM-313-ATT2

1.0 Background

1.1 The Public Health Agency of Canada and the Centers for Disease Control and Prevention work with States and Provinces, health authorities and other experts on research to define and monitor the occurrence of the ticks that carry bacterium that cause disease, including but not limited to:

1.1.1 *Borrelia burgdorferi*, the bacterium that causes Lyme disease.

- In the United States and Canada, the black-legged tick (*Ixodes scapularis*; often referred to as a deer tick) and the western black-legged tick (*Ixodes pacificus*) are the species known to transmit this disease-causing agent, as well as other less common agents.

1.1.2 *Rickettsia rickettsia,* the bacterium that causes Rocky Mountain Spotted Fever.

- In the United States and Canada, the American dog tick (*Dermacentor variabilis*), Rocky Mountain wood tick (*Dermacentor andersoni*), and brown dog tick (*Rhipicephalus sanguineus)* are known to transmit this disease-causing agent.

1.1.3 *Francisella tularensis*, the bacterium that causes Tularemia.

- In the United States, these include the American dog tick (*Dermacentor variabilis*), Rocky Mountain wood tick (*Dermacentor andersoni*), and Lone star tick (*Amblyomma americanum*).

1.1.4 *Ehrlichiosis*, the general name to describe several bacterial diseases that affect animals and humas.

- In the United States, these include the black-legged tick (*Ixodes scapularis*; often referred to as a deer tick) and the western black-legged tick (*Ixodes pacificus*), and Lone star tick (*Amblyomma americanum*).

1.2 Consult local health authorities to determine where tick populations are established or emerging. Locations where distribution may have previously been limited may show evidence of larger populations. Employees working in or adjacent to areas where there are established tick populations may have a greater chance of contact with ticks.

1.3 While there is a higher risk of coming in contact with infected ticks in areas where populations are established, there is also a low risk of tick-borne diseases being contracted almost anywhere in the Americas as migratory birds transport infected ticks over large geographic distances. Take precautions to reduce tick contact.

1.4 Lyme Disease

1.4.1 The rate of infection of ticks with the bacterium that causes Lyme disease varies. Infection rates are typically higher in adult ticks compared to the other stages (nymphs and larvae).

1.4.2 Despite the lower rates of infection, people are most likely to acquire Lyme disease from a nymph because this stage is so small and thus more likely to go unnoticed and feed for a sufficient amount of time for the Lyme disease bacterium to be transmitted (24-36 hours).

1.4.3 Infection rates are often greater in tick populations that have been established for long periods of time compared to newly established ones.

1.4.4 Lyme disease patients are most likely to have illness onset in April through November with onset peaking in June, July, or August and less likely to have illness onset from December through March

2.0 To Remove Attached Ticks



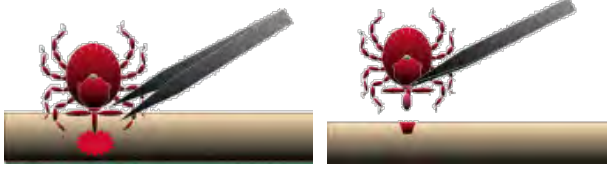
2.1 Use fine-tipped tweezers or notched tick extractor, and protect your fingers with a tissue, paper towel, or latex gloves (see figure). Persons should avoid removing ticks with bare hands.

2.2 Grasp the tick as close to the skin surface as possible and pull upward with steady, even pressure. Do not twist or jerk the tick; this may cause the mouthparts to break off and remain in the skin. (If this happens, remove mouthparts with tweezers. Consult your health care provider if illness occurs.)

2.3 After removing the tick, thoroughly disinfect the bite site and wash your hands with soap and water.

2.4 Do not squeeze, crush, or puncture the body of the tick because its fluids may contain infectious organisms. Skin accidentally exposed to tick fluids can be disinfected with iodine scrub, rubbing alcohol, or water containing detergents.

2.5 Save the tick for identification in case you become ill. This may help your doctor make an accurate diagnosis of potential diseases by determining what type of tick it is. Place the tick in a sealable plastic bag and put it in your freezer. Write the date of the bite on a piece of paper with a pencil and place it in the bag.



3.0 Folklore Remedies Don't Work

3.1 Folklore remedies, such as the use of petroleum jelly or hot matches, do little to encourage a tick to detach from skin. In fact, they may make matters worse by irritating the tick and stimulating it to release additional saliva or regurgitate gut contents, increasing the chances of transmitting the pathogen. These methods of tick removal should be avoided.

4.0 Configuration of Clothing

4.1 Loose-cuff trousers must be tucked into socks, wrapped with duct tape (or equivalent) completely around the cuff of the sock up on to the surface of the pant leg to prevent entry of insects between the sock and pants, and preferably reverse-wrapped with “sticky” side out (see figure below).



Americas

Poisonous Spider Identification

S3AM-313-ATT3

Black Widow Spider





- Found in warm, dry parts of throughout the United States and extend into the southern edge of Canada.
- Prefer to spin their webs in dark, sheltered spots close to the ground
- Abdomen usually shows hourglass marking.
- The female is 1 to 1.5 inches (3-4 centimeters) in diameter.
- Have been found in well casings and flush-mount covers.
- Not aggressive, but more likely to bite if guarding eggs.
- Light, local swelling and reddening of the bite are early signs of a bite, followed by intense muscular pain, rigidity of the abdomen and legs, difficulty breathing, and nausea.
- If bitten, see physician as soon as possible.

Brown Spiders (Recluse)





- Central and South U.S., although in some other areas, as well.
- 0.25-to 0.5-inch (0.6 to 1.3 centimeters)-long body and the size of silver dollar.
- Hides in decaying wood, baseboards, ceilings, cracks, and undisturbed piles of material.
- Bite either may go unnoticed or may be followed by a severe localized reaction, including scabbing, necrosis of affected tissue, and very slow healing.
- If bitten, see physician as soon as possible.

Hobo Spider





- Primarily found in Washington, Oregon, Wyoming, Colorado, Utah, Montana and the Pacific Northwest United States.
- 0.4-to 0.5-inch (1.1 to 1.3 centimeters)-long body and the size of silver dollar.
- Because of its common features and color, it is easily confused with other spider such as Brown Recluse Spiders.
- They rarely climb vertical surfaces and are uncommon above basements or ground level.
- Bite is initially painless. After 24 hours, the bite develops into a blister and after 24-36 hours, the blister breaks open, leaving an open, oozing ulceration.
- If bitten, see physician as soon as possible.

Exercise care when collecting samples and avoid reaching into areas where visibility is limited. If bitten by a spider, attempt to identify the spider, notify a co-worker or someone who can help should the bite site become painful, discolored, or swollen. Stay calm and treat the area with ice or cold water. Seek medical attention if you have any reactions to the sting such as developing a rash, excessive swelling or pain at the site of the bite or any swelling or numbness beyond the site of the bite.

Americas

Mosquito-Borne Diseases

S3AM-313-ATT4

1.0 Background

1.1 Employees working outdoors in the Americas may be exposed to mosquitoes that may transmit illnesses, including Encephalitis and Dengue.

1.2 Dengue is transmitted by the bite of a mosquito infected with one of the four dengue virus serotypes. Dengue is endemic to South America**.**

1.2.1 Dengue is a febrile illness that affects infants, young children and adults with symptoms appearing 3-14 days after the infective bite.

1.2.2 Symptoms range from mild fever, to incapacitating high fever, with severe headache, pain behind the eyes, muscle and joint pain, and rash.

1.2.3 Severe dengue (also known as dengue hemorrhagic fever) is characterized by fever, abdominal pain, persistent vomiting, bleeding and breathing difficulty and is potentially fatal.

1.3 West Nile encephalitis is an infection of the brain that is caused by a virus known as the West Nile virus.

1.3.1 Most individuals infected with WNV remain asymptomatic. West Nile (WN) fever is typically a mild illness lasting 3 to 6 days.

1.3.2 The main symptoms are sudden onset of fever with chills, rash, malaise, headache, backache, arthralgia, myalgia and eye pain. Other non-specific symptoms may include nausea, vomiting, anorexia, diarrhoea, rhinorrhoea, sore throat, and cough.

1.3.3 The main route of infection is via the bite of a mosquito that has been infected by feeding on West Nile Virus infected birds.

1.4 Arboviral encephalitis is a virus that exists in various forms in global distribution. Numerous forms occur in the Americas, including the following four primary forms that can be transmitted by mosquitoes:

1.4.1 Eastern equine encephalitis (EEE) – United States and Canada

1.4.2 Western equine encephalitis (WEE) – United States

1.4.3 St. Louis encephalitis (SLE) – United States and Canada

1.4.4 La Crosse (LAC) encephalitis.all of which are transmitted by mosquitoes – United States

1.5 Mosquitoes are known to breed in standing water; therefore, when standing water is found at a job site, actions should be taken to drain the water. Typically, mosquitoes will fly only a quarter of a mile (400 meters) from their breeding location.

1.6 The local Public Health Department and Center for Disease Control and Prevention (CDC) should be consulted to determine what diseases transmitted by mosquitoes are present and exposure prevention recommendations.

Americas

Plants of Concern

S3AM-313-ATT5

1.0 Background

1.1 Poison ivy, oak and sumac (poisonous plants) pose a significant threat to AECOM employees due to the dermatitis that results from exposure to the oil on these plants, called urushiol.



Poison Oak **Poison Sumac** **Poison Ivy**

1.2 Exposure to urushiol produces a rash that can be irritating and cause the exposed employee to scratch the infected area, increasing susceptibility for an infection to result from the rash.

1.3 It should be noted that each time an employee is exposed to urushiol, it increases the severity of the reaction they will have in subsequent exposures.

1.4 Giant Hogweed is a phototoxic plant that causes skin irritation on contact with the sap and, when exposed to sun causes deep blisters.

1.5 Blisters from contact with Giant Hogweed can form black or purplish scars that can last for several years. Even a tiny amount of the sap in the eyes can cause temporary to permanent blindness.



Giant Hogweed



Giant Hogweed Distribution

Image obtained from www.gclandscape.com

2.0 Treatment

2.1 In cases that involve severe rashes, medical treatment may be necessary to control the rash.

2.2 Employees that develop a rash as a result of exposure to poison ivy, oak or sumac should report the exposure immediately to their Supervisor, Project Manager and Region Safety, Health and Environment Manager.

Pacific Poison Oak Distribution



Image obtained from www.cdc.gov

Atlantic Poison Oak Distribution



Image obtained from www.cdc.gov

Poison Sumac Distribution



Image obtained from www.cdc.gov

Western Poison Ivy Distribution



Image obtained from www.cdc.gov

Eastern Poison Ivy Distribution



Image obtained from www.cdc.gov

Americas

Wild Parsnip Identification

S3AM-313-ATT6

1.0 Background

1.1 Wild parsnip (also known as poison parsnip) looks similar to a large carrot plant and is found in open places along roadsides and in waste places throughout the United States and Canada.

1.2 This plant produces a compound that causes severe blistering and discoloration after being exposed to sunlight—a condition known as photodermatitis. That is, when the skin comes in contact with this plant's juice and then is exposed to UV light, a severe burn develops.

2.0 Hazard

2.1 Everyone can get burned by wild parsnip. Unlike poison ivy, you don't need to be sensitized by a prior exposure. However, wild parsnip is only dangerous when the juice from broken leaves or stems gets on your skin—therefore, you can touch and brush against the undamaged plant without any danger.

2.2 If one gets some of the sap of hogweed (or meadow parsnip or cow parsnip) in contact with skin, it is critical that they stay out of the sun for 8 hours. If one needs to remove the plant they should be completely covered with overalls, gloves, hat and safety glasses.



Americas

Bird Droppings Safe Work Practices

S3AM-313-ATT8

1.0 Background

1.1 According to the National Institute for Occupational Safety and Health (NIOSH), histoplasmosis is an infectious disease caused by inhaling spores of a fungus called *Histoplasma capsulatum (*abbreviated *H. capsulatum)* that may inhabit accumulated masses of pigeon droppings and excrement of other birds and flying animals. Its symptoms vary greatly, but the disease primarily affects the lungs. Occasionally, other organs are affected. This form of the disease is called disseminated histoplasmosis, and it can be fatal if untreated. The acute respiratory disease form of histoplasmosisis is characterized by respiratory symptoms, a general ill feeling, fever, chest pains, and a dry or non-productive cough. Distinct patterns may be seen on a chest x-ray. Chronic lung disease resembles tuberculosis and can worsen over months or years. If symptoms occur, they may start within 3 to 17 days of exposure, with an average of 10 days. On a positive note, histoplasmosis is not contagious.

1.2 Psittacosis, although primarily a respiratory disease, can cause a wide variety of clinical manifestations. Generally, about 10 days after infection occurs, the clinical illness begins abruptly with fever, chills, weakness, fatigue, muscle pain, anorexia, nausea, vomiting, excessive sweating and difficulty with breathing, headache, backache, and sensitivity to light.

1.3 Hypersensitivity pneumonitis is also known as pigeon breeder's disease.

2.0 Symptoms

2.1 The acute form of hypersensitivity pneumonitis is clinically characterized by chills, fever, cough, breathlessness without wheezing, and malaise 4-10 hours after exposure. In general, an acute attack subsides after 18 to 24 hours.

3.0 Treatment

3.1 If a person should develop any of the symptoms as noted above, or others, it is important to see a physician and inform him of an exposure to pigeon/bird or bat excrement. A failure to diagnose the preceding conditions could occur if a treating physician is unaware of a patient's exposure to pigeon/bird or bat excrement.

4.0 Prevention

4.1 Prior to work in any area where pigeons or other flying animals may nest, a written statement from the client shall be obtained in regards to the potential for, and extent of, accumulation of excrement on/in the structure from pigeons and other winged animals.

4.2 The client shall be asked to provide appropriate details as to the basis for their statement (e.g., date of last visual survey for pigeon/bird or bat excrement accumulation, date of last excrement removal effort, etc.).

4.3 In no case will an AECOM employee or contract employee be permitted to commence structure inspection procedures without the Project Manager having received and evaluated the aforementioned written statement from the client.

4.4 According to NIOSH, the best way to prevent exposure to *H. capsulatum* spores during survey and inspection work is to avoid situations where excrement and other potentially contaminated material can become airborne and inhaled. Therefore, it is preferable that the efforts to determine if, and to what extent, there is an accumulation of pigeon/bird or bat excrement on/in structures, or the efforts to clean-up/remove/dispose of such contaminated material, be left to the client or subcontracted out.

5.0 Safe Work Practices

5.1 In those cases where AECOM employees or contract employees are contracted by the client to determine the extent of accumulation of animal excrement in/on structures, the following minimum safety and health precautions shall be taken. (NOTE: precautionary measures are based on recommendations and best practices prescribed in the NIOSH 2004 public document titled *Histoplasmosis – Protecting Workers at Risk*).

5.2 All workers shall wear disposable protective clothing (Tyvek® coveralls). Disposable overalls with hoods shall be donned when working in areas where *H. capsulatum* spore-contaminated material is likely to fall from overhead.

5.3 All workers shall wear disposable shoe coverings fitted with ridged soles made of slip-resistant material to reduce the likelihood of slipping on wet or dusty surfaces. Gloves shall be worn.

5.4 All workers shall wear a full facepiece air purifying respirator fitted with P100 (HEPA) cartridges. If entering an enclosed area in which the extent of excrement contamination is unknown, additional protective measures shall be taken such that workers shall wear a powered air-purifying respirator (APR) with full facepiece fitted with P100 (HEPA) cartridges. Any variance from these requirements must be approved by the Region Safety, Health an Environment Manager. Workers donning APRs shall be medically screened, cleared, and trained in their proper use in accordance with AECOM safety program standards.

5.5 If contaminated material must be disturbed for purposes of removal/disposal or during the structure inspect process, it shall be wetted down prior to all work and will be rewetted as necessary to minimize airborne dusting.

5.6 After working in *H. capsulatum* spore-contaminated areas and before removing any respiratory protective equipment, workers shall remove all protective clothing and shoe coverings and seal them in a heavy-duty plastic bag for disposal.

5.7 Workers shall observe a high degree of personal hygiene, even if the exposure is casual. Special care shall be taken to wash hands, face, and other areas of exposed skin thoroughly before eating, drinking or smoking.

Americas

Small Mammals

S3AM-313-ATT11

1.0 Hazard

1.1 Working in the field either directly or indirectly with small mammals has inherent risks of injury or exposure to zoonotic diseases (infectious diseases that can be transmitted from animals to humans) that all field staff need to protect themselves against.

1.2 The risks are usually higher when there is direct contact with a wild animal, either through a break in the skin (blood), saliva, or excrement; however, there are also risks through air-borne diseases (e.g., Hantavirus).

1.3 Obviously, wildlife biologists directly handling wildlife, dead or alive, or working with wildlife feces or in enclosed habitats (such as caves), have an increased risk of exposure to a wider range of zoonotic diseases and should take extra precautions.

2.0 Personal Protective Equipment

2.1 Full-length clothing (long sleeves and pants)

2.2 Insect repellent

2.3 Respiratory equipment (when directly handling wildlife)

2.4 Gloves (when directly handling wildlife)

3.0 References

3.1 None.

4.0 Restrictions

4.1 Wildlife handling must only be completed under direct supervision of an experienced individual.

5.0 Training

5.1 Any staff that will be handling wildlife must be adequately trained and/or supervised by a wildlife biologist experienced in the job task.

6.0 Safe Work Practice

6.1 Wild animals can carry a variety of diseases that humans can contract: viral, parasitic, bacterial, and protozoal. Basic Personal Protective Equipment such as full-length clothing, gloves and a respiratory mask will greatly reduce the risk of exposure.

6.2 Treat unknown dogs encountered in field activities in the same manner as a wild animal. Be conscious of behaviors that seem to indicate anxiety (tail under the belly), defensiveness or aggressiveness, and attempt to leave the area if these are identified.

6.3 Whenever a wild animal must be handled, the procedure must be accomplished as safely and quickly as possible.

6.4 Proper techniques must be employed to avoid or minimize the risk of personal injury while, at the same time, avoiding or minimizing injury to the animal.

6.5 Gloves, catch sticks, caging, and other appropriate equipment may be necessary when handling a wild animal. Most of these animals will be extremely stressed, resisting every restraint attempt.

6.6 In the unfortunate circumstance that a person is bitten or scratched, he or she should cleanse the wound thoroughly with soap and flush with water immediately, providing for a mechanical removal of potentially infective organisms. This should be followed by cleansing under medical supervision and consultation with a physician to consider the potential exposure to the rabies virus.

7.0 Rabies

7.1 You will not be able to accurately determine if an animal has rabies simply by observation as traditional symptoms of rabies (foaming at the mouth, biting, etc.) do not occur in all animals nor at all stages. There are some mammals that are at a higher risk than others for the rabies virus, such as raccoons, skunks, stray cats and dogs, foxes, coyotes, rodents. and bats; however, any mammal can contract the virus.

7.2 Rabies is contracted by contact of an infected animal's saliva with an open wound – a bite or a scratch.

7.3 Symptoms of rabies in humans usually do not present themselves for a minimum of 10 days to a year or longer (the average is 30 to 50 days). Symptoms are typical of a flu, including malaise, loss of appetite, fatigue, headache, and fever. Over half of all patients have pain (sometimes itching) or numbness at the site of exposure. They may complain of insomnia or depression. Two to ten days later, signs of nervous system damage appear; these include hyperactivity and hypersensitivity, disorientation, hallucinations, seizures, and paralysis.

7.4 Because rabies is so difficult to detect and positively identify, it is very important to consult a physician immediately. If rabies is a possibility, begin treatment with the rabies vaccine as soon as possible (unlike other vaccines, rabies vaccination begins after exposure because the virus takes a comparatively long time to induce disease).

8.0 Hantavirus

8.1 Rodents can carry a variety of diseases; of notable concern is the North American hantavirus which can cause Hantavirus Pulmonary Syndrome (HPS).

8.2 A common host of the hantavirus is deer mouse and related species (*Peromyscus* spp.), which are common throughout much of North America.

8.3 Although infection is rare, it can be fatal and, therefore, it is necessary that risk of exposure be minimized. Infection can be spread to humans when they:

8.3.1 Breathe air contaminated by deer mouse saliva, urine or feces containing infectious hantaviruses; or

8.3.2 Accidentally rub eyes, mouth or broken skin with hantavirus-infected deer mouse saliva, urine or feces.

8.4 The following precautions will be taken for all field operations:

8.4.1 Limit exposure to soils handling and use gloves where appropriate.

8.4.2 Wash or sanitize hands often throughout the day and before meals.

8.4.3 Equipment bags, storage areas, and vehicles will be inspected daily for signs of deer mouse infestation.

8.4.4 Rodent-proof storage containers will be used when practical.

8.4.5 Do not enter buildings infested with deer mice without adequate respiratory protection.

8.4.6 Droppings should never be removed by vacuuming or sweeping. Wetting down an area with a mixture of 1:9 household bleach and water solution will reduce risk of airborne exposure.

8.5 If flu-like symptoms develop three days to six weeks after exposure to rodents, a doctor should be contacted immediately (mechanical ventilation is the primary method of treatment).

9.0 Bubonic Plague

9.1 The bacteria that cause plague, *Yersinia pestis*, maintain their existence in a cycle involving rodents and their fleas.

9.1.1 In urban areas or places with dense rat infestations, the plague bacteria can cycle between rats and their fleas.

9.1.2 Humans may contract the plague bacteria through:

- Infected flea bites.
- Contact with contaminated fluid or tissue of a plague infected animal.
- Infectious droplets from an infected person coughing into the air (very uncommon in the United States, but relatively frequent in developing countries.

9.1.3 Individuals infected develop sudden onset of fever, headache, chills, and weakness and one or more swollen, tender and painful lymph nodes (called buboes).

9.1.4 Immediate medical attention is necessary to prevent complications or death.

9.1.5 Rodent control measures should be employed at AECOM locations.

9.1.6 Wear gloves if handling potentially infected animals to prevent contact between skin and the plague bacteria. Contact the local health department with and questions about disposal of dead animals.

9.1.7 Repellent shall be used if there is potential exposure to rodent fleas. Products containing DEET can be applied to the skin as well as clothing and products containing permethrin can be applied to clothing (always follow instructions on the label).

Americas

Snakes & Scorpions

S3AM-313-ATT12

1.0 Hazard

1.1 Snakes have the ability to inject venom. A bite from a venomous snake, which may inject varying degrees of toxic venom, is rarely fatal but should always be considered a medical emergency.

2.0 Personal Protective Equipment

2.1 Long pants and shirts

2.2 Heavy gloves if staff will be handling debris or be close to the ground

2.3 Rubber boots, or boots that fully cover the foot (not sandals!) and preferably are at least 10 inches (25 centimeters) high

2.4 Snake Chaps that cover at least the shin

2.5 Personal first aid kit

3.0 Restrictions

3.1 Staff must not work alone in areas where the risk of a snake encounter is high.

4.0 Safe Work Practice

4.1 Prior to going into the field, staff should research the area and identify what species are present. Once confirmed, staff should contact local hospitals to identify which carry anti-venom and include that information into the SH&E Plan and THA.

4.2 Staff working in areas known to be inhabited by venomous snakes should take extra precautions, be able to identify the local snake species, and understand the best practices for administering first aid.

4.3 Most snakes in Canada are non-venomous; and most snake bites are not fatal, only painful. Learning to identify snake species will assist you in responding appropriately to an encounter, and will assist medical professionals in determining if antivenin needs to be administered if anyone is bit.

4.4 Most snakes are non-aggressive and will only attack if immediately threatened.

4.5 Prevention

4.5.1 Before venturing out into the wilderness, familiarize yourself with the snakes in your area, both venomous and non-venomous species.

4.5.2 Learn which habitats the venomous species in your region are likely to be encountered in, and use caution when in those habitats.

4.5.3 Try as much as possible not to take a snake by surprise.

4.5.4 Stay on trails where possible, and watch where you place your hands and feet, especially when climbing or stepping over fences, large rocks, and logs, or when collecting firewood. Take care when overturning any objects on the ground when in snake country.

4.5.5 If you see a snake, give it as much room as possible. Most snakes have a strike distance that is only half the length of their body.

4.5.6 If you get very close to a rattlesnake, hold very still until it calms down and starts to move away. Then slowly move backwards until you are at least one snake-body length away.

4.6 Treatment

4.6.1 A bite from a venomous snake should be considered a major medical emergency. Emergency services should be contacted immediately and staff should follow the direction of the medical responders.

4.6.2 Try to keep the snakebite victim still, as movement helps the venom spread through the body.

4.6.3 Keep the injured body part motionless and just below heart level.

4.6.4 Keep the victim warm, calm, and at rest, and transport him or her immediately to medical care.

4.6.5 Do not allow him to eat or drink anything.

4.6.6 If medical care is more than half an hour away, wrap a bandage a few inches above the bite, keeping it loose enough to enable blood flow (you should be able to fit a finger beneath it). Do not cut off blood flow with a tight tourniquet. Leave the bandage in place until reaching medical care.

4.6.7 Identify the snake that caused the bite to determine if it is venomous, and if antivenin needs to be administered. Do not waste time or endanger yourself trying to capture or kill it. Note the shape and color of the snake's head.

4.6.8 If you are alone and on foot, start walking slowly toward help, exerting the injured area as little as possible.

- Note that there are several species of snakes that superficially resemble rattlesnakes. Several species, including Bull, Milk, Fox, and Rat Snakes will even rattle their tails when startled.
- Massasauga Rattlesnake is recognized as a Threatened Species in Ontario and it is an offence to harass, or destroy the habitat of this species.

4.6.9 Workers in scorpion habitat have the potential to be stung.

- Scorpions usually hide during the day and are active at night. They may be hiding under rocks, wood, or anything else lying on the ground. Some species may also burrow into the ground. Most scorpions live in dry, desert areas. However, some species can be found in grasslands, forests, and inside caves.
- Scorpions are found in Southern and Southwestern United States.
- One scorpion species, the Northern Scorpion (*Paruroctonus boreus*) occurs in semi-arid areas of southern British Columbia, Alberta, and Saskatchewan. It carries a stinger on the end of its tail. The sting is painful but not life threatening unless there is an allergic reaction.
- Workers should wear longsleeves and pants. Clothing and shoes should be shaken out before putton on.
- Symptoms of a scorpion sting may include:
  - A stinging or burning sensation at the injection site (very little swelling or inflammation)
  - Convulsions
  - Staggering gait
  - Slurred speech
  - Drooling
  - Muscle twitches
  - Abdominal pain and cramps
- Scorpion stings may be painful, but most are harmless. In the United States, only the Bark Scorpion has venom that can potentially cause severe symptoms.
- Scorpions capable of lethal stings are found predominantly in Mexico and South America.
- If the is any question as to what type of scorpion caused the sting, contact medical services immediately.

5.0 Species

5.1 Venomous Snakes in Canada

Eastern Massasauga Rattlesnake (*Sistrurus catenatus*) found around Wainfleet, Windsor, Bruce Penninsula and eastern Georgian Bay in Ontario.	 Eastern Massasauga Rattlesnake picture by Michael Redmer/Courtesy Lincoln Park Zoo
Northern Pacific Rattlesnake (*Crotalus viridis*) found primarily in Okanagan and Thompson River valleys of southern British Columbia.	
Prairie Rattlesnake (*Crotalus viridis*) found in south eastern Alberta, and south western Saskatchewan.	

5.2 Venomous snakes in the United States

Rattlesnake(*Crotalus cerastes)* found mostly concentrated in the southwestern United States, they extend north, east and south in diminishing numbers and varieties. Every contiguous state has one or more varieties of rattlesnake. The rattlesnake is found in many different biomes ranging from along the coast at sea level, the inland prairies and desert areas to the mountains at elevations of more than 10,000 feet. Species include: Sidewinder, Santa Catalina, Western,	 Western Rattlesnake

Mojave, Red Diamond, Western Diamond, Ridge Nosed, Eastern Diamondback, and Pigmy.	 Eastern Diamondback
Copperhead (*Agkistrodon contortrix*) is the most common venomous snake found in the eastern United States. It can be found in the states of Texas, Oklahoma, Kansas, Missouri, Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina, Tennessee, Kentucky, Virginia, Illinois, Indiana, Ohio, Iowa, Pennsylvania, Maryland, New Jersey, Delaware, New York, Connecticut, and Massachusetts.	
Cottonmouths (water moccasins) (*Agkistrodon piscivorus)* found in the eastern United States from Virginia, south through the Florida peninsula and west to Arkansas, eastern and southern Oklahoma, and east and central Texas.	
Coral Snake (*Micrurus sp.)* found in the southern range of many temperate United States including North Carolina, Georgia, Alabama, Mississippi, Louisiana, Texas, Arkansas, Kentucky, Arizona, and New Mexico.	 Eastern Coral Snake, *Micrurus fulvius*

Americas

Drilling, Boring & Direct Push Probing

S3AM-321-PR1

1.0 Purpose and Scope

1.1 This document provides procedures designed to help prevent injuries to personnel working on the project and pedestrians, property damage, and adverse environmental impact as a result of potential hazards associated with drilling, boring and direct-push probing. These hazards include, but are not limited to, encountering underground utilities, subsurface installations, rotating equipment and potential overhead hazards.

1.2 This procedure provides the minimum requirements to be followed when drilling, boring, and probing work are performed.

1.3 This procedure applies to all Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

1.4 The Manager is responsible for meeting all the requirements in this procedure.

1.5 AECOM's clients may have specific procedures which shall be followed to identify and map utility and subsurface structures on their properties or facilities. Provided the client's procedures meet or exceed those of AECOM, approval shall be obtained from the Manager and the SH&E Manager to follow the client's procedures.

2.0 Terms and Definitions

2.1 **Underground Utilities –** All utility systems located beneath grade level, including, but not limited to, gas, electrical, water, compressed air, sewage, signaling, and communications, etc.

2.2 **Ground Disturbance (GD) –** Any indentation, interruption, intrusion, excavation, construction, or other activity in the earth's surface as a result of work that results in the penetration of the ground.

2.3 **Intrusive Activities –** Examples: Excavation of soil borings, installations of monitoring wells, installation of soil gas sampling probes, excavation of test pits / trenches or other man-made cuts, cavity, trench, or depression in an earth surface formed by earth removal.

2.4 **Subsurface Installations –** Examples: Subterranean tunnels, underground parking garages, and other structures beneath the surface.

3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-118-PR1 Hearing Conservation

3.3 S3AM-208-PR1 Personal Protection Equipment

3.4 S3AM-209-PR1 Risk Assessment & Management

3.5 S3AM-213-PR1 Subcontractor Management

3.6 S3AM-305-PR1 Hand & Power Tools

3.7 S3AM-306-PR1 Highway and Road Work

3.8 S3AM-322-PR1 Overhead Lines

3.9 S3AM-322-FM1 Overhead Electrical Lines Acknowledgement

3.10 S3AM-325-PR1 Lockout Tagout

3.11 S3AM-326-PR1 Machine Guarding

3.12 S3AM-331-PR1 Underground Utilities

3.13 S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Manager**

- Confirm the development of the project SH&E Plan and compliance with this procedure.
- Confirm the appropriate equipment and materials are available to conduct the drilling, boring or direct-push operations.
- Confirm compliance with *S3AM-331-PR1 Underground Utilities.*
- Review the *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist* prior to authorizing work to proceed.
- Confirm that employees conducting drilling, boring or direct-push probing possess any required training, registrations or certifications.
- Confirm all employees involved and affected by the task review the SH&E Plan, *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist* and Task Hazard Assessment (THA) prior to work commencing.
- Confirm an equipment maintenance inventory is maintained, schedules adhered to and appropriate inspections of equipment are conducted.
- Provide authorization (with the concurrence of the Site Supervisor and SH&E Manager) for work to resume if interrupted due to unexpected conditions or events.

4.1.2 **Safety, Health & Environment (SH&E) Manager**

- Assist AECOM management as needed by providing guidance and clarification as to issues that may arise.
- Review the project SH&E Plan to confirm compliance with jurisdictional regulations**.** Provide technical guidance as needed when a variance is pursued related to this procedure. Confirm variance process meets requirements identified in *S2-001-SM1 Global SH&E Management System Manual*.

4.1.3 **Employees**

- Maintain training as appropriate to the work to be completed (e.g., ground disturbance, lockout tagout, equipment operation, etc.). Refer to *S3AM-003-PR1 SH&E Training.*
- Review the SH&E Plan, *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist* and Task Hazard Assessment (THA) prior to work commencing.
- As appropriate to the anticipated or encountered hazards and as addressed in the applicable planning documentation, utilize appropriate personal protective equipment (PPE) and applicable training, practices and operating procedures.
- Immediately notify the Manager of any unanticipated conditions or events. If assigned equipment, perform appropriate inspections and confirmations of maintenance and / or repairs.

4.2 Training

4.2.1 All on-site employees involved with drilling, boring, and direct-push probing shall be trained, at a minimum, in these procedures and in the procedures of *S3AM-331-PR1 Underground Utilities*.

4.2.2 All operators and assistants shall have the appropriate safety training based on the SH&E Training Matrix and any additional training assessments developed at the business group**,** and be versed in the equipment to be utilized.

- Refer to *S3AM-003-PR1 SH&E Training.*

- This training may include, but is not limited to, Excavation / Trenching (Ground Disturbance), HAZWOPER, Petroleum Safety Training (or Construction Safety Training), and H2S Alive as appropriate.
- Only qualified personnel shall operate and inspect equipment.

4.2.3 All on-site Employees involved with drilling, boring, and direct-push probing activities shall be provided with on-site orientation of the drill rig and its operation.

4.2.4 All Employees involved with drilling, boring and direct-push probing activities at a client site shall receive the applicable client-required training**.**

4.3 Planning

4.3.1 SH&E Plan – At a minimum, a SH&E plan that includes a pre-job hazard assessment shall be prepared and communicated to all involved personnel prior to any drilling, boring, and direct-push probing activities. Refer to *S3AM-209-PR1 Risk Assessment & Management*.

- Assessment shall include both overhead and subsurface utilities and installations. Refer to *S3AM-322-PR1 Overhead Lines* and *S3AM-331-PR1 Underground Utilities*.
- The SH&E Plan will address any required environmental monitoring including gas monitoring, dust, noise, metals, radiation or other monitoring as may be appropriate for site conditions.
- All SH&E Plan requirements will be followed by the project team.
- The location specific emergency response plan shall be in place, contain procedures applicable to the potential emergencies presented by the operations, and be reviewed with all personnel potentially affected.

4.3.2 A Task Hazard Assessment (THA) shall be completed before every assigned task at the work location. The focus of the analysis shall be on the specific assigned task and the evaluation of risks and assignment of control measures based on actual work conditions.

4.3.3 *S3AM-321- ATT2 Pre-Drilling, Boring & Direct-Push Probing Flow Chart* summarizes the key Pre-Drilling, Boring, and Direct-push probing requirements addressed in this procedure.

4.3.4 Procedures and documentation as detailed in *S3AM-322-PR1 Overhead Lines* and *S3AM-331-PR1 Underground Utilities* shall be completed prior to any intrusive subsurface work.

- The locations of subsurface and overhead utilities and subsurface installations will be investigated, documented, mapped on a site plan and evidenced with appropriate surface markings.
- A site walk shall be conducted by the project team / site Manager and any other appropriate personnel, with the objectives of reviewing all planned intrusive activity locations, the locations of subsurface and overhead utilities and the potential for subsurface installations, to determine the appropriate utility clearance activities, and to observe other physical hazards.
- All proposed subsurface activities will be reviewed in comparison to subsurface and overhead utilities and subsurface installations and adjustments made as necessary.
- Appropriate clearance activities shall confirm location(s) of identified underground utilities and subsurface structures. Review the applicable completed *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist.*
- Site Walks should be repeated as necessary following the clearance of subsurface utilities and installations to confirm hazards are clearly identified.

4.3.5 Confirm drilling location(s) and / or bore entry and bore exit points are adequately identified on the worksite to enable appropriate equipment positioning.

4.4 Permits, Notifications and Access Agreements

4.4.1 Any required notifications shall be provided within the appropriate timeframe to the applicable organization (e.g. owner, agency, governing body, etc.).

4.4.2 All applicable permits (e.g. client, government, working near rail road, etc.) will be identified, obtained, and adhered to.

4.4.3 Access agreements will be obtained and adhered to as necessary.

4.5 Pre-Qualifying and Re-Qualifying Drilling Subcontractors

4.5.1 All drilling subcontractors will be properly pre-qualified in accordance with *S3AM-213-PR1 Subcontractor Management*.

4.5.2 The qualifications of the drilling crew performing the work will be evaluated prior to each mobilization and each day by AECOM's on-site representative to assure that their safety performance, training, qualifications, equipment, processes, and approaches reflect AECOM standards for excellence.

4.5.3 All drilling subcontractor equipment will be properly maintained and properly equipped, and the drilling subcontractor will verify their equipment is fully functional as a normal part of their daily and pre-work routine. Refer to *S3AM-321-FM1 Daily Drilling, Boring & Direct Push Equipment Inspection.*

4.6 General Health and Safety

4.6.1 Personal Protective Equipment – Refer to the *S3AM-208-PR1 Personal Protection Equipment* for best practices. These requirements may be modified or expanded in the SH&E Plan. Clothing shall be close fitting and comfortable without loose ends, straps, draw strings, belts, or otherwise unfastened parts that might catch on some rotating or translating component of the rig.

- Depending upon the hazards present, additional PPE may be required such as fire retardant clothing, specific hearing protection, respiratory protective equipment and chemical protective clothing.
- If the location has potential for underground electrical utilities to be present, workers shall ensure footwear has additional protection of shock resistant soles required (white rectangle with omega symbol).

4.6.2 Hearing Conservation – Hearing conservation program requirements may apply when working around operating equipment. Refer to *S3AM-118-PR1 Hearing Conservation*.

- Each worker shall wear noise-reducing ear protectors around operating equipment or during elevated noise levels. Distance from the elevated noise level is the primary measure of control for non-essential drilling personnel.

4.7 Drilling, Boring and Direct Push Equipment Maintenance and Inspections

4.7.1 All equipment will be inspected prior to the initiation of operations and daily during operations using the *S3AM-321-FM1 Daily Drilling, Boring & Direct-Push Equipment Inspection*. This inspection is the responsibility of the operator who will provide written documentation of the inspection prior to the start of drilling each day.

- Equipment that is deemed defective will immediately be repaired by a qualified person, or, if repair is not practicable, tagged "Out of Service" and sent for repairs or discarded.

4.7.2 Managers shall confirm an accurate inventory of the equipment within their operation requiring scheduled maintenance is developed. Using applicable regulations, industry standards, best practices, and manufacturer's recommendations, a maintenance schedule shall be developed with defined responsibility, required actions, and frequency. Refer to *S3AM-321-FM2 Drilling, Boring, & Direct-Push Equipment Maintenance Inventory.*

4.7.3 The maintenance program for equipment shall:

- Adhere to applicable regulations, standards, and manufacturers' specifications;
- Provide for service by appropriately qualified maintenance personnel; and,
- Require maintenance schedules and records of maintenance.

4.7.4 Employees or operators who are assigned equipment are required to review maintenance schedules for that equipment and will confirm that required maintenance has occurred or see that it is undertaken.

4.8 General Requirements

4.8.1 Excluding geoprobe activities, set up any sample tables and general work areas for employees at a safe distance from the rig.

- The recommended safe distance is the height of the fully extended mast plus 5 feet (1.5 meters), and no less than 30 feet (9.1 meters) from the rig.
- An increase to this distance may be required due to noise exposure hazards. Refer to *S3AM-118-PR1Hearing Conservation.*

4.8.2 Operation of the drilling, boring or direct-push equipment shall be restricted to the designated operator except to activate the emergency shut-off as required.

- All rotary drilling equipment shall have an emergency shut off / kill switch. The location of the switch and operation should be reviewed with all involved Employees.

4.8.3 Sit-on direct push rigs are not permitted on AECOM worksites unless the rig has been modified (in accordance with manufacturer's requirements) to be operated by remote control or the rig has been manufactured with a rollover protection system and seat belt.

4.8.4 Consult jurisdictional regulations as use of J-hooks and cat-heads may be prohibited. Examples:

- 29 CFR 1926 requires derricks and cranes to use hooks with self-closing latches and permits the use of J-hooks only for a task unrelated to this procedure (setting trusses).
- British Columbia and Saskatchewan prohibit the use of friction cat-heads**.**

4.9 Identifying the Work Area

4.9.1 Ensure the work area is adequately identified:

- Including zone around the drilling, boring, or direct push equipment, as well as fluid equipment, entry point, exit point and any excavated areas.
- Utilize barricades, signage, pylons, snow fence, etc. as appropriate.
- Implement traffic control as necessary.
- Coordinate with concurrent operations to identify their associated hazards and controls, and communicate those associated with AECOM tasks.

4.9.2 When operating near public vehicular and pedestrian traffic, the on-site personnel shall take every precaution necessary to see that the work zone is properly established, identified, and isolated from both moving traffic and passer-by pedestrians (refer to *S3AM-306-PR1 Highway and Road Work*).

4.9.3 All traffic control devices shall be installed, placed, and maintained in accordance with a Traffic Control Plan, client specifications, and / or the Manual of Uniform Traffic Control Devices and Manual of Uniform Traffic Control Devices for Canada in Canada. Traffic control devices shall consist of and not be limited to

- Directional and informational signage;
- High visibility barricades, cones, or barrels;
- Lighting; and
- Other equipment and devices as required.

4.10 Clearing Work Areas

4.10.1 In addition to any minimum requirements the drilling subcontractor may have, prior to set up, adequate site clearing and leveling shall be performed to accommodate the rig and supplies and provide a safe working area.

4.10.2 Clearing the site includes clearing the intended drilling area obstacles and of underground utilities in accordance with *S3AM-331-PR1 Underground Utilities*.

4.10.3 Drilling or probing shall not commence when tree limbs, unstable ground, or site obstructions cause unsafe tool handling conditions.

- The cleared / levelled area should be large enough to accommodate the rig and supplies.
- If the rig is positioned on a steep grade and levelling of the ground is impossible or impractical, the wheel of the transport vehicle shall be blocked and other means employed of preventing the rig from moving or toppling over.

4.11 Drilling Activities

4.11.1 Federal / State / Provincial / Territorial regulations that govern drill rig operations and exposed moving parts shall be adhered to.

4.11.2 All applicable client on-site safety procedures shall be understood and adhered to.

4.11.3 Minimum approach distances (MAD) from subsurface and overhead utilities and subsurface installations will be established including 5 feet (1.5 meters) from any subsurface utility, 7 feet (2.1 meters) from the pad surrounding any underground storage tanks, and 10 feet (3 meters) from any overhead energized electrical line (or further depending on line voltage). These approach distances are a minimum; government regulations and utility requirements may dictate a greater set back distance and should be confirmed.

4.11.4 Verify that equipment / energy is isolated when lockout is required:

- Refer to operator's manual and *S3AM-325-PR1 Lockout Tagout*.
- Ensure stop switch is activated.
- Driller is out of the seat.
- Test controls to ensure they do not engage.

4.11.5 In addition to any identified minimum requirements (as applicable, client, drilling subcontractor), the following safety measures shall be taken during drilling, boring or probing operations on site:

- The operator and helper shall be present during all active rig operations.
- Site personnel shall remain within visual contact of the rig operator.
- Hard hats, approved safety boots, safety glasses, and hearing protection shall be worn in the work zone (minimum, the radius around the rig equal to the height of the drill rig mast) of a rig.
- Gas monitoring shall be conducted as appropriate.
- Hands, feet and other body parts shall be kept away from moving parts, (e.g. hoisted, rotating, pushing, etc.) including augers, drill rods and reamers.
- When observing drilling, stand upwind of the drill rig to prevent potential exposure to vapors that may be emitted from the borehole.
- The emergency shut-off switch on the rig shall be identified to site personnel and tested on a daily basis by the operator.
- Unauthorized personnel shall be kept outside of the established work zone.
- Rig crew and other worksite personnel shall not use a cell phone while operating the drill rig or other equipment or within the rig work zone.
- Do not drive the rig from hole to hole with the mast (derrick) in the raised position.
- Before raising the mast (derrick) look up to check for overhead obstructions. Refer to *S3AM-322-PR1 Overhead Lines*.

- Before raising the mast (derrick), all rig personnel (with the exception of the operator) and visitors should be cleared from the areas immediately to the rear and the sides of the mast. All rig personnel and visitors should be informed that the mast is being raised prior to raising it.
- Before the mast (derrick) of a drill rig is raised and drilling is commenced, the drill rig shall be first levelled and stabilized with levelling jacks and / or solid cribbing.
    - The drill rig shall be releveled if it settles after initial set up.
    - Lower the mast (derrick) only when the levelling jacks are down, and do not raise the levelling jack pads until the mast (derrick) is lowered completely.
- After the rig has been positioned to begin drilling, all brakes and / or locks shall be set before drilling begins.
- The operator of a rig shall only operate a drill rig from the position of the controls. The rig shall not be in operation if the operator of the rig leaves the area of the controls.
- Throwing or dropping tools shall not be permitted. All tools shall be carefully passed by hand between personnel or a hoist line should be used.
- If it is necessary to operate the rig within an enclosed area, make certain that exhaust fumes are conducted out of the area.
    - Exhaust fumes can be toxic and some cannot be detected by smell.
    - Air monitoring and, as necessary, noise monitoring shall be conducted.
- Clean mud and grease from boots before mounting a rig platform and use hand holds and railings. Watch for slippery ground when dismounting from the platform.
- During freezing weather, do not touch any metal parts of the rig with exposed flesh. Freezing of moist skin to metal can occur almost instantaneously.
- All unattended bore holes shall be adequately covered or otherwise protected to prevent rig personnel, site visitors, or animals from stepping or falling into the hole. All open bore holes shall be covered, protected, or backfilled adequately and according to Federal / State / Provincial / Territorial or local regulations on completion of the drilling project.
- When using a ladder on a rig, face the ladder and grasp either the side rails or the rungs with both hands while ascending and descending. Always use adequate fall protection and a full body harness when climbing above 6 feet (1.8 meters) of the ground. Do not attempt to use one or both hands to carry a tool while on a ladder. Use a hoist line and a tool “bucket” or a safety hook to raise or lower hand tools.

4.12 Drilling Fluid

4.12.1 Ensure drilling fluid is appropriate to the soil type and conditions to be encountered to enable smooth drilling.

4.12.2 Drilling fluid used in the boring process shall be contained at the entry and, as applicable, exit locations until recycled or removed from the site.

4.12.3 Confirm drilling fluid does not enter roadways, streams, municipal storm or sanitary sewer lines, and / or any other drainage system or body of water.

4.12.4 Monitor drilling equipment and fluid equipment for any leakage or spills. Confirm appropriate containment is in place and adequate spill response supplies are available.

4.12.5 It is important to monitor fluid flow and pressure gauges when drilling with any tooling, but it is essential when drilling with a mud motor (pump placed in the drill string to provide additional power to the bit while drilling).

4.13 Unanticipated Concrete / Debris or Void

4.13.1 The presence of subsurface installations and utilities requires special care when obstructions / refusal and voids are encountered and when unexpected absence of soil recovery occurs during

drilling operations. Other indicators of subsurface installations and utilities are the presence of warning tape, pea gravel, sand, non-indigenous material, bentonite, red concrete (indicative of electrical duct banks) and any departure from native soil or backfill.

4.13.2 If unanticipated concrete / debris is encountered and / or if a void is encountered, drilling will be immediately discontinued and the Manager notified. Drilling may only proceed with Manager or SH&E Manager approval.

4.14 Use of Manual Slide Hammer

4.14.1 The following health and safety procedures should be followed when using a manual slide hammer to install shallow injection points, drive point piezometers, and drill tools:

- Only use a manual slide hammer that either attaches directly to the point / piezometer being driven or that incorporates a cap on the point / piezometer / drill tool that prevents the slide hammer from slipping off the point / piezometer / drill tool.
- Always grasp the manual slide hammer (handles if equipped with handles) with both hands while driving the point / piezometer / drill tool.
- Never allow hands or feet to get between the manual slide hammer and the drive plate or anvil.

4.15 Use of Augers

4.15.1 The following general health and safety procedures should be followed when supervising borings with continuous flight hollow-stem augers:

- Never place hands or fingers under the bottom of an auger section when it is being hoisted over the top of the auger section in the ground or other hard surfaces such as the drill rig platform.
- Never allow feet to get under the auger section that is being hoisted.
- When augers are rotating, stay clear of the rotating auger and other rotating components of the drill rig. Never reach behind or around a rotating auger for any reason.
- Use a long-handled shovel to move auger cuttings away from a rotating auger. Never use hands or feet to move cuttings away from a rotating auger.
- Do not attempt to remove earth from rotating augers. Augers should be cleaned only when the drill rig is in neutral and the augers are stopped from rotating.
- Loud noises may occur while driving split spoons. At minimum hearing protection shall be worn when driving split spoons.
- When pulling / lifting augers, a clevis pin or other closed device shall be used. Use of J-hooks is prohibited.

4.16 Attaching and Breaking Rods

4.16.1 Do not use manual tools (e.g., pipe wrenches) in combination with rotation of the drill stem. Manual tools are not designed for the load, and may break.

- The use of such tools creates a significant impact hazard for those in the work area, because they rotate with the drill stem. Manual tool use in combination with a rotating drill stem to attach or break rods is therefore prohibited.
- Manual tools may be used if the drill stem is isolated / positively disengaged.
- Mechanical means of rod separation that are permitted include:
  - Opposing hydraulic controls.
  - Rod locking devices or machine's power vice.
  - Hydraulic breakout tools.
  - Hydraulic foot clamps.

4.16.2 Rod box changes present severe crushing hazards. Operators shall ensure all crew members are clear of the machine and hoisting equipment while they are changing rod boxes.

4.17 Rotary, Sonic and Core Drilling

4.17.1 In addition to the health and safety procedures identified above, the following general health and safety procedures should be followed when supervising borings with rotary, sonic and core drilling:

- Drill rods should not be braked during lowering into the hole with drill rod chuck jaws. Drill rods should not be held or lowered into the hole with pipe wrenches.
- If a string of drill rods are accidentally or inadvertently released into the hole, do not attempt to grab the falling rods with your hands or a wrench.
- When drill rods are hoisted from the hole, they should be cleaned for safe handling with a rubber or other suitable rod wiper. Do not use hands to clean drilling fluids from drill rods.
- When drill rods are rotating, stay clear of the rotating components of the drill rig. Never reach behind or around a rotating drill rod for any reason.
- Use a long-handled shovel to move cuttings away from the top of the borehole. Never use hands or feet to move cuttings away from the borehole.
- If work shall progress over a portable drilling fluid (mud) pit, do not attempt to stand on narrow sides or cross members. The mud pit should be equipped with rough-surfaced, fitted cover panels of adequate strength to hold drill rig personnel.
- Keep away from area where drill rods are being moved or raised to the rig. Do not stand in the area where a drill rod will fall or slide if it should be dropped.
- Loud noises may occur during drilling. Hearing protection shall be worn.

4.18 Direct-push

4.18.1 The following general health and safety procedures should be followed when supervising drilling borings with direct-push drilling:

- Loud noise may occur during direct-push drilling. Appropriate hearing protection shall be worn.
- When drill rods are hoisted from the hole, they should be cleaned for safe handling with a suitable rod wiper. Do not use hands to clean drilling fluids from drill rods.
- If work shall progress over a portable drilling fluid (mud) pit, do not attempt to stand on narrow sides or cross members. The mud pit should be equipped with rough-surfaced, fitted cover panels of adequate strength to hold drill rig personnel.
- Drill rods should not be lifted and leaned unsecured against the mast. Either provide some method of securing the upper ends of the drill rod sections for safe vertical storage or lay the rods down.

4.19 Horizontal Directional Drilling

4.19.1 During surface to surface operations a 16.4’ (5 meters) safe zone shall be established and identified at both the entry and exit locations; no personnel are permitted to be within this zone unless the drill is locked out and the operator is out of the seat.

4.19.2 Machine shall be locked out before entering an excavation, changing tools, adding or removing drill stem or doing any other work on tools or the drill stem at the exit end of the bore.

4.19.3 A tracking head shall be installed on the drill stem:

4.19.4 Assemble drill head using components appropriate to the soil conditions to be encountered (e.g. nozzle, bit, beacon housing, etc.).

4.19.5 Ensure all personnel are clear of the bore entry point (outside of identified work zone).

4.19.6 At all times two way communication will be maintained at entrance and exit points using two way radios or equally effective communication means. If at any time communication is lost, all work will be stopped until communication is re-established

4.19.7 Locate drill head with tracking device at least every half-length of pipe. Adjust direction as necessary to follow the intended bore path.

4.19.8 Any drilling fluid returning to the surface shall be cleaned up promptly.

4.19.9 Drill pipe should exit the bore at an angle of 5 to 10° from the ground surface.

4.19.10 Turn off fluid flow as soon as drill head emerges.

4.19.11 Lockout machine and remove drill head using appropriate breakout tools.

4.19.12 Select and attach a reamer that allows the return of drilling fluids and cuttings, to reduce frictional pullback forces, and to allow for bend radius of the pipe. Reamer shall be:

- The smaller of 1.5 times the outside diameter (O.D.) or 12 inches (300mm) larger than the diameter of the product pipe.
- A diameter less than 1.5 times the diameter of the product may be necessary in collapsing soil formations.
- Reamed diameter may need to be increased by up to 25% if substantial swelling of the soil is expected to occur.

4.19.13 All personnel shall clear the trench or the designated surface zone (16.4 feet [5 meters]) once the reamer is attached. Operator shall only reverse lockout and commence pullback when communication is received from personnel on exit hole side and operator has confirmed the message.

4.19.14 Personnel on exit hole side shall ensure reamer is pulled the entire way back to the exit hole.

- If rotation is started when drill rod and reamer are away from the exit hole, very fast sideways movement of the rod and reamer can occur.
- Larger reamers and longer lengths of exposed drill rod increase the speed and distance of this movement.

4.19.15 If working with trailing drill stem, swivels shall be verified as lubricated and rotating freely by hand prior to use:

- A freely moving swivel prevents trailing drill stem or product from rotating / whipping.
- If the swivel does not move freely by hand it shall be removed from service and repaired or replaced.
- Only use swivels with limited articulation to prevent whipping or cranking action between the reamer and trailing drill pipe or product.

4.19.16 It is important to clean and lubricate the tool and drill stem joint threads before each use.

4.19.17 Any individual drill pipes that are bent or damaged shall be immediately taken out of service.

4.19.18 Occasionally change the order of the lead drill pipe (i.e. move the lead pipe to the end of the stem, or other pipe rotation procedures) to extend drill stem life.

4.19.19 Operator should avoid stalling the pipe rotation to avoid stress damage from shock loading.

4.20 Drilling at Potential MEC / UXO Sites

4.20.1 If the project site is suspected of containing munitions and explosives of concern (MEC) or unexploded ordnance (UXO), the UXO team will conduct a reconnaissance and MEC / UXO avoidance to provide clear access routes to each site before drilling crews enter the area. The following procedures will be implemented:

- Drilling operations on an MEC / UXO site will not be conducted until a complete plan for the site is prepared and approved by the AECOM UXO Safety Officer. MEC / UXO avoidance shall be conducted during drilling operations on known or suspect MEC / UXO sites.
- The UXO team will identify and distinctly mark the boundaries of a clear approach path for the drilling crews, vehicles, and equipment to enter the site. This path will be, at a minimum, twice the width of the widest vehicle. No personnel will be allowed outside any marked boundary.
- If MEC / UXO is encountered on the ground surface, the UXO team will clearly mark the area where it is found, report it to the proper authorities, and divert the approach path around it.
- The UXO team will conduct an access survey using the appropriate geophysical instrument over the approach path for avoidance of MEC / UXO that may be in the subsurface. If a magnetic anomaly is encountered, it will be assumed to be MEC / UXO, and the approach path will be diverted around the anomaly. UXO personnel only will operate the appropriate geophysical instrument and identify MEC / UXO.
- An incremental geophysical survey of the drill-hole location(s) will be initially accomplished by the UXO team using a hand auger to install a pilot hole. If MEC / UXO is encountered or an anomaly cannot be positively identified as inert material, Hazardous, Toxic, and Radioactive Waste (HTRW) sampling personnel will select a new drill-hole location.
- Once the surface of a drilling site has been cleared and a pilot hole established as described above, the drilling contractor will be notified that the site is available for subsurface drilling.

4.21 Movement and Transport of Drilling, Boring or Direct-Push Equipment

4.21.1 Personnel transporting equipment shall be properly licensed and shall operate the vehicle according to Federal / State / Provincial / Territorial, and local regulations. Refer to *S3AM-005-PR1 Driving* and *S3AM-320-PR1 Commercial Motor Vehicles*.

4.21.2 Confirm the traveling height (overhead clearance), width, length and weight of the equipment with the carrier. Identify highway and bridge load, width and overhead limits, to confirm these limits are not exceeded and with adequate margin.

4.21.3 Allow for overhang of any drilling, boring or direct-push equipment when cornering or approaching other vehicles or structures.

4.21.4 Be aware that the canopies of service stations and motels are often too low for equipment loaded on a trailer to clear

4.21.5 Watch for low hanging electrical lines, particularly at the entrances to drilling sites or restaurants, motels, other commercial sites.

4.21.6 Never travel on a street, road, or highway with any part of the drilling, boring or direct-push equipment in a raised or partially raised position.

4.21.7 Remove all ignition keys if rig is left unattended unless client requirements specify that the keys remain in the ignition switch at all times.

4.21.8 Before moving a rig on location, the operator shall do the following:

- To the extent practical, walk the planned route of travel and inspect it for depressions, gullies, ruts, and other obstacles.
- Check the brakes of the truck / carrier, especially if the terrain along the route of travel is rough or sloped.
- Discharge all passengers before moving on rough or steep terrain.

4.21.9 Engage the front axle (on 4x4, 6x6, etc., vehicles) before traversing rough or steep terrain

4.21.10 Driving drill rigs along the sides of hills or embankments should be avoided; however, if side-hill travel becomes necessary, the operator shall conservatively evaluate the ability of the rig to remain upright while on the hill or embankment. The possibility shall be considered that the presence of

drilling tools on the rig may reduce the ability of the rig to remain upright (raises the center of mass of the rig).

4.21.11 Logs, ditches, road curbs, and other long and horizontal obstacles should be approached and driven over squarely, not at an angle.

4.21.12 When close lateral or overhead clearance is encountered, or when backing up, the driver of the rig shall be guided by another person on the ground.

4.21.13 Loads on the drill rig and truck shall be properly stored while the truck is moving, and the mast shall be in the fully lowered position.

4.22 Loading and Unloading

4.22.1 Consult applicable manufacturer's recommendations for loading and unloading of the equipment.

4.22.2 Use ramps of adequate design that are solid and substantial enough to bear the weight of the rig with carrier, including tools.

4.22.3 Load and unload on level ground.

4.22.4 Use the assistance of someone on the ground as a guide.

4.22.5 Check the brakes on the rig carrier before approaching loading ramps.

4.22.6 Distribute the weight of the rig, carrier, and tools on the trailer so that the center of weight is approximately on the centerline of the trailer and so that some of the trailer load is transferred to the height of the pulling vehicle. Refer to the trailer manufacturer's weight distribution recommendations.

4.22.7 The rig and tools should be secured to the hauling vehicle with ties, chains, and / or load binders of adequate capacity.

5.0 Records

5.1 All employee training files shall be maintained in accordance with *S3AM-003PR1 SH&E Training*.

5.2 Completed inspections and maintenance inventories shall be maintained the site or project files.

6.0 Attachments

6.1 S3AM-321-ATT1 Core Drilling Machine

6.2 S3AM-321-ATT2 Pre-Drilling, Boring, & Direct-Push Probing Flow Chart

6.3 S3AM-321-FM1 Daily Drilling, Boring & Direct-Push Equipment Inspection

6.4 S3AM-321-FM2 Drilling, Boring & Direct-Push Equipment Maintenance Inventory

Americas

Core Drilling Machine

S3AM-321-ATT1

1.0 Objective / Overview

1.1 Core drilling machines are used on all types of jobs. They can be electrical or gas powered and come with a stand or can be hand held. Caution should be used when operating such a machine. It may look harmless and easy to run, but drilling machines have many hazards.

1.2 Prior to coring activities the location should be checked for buried utilities in accordance with *S3AM-331-PR1 Underground Utilities*.

2.0 Safe Operating Guidelines

2.1 Clean the flanges before mounting the blade.

2.2 Make sure the blade is correct for the material being cut and that the arrow on the blade corresponds with the direction of rotation of the machine spindle.

2.3 Use built-in vacuum or bolt-down anchors depending on the type of surface to be cored. Do not bypass anchoring system.

2.4 Properly manage power cable for electric units to prevent slips, trips or falls by the operator or those nearby.

2.5 Avoid tilting the blade when cutting.

2.6 Use only the machines that have an approved safety guard.

2.7 Remove the diamond blade from the machine during transit to prevent accidental damage.

2.8 Inspect the blades frequently to detect cracks or undercutting of the steel center.

2.9 Do not let excessive heat be generated at the cutting edge of the blade.

2.10 Use adequate water supply to both sides of the blade.

2.11 Follow the manufacturers recommended pulley sizes and operating speeds for specific blade diameters.

2.12 Make sure to tighten drive belts to ensure full available power.

2.13 Don't force the blade on the blade shaft or mount blade on an undersized spindle.



3.0 Potential Hazards

3.1 Utilities

3.2 Electricity

3.3 Flying debris

3.4 Noise exposure

3.5 Inadequate housekeeping

3.6 Fumes or dust

3.7 Pinch points

3.8 Binding/biting – torque control

4.0 Training Requirements

4.1 Review of applicable SOPs (e.g., *S3AM-305-PR1 Hand & Power Tools*; *S3AM-302-PR1 Electrical Safety*).

4.2 Demonstrated knowledge on the use of a coring machine.

4.3 Review and follow manufacturers' operating guidelines.

5.0 Personal Protective Equipment (Level D PPE)

5.1 Hard hat

5.2 Safety Vest

5.3 Leather gloves

5.4 Face shield

5.5 Steel-toed/composite-toed boots

5.6 Hearing protection

5.7 Respirator or dust mask (as applicable to the respiratory hazards)

6.0 Other Safety Tips

6.1 Keep fingers and hands away from the cutting edge.

6.2 Hold handle firmly when operating.

6.3 A subsurface utility clearance shall be performed prior to initiating drilling operations.

6.4 Stand firmly and apply body weight at anchored side of guarded platform.

Americas

Pre-Drilling, Boring & Direct Push Probing Flow Chart

S3AM-321-ATT2

Before Any Drilling, Boring and Direct Push Probing Activities

PERMITS and ACCESS AGREEMENTS

- **Government and Utility/Infrastructure Permits**
- **Client Permits and Procedures**
- **Access Agreements**

KEY POINT: Obtain all permits and sign Access Agreement (if required).

GENERAL HEALTH and SAFETY

KEY POINT: Prepare SH&E Plan, as well as Task Hazard Assessments (THA).

IDENTIFICATION and MAPPING OF UTILITY and SUBSURFACE STRUCTURES

KEY POINT: Generate a comprehensive site map illustrating known locations of overhead/subsurface utilities, subsurface structures, and proposed boring locations.
Review completed *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist*.

SITE WALK

KEY POINT: Perform a site walk utilizing site map and 360 degree view to verify known conditions, including overhead obstructions or hazards, and identify potential issues. Add discovered items/issues to map for use in location confirmation.

PROPOSED SUBSURFACE INVESTIGATION LOCATIONS

KEY POINT: Confirm that locations meet the minimum required set-back distances.

UTILITY CLEARANCE INVESTIGATION LOCATION CONFIRMATION

KEY POINT: Visually verify hand clearance. Review completed *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist*.

DRILL RIG INSPECTIONS

KEY POINT: Drill rig inspected and documented daily by operator prior to drilling.

BEGIN DRILLING, BORING OR DIRECT PUSH PROBING

KEY POINT: Prior to commencing any intrusive subsurface work, *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist* shall be completed.
Upon commencing the work, if unanticipated conditions or events are encountered (e.g. concrete/debris, void encountered, etc.) stop work and notify the Manager. Authorization to proceed shall have the concurrence of the Manager, Site Supervisor and SH&E Manager.

Americas

Daily Drilling, Boring & Direct-Push Equipment Inspection

S3AM-321-FM1

Site / Project Name _____ Rig Inspector (Name/Company) _____

RIG INFORMATION:

Rig Type Rotary/Auger Drilling Rig ☐ Direct Push Type (DPT) ☐

Owner _____ VIN# _____

Year/Make _____ Mileage _____

Model _____ Drill Hrs _____

INSTRUCTIONS: Each shift shall inspect all applicable items. If an unsatisfactory condition (fail) is observed, suspend operation of the equipment and report the condition to the site supervisor immediately.

Emergency Equipment / Devices / Switches	
Kill switches are located and accessible to workers on both sides of the rotating stem. NOTE: Location and number of switches depend on the rig manufacturer; please refer to owner's manual (DPT typically has one switch on control panel).	☐ Pass ☐ Fail ☐ N/A
Kill switches installed by the manufacturer, alarms and other devices (e.g. positive air shut-off valve) tested and in operable condition. All workers familiar with location and operation of devices. **NEVER BYPASS, DISABLE, OR REMOVE KILL DEVICES.**	☐ Pass ☐ Fail ☐ N/A
First aid kit adequate and on equipment / readily available.	☐ Pass ☐ Fail ☐ N/A
Absorbent materials on equipment / readily available (spill response).	☐ Pass ☐ Fail ☐ N/A
A fire extinguisher of appropriate size is located on drill rig and readily available/accessible for drilling crew (recommended 20 lbs.).	☐ Pass ☐ Fail ☐ N/A
Protective Guards	
Drive shafts, belts, chain drives, and universal joints are guarded to prevent accidental insertion of hands, fingers, or tools.	☐ Pass ☐ Fail ☐ N/A
Cables	
Cables on drill rig free of kinks, frayed wires, birdcages, flat spots, grease, and worn or missing sections.	☐ Pass ☐ Fail ☐ N/A
Cables are terminated at the working end with a proper eye splice; either swaged, coupled, or using cable clamps.	☐ Pass ☐ Fail ☐ N/A
Cable clamps are installed with the saddle on the live or load side. Clamps are not alternated and are of the correct size and number for the cable size.	☐ Pass ☐ Fail ☐ N/A
Wire ropes are not allowed to bend around sharp edges without cushion material.	☐ Pass ☐ Fail ☐ N/A
Pulleys and Cable Winches	
Pulleys are not bent, cracked, or broken.	☐ Pass ☐ Fail ☐ N/A
Pulleys operate smoothly and freely, without resistance.	☐ Pass ☐ Fail ☐ N/A
Motor is mounted in correct location and tightly secured to drill rig.	☐ Pass ☐ Fail ☐ N/A
Winch capable of being placed in the free spool (unwind smoothly) and locked position correctly, demonstrating that the cable is suitable for lifting during drilling operations.	☐ Pass ☐ Fail ☐ N/A
Safety Latches	
Hooks installed on hoist cables are the safety type with a functional latch to prevent accidental separation.	☐ Pass ☐ Fail ☐ N/A
Safety latches are functional and completely span the entire throat of the hook and have positive action to close the throat except when manually displaced for connecting or disconnecting a load.	☐ Pass ☐ Fail ☐ N/A
Flights / Augers / Reamers	
Flights / Augers / Reamers are not bent, cracked, or broken. NOTE: Flights / Augers / Reamers failing inspection must be removed from jobsite.	☐ Pass ☐ Fail ☐ N/A

Flights are blunt to prevent the risks of cuts.	☐ Pass ☐ Fail ☐ N/A
Auger keys are not bent, cracked/fractured, excessively worn, or otherwise damaged.	☐ Pass ☐ Fail ☐ N/A
Auger bolt holes and threads are not damaged.	☐ Pass ☐ Fail ☐ N/A
Inspect flights/augers for metal burns. NOTE: Burrs must be filed to flat surface.	☐ Pass ☐ Fail ☐ N/A
Augers / Reamers lying flat on the ground (avoid stacking).	☐ Pass ☐ Fail ☐ N/A
Augers / Reamers over 50lbs (22.7kg) moved mechanically. (Avoid manual lifting).	☐ Pass ☐ Fail ☐ N/A
Drill String	
Appropriate break out tool(s) available.	☐ Pass ☐ Fail ☐ N/A
Rod box and power vice operating smoothly and freely.	
Drill string are not bent and do not have any cracks/fractures.	☐ Pass ☐ Fail ☐ N/A
Drill string connections (e.g. pins, threads, couplers) are of the proper type, are not bent, have no cracks/fractures, and are not excessively worn.	☐ Pass ☐ Fail ☐ N/A
Swivel connectors (for trailing horizontal drill stem) lubricated and freely rotating.	☐ Pass ☐ Fail ☐ N/A
Mast	
Mast is free of bends, cracks, or broken sections.	☐ Pass ☐ Fail ☐ N/A
All mounting hardware (pins, bolts, etc.) in place.	☐ Pass ☐ Fail ☐ N/A
No moving of drill rig or maintenance/repairs while mast is in vertical position.	☐ Pass ☐ Fail ☐ N/A
Hammering Device	
Hammer free of cracks, fatigue, or other signs of excessive wear.	☐ Pass ☐ Fail ☐ N/A
Hammer connections are secure.	☐ Pass ☐ Fail ☐ N/A
Leveling Devices	
Outriggers move in/out and up/down smoothly and freely while using controls on drill rig, with no hydraulics leaks.	☐ Pass ☐ Fail ☐ N/A
Outriggers are extended prior to and whenever the mast is raised off its cradle. Outriggers must maintain pressure to continuously support and stabilize the drill rig (even while unattended).	☐ Pass ☐ Fail ☐ N/A
Outriggers are properly supported on the ground surface to prevent setting into the soil (use of outrigger support pads).	☐ Pass ☐ Fail ☐ N/A
Controls	
Controls are intact, properly labeled, have freedom of movement, and have no loose wiring or connections.	☐ Pass ☐ Fail ☐ N/A
Controls are not blocked or locked into an operating position.	☐ Pass ☐ Fail ☐ N/A
Installed lights, signals, gauges, and alarms operate properly.	☐ Pass ☐ Fail ☐ N/A
Lifting Devices	
Slings, chokers, and lifting devices (straps, not chains) inspected before using and are in proper working order. NOTE: Damaged units are labeled and removed from jobsite.	☐ Pass ☐ Fail ☐ N/A
Shackles/Clevises are in proper working order with pins/screws in place that is to be used while lifting.	☐ Pass ☐ Fail ☐ N/A
Cables and lifting devices are not operated erratically or with a jerking action to overcome resistance.	☐ Pass ☐ Fail ☐ N/A
Hydraulic System	
Hydraulic lines are secure, in good condition with no signs of excessive wear, and not leaking. NOTE: Check while pressurized.	☐ Pass ☐ Fail ☐ N/A
Hydraulic lines are not in a bent or pinched position causing additional fluid restrictions/pressures.	☐ Pass ☐ Fail ☐ N/A
Hydraulic oil reservoir has appropriate amount of oil and not leaking.	☐ Pass ☐ Fail ☐ N/A
Documentation available to confirm that pressure relief valve was checked during shop maintenance activity and noted on maintenance log.	☐ Pass ☐ Fail ☐ N/A
Pump Lines (water, grout, etc)	
Suction/Discharge hoses, pipes, valves, and fittings are secured and not leaking.	☐ Pass ☐ Fail ☐ N/A
High pressure hoses have a safety chain, cable, or strap at each end to prevent whipping in the event of a failure.	☐ Pass ☐ Fail ☐ N/A

Ladders	
Drill rig has a permanently attached or proper portable ladder to be used for access to drilling platform.	☐ Pass ☐ Fail ☐ N/A
Ladders and platforms not to be used for tool storage- keep ladders and operator platforms clear during drilling.	☐ Pass ☐ Fail ☐ N/A
Tires / Tracks	
Tires / Tracks on rig are not excessively worn and free of any debris or foreign material.	☐ Pass ☐ Fail ☐ N/A
General	
General condition – exterior (no structural damage, no loose bolts, platform tidy, etc.)	
General condition – interior (cab clean, tidy)	
Drill rig meets regulations for transport on state/federal highways (inspection sticker, license plate, etc.).	☐ Pass ☐ Fail ☐ N/A
Rig is of appropriate size to meet job requirements.	☐ Pass ☐ Fail ☐ N/A
Maintenance log available for previous 3 months to confirm proper maintenance/inspection.	☐ Pass ☐ Fail ☐ N/A
Exhaust	
Exhaust system is free from defect and routes engine exhaust away from drill rig workers.	☐ Pass ☐ Fail ☐ N/A
Fuels	
Fuel stored in an approved and properly labeled container.	☐ Pass ☐ Fail ☐ N/A
Fuel transfer lines free from signs of excessive wear and not leaking.	☐ Pass ☐ Fail ☐ N/A
Refueling and transferring of fuel is performed in an approved area with sufficient containment to prevent spillage.	☐ Pass ☐ Fail ☐ N/A
Exclusion/Work Zones	
The exclusion/work zone is centered over the borehole (and if applicable, bore exit point) and the radius equal to or greater than the height of the mast (measured from ground level).	☐ Pass ☐ Fail ☐ N/A
The exclusion/work zone is clear of tripping hazards or the hazards are documented with appropriate controls on the Task Hazard Assessment.	☐ Pass ☐ Fail ☐ N/A
The exclusion/work zone communicated to concurrent/adjacent operations to prevent overlap of work zones or line of fire.	☐ Pass ☐ Fail ☐ N/A
Subsurface Utilities / Installations and Overhead Obstructions	
Subsurface utilities / installations have been confirmed as identified and cleared through site observation and review of the completed *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist.*	☐ Pass ☐ Fail ☐ N/A
Except where electrical distribution and transmission lines have been de-energized and visibly grounded, drill rigs will be operated proximate to under, by, or near power lines in accordance with the Minimum Approach Distance (MAD).	☐ Pass ☐ Fail ☐ N/A
Rig Repairs	
Repairs, when possible, are conducted offsite to reduce the risk of any onsite incidents.	☐ Pass ☐ Fail ☐ N/A
Specialized PPE	
When working at elevated heights, workers are to wear a fall restraining device attached in a manner to restrict falls to less than six feet (1.83 meters).	☐ Pass ☐ Fail ☐ N/A
When working in wet/slippery conditions, all workers have a lug-type sole or similar slip resistant sole, on their safety footwear to prevent slipping.	☐ Pass ☐ Fail ☐ N/A

Comments:

Signature of Inspector: _____ Date: _____

Americas

Drilling, Boring & Direct-Push Equipment Maintenance Inventory

S3AM-321-FM2

EQUIPMENT (*MAKE, MODEL, SERIAL #*)	EQUIPMENT OWNER	EQUIPMENT STATUS (*ON HIRE, ACTIVE, DECOMMISSIONED*)	FREQUENCY OF SERVICE	SERVICE TYPE	MANUFACTURER'S STANDARDS	INDUSTRY STANDARDS	LEGISLATED REQUIREMENTS	LOCATION OF EQUIPMENT

Americas

Overhead Lines & Obstructions

S3AM-322-PR1

1.0 Purpose and Scope

1.1 Provides the safe work requirements to be observed where overhead obstructions (e.g., cable trays, pipe racks, etc.), overhead utilities, or other lines are present at a work location, including, but not limited to electric power lines, electrical apparatus, or any energized (exposed or insulted) parts, communication wires, or any other overhead wire or cable.

1.2 This procedure applies to all AECOM Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

2.0 Terms and Definitions

2.1 **Arc Flash Hazard** – A dangerous condition associated with the possible release of energy caused by and electric arc. Arc flash is the light and heat produced from an electric arc supplied with sufficient electrical energy to cause substantial damage, harm, fire, or injury.

2.2 **Electrical Hazard** – A dangerous condition such that contact or equipment failure can result in electric shock, arc flash burn, thermal burn, or blast.

2.3 **Minimum Approach Distance (MAD)** – The MAD is the closest distance any employee or any part of the operating equipment is permitted to approach an energized or a grounded object.

2.4 **Qualified Person (Electrical Transmission and Distribution) –** A person trained and knowledgeable in the construction and operation of electrical transmission and distribution equipment or a specific work method, and has been trained to recognize and avoid electrical hazards that might be present with respect to that equipment or work method.

2.5 **Types of Overhead Lines / Obstructions (examples)**:

- Overhead electric power lines
- Structural cable supports
- Guy wires
- Cable television / communication lines
- Cable Trays
- Pipe Racks
- Low Clearance Overpasses

3.0 References

3.1 S3AM-004 PR1 Incident Reporting, Notifications & Investigation

3.2 S3AM-010-PR1 Emergency Response Planning

3.3 S3AM-209-PR1 Risk Assessment & Management

3.4 S3AM-302-PR1 Electrical Safety

3.5 S3AM-303-PR1 Excavation

4.0 Procedure

4.1 Roles & Responsibilities

4.1.1 **Manager**

- Identify conditions where overhead electric power lines and other overhead obstructions may be present and outline what is required in the SH&E Plan and Task Hazard Assessments. Refer to the *S3AM-209-PR1 Risk Assessment & Management*.
- Confirm electrical and communication lines, and as appropriate other overhead obstructions, are identified on all site and project drawings.
- Coordinate and communicate with overhead electrical line owner or operator to identify and implement appropriate control measures.
    - Provide adequate advance notification to the Overhead Electrical Line Owner / Operator to allow for insulation or isolation and grounding of the line(s) if required.
    - Confirm the Overhead Electrical Line Owner / Operator(s) are fully informed as to when the operations are to begin, end and when any location changes are planned if applicable.
- Confirm Employees are trained as required for the scope of work and associated hazards.
- Coordinate and communicate with subcontractors or employees working around overhead electric power lines and as applicable, other overhead obstructions.
- Confirm the *S3AM-322-FM1 Overhead Electric power lines Acknowledgement* is completed by concurrent operations working around overhead electric power lines on the worksite.

4.1.2 **Safety Health & Environment (SH&E) Manager**

- Assist and support the Manager in planning and responding to concerns regarding the exposure to overhead electric power lines.

4.1.3 **Employees**

- Maintain current training required for the scope of work and associated hazards.
- Inform the Manager of location conditions that may expose risks to overhead electric power lines.
- Comply with established minimum approach distances.

4.2 Training

4.2.1 The Manager shall confirm all Employees are oriented to the SH&E Plan and Task Hazard Assessment (THA) process, in accordance with *S3AM-209-PR1 Risk Assessment & Management*.

4.2.2 Confirm training requirements were met prior to work starting.

-
- Employee orientation shall include the Location Specific Emergency Response Plan.
- Proof of training and orientation shall be documented and retained in the project files.

4.2.3 Managers shall confirm that each Employee has received training required for the scope of work and associated hazards in accordance with *S3AM-003-PR1 SH&E Training*.

4.2.4 Additional training requirements may include, but are not limited to:

- The limitations of an insulating link / device, proximity alarm, and range control (and similar) device, if used.

- Grounding and bonding procedures.
- Client specific requirements

4.3 General Requirements

4.3.1 The AECOM Manager or supervisor and employees shall perform a walk-thru of the work site and / or review of the work area / travel route to identify the overhead electric power lines and any other overhead obstructions that could be impacted by the work. Consider high profile equipment, equipment in transport, swing radius of equipment, potential for shifting loads, etc. AECOM personnel may be accompanied by other applicable personnel (e.g. client representatives, contractors operating concurrently, etc.).

4.3.2 The location or project specific SH&E Plan shall identify all overhead line hazards and provide suitable methods of elimination or control. All involved or affected workers shall review the SH&E Plan to confirm proper communication of the overhead line hazards and awareness of the control measures associated with their work.

4.3.3 Assess applicable factors such as, but not limited to:

- Scope of work (e.g. hoisting materials, excavation, grubbing, etc.).
- Transportation route.
- Hoisting, excavating, or other equipment to be operated.
- Height, placement, and reach of equipment.
- Equipment or material loading / unloading.
- Location(s) of electric power lines, communication lines, guy wires, etc.
- Worker training and experience.
- Soil or ground condition and environmental conditions.
- Interruptions to electrical services.
- Hazard to public.
- Use of ladders.
- Pipe and other conducting materials.
- Notification of electric utility owner.
- Changing conditions.
- Communication of all hazards to all workers including contractors, sub-contractors, and concurrent operations.

4.3.4 Task Hazards Assessments (THAs) shall be completed to record the hazards and control measures specific to the task, including those related to overhead line and obstructions hazards, prior to undertaking assigned tasks. THAs shall be reviewed and signed by all workers involved in the specific task.

4.3.5 Should adverse weather conditions cause the work associated with overhead lines to be unsafe, the activities shall be discontinued.

4.3.6 Managers or designated employees shall formally notify all concurrent operations, or any others who may not have had reason to review and sign the related SH&E Plan or THAs, of work that is to be done in the vicinity of overhead lines at distances less than 50 feet (15.25 meters), and for non-electrical obstructions, at distances less than 10 feet (3.05 meters) if appropriate to the obstruction’s potential hazards, and obtain the operator's assistance in protecting workers involved.

- Formal notification may be accomplished through a review of the SH&E Plan or THAs by the concurrent operator and associated personnel, as evidenced by signing the respective document's acknowledgement.
- Alternately, the concurrent operations may acknowledge having reviewed AECOM's procedures with a separate acknowledgment form. *S3AM-322-FM1 Overhead Electric Power Lines Acknowledgement Form* or equivalent may be used.
- Prior to equipment operation within 10 feet (3.05 meters) of non-electrical obstructions, as appropriate to potential hazards associated with the obstruction, the Owner/Operator should be contacted to obtain specific details regarding the obstruction such as piping or tray contents,

4.3.7 Overhead lines are presumed to be energized unless the Overhead Electrical Line Owner / Operator confirms that the overhead line has been, and continues to be de-energized and visibly grounded at the worksite.

4.3.8 Overhead lines are presumed to be uninsulated unless the Overhead Electrical Line Owner / Operator or a registered Professional Engineer who is a Qualified Person with respect to electrical power transmission and distribution confirms that a line is insulated.

4.3.9 Confirm accurate measurement of load heights, maximum equipment radius and height or reach of any other equipment that could potentially encroach on the safe limit of approach for the overhead electrical line,guy wires, or other applicable overhead obstructions.

- The height of all applicable overhead lines and obstructions that pose contact or encroachment potential shall be determined prior to work commencing.
- The height of electric power lines may only be determined by the client, utility company professional, or by using an approved electronic measuring device.
- Awareness shall be maintained for any elements that could affect clearance (e.g. snow pack, ice or snow weighing down lines, excessive heat causing sag, etc.).
- Caution shall be exercised when working or travelling near overhead lines having long spans, since they tend to be more prone to lateral swing in response to the wind and can present a contact hazard.
- All low hanging communication lines in close proximity to energized lines shall be clearly identified as *Encroaching on Energized Lines.*

4.3.10 Managers shall contact the overhead owner/operator (i.e. local utility company) if work is to be done or before equipment is operated within 50 feet (15.25 meters) of an energized overhead line, to determine the voltage of the overhead line and establish the appropriate MAD.

- All inquiries regarding electric utilities shall be made in writing and a written confirmation of the outage / isolation shall be received by the appropriate AECOM Manager prior to the start of the task that may impact the utility.

4.3.11 Until the voltage of the overhead electrical line is known and the MAD established, an exclusion zone shall be created at ground level beneath and 50 feet (15 meters) perpendicular to the overhead electric power lines on each side.

- The exclusion zone shall be demarcated with visual indicators (e.g., signage, flagging, paint, cones). No equipment shall enter the exclusion zone without approval from AECOM management.
- Unqualified employees shall maintain a safe clearance distance in accordance with the established MAD when working in an elevated position near energized overhead lines. For additional information associated with Qualified Employees refer to *S3AM-302-PR1 Electrical Safety*.

4.3.12 The Minimum Approach Distance (MAD) as it relates to Voltage varies from jurisdiction to jurisdiction. The MAD or the regulatory minimum distance requirements, whichever is more stringent, shall be maintained. The below chart shows the Phase-to-Phase voltage rating voltages in kilovolts and the MADs applicable to all AECOM operations:

Minimum Approach Distances (MAD)

Voltage Range (Kilovolts) (Phase-to-Phase)	Minimum Approach Distance (MAD) in Feet (Meters)
Personnel shall allow for equipment movement and electrical line swaying when establishing a M.A.D.	
0 – 50 KV	10 (3)
Over 50 – 200 KV	15 (5)
Over 200 – 350 KV	20 (6)
Over 350 – 500 KV	25 (8)
Over 500 – 750 KV	35 (11)
Over 750 – 1,000 KV	45 (14)
Note: This requirement shall apply except where client, local, or governmental regulations are more stringent.	

Source: American National Standards Institute, Publication B30.5.

4.3.13 An appropriate distance shall be kept between equipment, its occupants, their tools and energized overhead lines, electrical apparatus, or any energized parts.

4.3.14 These minimum approach distances do not apply to a load, equipment, or building that is transported under energized overhead power lines if the total height, including equipment transporting it, is less than 13.5 feet (4.15 meters).

- If the travelling equipment, including load, is over 4.15m (13.62ft) a transportation permit shall be acquired from the appropriate jurisdiction to travel on any public road or highway.
    - Consult local jurisdiction as some US states may use heights of up to 4.45m (14.6ft).
    - Notification of appropriate utility companies may be required in conjunction with the transportation permit. Jurisdictional requirements shall be verified prior to transport.
    - Route shall be checked for clearance of overhead electrical and communication lines prior to transport.
    - A designated signaler will be utilized when the height of the equipment, buildings, tractor / trailers or any other transport equipment travelling under an overhead electrical line is greater than 4.15m (13.62ft).

4.3.15 Employees shall not place earth or other material under or beside an electrical overhead line if doing so reduces the safe clearance to less than 50 feet (15.25 meters) or, if appropriate to potential hazards associated with other types of overhead obstruction, less than 10 feet (3.05 meters). To maintain a safe distance:

- Install warning devices and signs (hang a sign from and mark all guy wires to warn traffic of low clearance; provide warning signage for all overhead services).
- Install telescopic, nonconductive posts and flagging across right-of-way at the minimum allowable clearance as allowed by regulations for the line voltage.
- Position signs or other devices to determine the “Danger Zone”.

- Inform all job site personnel of the danger zone and the safe distances required.
- Beware of atmospheric conditions, such as temperature, humidity, and wind that may dictate more stringent safety procedures.

4.3.16 If employees are to climb or perform work on poles or towers, the structures shall be confirmed as capable of withstanding the weight and activity without failure.

4.3.17 If holes are dug for poles or foundations for structures, appropriate measures shall be taken to prevent inadvertent entry by personnel or equipment. Refer to *S3AM-303-PR1 Excavation*.

4.3.18 Operation of heavy equipment and cranes in areas with overhead lines represents a significant arc flash and electrical hazard to all personnel on the job site.

- Accidental contact with an energized overhead line or arcing between a high power line and grounded equipment, can cause harm to nearby equipment operators or ground personnel and damage to power transmission systems and / or operating equipment.
- Equipment will be repositioned and blocked so that no part, including cables, can come within the established minimum clearances.

4.3.19 Gravel trucks, cranes, boom trucks, etc. shall retract, stow and lower boxes, outriggers, booms, etc. to the travel position prior to entering municipal and client owned roads (e.g. leaving plant sites, work over rig sites, battery sites, and storage yards) and any time travel may put the equipment within the MAD of an electrical line.

4.3.20 When a signal person is required, the individual shall wear reflective striping (coveralls or vest) and carry an air horn or other appropriate means of emergency communication.

4.3.21 The signal person shall be aware of the potential electrical line hazards, be verified as competent by their supervisor and not have any other duties while acting as the signal person.

4.3.22 The signal person shall remain outside the MAD and in a position that allows for monitoring of equipment or loads to prevent encroachment on the MAD.

4.3.23 Signs, pylons, high visibility tape and / or signalers shall not be removed until the last piece of AECOM equipment has traveled under the overhead electrical line.

4.4 Minimum Approach Distance (MAD) Reduction

4.4.1 Where any work task will not allow the MAD to be maintained, an alternate means of protection shall be implemented by the Manager and approved by the SH&E Manager. In order of preference, acceptable procedures are:

- De-energize the overhead line(s) / lockout by local utility authorities; or
- Implement alternative procedures as identified by the Overhead Electrical Line Owner / Operator or a registered professional engineer.

4.4.2 De-energize Overhead Lines

- Elimination of electrical power provides the most acceptable means of ensuring safety of personnel. While temporary site overhead lines are often under the control of the site manager (and can be de-energized locally), electrical distribution and transmission lines can be de-energized only by the Overhead Electrical Line Owner / Operator. De-energizing of an overhead line often requires advance coordination with the Overhead Electrical Line Owner / Operator. At least one week advance notice should be provided.
- Managers shall confirm with the utility Overhead Electrical Line Owner / Operator that the overhead line has been de-energized and visibly grounded at the job site.

4.4.3 Alternative Procedures

- Managers may implement alternative procedures to prevent arc flash and electrical contact. These procedures shall be identified by the Overhead Electrical Line Owner / Operator or a registered Professional Engineer who is a Qualified Person with respect to electrical power transmission and distribution.
- A planning meeting with the Manager, SH&E Manager and the Overhead Electrical Line Owner / Operator (or registered Professional Engineer) shall be held to determine the most effective alternative procedures.
- Alternative procedures shall meet all client, local and governmental regulatory requirements.
- The work will be conducted by qualified and competent individuals, following the alternative written safe work procedures. All others are restricted from entering the MAD.
- Insulating Barriers shall be rated for the voltage line being guarded. These barriers may not be part of or attached to the equipment. The MAD shall only be reduced within the designed working dimensions of the insulating barrier. This determination shall be made by a Qualified Person in accordance with local or governmental requirements for work practices near energized equipment.
- Consult *S3AM-302-PR1 Electrical Safety* procedures to properly ground equipment and for limitations of grounding.
- Dedicated Line Spotters shall be trained to enable them to effectively perform their task, including training on the applicable local and governmental regulations.
- No work that encroaches on an energized power line will be completed outside of daylight hours.

4.5 Additional Safety Measures.

4.5.1 When equipment shall repeatedly travel beneath electric power lines, a route shall be plainly marked and “rider poles” of non-conductive material shall be erected on each side to confirm equipment structures are lowered into a safe position.

- 20” X 28” (50.8cm X 71.12cm) Danger Overhead Power Lines signs, which are highly visible, shall be erected at a height of 1.8 meters (6ft) on each side of the electrical line. A combination of pylons and high visibility tape shall be placed underneath the electrical line.
- These signs shall be in plain view of equipment traveling in either direction, but no closer than the MAD.
- If physical guards (i.e. goal posts, rider poles) are used, the guards shall be of non-conductive material and consist of a pole on each side of the approach connected by a rope.
- The poles will be placed at the MAD from and on each side of the electrical line. The ropes will be set at a height, which will maintain the MAD from the electrical line.

4.5.2 Watch for uneven ground that may cause vehicles and equipment to weave, bob, or bounce.

4.5.3 The following additional safety measures shall be implemented as needed when working around energized power lines:

- Provide equipment with proximity warning devices. These provide an audible alarm if any part of the equipment gets too close to a line.
- Install ground safety stops. These prevent vehicles from accidentally entering hazardous areas.
- Equip cranes with a boom-cage guard. This prevents the boom from becoming energized if an electrical line is contacted.

- Utilize insulated links and polypropylene tag lines. These prevent the transmission of electricity to loads or tag line handlers if an electrical line is contacted.

  NOTE: These additional safeguards are intended as supplemental protection. Use of these measures is not permissible as a substitute for maintaining the safe working distance or implementation of the procedures outlined in this document.

4.6 Emergency Planning

4.6.1 Managers shall complete a location specific emergency response plan as part of their location or project specific SH&E Plan for all operations during which equipment is operated within 50 feet (15.25 meters) of an energized overhead electrical line or conductor. Refer to *S3AM-010-PR1 Emergency Response Planning*. This plan shall identify the following information:

- The importance to the operator's safety of remaining inside the cab except where there is an imminent danger of fire, explosion, or other emergency that necessitates leaving the cab.
- The safest means of evacuating from equipment that may be energized.
- The potentially energized zone around the equipment.
- The need for crew in the area to avoid approaching or touching the equipment and the load.
- The means to de-energize the electrical line or live conductor.
- The contact information for the utility Overhead Electrical Line Owner / Operator and emergency services.

4.6.2 In the event of an incident, the Employee shall report it in accordance with *S3AM-004 PR1 Incident Reporting, Notifications & Investigation.*

4.6.3 All damaged utilities shall be repaired by a qualified and / or licensed professional.

5.0 Records

5.1 Retain the Overhead Electric power lines Acknowledgement forms and any document related to requests of and confirmation from the Overhead Electrical Line Owner / Operator in the project files. Documentation of employee training completed shall be retained in accordance with *S3AM-003-PR1 SH&E Training*.

6.0 Attachments

6.1 S3AM-322-FM1 Overhead Electric Power Lines Acknowledgement Form

Americas

Overhead Electrical Lines Acknowledgment

S3AM-322-FM1

Company Information		
Name of Employer or Contracting Operation:		
Address:		
City:	**Province:**	**Postal Code:**
Telephone:	**Fax:**	
Project / Location Name:		
AECOM Contact Name:		

Acknowledgement		
I acknowledge that I have received a copy of *S3AM-322-PR1 Overhead Lines* and any other AECOM documentation related to the overhead electrical lines. List any additional documentation received: I understand that this worksite may have Overhead Electrical Hazards, and I have discussed the received documentation with all of our company staff who will be on this site.		
Name & Title (Print)	**Signature**	**Date**

Americas

Underground Utilities

S3AM-331-PR1

1.0 Purpose and Scope

1.1 Provides procedures designed to help prevent injuries to personnel working on the location and pedestrians, property damage, and adverse environmental impact as a result of potential hazards associated with encountering underground utilities, subsurface installations, and potential overhead hazards.

1.2 Provides the minimum requirements to be followed for underground work (e.g., excavations, drilling, boring, and probing work) to ensure that underground installations, and subsurface structures, are identified properly before work commences.

1.3 This procedure applies to all Americas-based employees and operations and any other entity and its personnel contractually required to comply with this document's content.

1.4 The Manager is responsible for meeting all the requirements in this procedure.

1.5 AECOM's clients may have specific procedures which shall be followed to identify and map utility and subsurface structures on their properties or facilities. Provided the client's procedures meet or exceed those of AECOM, approval shall be obtained from the Manager and the SH&E Manager to follow the client's procedures.

2.0 Terms and Definitions

2.1 **Underground Utilities –** All utility systems located beneath grade level, including, but not limited to, gas, electrical, water, compressed air, sewage, signaling and communications, etc.

2.2 **Clearance** – includes the following:

- The positive locating of underground utilities or subsurface installations in or near the work area.
- A signed statement by an appropriate representative attesting to the location of underground utilities and/or the positive de-energizing (including lockout) and testing of electrical utilities.

2.3 **Ground Disturbance (GD) –** Any indentation, interruption, intrusion, excavation, construction, or other activity in the earth's surface as a result of work that results in the penetration of the ground.

2.4 **Hand Clearance Zone –** The area on either side of the locate marks of a utility that shall be maintained in order to expose the utility through the use of non-destructive ground disturbance techniques acceptable to the owner of the buried utility. Visual exposure is required before mechanical excavation equipment may be used.

2.5 **Intrusive Activities –** Examples: Excavation of soil borings, installations of monitoring wells, installation of soil gas sampling probes, excavation of test pits/trenches or other man-made cuts, cavity, trench or depression in an earth surface formed by earth removal.

2.6 **Non-Destructive Ground Disturbance Technique –** A safe and acceptable excavation method that is used to visually expose an underground utility without causing damage. Non-destructive ground disturbance techniques may include, but are not limited to:

- Hand digging.
- Use of non-conductive tools.
- Hydro-vacuum.

2.7 **Subsurface Installation –** Examples: Subterranean tunnels, underground parking garages and other structures beneath the surface.

2.8 **Utility Strikes –** Unplanned contact with utilities resulting in damage to the utility or its protective coating.

3.0 References

3.1 S3AM-003-PR1 SH&E Training

3.2 S3AM-303-PR1 Excavation

3.3 S3AM-321-PR1 Drilling, Boring & Direct-Push Probing

4.0 Procedure

4.1 Roles and Responsibilities

4.1.1 **Manager**

- Administer this procedure and the development of the SH&E Plan.
- Confirm the appropriate equipment and materials are available to conduct the underground utility and/or subsurface installation clearance.
- Confirm all employees involved and affected by the task review the SH&E Plan and Task Hazard Assessment (THA) prior to work commencing
- Authorize work to proceed using the *S3AM-331-FM1 Underground Utility & Subsurface Installation Clearance Checklist*.
- Confirm that employees conducting underground utilities and subsurface clearance processes possess all required training, registrations or certifications.
- Provide authorization (with the concurrence of the Site Supervisor and SH&E Manager) for work to resume if interrupted due to unexpected conditions or events.

4.1.2 **Safety, Health & Environment (SH&E) Manager**

- Assist AECOM management as needed by providing guidance and clarification as to issues that may arise.
- Review the SH&E Plan to confirm compliance with jurisdictional regulations. Provide technical guidance as needed when a variance is pursued related to this procedure.

4.1.3 **Employees**

- Maintain training as appropriate to the work to be completed (e.g. ground disturbance, lockout tagout, equipment operation, etc.). Refer to *S3AM-003-PR1 SH&E Training*.
- Review the SH&E Plan and Task Hazard Assessment (THA) prior to work commencing.
- As appropriate to the anticipated or encountered hazards and as addressed in the applicable planning documentation, utilize appropriate personal protective equipment (PPE) and applicable training, practices and operating procedures.
- Immediately notify the Manager of any unanticipated conditions or events. If assigned equipment, perform appropriate inspections and confirmations of maintenance and/or repairs.

4.2 Training

4.2.1 All on-site employees involved with the underground utility and subsurface identification and associated clearance process shall be trained, at a minimum, in these procedures.

4.2.2 Employees shall complete all required training associated with their tasks in accordance with the SH&E Training Matrix and any training assessments developed at the business group.

- Refer to *S3AM-003-PR1 SH&E Training.*
- This training may include, but is not limited to, Excavation / Trenching (Ground Disturbance), HAZWOPER, Petroleum Safety Training (or Construction Safety Training), and H2S Alive as appropriate.

4.2.3 As applicable, employees shall receive client-required training.

4.3 Planning

4.3.1 Health and Safety Plan – At a minimum, a SH&E Plan and task hazard assessments (THAs) shall be prepared prior to any underground utilities and subsurface installations clearance activities.

- The SH&E Plan will address any required environmental monitoring including gas monitoring, dust, noise, metals, radiation or other monitoring as may be appropriate for site conditions.
- Employees shall comply with all SH&E Plan requirements.
- The location specific emergency response plan shall be in place, contain procedures applicable to the potential emergencies presented by the operations, and be reviewed with all personnel potentially affected.

4.3.2 *S3AM-331-ATT2 Underground Utilities & Subsurface Installation Clearance Flow Chart* provides a summary of the key requirements addressed in this procedure.

4.3.3 Underground utilities and subsurface installations shall be investigated as being present, including the following, but not limited to:

- Steam, gas and electric.
- Sewer and water.
- Subterranean tunnels.
- Fibre optics (note: routine geophysical surveys will not identify fibre optic cables).
- Traffic control cables.

4.3.4 Location of underground utilities and subsurface installations will be confirmed by cross-referencing available information:

- Maps, as-built drawings and issued for construction (IFC) drawings.
- Plot plans, permits, crossing/encroachment agreements.
- One-Call information, locator and provided surveys.
- Private utility information, locator and provided surveys (e.g. ground penetrating radar (GPR), electromagnetic, etc.).
- Owner supplied documentation.
- Site walks.

4.3.5 As applicable, emergency shut-off locations of utilities shall be verified before work activities commence.

4.3.6 Jurisdictional, land owner, client and utility owner requirements shall be consulted to determine the minimum search zone dimensions and appropriate clearance distances.

4.3.7 As necessary and if possible, adjust locations of excavations or intrusive subsurface work away from subsurface utilities and installations

4.3.8 Prior to any excavation or intrusive subsurface work, the *S3AM-331-FM1 Underground Utility & Subsurface Installation Clearance Checklist* shall be completed. The form shall be reviewed and signed by the Manager.

- If the answer to any question in Part 1 of the checklist is “No” or “N/A”, no ground disturbance may take place without review by the Manager, in consultation with SH&E Manager, of the circumstances related to the particular item. The Manager shall initial beside each “No” or “N/A” item to indicate review and authorization.

4.4 Permits, Notifications and Access Agreements

4.4.1 Any required notifications shall be provided within the appropriate timeframe to the applicable organization (e.g. owner, utility company, agency, governing body, etc.).

4.4.2 All applicable permits (e.g. client, government, working near rail road, etc.) will be identified, obtained, and adhered to.

4.4.3 All access agreements will be obtained and adhered to.

4.5 Locating Underground Utilities and Subsurface Installations

4.5.1 Utilize the appropriate call/click-before-you-dig provider. Refer to *S3AM-331-ATT1 One-Call System*.

4.5.2 Federal/State/Provincial/Territorial and other "One Call" providers shall be contacted at least two working days and no more than ten working days prior to commencing the ground disturbance. Jurisdictional requirements shall be consulted to verify the appropriate advance notice. (e.g. 24 hours, two full working days, three to ten business days, etc.).

4.5.3 If the location of proposed excavation or intrusive subsurface work cannot be clearly and adequately identified, the route and/or area of the proposed ground disturbance shall be identified using white flags, paint or stakes prior to the arrival of the locator. Consult jurisdictional requirements as white-lining may be a mandatory requirement on all ground disturbances.

4.5.4 One Call providers shall appropriately identify and mark the subsurface utilities or installations, or otherwise provide written notification they do not have any facilities near the proposed subsurface/intrusive locations.

4.5.5 Confirm all circuits were on during subsurface checks if the checks were for identifying energized lines (e.g. circuits on timers or light sensing switches).

4.5.6 Areas that have a high density of sub-surface facilities may require a secondary locate by another independent locator to verify locations identified by the first locator.

4.6 Private Utility Locating

4.6.1 One Call services may not be available in various non-urban locations. Private utility locating companies shall be utilized to identify and located any underground utilities or subsurface installations.

4.6.2 Be aware urban areas (e.g. city or town) may have subsurface installations (e.g. underground garages) and utilities (e.g. public water, sewer, and gas pipelines) that are not covered by one-call systems.

- These subsurface installations and utilities require additional investigation and diligence beyond the one-call system.
- Additional investigation and diligence beyond the one-call system is also recommended for non-urban areas.

4.6.3 In urban areas, private utility locating companies shall be called to identify and locate, through geophysical surveys and other means, the presence of private utilities installed by the property owner (e.g. irrigation systems) and to verify the presence of public utilities on the properties.

- Hand clearing is required in urban areas.

4.6.4 Hand clearing is also recommended for non-urban areas and may be required by the given jurisdiction.

4.6.5 Warning tape, pea gravel, sand, non-indigenous material, bentonite, red concrete (indicative of electrical duct banks) and any departure from native soil or backfill may be evidence of the presence of subsurface installations and utilities.

4.7 Surface Markings

4.7.1 Once the underground installation has been identified, proper surface markings shall be made in accordance with the guidelines from the One-Call System (refer to S3AM-331-ATT1), guidance contained in this procedure or as contract-specified.

4.7.2 Color-coded surface marks (paints or similar coatings) shall be used to indicate the type, location, and route of buried installations. Additionally, to increase visibility, color-coded vertical markers (temporary stakes or flags) shall supplement surface marks.

4.7.3 All marks and markers shall indicate the name, initials, or logo of the company that owns or operates the installation and the width of the installation if it is greater than 2 inches.

4.7.4 If the surface over the buried installation is to be removed, supplemental offset marking shall be used. Offset markings shall be on a uniform alignment and shall clearly indicate that the actual installation is a specific distance away.

4.7.5 Locate marks shall be re-verified as per jurisdictional requirements or no later than 14 days after the previous locate was completed, whichever interval is shorter. These locate time intervals shall be maintained for the duration of the ground disturbance.

- If the work is interrupted during the determined lifespan or work does not commence during the applicable lifespan, a new locate shall be performed.
- Jurisdictional provisions may allow for an extension to the lifespan of the locate marks, however certain conditions may need to be met. (e.g. activities uninterrupted)
- If locate marks are moved or destroyed the location of the buried facilities shall be re-established.

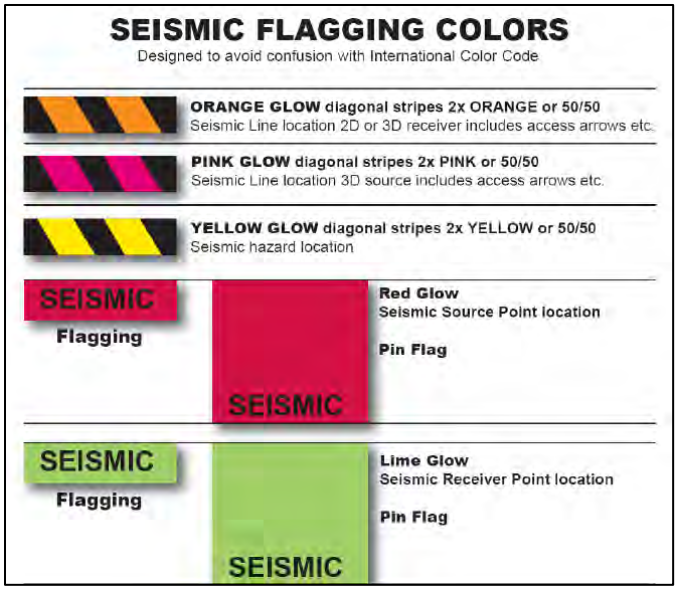
4.8 Uniform Color Coding

4.8.1 The colors and corresponding installation type are as follows unless otherwise contract-specified:

AMERICAN PUBLIC WORKS ASSOCIATION – APWA
Color Coding for Marking of Buried Facilities

White	Proposed Ground Disturbance Area
Pink	Temporary Survey Markings
Red	Electric Power Lines, Cables, Conduit and Lighting Cables
Yellow	Gas, Oil, Steam, Petroleum Lines or Gaseous Materials
Orange	Conduit, Cable, Communication, Alarm or Signal Lines
Blue	Potable Water
Green	Sewer, Storm Sewer and Drain Lines
Purple	Reclaimed Water, Irrigation and Slurry Lines (non-potable)

Canadian Association of Geophysical Contractors



4.9 Identification and Mapping of Utility and Subsurface Structures

4.9.1 The locations of subsurface utilities and subsurface installations shall be investigated, documented, and shown on a site plan (a scaled site plan shall be used when feasible). Refer to *S3AM-331-FM1 Underground Utilities & Subsurface Installation Clearance Checklist.*

4.9.2 Documentation of utility and subsurface installation identification (calling one call, responses from utilities) along with the scaled site plan shall be available on the worksite at all times of intrusive activities.

4.10 Site Walk

4.10.1 A site walk shall be conducted by the AECOM Manager and any other appropriate personnel with the objectives of reviewing all planned intrusive activity locations, the locations of subsurface and overhead utilities, overhead obstructions, and the potential for subsurface installations, to determine the appropriate utility clearance activities, and to observe other physical hazards.

- Walk the area at least 50 feet (15.2 meters) from perimeter of the site to observe physical hazards.
- Walk the area of at least 50 feet (15.2 meters) radius from each proposed subsurface intrusion location.
- If possible, particularly at urban and industrial sites, the client/property owner or an individual knowledgeable about the site and site utilities will attend the site walk.
- Add discovered items/issues to map for use in location confirmation.

4.10.2 The Site Walk further supplements the Identification and Mapping of Utility and Subsurface Structures procedure. Site Walks should be repeated as necessary following the Identification and Mapping of Utility and Subsurface Structures as visual verification of the hazards. Examples include:

- Proposed location(s) does not lie on a line connecting two similar manhole covers (e.g. sanitary sewer or storm drain).
- Proposed subsurface location(s) has not subsided, been excavated and patched, nor gives the appearance it may be covering a former trench (e.g. linear cracks, sagging curbs, linear re-pavements, etc.).
- Proposed subsurface location(s) does not lie on a line with any water, gas, electrical meters, utility cleanouts, or other utility boxes in the surrounding areas.

4.11 Proposed Subsurface Investigation Locations

4.11.1 All proposed subsurface locations will be reviewed in comparison to subsurface and overhead utilities and subsurface installations and adjustments made as necessary.

4.11.2 Minimum set back distances from subsurface and overhead utilities and subsurface installations will be established including 5 feet (1.5 meters) from any subsurface utility, 7 feet (2.1 meters) from the pad surrounding any underground storage tanks, and 10 feet (3 meters) from any overhead energized electrical line (or further depending on line voltage). These set back distances are a minimum; government regulations and utility requirements may dictate a greater set back distance.

4.12 Utility Clearance Investigation Location Confirmation

4.12.1 As applicable, all client on-site safety procedures shall be understood and adhered to.

4.12.2 Hand exposure or non-destructive ground disturbance techniques to expose an underground utility or subsurface installation are necessary to accurately determine size, location and alignment prior to mechanical excavation or intrusive subsurface work in the vicinity of that utility or installation.

4.12.3 Non-destructive ground disturbance techniques shall be acceptable to the owner of the buried utility (i.e. hydro-vacuum temperature or pressure).

4.12.4 Hydro-vacuum or air-knife require proper grounding equipment at sites where the subsurface may contain flammable gases, liquids, or vapors

4.12.5 Jurisdictional, land owner, client and utility owner requirements shall be consulted to determine the distance of the hand exposure zone, and what requirements, when met, may allow mechanical excavation within these zones.

4.12.6 At a minimum, all underground utilities and subsurface installations within a 5 feet (1.5 meter) radius of the work site shall be identified and physically located (seen) before use of mechanical excavation equipment is permitted. Jurisdictional, client, land owner and utility owner requirements shall be consulted as the required hand exposure radius may be larger.

4.12.7 In urban areas, proposed subsurface locations will be hand cleared to 5 feet (1.5 meters) (soil borings and wells) or 12 inches (30 centimeters) (soil gas sampling probes) using non-mechanical methods.

- In non-urban areas, hand clearing should be conducted if possible and shall be conducted as required by the given jurisdiction.
- Hand clearance should be extended if locations of deep utilities and structures are not known.
- Hand exposure or non-destructive ground disturbance techniques should extend a minimum of 24 inches (60 centimeters) below the intended ground disturbance depth to minimize the hazard of mechanical equipment contact with any utility or installation.

4.12.8 Mechanical equipment and attachment dimensions shall be considered when establishing the zone in which all underground utilities and subsurface installations are physically located (seen) prior to the use of that equipment. The radius may require expanding to maintain safe distances when using large equipment.

4.13 Utility Strikes

4.13.1 Utility strikes shall be reported in accordance with *S3AM-004-PR1 Incident Reporting, Notifications & Investigation*.

4.13.2 All damaged utilities shall be repaired by a qualified and/or licensed professional.

5.0 Records

5.1 Retain completed *S3AM-331-FM1 Underground Utility & Subsurface Installation Clearance Checklist* and documents related the clearance process (e.g. Utility Owner communication, etc.) in the site or project files.

5.2 Documentation of employee training completed shall be retained in accordance with *S3AM-003-PR1 SH&E Training*.

6.0 Attachments

6.1 S3AM-331-ATT1 One-Call System

6.2 S3AM-331-ATT2 Underground Utilities & Subsurface Installation Flow Chart

6.3 S3AM-331-FM1 Underground Utility & Subsurface Installation Clearance Checklist

Americas

One-Call System

S3AM-331-ATT1

1.0 What Is It?

1.1 One-call systems are established across the Americas to provide one telephone number for excavating contractors and the general public to call for notification of their intent to use equipment for excavating, tunneling, demolition, or any other similar work. This one-call system provides the participating members an opportunity to identify and locate their underground facilities.

1.2 As described on their web site (http://www.call811.com), Common Ground Alliance (CGA) was "created specifically to work with all industry stakeholders in an effort to prevent damage to underground utility infrastructure and ensure public safety and environmental protection." CGA also serves as an organization to continuously update best practices amongst the growing underground industry. The CGA web site provides current one-call information for all states and provinces.

2.0 Why Is It Needed?

2.1 Damage to underground facilities increased considerably following the building boom of the 1950s, 1960s, and early 1970s when the trend was to go underground with utilities. Thousands of miles of underground facilities are vulnerable to excavating machines such as backhoes, and the resulting damage can interrupt utility service and threaten life, health, and property.

3.0 How to Get It

3.1 In the United States 811 is the Federally-mandated national "Call Before Your Dig" number that connects directly to the local one-call center. Each state has different rules and regulations governing digging, some stricter than others. The CGA web site provides current contact information to find state-specific information as well as links to submit an online digging request where available. Canadian one-call numbers vary by jurisdiction. One-call services are not available in Canada's Atlantic provinces (New Brunswick, Newfoundland, Nova Scotia) or in the three Northern Territories (Nunavut, Northwest Territories, Yukon).

4.0 Disclaimer

4.1 The purpose of this directory is to illustrate the extent of one-call service available. Some jurisdictions have a list of "Tier 1" subscriber utilities notified by 811, and a "Tier 2" list that the excavator/contractor is responsible for contacting directly. Users shall verify information is current including the extent and limit of service from local sources.

Province/State	One-Call Agency		Number
Canada	www.clickbeforeyoudig.com		
Alberta	Alberta One Call	www.albertaonecall.com	1.800.242.3447
British Columbia	BC One Call	www.bconecall.bc.ca	1.800.474.6886
Manitoba	Click Before You Dig	www.clickbeforeyoudigmb.com	Various – see website
Ontario	Ontario One Call	www.on1call.com	1.800.400.2255
Québec	Info Excavation	www.info-ex.com	1.800.663.9228
Saskatchewan	Sask 1st Call	www.sask1stcall.com	1.866.828.4888

United States	www.call811.com	811
Alabama	Alabama 811	1.800.292.8525
Alaska	Alaska Digline, Inc.	1.800.478.3121
Arizona	Arizona 811	1.800.782.5348
Arkansas	Arkansas One Call	1.800.482.8998
California	(North & Central) USA North 811	1.800.227.2600
	(South) Dig Alert	1.800.227.2600
Colorado	Colorado 811	1.800.922.1987
Connecticut	Call Before You Dig	1.800.922.4455
Delaware	Miss Utility of Delmarva	1.800.282.8555
District of Columbia	District One Call	1.202.265.7177
Florida	Sunshine 811	1.800.432.4770
Georgia	Georgia 811	1.800.282.7411
Hawaii	Hawaii One Call	1.866.423.7287
Idaho	Dig Line, Inc.	1.800.342.1585
	(Bonner/Boundary) Pass Word	1.800.626.4950
	(Kootenai County) Pass Word	1.800.428.4950
	(Shoshone-Benewah) Pass Word	1.800.398.3285
Illinois	(Chicago) Digger -Chicago Utility Alert Network	312.744.7000
	(Outside of Chicago) JULIE	1.800.892.0123
Indiana	Indiana 811	1.800.382.5544
Iowa	Iowa One Call	1.800.292.8989
Kansas	Kansas 811	1.800.344.7233
Kentucky	Kentucky 811	1.800.752.6007
Louisiana	LA One Call	1.800.272.3020
Maine	Dig Safe	1.888.344.7233
Maryland	(West of Chesapeake Bay) Miss Utility of Maryland	1.800.257.7777
	(East of Chesapeake Bay) Miss Utility of Delmarva	1.800.282.8555
Massachusetts	Dig Safe System, Inc.	1.888.344.7233
Michigan	Miss Dig	1.800.482.7171
Minnesota	Gopher State One Call	1.800.252.1166
Mississippi	Mississippi 811	1.800.227.6477

Missouri	Missouri One Call System	1.800.344.7483
Montana	Montana 811	1.800.424.5555
	(Flathead and Lincoln Counties) Montana One Call Center	1.800.551.8344
Nebraska	Nebraska 811	1.800.331.5666
Nevada	USA North 811	1.800.227.2600
New Hampshire	Dig Safe System, Inc.	1.888.344.7233
New Jersey	New Jersey One Call	1.800.272.1000
New Mexico	New Mexico 811	1.800.321.2537
New York	(North of 5 Boroughs) Dig Safely New York	1.800.962.7962
	(5 Boroughs and Long Island) New York 811, Inc.	1.800.272.4480
North Carolina	North Carolina 811	1.800.632.4949
North Dakota	North Dakota One Call	1.800.795.0555
Ohio	Ohio Utilities Protection Service	1.800.362.2764
Oklahoma	Call Okie	1.800.522.6543
Oregon	Oregon Utilities Notification Center	1.800.332.2344
Pennsylvania	Pennsylvania One Call System, Inc.	1.800.242.1776
Puerto Rico	Puerto Rico Public Service Commission 811	
Rhode Island	Dig Safe System, Inc.	1.888.344.7233
South Carolina	South Carolina 811	1.888.721.7877
South Dakota	South Dakota One Call	1.800.781.7474
Tennessee	Tennessee 811	1.800.351.1111
Texas	Texas 811	1.800.545.6005
	Lone Star 811	1.800.669.8344
Utah	Blue Stakes of Utah	1.800.662.4111
Vermont	Dig Safe System, Inc.	1.888.344.7233
Virginia	Virginia 811	1.800.552.7001
Washington	Utility Notification Center	1.800.424.5555
West Virginia	WV 811	1.800.245.4848
Wisconsin	Diggers Hotline	1.800.242.8511
Wyoming	One-Call Of Wyoming	1.800.849.2476

Americas

Underground Utilities & Subsurface Installation Clearance Flow Chart

S3AM-331-PR1

Before Any Underground Utilities and Subsurface Installation Clearance

PERMITS AND ACCESS AGREEMENTS

- Government and Utility/Infrastructure Permits
- Client permits and procedures
- Access Agreements

KEY POINT: Obtain all permits and sign Access Agreement (if required)

↓

GENERAL HEALTH and SAFETY

KEY POINT: Prepare the SH&E Plan and a Task Hazard Assessment (THA).

↓

LOCATING UNDERGROUND UTILITIES & SUBSURFACE INSTALLATIONS

KEY POINT: Utilize the appropriate call/click-before-you-dig provider and as necessary, engage private locators. Refer to *S3AM-331-ATT1 One-Call System*.

↓

IDENTIFICATION & MAPPING OF UTILITY and SUBSURFACE STRUCTURES

KEY POINT: Generate a comprehensive site map illustrating known locations of overhead/subsurface utilities, subsurface structures, and proposed boring locations.
Complete *S3AM-331-FM1 Pre-Drilling, Boring, & Direct-Push Checklist*.

↓

SITE WALK

KEY POINT: Perform a site walk utilizing site map and 360° view to verify known conditions and identify potential issues. Add discovered items/issues to map for use in location confirmation.

↓

PROPOSED SUBSURFACE INVESTIGATION LOCATIONS

KEY POINT: Confirm that locations meet the minimum required set-back distances.

↓

UTILITY CLEARANCE INVESTIGATION LOCATION CONFIRMATION

KEY POINT: Locations shall be hand-cleared using non-destructive ground disturbance techniques and visually verified.

Americas

Underground Utilities & Subsurface Installation Clearance Checklist

S3AM-331-FM1

Location:	**Project #:**	**Date & Time:**
Manager:	**Contractor (if applicable):**	**Weather:**
Client:	**Inspector:**	
Notes:		

Part 1

Part 1 and Part 2 shall be completed prior to any intrusive subsurface work. DO NOT DISTURB GROUND if a "No" or "N/A" answer to any of the Part 1 questions has not been initialed as authorized by the AECOM Manager.

Any variance from these procedures requires approval of the Vice President of the applicable business group.

		Yes	No	N/A
I.	**Permits and Access Agreements**			
1.	Have all appropriate permits and agreements been identified and obtained (e.g. client, drilling, encroachment, working near railroads, etc.)?	☐	☐	☐
2.	Have all client requirements been identified and obtained?	☐	☐	☐
3.	If working off-site is (are) site access agreement(s) executed?	☐	☐	☐
II.	**General Health and Safety**			
1.	Has a Health and Safety Plan (HASP) been prepared for AECOM employees?	☐	☐	☐
2.	Do on-site personnel have required-level PPE?	☐	☐	☐
3.	Do on-site personnel have required-level of training?	☐	☐	☐
4.	Is appropriate monitoring equipment as specified in HASP/THAs available at each clearance location?	☐	☐	☐
5.	Has the field screening equipment been calibrated as required by the HASP?	☐	☐	☐
6.	Are calibration gases available at the site?	☐	☐	☐
III.	**Identification and Mapping of Utility and Subsurface Structures**			
1.	Is a Site Plan showing proposed subsurface locations and utility locations attached to this check list?	☐	☐	☐
2.	Have above/below ground utilities & subsurface installations been investigated (Part 2 of this form)?	☐	☐	☐
3.	Have all Federal/State/Provincial/Territorial and other "One Call" providers marked their facilities or otherwise notified they do not have any facilities near the proposed subsurface/intrusive locations?	☐	☐	☐
4.	Have Federal/State/Provincial/Territorial or other "One Call" providers identified what utilities and underground structures are ***not*** included in their provider system (e.g. underground structures)?	☐	☐	☐
5.	As noted in the exception at the bottom of Section VI of this checklist, has a utility locating contractor performed geophysical and/or other surveys of the proposed subsurface/intrusive locations?	☐	☐	☐
6.	Visual verification that each of the proposed locations does not lie on a line connecting two similar manhole covers (e.g. sanitary sewer or storm drain)?	☐	☐	☐
7.	Visual verification that the ground in the vicinity of each of the proposed subsurface locations has not subsided, been excavated and patched, give the appearance it may be covering a former trench (e.g. linear cracks, sagging curbs, linear re-pavements, etc.) and does not lie on a line with any water, gas, electrical meters, utility cleanouts, or other utility boxes in the surrounding areas?	☐	☐	☐

Part 1 and Part 2 shall be completed prior to any intrusive subsurface work. DO NOT DISTURB GROUND if a "No" or "N/A" answer to any of the Part 1 questions has not been initialed as authorized by the AECOM Manager.

Any variance from these procedures requires approval of the Vice President of the applicable business group.

	Yes	No	N/A
IV. Site Walk			
1. Has a site walk been performed that includes the following:	☐	☐	☐
a. Reviewing all planned intrusive locations?	☐	☐	☐
b. Adjusting locations away from subsurface utilities and installations?	☐	☐	☐
c. Determining the appropriate utility clearance activities for each location?	☐	☐	☐
d. Determining the presence and location of overhead utilities and obstructions?	☐	☐	☐
e. Walk around perimeter of the site to observe physical hazards?	☐	☐	☐
f. Includes 50 feet (15.2 meters) from perimeter of the site to observe physical hazards and 50 feet (15.2 meters) radius from each proposed subsurface location?	☐	☐	☐
V. Proposed Subsurface Investigation Locations*			
1. Are all of the proposed subsurface locations at least 5 feet (1.5 meters) from any identified subsurface utility?	☐	☐	☐
2. Are all of the proposed subsurface locations at least 7 feet (2.1 meters) from the pad surrounding any underground storage tanks (USTs) shown on the Site Plan?	☐	☐	☐
3. Are all of the proposed subsurface locations at least 5 feet (1.5 meters) from any subsurface utilities shown on the Public Right-of-Way street improvements?	☐	☐	☐
** These set back distances are a minimum; government regulations and utility requirements may dictate a greater set back distance.*			
VI. Utility Clearance Investigation Location Confirmation*			
1. Have subsurface locations been hand cleared as follows? Hand clearance should be extended if locations of deep utilities and structures are not known. In non-urban areas hand clearing should be conducted if possible and according to local requirements.	☐	☐	☐
a. For soil borings/monitoring wells; excavated to a minimum of 5 feet (1.5 meters) below ground surface using non-mechanical methods?	☐	☐	☐
b. For soil gas sampling; excavated to 2 foot (0.6 meter) below grade or below the bottom of a concrete floor prior to the installation of soil gas sample probe points?	☐	☐	☐

** Exceptions to requirements of the utility clearance process, as permitted by the applicable jurisdiction, include the following:*

- *Sites where extensive utility mapping (e.g. geophysical survey) has been completed and/or where extensive activities have already been performed.*
- *Locations where facility layout is well documented and understood.*
- *Sites or portions of large sites where utilities are known not to exist currently or to not have ever existed throughout the life of the facility, property or site.*

Comments:

Documentation supplied by one-call or private utility and installation locators, including email or written field confirmation / maps of mark-out requests and status shall accompany this form. If this form is supporting multiple ground disturbance activities, a copy of this completed form should be provided to each activity.

Part 2

Public Utility Locate (OneCall)				Prior Locate Ticket #	
Date Called:		Called By:		Valid Until:	
Ticket Number:		Area Requested To Be Cleared:			

Private Utility Locate		Prior Locate Ticket #	
Company Performing Locate:		Date Completed:	
Area(s) Requested To Be Cleared (including distance around marked locations):			
Method(s) Used (e.g., GPR, EM):			
Confirm Area(s) Cleared:			

OneCall Utilities			Field Observation
Utility	**Notified by**	**Comments**	**Marked** (mains & services)
Electric (Red)	☐ OneCall ☐ Other		☐ Yes ☐ No ☐ Above
Gas/Petroleum Pipeline (Yellow)	☐ OneCall ☐ Other		☐ Yes ☐ No
Sewer/Drainage (Green)	☐ OneCall ☐ Other		☐ Yes ☐ No
Water (Blue)	☐ OneCall ☐ Other		☐ Yes ☐ No
Communications (Orange)	☐ OneCall ☐ Other		☐ Yes ☐ No ☐ Above
Other	☐ OneCall ☐ Other		☐ Yes ☐ No ☐ Above
Were all circuits on during subsurface checks if the checks were for identifying energized lines (e.g., circuits on timers or light sensing switches)?			☐ Yes ☐ No ☐ N/A

Utilities Not Identified By OneCall (Includes both Public and Private along with Regional and Site Utilities)			Field Observation
Utility (Colors may vary)	**Owner / Contact / Phone #**	**Notified**	**Marked**
Communications: (Orange) TV, computer, phone, cell towers, site communication, cameras, security, etc.		☐ Yes ☐ No	☐ Yes ☐ No ☐ Above
Electricity: (Red) Mains / Supplies / Interior / Exterior (signs, fuel pumps, low voltage security perimeters, gates, property light posts, equipment, substations, etc.)		☐ Yes ☐ No	☐ Yes ☐ No ☐ Above
Gas: (Yellow) Mains / Supplies / Equipment / Pipelines (Natural, Process, Oil, Crude, Refined (Gas, Diesel, Jet), etc.)		☐ Yes ☐ No	☐ Yes ☐ No ☐ Above
Steam: (Yellow)		☐ Yes ☐ No	☐ Yes ☐ No ☐ Above
Structures: Possible horizontally installed facilities, vaults, basements, tunnels, sub-grade structures, foundations, overhead obstructions, etc.		☐ Yes ☐ No	☐ Yes ☐ No ☐ Above
UST Systems (Tanks / piping / electric)		☐ Yes ☐ No	☐ Yes ☐ No
Sewer: (Green) Sanitary, storm, combined, septic, drainage (parking, buildings, fields), irrigation		☐ Yes ☐ No	☐ Yes ☐ No
Water: (Blue) Process, Plant, potable, well, cooling, return/makeup, fire, sprinkler, landscape irrigation, reclaim (Purple) other		☐ Yes ☐ No	☐ Yes ☐ No ☐ Above
Other: Abandoned lines, invisible dog fences, shopping cart perimeter monitoring, traffic lights		☐ Yes ☐ No	☐ Yes ☐ No ☐ Above

Manager: _____ Print _____ Sign _____ Date

Americas

Concrete

S3AM-338-PR1

1.0 Purpose and Scope

1.1 The purpose of this procedure is to confirm the safety of AECOM Americas personnel during the installation of concrete forms, pouring of new concrete structures, or installation of preformed concrete structures.

1.2 This procedure applies to AECOM Americas employees and any other entity and its personnel contractually required to comply with this document's content where concrete is poured or handled. This procedure also applies to Portland cement, mortar, stucco, and other applications of cementitious products.

2.0 Definitions

2.1 None

3.0 References

3.1 S3AM-208-PR Personal Protect Equipment

3.2 S3AM 304 PR1 Fall Protection

4.0 Procedure

4.1 Implementation of this procedure is the responsibility of the manager directing activities of the facility, site, or project location.

4.2 General

4.2.1 Employees working above any adjacent working surfaces shall review and conform to the applicable fall protection requirements listed in *S3AM 304 PR1 Fall Protection*.

4.2.2 No employees will be permitted to work above an impalement hazard (e.g., rebar) unless it has been protected to eliminate the hazard of impalement.

4.2.3 Prohibit riding of concrete buckets for any purpose. Keep vibrator crews out from under concrete buckets suspended from cranes or cableways.

4.2.4 Provide an employee with a whistle or other sound-producing device to watch for approaching buckets and warn employees to stand clear while the concrete is dumped.

4.2.5 Where practical, use tag lines to control and position suspended concrete buckets.

4.2.6 Provide PumpCrete™ or similar systems using discharge pipes with pipe supports designed for 100 percent overload. Provide compressed-air hoses in such systems with positive fail-safe joint connectors, or otherwise secure them to prevent separation of sections when pressurized.

4.2.7 All nozzle men applying cement, air, sand and water through a pneumatic or high-pressure hose shall wear protective head, hand, and face equipment.

4.2.8 All concrete workers shall wear protective clothing, including safety glasses; rubber boots, and gloves, to reduce the danger of concrete burns. Refer to *S3AM-208-PR Personal Protection Equipment* for additional information.

4.2.9 Wear appropriate personal protective equipment when using tools and equipment associated with concrete masonry work.

4.2.10 Finishers shall wear safety glasses and face shields when chipping, wire brushing, or using power-impact or rotary tools in patching concrete.

4.2.11 In the pour area, or any area where dry Portland cement is being handled or mixed with water or

aggregate, provide means to flush eyes (e.g., eyewash station, bottles) for 15 minutes. If the material contacts skin, wash skin with water and ph-neutral soap or mild detergent.

4.2.12 Provide temporary winter protection enclosures with adequate ventilation, lighting, and fire protection.

4.2.13 Equip pavers with a loud warning bell or horn that sounds when a paver moves ahead or the bucket is run out.

4.2.14 Provide conical or tapered bottoms with mechanical or pneumatic means of starting the flow of materials for bulk storage bins, containers, or silos.

4.2.15 Construct handles on bull floats used where they may contact energized electrical conductors of nonconductive material, or insulate with a nonconductive sheath whose electrical and mechanical characteristics provide the equivalent protection of a handle constructed of nonconductive material.

4.2.16 Do not extend handles of buggies beyond the wheels on either side of the buggy. Installation of knuckle guards on buggy handles is recommended.

4.2.17 Provide concrete buckets equipped with hydraulic or pneumatically operated gates with positive safety latches or similar safety devices installed to prevent premature or accidental dumping. The buckets will be designed to prevent excess aggregate and loose material from accumulating excessively on the top and sides of the bucket.

4.2.18 Block the wheels of ready-mix trucks and set the brakes to prevent movement when discharging on a slope.

4.2.19 Properly guard exposed gears, chains, and rollers of mixers.

4.2.20 Secure sections and ends of tremies, elephant trunks, and similar concrete conveyances with wire rope, chain, or similar safe fastener.

4.2.21 Equip powered and rotating-type concrete troweling machines that are manually guided with a control or dead-man switch that will automatically shut off the power whenever the operator removes his hands from the equipment handles.

4.2.22 The use of ready-mix concrete trucks may create traffic problems, which proper planning and care can lessen and/or eliminate. Control backing operations through the use of a properly trained and attired flag person/spotter who will be positioned so that they have a clear view of the area behind the truck, as well as be clearly visible to the truck driver. Route movement of personnel and project equipment away from this area so that they do not have to cross the truck's means of egress.

4.3 Forms and Shoring

4.3.1 The completed shoring setup should be a homogenous unit or units. For example, do not use tubular steel shoring in combination with adjustable wood or jack-type shoring.

4.3.2 Confirm that formwork and shoring are be designed, erected, supported, braced, and maintained so that they will safely support all vertical and lateral loads that may be imposed upon them during placement of concrete.

4.3.3 Confirm that drawings or plans showing the jack layout, formwork, shoring, working decks, and scaffolding are available at the jobsite.

4.3.4 Remove and stockpile stripped forms and shoring promptly after stripping in all areas in which persons are required to work or pass. Remove and dispose of adhered concrete from forms and planking before stacking when possible to prevent generation of concrete dust. Pull, cut, or remove by other means any protruding nails, wire ties, and other form accessories not necessary to subsequent work to eliminate the hazard.

4.3.5 Do not impose any construction loads on the partially completed structure unless such loading has been considered in the design and approved by the engineer-architect.

4.3.6 When temporary storage of reinforcing rods, material, or equipment on top of formwork becomes

necessary, strengthen these areas to meet the intended loads.

4.3.7 Provide sills for shoring that are sound, rigid, and capable of carrying the maximum intended load.

4.3.8 Inspect all shoring equipment prior to erection to determine that it is as specified in the shoring layout. Do not use any equipment for shoring that is found to be damaged.

4.3.9 Inspect erected shoring equipment immediately prior to, during, and immediately after the placement of concrete. Immediately reinforce or re-shore any shoring equipment that is found to be damaged or weakened.

4.3.10 Provide re-shoring when necessary to safely support slabs and beams after stripping, or where such members are subjected to superimposed loads due to construction work done.

4.3.11 Build shoring or form systems in accordance with the AECOM procedure governing excavation when working in excavations.

4.4 Tube and Coupler Shoring

4.4.1 Use tubular steel frames for shoring layouts in accordance with each manufacturer's recommended safe working load based on tests conducted according to the "Recommended Procedure for Compression Testing Scaffolds and Shores" by the Scaffolding and Shoring Institute.

4.4.2 Prior to erection of steel frame shoring, conduct a thorough inspection to confirm material is not heavily rusted, bent, dented, or otherwise damaged or defective.

4.4.3 Provide final adjustment of adjustment screws prior to placement of concrete. Keep screw extensions to a minimum for maximum load carrying capacity.

4.4.4 Plan, design and construct any form, regardless of size, with an adequate factor of safety.

4.4.5 Do not use couplers (clamps) if they are deformed, broken, have defective or missing threads on bolts, or other defects.

4.4.6 Use material for the coupler (clamps) that is of a structural type such as drop forged steel, malleable iron, or structural grade aluminum. Do not use gray cast iron.

4.4.7 When checking the erected shoring towers with the shoring layout, confirm that the spacing between posts does not exceed that shown on the layout; check all interlocking of tubular members and tightness of couplings.

4.4.8 Confirm that all base plates, shore heads, extension devices, or adjustment screws are in firm contact with the footing sill and the form material, and are snug against the posts.

4.5 Vertical Slip Forms

4.5.1 Confirm that the steel rods or pipe on which the jacks climb or by which the forms are lifted are designed specifically for that purpose. Brace any rods not encased in concrete.

4.5.2 Position jacks and vertical supports in such a manner that the vertical loads are distributed equally and do not exceed the capacity of the jacks.

4.5.3 Provide the jacks or other lifting devices with mechanical dogs or other automatic holding devices to provide protection in case of failure of the power supply or the lifting mechanism.

4.5.4 Lift steadily and uniformly, and do not exceed the predetermined safe rate of lift.

4.5.5 Provide lateral and diagonal bracing of the forms to prevent excessive distortion of the structure during the jacking operation.

4.5.6 During jacking operations, the form structure shall be maintained in line and plumb.

4.5.7 Provide all vertical lift forms with scaffolding or work platforms completely encircling the area of placement.

4.6 Pre-Stressed and Post-Stressed Concrete

4.6.1 Keep tools and strand devices clean and in good repair to prevent failure.

4.6.2 Do not permit employees to stand in line or directly over the jacking equipment during tensioning operations. Provide signs and barriers to prevent employees from working behind the jack. Shield all jacking equipment and attachment pieces to protect the workers performing the stressing operations.

4.6.3 Carefully stack stressed members on a level base.

4.6.4 Pre-stressed girders and beams are often unstable when tipped; brace during transportation and handle in such a way to keep the member upright.

4.6.5 Handle stressed members at pick points specifically designated on the manufacturer's drawings, and with the lifting devices recommended by the manufacturer or the engineer in charge.

4.6.6 Do not allow personnel under stressed members during lifting and erection.

4.6.7 Keep anchor(s) turned up close to the anchor plate during jacking operations of any tensioning element(s).

4.6.8 Frequently inspect pulling heads, bolts, and hydraulic rams for indication of fatigue, and the threads on bolts and nuts for diminishing cross section.

4.7 Pre-Cast Concrete and Tilt-Up Operations

4.7.1 Do not permit employees under pre-cast walls, panels, or sections while they are being lifted or tilted into position.

4.7.2 Use properly attached tag lines, especially if the load is to be lifted and moved into place.

4.7.3 Adequately brace pre-cast walls or vertical concrete panels during construction.

4.7.4 Securely attach braces or shores to the concrete member.

4.7.5 Confirm lifting inserts on or in tilt-up pre-cast concrete members are capable of supporting at least two (2) times the maximum intended load applied or transmitted to them.

4.7.6 Confirm lifting hardware can support at least five (5) times the maximum intended load applied or transmitted to the lifting hardware.

4.8 Masonry Work

4.8.1 Handle and store masonry building materials in accordance with AECOM procedures for material handling; scaffolds for masonry construction shall be built in accordance with the AECOM procedures for scaffolding.

4.8.2 Equip power saws for cutting brick or stone with dust collectors or wet cutting methods to control dust. The exhausted dust will be directed away from vehicle or personnel traffic. If brick, stone, or mortar contains more than 1 percent crystalline silica, respirators may be required until air sampling determines that the task does not constitute a potential respiratory hazard.

4.8.3 Employees cutting brick or stone shall wear approved safety goggles or face shields over safety glasses, and hearing protection as appropriate for the task noise levels.

4.8.4 Keep mortar tubs free from ragged edges that may cut the hands, legs, and arms of bricklayers.

4.8.5 Properly brace all walls or vertical surfaces during construction to withstand wind and other pressure.

4.8.6 Dried mortar will not be dropped from planks, crushed by vehicles, or otherwise handled in such a manner as to create a dust hazard.

4.8.7 Masons and other workers with dusty clothes shall remove their outer clothing or otherwise remove masonry-generated dust from their clothes prior to leaving the work area for breaks or end of work. Do not use high-pressure air to remove dust.

5.0 Records

5.1 The following documentation will be maintained.

5.1.1 Training of flagmen/spotters

5.1.2 Inspections of shoring equipment

5.1.3 Air sampling logs for crystalline silica, as needed

6.0 Attachments

6.1 S3AM-338-ATT1 Concrete Products Health Effects

Americas

Concrete Products Health Effects

S3AM-338-ATT1

Powdered cement products are responsible for a wide variety of occupational health hazards, including inhalation, dermal, and eye hazards.

Dermal and Eye Hazards: Exposure to powdered cement products may cause drying of the skin and mild irritation, or more significant effects from the aggravation of other conditions. Wet cement is typically caustic (pH > 12) and dermal exposure may cause more severe skin effects, including thickening, cracking or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of chemical (caustic) burns. Eye exposures may cause immediate or delayed irritation or inflammation of the cornea. Eye contact with larger amounts of dry powder or splashes of wet cement may cause effects ranging from moderate eye irritation to chemical burns and blindness.

Some individuals who are exposed to cement may exhibit an allergic response, which can result in symptoms ranging from mild rashes to severe skin ulcers. Cement dermatitis may be irritant contact dermatitis induced by the alkaline, abrasive, and hygroscopic (water-absorbing) properties of cement.

Where these compounds are used, eyewash stations and drenching equipment should be staged in close proximity. OSHA requires that suitable facilities for quick drenching or flushing be provided within the work area for immediate use if an employee's eyes or body may be exposed to corrosive materials.

PPE: Refer to *S3AM-208-PR1 Personal Protective Equipment*. Appropriate PPE should include boots and gloves, and may also include eye protection, such as safety glasses with side shields or goggles, in some circumstances. Such equipment must be maintained in a sanitary and reliable condition when not in use, and employees must be able to clean or exchange their equipment if it becomes ineffective or contaminated on the inside with cement. In addition to long-sleeved shirts and long pants, protective clothing such as coveralls may also be appropriate to prevent the skin from coming in contact with cement.

Sanitation: In construction operations where employees may be exposed to harmful contaminants adequate washing facilities in near proximity to the worksite shall be supplied. Refer to *S3AM-013-PR1 Housekeeping*.

Inhalation Hazards/Established Exposure Limits: Inhalation of dry cement may cause irritation to the moist mucous membranes of the nose, throat and upper respiratory system, or may cause or aggravate certain lung diseases or conditions. Although powdered cement products are not recognized as carcinogenic by NTP, OSHA, or IARC, they may contain small amounts of substances, such as crystalline silica and Cr(VI), which are recognized as carcinogens by these organizations. Refer to *S3AM-110-PR1 Toxic & Hazardous Substances*.

Managers shall confirm that concentrations of cement dust are at or below the established exposure limit for the applicable jurisdiction. If maintaining dust levels below the established exposure limit is not feasible, exposed employees must wear respiratory protection in accordance with *S3AM-123-PR1 Respiratory Protection*. This would be most likely in construction operations such as terrazzo work, mixing mortar and jobsite mixing of concrete.

Training/Hazard Communication: Powdered cement is considered a hazardous chemical under OSHA's Hazard Communication standard; it should be included in the employer's Hazard Communication program. Employers whose employees are exposed to cement must provide appropriate training, maintain labels and copies of SDS for cement products in their workplaces, and ensure that these documents are readily accessible during each work shift.

The Hazard Communication standard also requires chemical manufacturers and importers to assess the hazards of chemicals that they produce or import and disseminate information regarding those hazards. Among other information, each MSDS must identify the hazardous chemicals it pertains to, and the health hazards presented by those chemicals, "including signs and symptoms of exposure," as well as generally applicable precautions for safe handling and use and control measures.

Because powdered cement is a mixture, the Hazard Communication standard provides two ways in which the SDS can list the hazardous chemicals it contains. If the mixture is tested as a whole to determine its hazards, the standard allows the SDS to list only "the ingredients which contribute to these known hazards." For a mixture that has not been tested as a whole, the SDS must include the ingredient(s) present in a concentration below 1% (0.1% for a

carcinogens) - as is likely for the Cr(VI) in portland cement - "if there is evidence that the ingredients(s) could be released from the mixture in concentrations which could present a health risk to employees".

Attachment D

Stretch/Flex Poster

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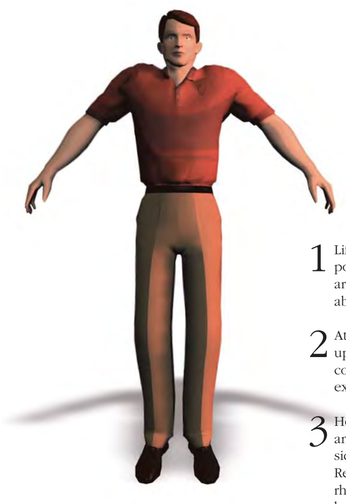
URS

Stretch & Flex Program

WARM-UP BEFORE STRETCHING

Run in place for 30 seconds, 10 jumping jacks, chicken dance, hokie pokie, Macarena, etc. to warm your muscles up.

SHOULDER SHRUG WITH HIGH REACH *Reach High*



1 Lift (shrug) shoulders as high as possible while slowly raising your arms to fully extended position above head.

2 At the same time, lift the body up onto your toes (for as long as comfortable). While reaching high, extend and spread fingers.

3 Hold this position for 10 seconds and then slowly lower arms to the side into a neutral body position. Relax while breathing slowly and rhythmically. Concentrate on your breathing rate for at least five breath cycles.



TARGET: Biceps, lats, forearms, and muscles that support the spine. Particularly good for using hand tools and light lifting tasks.

NECK STRETCH *Bobblehead*

1 Keep your neck as straight as possible while relaxing your shoulders. Tilt your head to the right. Slowly lower head toward right shoulder.



2 Repeat in four positions: right; left; front, and back each time returning to the upright position.



3 Be sure to do this slowly and do not hold your breath. There should be a complete breath cycle with each position of the head!

TARGET: Neck muscles and stress reducer. Particularly good for equipment operators, office personnel, drafters, CAD operators, and engineers.

TRICEP STRETCH *Backscratch*

1 Bring right hand to upper back between shoulder blades from above shoulder.

2 Place left hand on the tricep (muscle on the underside of the arm) near the elbow.

3 Gently pull right elbow up and back with left hand, moving the right hand down center of upper back as far as comfortable. This should not cause pinching in the neck. Repeat on opposite side.



TARGET: Triceps and shoulders. Particularly good for light lifting, carrying or pushing such as laborers, and mail clerks.

UPPER TRUNK STRETCH *Back Bend*



1 Place hands on back of hips.

2 Slowly arch upper body backward to a comfortable position. Hold while continuing to breath.

3 Return to neutral position and repeat two more times.

TARGET: Lower back, abdominals. Particularly good for truck drivers, equipment operators, laborers.

SHOULDER ROTATION STRETCH *Can Opener*

1 Keeping knees slightly bent, clasp hands behind back.

2 Slowly bend forward from the waist to a comfortable angle while lifting arms upward and behind your back.

3 Hold position for one breath cycle and slowly return to upright position. Repeat two more times.



TARGET: Shoulders and upper back. Particularly good for carpenters, office workers.

TRUNK ROTATION *Sprinkler*

1 Extend left arm out to side and grasp left hip with right hand.





2 Rotate upper body to the left while pulling on hip with right hand.

3 Release tension and change to other side. Repeat on opposite side.

TARGET: Lower back and trunk support muscles. Particularly good for laborers, mechanics, iron workers.

LATERAL ROTATION STRETCH *Take a Bow*



1 Stand upright, feet slightly apart for balance. Extend left arm out to side and grasp left hip with right hand.





2 Rotate upper body to left while pulling on hip with right hand, then bend slowly from waist to left side to a comfortable angle.

3 Return to upright position and change hand locations to other side. Repeat on opposite side.

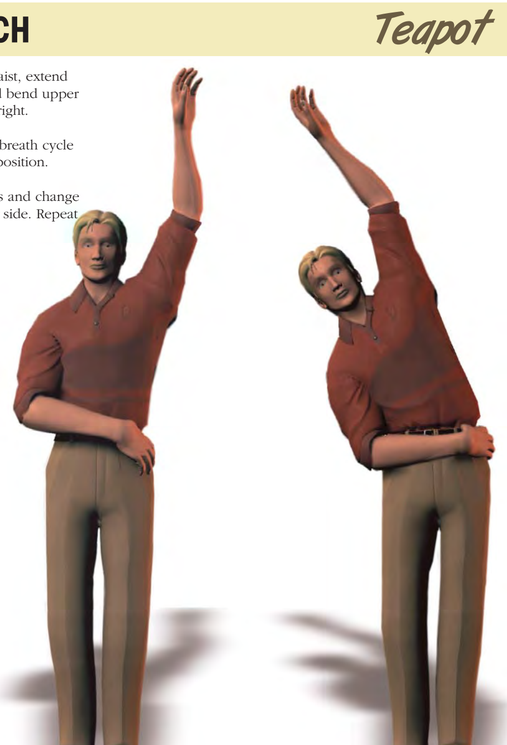
TARGET: Lats, lower back muscles, abdominals, upper leg muscles. Particularly good for laborers, iron workers.

LATERAL STRETCH *Teapot*

1 Place right hand on waist, extend left arm over head and bend upper body sideways to the right.

2 Hold position for one breath cycle and return to upright position.

3 Repeat two more times and change hand position to other side. Repeat on opposite side.



TARGET: Lats, and triceps plus shoulder mobility. Particularly good for masons, riggers, machinists.

SINGLE LEG STRETCH *Touch Your Toes*



1 Cross legs, keeping both knees slightly flexed.

2 Bend forward slowly from the waist and place both hands on the forward knee. Continue bending forward as far as possible.

3 Hold position for one breath cycle. WARNING: discontinue this exercise if you become dizzy or lose your balance. Change leg position and repeat.

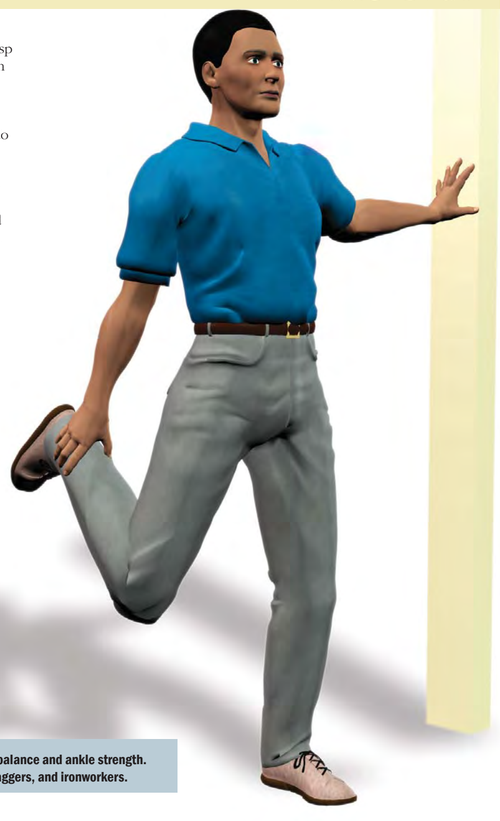


TARGET: Hamstrings, lower back muscles and stability. Particularly good for laborers, masons, mechanics.

SINGLE QUADRICEPS STRETCH *Ankle Grab*

1 With your left hand hold onto a stationary object for support, grasp your right ankle behind hips with right hand.

2 Pull ankle upward to stretch the quadriceps muscle. WARNING: do not attempt this exercise if you have problems with balance or severe knee injuries. If you have knee injuries, you may elect to lift the lower leg behind you and hold the position for 10 seconds. Repeat on opposite side.



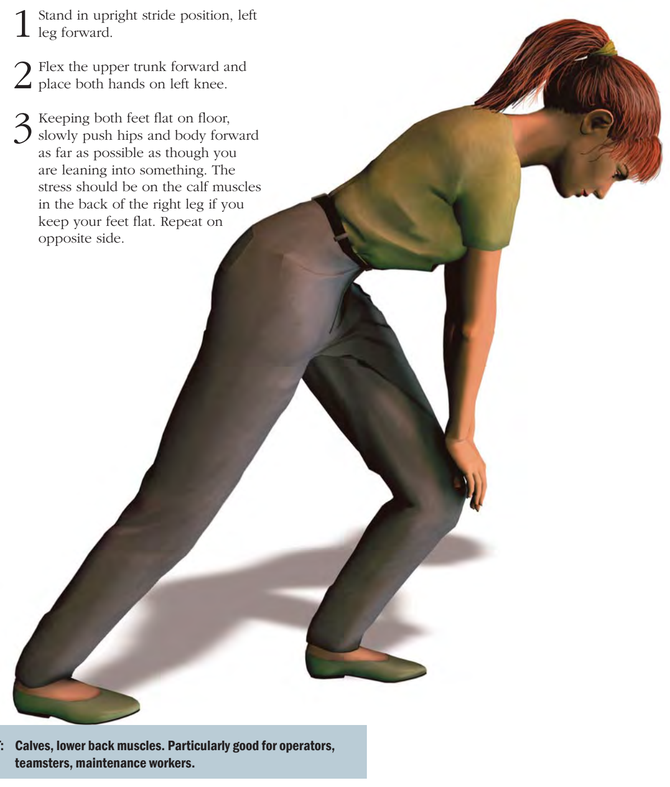
TARGET: Quadriceps and also helps body balance and ankle strength. Particularly good for laborers, flaggers, and ironworkers.

CALF STRETCH *Starting Line*

1 Stand in upright stride position, left leg forward.

2 Flex the upper trunk forward and place both hands on left knee.

3 Keeping both feet flat on floor, slowly push hips and body forward as far as possible as though you are leaning into something. The stress should be on the calf muscles in the back of the right leg if you keep your feet flat. Repeat on opposite side.



TARGET: Calves, lower back muscles. Particularly good for operators, teamsters, maintenance workers.

WRIST EXTENSION *Magic Hands*

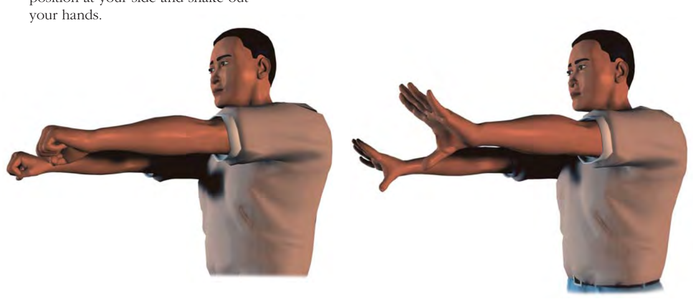
1 Palms together with fingers apart, press momentarily together and release.

2 Stretch arms out forward and make a fist in each hand. Hold 5 seconds and open hand wide.

3 Force your thumbs down while keeping fingers pointing up towards the sky, wrists are bent back and elbows should be locked. You should feel a slight burn in the upper arm muscles (extensor muscles) of the forearm. These muscles are frequently less used and developed than the flexor muscles in the forearm which leads to unbalance and potential wrist injuries.

4 Hold 10 seconds and release. Return your arms to the neutral arm position at your side and shake out your hands.





TARGET: Extensor muscles. Particularly good for carpenters, administrative professionals, CAD operators, machinists, and maintenance workers.

Attachment E

Safety Data Sheets (SDSs)

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SAFETY DATA SHEET

Creation Date 10-Dec-2009 **Revision Date** 12-Jul-2016 **Revision Number** 3

1. Identification

Product Name **Tetrachloroethylene**

Cat No. : **AC445690000; ACR445690010; AC445690025; AC445691000**

Synonyms Perchloroethylene

Recommended Use Laboratory chemicals.

Uses advised against No Information available

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Entity / Business Name
Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Skin Sensitization	Category 1
Carcinogenicity	Category 1B
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, Blood.	

Label Elements

Signal Word
Danger

Hazard Statements
Causes skin irritation
Causes serious eye irritation
May cause an allergic skin reaction
May cause drowsiness or dizziness
May cause cancer
May cause damage to organs through prolonged or repeated exposure



Precautionary Statements
Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Contaminated work clothing should not be allowed out of the workplace
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
Response
IF exposed or concerned: Get medical attention/advice
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Skin
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Toxic to aquatic life with long lasting effects
WARNING! This product contains a chemical known in the State of California to cause cancer.

3. Composition / information on ingredients

Component	CAS-No	Weight %
Tetrachloroethylene	127-18-4	>95

4. First-aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Inhalation Move to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms/effects None reasonably foreseeable. May cause allergic skin reaction. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature No information available
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors. Containers may explode when heated.

Hazardous Combustion Products
Chlorine Hydrogen chloride gas Phosgene
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	0	0	N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment. Ensure adequate ventilation.
Environmental Precautions Do not flush into surface water or sanitary sewer system.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Ensure adequate ventilation. Avoid ingestion and inhalation.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from sunlight.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Tetrachloroethylene	TWA: 25 ppm STEL: 100 ppm	(Vacated) TWA: 25 ppm (Vacated) TWA: 170 mg/m³ Ceiling: 200 ppm TWA: 100 ppm	IDLH: 150 ppm

Component	Quebec	Mexico OEL (TWA)	Ontario TWAEV

Tetrachloroethylene	TWA: 25 ppm TWA: 170 mg/m³ STEL: 100 ppm STEL: 685 mg/m³	TWA: 100 ppm TWA: 670 mg/m³ TWA: 200 ppm TWA: 1250 mg/m³ STEL: 200 ppm STEL: 1340 mg/m³	TWA: 25 ppm STEL: 100 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Long sleeved clothing.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Characteristic, sweet
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-22 °C / -7.6 °F
Boiling Point/Range	120 - 122 °C / 248 - 251.6 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	6.0 (Ether = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	18 mbar @ 20 °C
Vapor Density	No information available
Density	1.619
Specific Gravity	1.625
Solubility	0.15 g/L water (20°C)
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	> 150°C
Viscosity	0.89 mPa s at 20 °C
Molecular Formula	C2 Cl4
Molecular Weight	165.83

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products. Excess heat. Exposure to moist air or water.

Incompatible Materials Strong acids, Strong oxidizing agents, Strong bases, Metals, Zinc, Amines, Aluminium

Hazardous Decomposition Products Chlorine, Hydrogen chloride gas, Phosgene

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Tetrachloroethylene	LD50 = 2629 mg/kg (Rat)	LD50 > 10000 mg/kg (Rat)	LC50 = 27.8 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Tetrachloroethylene	127-18-4	Group 2A	Reasonably Anticipated	A3	X	A3

IARC: (International Agency for Research on Cancer)

IARC: (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program)

NTP: (National Toxicity Program)
Known - Known Carcinogen
Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

A1 - Known Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Animal Carcinogen
ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens

Mexico - Occupational Exposure Limits - Carcinogens
A1 - Confirmed Human Carcinogen
A2 - Suspected Human Carcinogen
A3 - Confirmed Animal Carcinogen
A4 - Not Classifiable as a Human Carcinogen
A5 - Not Suspected as a Human Carcinogen

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)
STOT - repeated exposure Kidney Liver Blood

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Endocrine Disruptor Information

Component	EU - Endocrine Disrupters Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Tetrachloroethylene	Group II Chemical	Not applicable	Not applicable

Other Adverse Effects Tumorigenic effects have been reported in experimental animals.

12. Ecological information

Ecotoxicity

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Tetrachloroethylene	EC50: > 500 mg/L, 96h (Pseudokirchneriella subcapitata)	LC50: 4.73 - 5.27 mg/L, 96h flow-through (Oncorhynchus mykiss) LC50: 11.0 - 15.0 mg/L, 96h static (Lepomis macrochirus) LC50: 8.6 - 13.5 mg/L, 96h static (Pimephales promelas) LC50: 12.4 - 14.4 mg/L, 96h flow-through (Pimephales promelas)	EC50 = 100 mg/L 24 h EC50 = 112 mg/L 24 h EC50 = 120.0 mg/L 30 min	EC50: 6.1 - 9.0 mg/L, 48h Static (Daphnia magna)

Persistence and Degradability Insoluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility . Is not likely mobile in the environment due its low water solubility. Will likely be mobile in the environment due to its volatility.

Component	log Pow
Tetrachloroethylene	2.88

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Tetrachloroethylene - 127-18-4	U210	-

14. Transport information

DOT

UN-No UN1897
Proper Shipping Name TETRACHLOROETHYLENE
Hazard Class 6.1
Packing Group III

TDG

UN-No UN1897
Proper Shipping Name TETRACHLOROETHYLENE
Hazard Class 6.1
Packing Group III

IATA

UN-No	UN1897
Proper Shipping Name	TETRACHLOROETHYLENE
Hazard Class	6.1
Packing Group	III

IMDG/IMO

UN-No	UN1897
Proper Shipping Name	TETRACHLOROETHYLENE
Hazard Class	6.1
Subsidiary Hazard Class	P
Packing Group	III

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Tetrachloroethylene	X	X	-	204-825-9	-		X	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Tetrachloroethylene	127-18-4	>95	0.1

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Tetrachloroethylene	-	-	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Tetrachloroethylene	X		-

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Tetrachloroethylene	100 lb 1 lb	-

California Proposition 65 This product contains the following proposition 65 chemicals

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Tetrachloroethylene	127-18-4	Carcinogen	14 µg/day	Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Tetrachloroethylene	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant Y
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class D1B Toxic materials
D2A Very toxic materials



16. Other information

Prepared By Regulatory Affairs
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Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other

materials or in any process, unless specified in the text

End of SDS

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Safety Data Sheet

1. PRODUCT IDENTIFICATION

Name **Trichloroethylene**
Synonyms **1,1,2-trichloroethylene, acetylene trichloride, TCE & trade names**
CAS# **79-01-6**
Europe EC# **201-167-4**
Product Uses **cleaning solvent for vapour degreasing**

EMERGENCY INFORMATION
Canada **Call CANUTEC (collect)** **(613) 996-6666**
U.S.A. **Call CHEMTREC** **(800) 424-9300**

2. HAZARDS

GHS Class (Category)	***skin irritant (2)***	***eye irritant (2)***	***STOT (3)***	***carcinogen (1B)***	***aquatic chronic (2)***
Signal Words	***WARNING***	***WARNING***	***WARNING***	***DANGER***	***no Signal Word***
Hazard Statements	*causes skin irritation (H315)*	*causes serious eye irritation (H319)*	*may cause drowsiness or dizziness (H336)*	*may cause cancer (H350)*	*toxic to aquatic life with long-lasting effects (H411)*



GHS Precautionary Statements for Labelling

P261 P271	**Avoid breathing vapour. Use only in a well ventilated area**
P262 P264	**Do not get in eyes, on skin or on clothing. Wash thoroughly after handling.**
P270	**Do not eat, drink or smoke when using this product.**
P280	**Wear eye protection, protective gloves and clothing of butyl or "Viton".**
P273 P391	**Avoid release to the environment. Collect spillage.**

Canada – WHMIS Key: **D 1B, D 2A, D 2B**
B 2 *– Flash Point <38°C,* ***B 3*** *– Flash Point >38°C & <93°C*
D 1 *– Immediately Toxic,* ***D 2*** *– Chronic Toxicity*
C *– Oxidising Substance,* ***E*** *– Corrosive,* ***F*** *– Reactive Substance*



3. COMPOSITION

	%	TWAEV / TLV ppm / mg/m^3	LD_{50} (mg/kg) ORAL	LD_{50} (mg/kg) SKIN	LC_{50} ppm INHALATION
1,1,2-trichloroethylene	100%	10 / 55	2400	29,280	7175

4. FIRST AID

SKIN: Wash with soap & plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.
EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if irritation persists.
INHALATION: Remove from contaminated area promptly. ***CAUTION: Rescuer must not endanger himself!*** If breathing stops, administer artificial respiration and seek medical aid promptly.
INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

Please ensure that this SDS is given to, and explained to people using this product.

5. FIRE FIGHTING & FLAMMABILITY

Flash Point	will not flash[1]
Autoignition Temperature	410°C / 770°F[1]
Flammable Limits	8% – 50% – *only burns in continuous contact with ignition source*
Combustion Products	hydrogen chloride & chlorine (*both corrosive*), plus phosgene (*highly toxic*)
Firefighting Precautions	as for substances sustaining fire; firefighters must wear SCBA
Static Discharge	will accumulate a static charge, but cannot be ignited by a spark

NOTE: *Trichloroethylene may ignite in the presence of a welding torch – and then produce highly hazardous vapours.*

6. ACCIDENTAL RELEASE MEASURES

Leak Precaution	dyke to control spillage; dyke must be able to contain the entire volume of a bulk storage tank
Handling Spill	ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep shovel & store in closed containers for recycling or disposal

7. HANDLING & STORAGE

Store in a cool environment, away from substances named in Part 10 (below).

Avoid breathing product vapour. Product should be used in equipment designed for the purpose (eg: vapour degreaser) Use with adequate ventilation. If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator (see Part 8). ***Do not routinely wear a respirator for handling this product! Effective ventilation or engineering control of vapour is the ONLY acceptable way to protect people working with this product.***

When transferring product, if there is any danger of contact, wear appropriate protective clothing.

Never cut, drill, weld or grind on or near this container. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

NOTE: *Although trichloroethylene is hard to ignite, fire can convert vapours into highly toxic, corrosive gases – Part 5, above.*

8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	10ppm / 55mg/m^3	Ontario STEV	25ppm / 135mg/m^3
ACGIH TLV	10ppm / 55mg/m^3	ACGIH STEL	25ppm / 135mg/m^3
OSHA PEL	50ppm / 270mg/m^3	OSHA STEL	200ppm / 1080mg/m^3

Ventilation	product should only be used in specially designed equipment (eg: vapour degreaser); mechanical ventilation should not be required so long as the equipment is working properly; ***using this product in open air and relying on mechanical ventilation is NOT ACCEPTABLE;*** a respirator with organic vapour cartridge should be available for escape purposes, should vapour containment fail (*always store respirators in airtight containers [eg: "Tupperware"] to maintain cartridge "freshness"*)
Hands	"Viton" gloves – *other types also protect, always confirm suitability with supplier*
Eyes	safety glasses with side shields or chemical goggles – *always protect eyes!*
Clothing	impermeable (hands, above) apron, boots, long sleeves, if splashing is anticipated

9. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless, liquid with mild, sweet, *pleasant* ether odour
Odour Threshold	80ppm – 100ppm – *well above the TLV; hazardous below odour threshold!*
Vapour Pressure	60mmHg / 8kPa (20°C/ 68°F); also 74.5mmHg / 9.9kPa (25°C / 77°F)[1]
Evaporation Rate (*Butyl Acetate = 1*)	4.5-4.9
Vapour Density (air = 1)	4.5
Boiling Point	87°C / 189°F
Freezing Point	-73°C / -99°F; also -85°C / -121°F[1]
Specific Gravity	1.46 (20/20°C)
Water Solubility	1.1 grams/litre (20°C / 68°F)
- in other solvents	most organic solvents
Log $P_{O/W}$ (Octanol/H_2O partition)	2.53[1]
Viscosity	0.58centipoise (20°C / 68°F)[1]
pH	none – *does not yield hydrogen ions in solution*
Conversion Factor	1ppm = 5.36mg/m^3
Molecular Weight	131

10. REACTIVITY

Dangerously Reactive With	strong oxidising agents or reducing agents; reactive metals (eg: Na, K, Ca, Ba)
Also Reactive With	strong alkalies forming explosive dichloroacetylene gas; copper reacts with any dichloroethylene present to form explosive acetylides; reactive with epoxides; unstabilised trichloroethylene may corrode aluminium, copper, zinc in presence of moisture
Chemical Stability	stable; will not polymerize – except under x-ray or other radiation source, or in the presence of aluminium chloride
Decomposes in Presence of	iron, copper, zinc or aluminium at 250-600°C cause decomposition to phosgene; reactive metals cause decomposition to dichloroacetylene
Decomposition Products	apart from Hazardous Combustion Products – dichloroacetylene
Mechanical Impact	not sensitive

11. TOXICITY

Effects, Acute Exposure

Skin Contact	severely irritating if not removed promptly; chemical burns if contact is prolonged (*>5 minutes*)
Skin Absorption	slight – no systemic toxic effects by this route
Eye Contact	liquid severely irritating, may damage eyes; vapour irritates some above 160ppm, others at 350ppm blurred vision & other disturbances have been reported following contact with eyes
Inhalation	headache, dizzyness, drowsiness, intoxication may occur at above 350ppm; irritating above 1000ppm; high concentrations can lead to unconsciousness & death, numbness & muscle weakness also reported
Ingestion	burning sensation in mouth & throat; headache, dizzyness, drowsiness, intoxication & vomiting, followed by muscle weakness, plus possible delayed heart, kidney & liver damage
LD_{50} (oral)	4920 & 5620mg/kg (rat), 2400mg/kg (mouse), >7330mg/kg (rabbit), >5865mg/kg (cat), 5680mg/kg (dog)
LD_{50} (skin)	29,280mg/kg (rabbit)
LC_{50} (inhalation)	7175, 7440, 8450, 40,920 & 48,730ppm (mouse), 7250 & 26,170ppm (rat)

Effects, Chronic Exposure

General	prolonged or repeated exposure may cause dermatitis; neurological damage (headache, sleeplessness, mood change), plus blurred or tunnel vision may be seen; loss of sensation in hands & feet may occur
Sensitising	not a sensitiser
Carcinogen/Tumorigen	probable carcinogen – IARC – Group 1, ACGIH – A2; the NTP rates trichloroethylene a carcinogen
Reproductive Effect	no known effect on humans or animals
Mutagen	mutagen in a few animal tests, but not in others[1]; not known to be a mutagen or teratogen in humans
Synergistic With	alcohol – prior exposure to trichloroethylene followed by alcohol consumption causes upper body flush – called "*degreasers flush*"

12. ECOLOGICAL INFORMATION

Bioaccumulation	trichloroethylene metabolised & excreted (½-life ~40hr) and will not bioaccumulate
Biodegradation	biodegrades in aerobic sewage treatment facilities, but only in the presence of other carbon sources; biodegradation is much slower under anaerobic conditions
Abiotic Degradation	reacts with atmospheric hydroxyl (OH) radicals; estimated ½-life in air 5-7 days
Mobility in soil, water	shown to have moderate mobility in soil and the water column
Marine Toxicity	
LC_{50} (96 hr) Fish	28 & 63mg/litre/96hr (Jordanella floridae), 41mg/litre/96hr (Pimephelas promelas), 16mg/litre Limada limada), 52 & 99mg/litre (Cyprinodon variegatus), 45mg/litre (Lepomis macrochirus)
LC_{50} (48hr) Shrimp	58mg/litre/ (Daphnia cucullata), 2.2, 8, 21 & 42-97mg/litre (Daphnia magna) & others
EC_{50} (Algae)	450mg/litre (Scenedesmus subspicatus), 175mg/litre (Selenastrum capricornutum), 95 & 150mg/litre (Skeletonema costatum)
EC_{50} (Bacteria)	235mg/litre (Bacillus subtilis), >400mg/litre (Chilomonas paramecium), 975mg/litre (Photobacterium phosphoreum) & others

13. DISPOSAL

Waste Disposal	**do not flush to sewer**, recycle solvent if possible, may be incinerated in approved facility ***with flue gas monitoring and scrubbing*** *after mixing with a suitable flammable waste solvent*
Containers	**Drums** should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. **Pails** must be vented and thoroughly dried prior to crushing and recycling. **IBCs** (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. ***Never cut, drill, weld or grind on or near this container, even if empty***

14. TRANSPORT CLASSIFICATION

Canada TDG	**PIN**	**UN-1710**
AND	**Shipping Name**	**trichloroethylene**
U.S.A. 49 CFR	**Class**	**6.1**
	Packing Group	**III**
Marine Pollutant		not a marine pollutant
ERAP Required		**NO**



15. REGULATIONS

Canada DSL	**on inventory**
U.S.A. TSCA	**on inventory**
Europe EINECS	**on inventory**

U.S.A. Regulations:

Immediately Dangerous to Life or Health: 1000 ppm; NIOSH considers trichloroethylene to be a potential occupational carcinogen.

Allowable Tolerances: Tolerances are established for residues of trichloroethylene resulting from its use as a solvent in the manufacture of foods as follows:

Food	Parts per million
Decaffeinated ground coffee	25
Decaffeinated soluble (instant) coffee extract	10
Spice oleoresins	30 parts per million (*provided that if residues of other chlorinated solvents are also present, the total of all residues of such solvents in spice oleoresins shall not exceed 30 parts per million*).

OSHA Standards: Permissible Exposure Limit: Table Z-2 8-hr Time Weighted Avg: 100 ppm. Permissible Exposure Limit: Table Z-2 Acceptable Ceiling Concentration: 200 ppm. Permissible Exposure Limit: Table Z-2 Acceptable maximum peak above the acceptable ceiling concentration for an 8-hour shift. Concentration: 300 ppm. Maximum Duration: 5 minutes in any 2 hours. Vacated 1989 OSHA PEL TWA 50 ppm (270 mg/cu m); STEL 200 ppm (1080 mg/cu m) is still enforced in some states.

NIOSH Recommendations: NIOSH considers trichloroethylene to be a potential occupational carcinogen. NIOSH usually recommends that occupational exposures to carcinogens be limited to the lowest feasible concentration. Recommended Exposure Limit: 60 Minute Ceiling Value: 2 ppm. /During the usage of trichloroethylene as an anesthetic agent/ Recommended Exposure Limit: 10 Hour Time-Weighted Average: 25 ppm. /During exposures to trichloroethylene other than as an anesthetic agent/

15. REGULATIONS, cont'd

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 10 ppm; 15min Short Term Exposure Limit (STEL) 25 ppm, A2: Suspected human carcinogen.

Atmospheric Standards: This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. Trichloroethylene is produced, as an intermediate or a final product, by process units covered under this subpart. Listed as a hazardous air pollutant (HAP) generally known or suspected to cause serious health problems. The Clean Air Act, as amended in 1990, directs EPA to set standards requiring major sources to sharply reduce routine emissions of toxic pollutants. EPA is required to establish and phase in specific performance based standards for all air emission sources that emit one or more of the listed pollutants. Trichloroethylene is included on this list.

Federal Drinking Water Standards: Maximum contaminant level goals for organic contaminants: Trichloroethylene, MCLG: zero. Maximum contaminant levels (MCL) for organic contaminants apply to community and non-transient, non-community water systems: Trichloroethylene, MCL 0.005 mg/L. EPA 5 ug/l

State Drinking Water Standards: Florida 3 ug/l, New Jersey 1 ug/l

State Drinking Water Guidelines: Arizona 3.2 ug/l, Connecticut 5 ug/l, Maine 32 ug/l, Minnesota 5 ug/L

Clean Water Act Requirements: Toxic pollutant designated pursuant to section 307(a)(1) of the Federal Water Pollution Control Act and is subject to effluent limitations. Trichloroethylene is designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance. This designation includes any isomers and hydrates, as well as any solutions and mixtures containing this substance.

CERCLA Reportable Quantities: Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 100 lb or 45.4 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

RCRA Requirements: As stipulated in 40 CFR 261.33, when trichloroethylene, as a commercial chemical product or manufacturing chemical intermediate or an off-specification commercial chemical product or a manufacturing chemical intermediate, becomes a waste, it must be managed according to Federal and/or State hazardous waste regulations. Also defined as a hazardous waste is any residue, contaminated soil, water, or other debris resulting from the cleanup of a spill, into water or on dry land, of this waste. Generators of small quantities of this waste may qualify for partial exclusion from hazardous waste regulations (40 CFR 261.5). A solid waste containing trichloroethylene may or may not become characterized as a hazardous waste when subjected to the Toxicity Characteristic Leaching Procedure listed in 40 CFR 261.24, and if so characterized, must be managed as a hazardous waste. When trichloroethylene is a spent solvent, it is classified as a hazardous waste from a nonspecific source, as stated in 40 CFR 261.31, and must be managed according to state and/or federal hazardous waste regulations.

FDA Requirements: Trichloroethylene is an indirect food additive for use as a component of adhesives. Tolerances are established for residues of trichloroethylene resulting from its use as a solvent in the manufacture of foods as follows:

Food	Parts per million
Decaffeinated ground coffee	25
Decaffeinated soluble (instant) coffee extract	10
Spice oleoresins	30 parts per million (*provided that if residues of other chlorinated solvents are also present, the total of all residues of such solvents in spice oleoresins shall not exceed 30 parts per million*).

16. OTHER INFORMATION

Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577
*Data from **RTECS**, **HSDB** (Haz. Substance Data Base), **Cheminfo** (CCOHS), **IUCLID** Datasheets (ESIS – European Chem. Substance Info. System), & others.*
*Preparation Date: **May 2005** Revision Date: **June 2008, June 2011, June 2014***

European Chemicals Agency (EChA) dossier for Trichloroethylene:
http://apps.echa.europa.eu/registered/data/dossiers/DISS-9c83a2d3-4a9f-1ff5-e044-00144f67d249/DISS-9c83a2d3-4a9f-1ff5-e044-00144f67d249_DISS-9c83a2d3-4a9f-1ff5-e044-00144f67d249.html

SAFETY DATA SHEET

Vinyl Chloride (Chloroethylene)

Section 1. Identification

GHS product identifier : Vinyl Chloride (Chloroethylene)

Chemical name : vinyl chloride

Other means of identification : chloroethylene; Ethene, chloro-; Vinyl chloride monomer; Chloroethene; Vinyl chloride, monomer; Ethene, chloro- (vinyl chloride); VCM; VC; Monochloroethylene; Monochloroethene

Product use : Synthetic/Analytical chemistry.

Synonym : chloroethylene; Ethene, chloro-; Vinyl chloride monomer; Chloroethene; Vinyl chloride, monomer; Ethene, chloro- (vinyl chloride); VCM; VC; Monochloroethylene; Monochloroethene

SDS # : 001067

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE GASES - Category 1
GASES UNDER PRESSURE - Liquefied gas
CARCINOGENICITY - Category 1
SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (liver) - Category 2

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : Extremely flammable gas.
Contains gas under pressure; may explode if heated.
May cause frostbite.
May form explosive mixtures in Air.
May displace oxygen and cause rapid suffocation.
May cause cancer.
May cause damage to organs through prolonged or repeated exposure. (liver)

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Approach suspected leak area with caution.

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not breathe gas.

Section 2. Hazards identification

Response : Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Storage : Store locked up. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : vinyl chloride

Other means of identification : chloroethylene; Ethene, chloro-; Vinyl chloride monomer; Chloroethene; Vinyl chloride, monomer; Ethene, chloro- (vinyl chloride); VCM; VC; Monochloroethylene; Monochloroethene

CAS number/other identifiers

CAS number : 75-01-4

Product code : 001067

Ingredient name	%	CAS number
vinyl chloride	100	75-01-4

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : As this product is a gas, refer to the inhalation section.

Section 4. First aid measures

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
halogenated compounds

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Section 6. Accidental release measures

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
vinyl chloride	**ACGIH TLV (United States, 3/2016).** TWA: 1 ppm 8 hours. **OSHA PEL (United States, 2/2013).** STEL: 5 ppm 15 minutes. TWA: 1 ppm 8 hours. **OSHA PEL 1989 (United States, 3/1989).** STEL: 5 ppm 15 minutes. TWA: 1 ppm 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Section 8. Exposure controls/personal protection

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas. [COLORLESS GAS OR LIQUID (BELOW 7 F) WITH A PLEASANT ODOR AT HIGH CONCENTRATIONS. [NOTE: SHIPPED AS A LIQUEFIED COMPRESSED GAS.]

Color : Colorless.

Molecular weight : 62.5 g/mole

Molecular formula : C2-H3-Cl

Boiling/condensation point : -13.4°C (7.9°F)

Melting/freezing point : -153.8°C (-244.8°F)

Critical temperature : 158.45°C (317.2°F)

Odor : Characteristic.

Odor threshold : Not available.

pH : Not available.

Flash point : Closed cup: -78°C (-108.4°F)
Open cup: -78°C (-108.4°F)

Burning time : Not applicable.

Burning rate : Not applicable.

Section 9. Physical and chemical properties

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Lower: 3.8%
Upper: 29.3%

Vapor pressure : Not available.

Vapor density : 2.2 (Air = 1)

Specific Volume (ft^3/lb) : 1.0989

Gas Density (lb/ft^3) : 0.91 (20°C / 68 to °F)

Relative density : Not applicable.

Solubility : Not available.

Solubility in water : 1.1 g/l

Partition coefficient: n-octanol/water : 1.38

Auto-ignition temperature : 472°C (881.6°F)

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not applicable.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Oxidizers

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Section 11. Toxicological information

Classification

Product/ingredient name	OSHA	IARC	NTP
vinyl chloride	+	1	Known to be a human carcinogen.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
vinyl chloride	Category 2	Not determined	liver

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : May cause damage to organs through prolonged or repeated exposure.

Carcinogenicity : May cause cancer. Risk of cancer depends on duration and level of exposure.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Section 11. Toxicological information

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
vinyl chloride	1.38	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Vinyl chloride; Ethene, chloro-	75-01-4	Listed	U043

Section 14. Transport information

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1086	UN1086	UN1086	UN1086	UN1086
UN proper shipping name	VINYL CHLORIDE, STABILIZED	VINYL CHLORIDE, STABILIZED	VINYL CHLORIDE, STABILIZED	VINYL CHLORIDE, STABILIZED	VINYL CHLORIDE, STABILIZED
Transport hazard class(es)	2.1 	2.1 	2.1 	2.1 	2.1 
Packing group	-	-	-	-	-
Environment	No.	No.	No.	No.	No.
Additional information	**Reportable quantity** 1 lbs / 0.454 kg Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements. **Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: Forbidden. **Cargo aircraft** Quantity limitation: 150 kg **Special provisions** 21, B44, T50	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2). **Explosive Limit and Limited Quantity Index** 0.125 **ERAP Index** 3000 **Passenger Carrying Road or Rail Index** Forbidden	-	-	**Passenger and Cargo Aircraft** Quantity limitation: 0 Forbidden **Cargo Aircraft Only** Quantity limitation: 150 kg

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

United States inventory (TSCA 8b): This material is listed or exempted.

Clean Water Act (CWA) 307: vinyl chloride

Clean Air Act (CAA) 112 regulated flammable substances: vinyl chloride

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

Section 15. Regulatory information

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Fire hazard
Sudden release of pressure
Delayed (chronic) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
vinyl chloride	100	Yes.	Yes.	No.	No.	Yes.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	vinyl chloride	75-01-4	100
Supplier notification	vinyl chloride	75-01-4	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : This material is listed.

New York : This material is listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
vinyl chloride	Yes.	No.	Yes.	No.

International regulations

International lists

National inventory

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

Europe : This material is listed or exempted.

Japan : This material is listed or exempted.

Malaysia : This material is listed or exempted.

New Zealand : This material is listed or exempted.

Philippines : This material is listed or exempted.

Republic of Korea : This material is listed or exempted.

Section 15. Regulatory information

Taiwan : This material is listed or exempted.

Canada

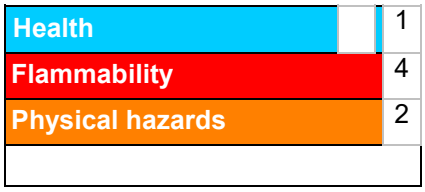
WHMIS (Canada) : Class A: Compressed gas.
Class B-1: Flammable gas.
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).
Class F: Dangerously reactive material.

CEPA Toxic substances: This material is listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Section 16. Other information

Canada Label requirements : Class A: Compressed gas.
Class B-1: Flammable gas.
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).
Class F: Dangerously reactive material.

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
Flam. Gas 1, H220	Expert judgment
Press. Gas Liq. Gas, H280	Expert judgment
Carc. 1, H350	Expert judgment
STOT RE 2, H373 (liver)	Expert judgment

History

Section 16. Other information

Date of printing : 10/11/2016

Date of issue/Date of revision : 10/11/2016

Date of previous issue : No previous validation

Version : 0.01

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SAFETY DATA SHEET

Creation Date 22-Sep-2009 **Revision Date** 23-Jan-2018 **Revision Number** 3

1. Identification

Product Name **cis-1,2-Dichloroethylene**

Cat No. : **AC113380000; AC113380025; AC113380100; AC113380500**

Synonyms cis-Acetylene dichloride.

Recommended Use Laboratory chemicals.
Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number
For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US:**001-201-796-7100 / **Europe:** +32 14 57 52 99
CHEMTREC Tel. No.**US:**001-800-424-9300 / **Europe:**001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Acute oral toxicity	Category 4
Acute Inhalation Toxicity - Vapors	Category 4
Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

Label Elements

Signal Word
Danger

Hazard Statements
Highly flammable liquid and vapor
Harmful if swallowed
Harmful if inhaled
Causes serious eye irritation
Causes skin irritation
May cause respiratory irritation



Precautionary Statements
Prevention
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Avoid breathing dust/fume/gas/mist/vapors/spray
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Take precautionary measures against static discharge
Do not eat, drink or smoke when using this product
Response
Call a POISON CENTER or doctor/physician if you feel unwell
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
Skin
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation occurs: Get medical advice/attention
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Ingestion
Rinse mouth
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Fire
Explosion risk in case of fire
Fight fire with normal precautions from a reasonable distance
Evacuate area
Storage
Store in a well-ventilated place. Keep cool
Store in a closed container
Store locked up
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
cis-1,2-Dichloroethylene	156-59-2	97

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Inhalation Move to fresh air. Obtain medical attention. If not breathing, give artificial respiration.

Ingestion Do not induce vomiting. Obtain medical attention.

Most important symptoms and effects Breathing difficulties. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Water spray. Carbon dioxide (CO_2). Dry chemical. Use water spray to cool unopened containers. Chemical foam. Cool closed containers exposed to fire with water spray.

Unsuitable Extinguishing Media No information available

Flash Point 6 °C / 42.8 °F

Method - No information available

Autoignition Temperature 440 °C / 824 °F

Explosion Limits

Upper 12.80%

Lower 9.70%

Sensitivity to Mechanical Impact No information available

Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Flammable. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Vapors may form explosive mixtures with air.

Hazardous Combustion Products

Hydrogen chloride gas Carbon monoxide (CO) Carbon dioxide (CO_2)

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	3	0	N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges. Avoid contact with skin, eyes and clothing.

Environmental Precautions See Section 12 for additional ecological information. Do not flush into surface water or sanitary sewer system.

Methods for Containment and Clean Up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling Ensure adequate ventilation. Wear personal protective equipment. Use explosion-proof equipment. Use only non-sparking tools. Avoid contact with skin, eyes and clothing. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

Storage Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep away from heat and sources of ignition. Flammables area. Keep container tightly closed in a dry and well-ventilated place.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
cis-1,2-Dichloroethylene	TWA: 200 ppm			

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

Engineering Measures Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection No protective equipment is needed under normal use conditions.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	aromatic
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-80 °C / -112 °F
Boiling Point/Range	60 °C / 140 °F @ 760 mmHg
Flash Point	6 °C / 42.8 °F
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	12.80%
Lower	9.70%
Vapor Pressure	201 mmHg @ 25 °C
Vapor Density	3.34 (Air = 1.0)
Specific Gravity	1.280
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	440 °C / 824 °F
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	C2 H2 Cl2
Molecular Weight	96.94

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Keep away from open flames, hot surfaces and sources of ignition. Exposure to air. Exposure to light. Incompatible products. Exposure to moist air or water.

Incompatible Materials Bases

Hazardous Decomposition Products Hydrogen chloride gas, Carbon monoxide (CO), Carbon dioxide (CO_2)

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information
Component Information
Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes, respiratory system and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
cis-1,2-Dichloroethylene	156-59-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. Do not flush into surface water or sanitary sewer system. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea

cis-1,2-Dichloroethylene	Not listed	Not listed	EC50 = 721 mg/L 5 min EC50 = 905 mg/L 30 min	Not listed

Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No	UN1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

TDG

UN-No	UN1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

IATA

UN-No	1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

IMDG/IMO

UN-No	1150
Proper Shipping Name	1,2-DICHLOROETHYLENE
Hazard Class	3
Packing Group	II

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
cis-1,2-Dichloroethylene	X	-	X	205-859-7	-		-	X	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
cis-1,2-Dichloroethylene	X	-	X	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 22-Sep-2009
Revision Date 23-Jan-2018
Print Date 23-Jan-2018
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

SAFETY DATA SHEET

Version 4.8
Revision Date 05/27/2016
Print Date 04/18/2017

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : *trans*-1,2-Dichloroethylene

Product Number : D62209
Brand : Aldrich
Index-No. : 602-026-00-3

CAS-No. : 156-60-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Inhalation (Category 4), H332
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H332 Harmful if inhaled.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.

P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a POISON CENTER/doctor if you feel unwell.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : *trans*-1,2-Dichloroethene
trans-Acetylene dichloride

Formula : $C_2H_2Cl_2$
Molecular weight : 96.94 g/mol
CAS-No. : 156-60-5
EC-No. : 205-860-2
Index-No. : 602-026-00-3

Hazardous components

Component	Classification	Concentration
trans-Dichloroethylene		
	Flam. Liq. 2; Acute Tox. 4; Aquatic Acute 3; Aquatic Chronic 3; H225, H332, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of 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
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 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.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature 2 - 8 °C

Light sensitive. Air and moisture sensitive. Refrigerate before opening.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
trans-Dichloroethylene	156-60-5	TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Eye irritation		

		TWA	200.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Eye irritation		
		TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Eye irritation		

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face 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 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.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) 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).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: light yellow
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -50 °C (-58 °F) - lit.
f)	Initial boiling point and boiling range	48 °C (118 °F) - lit.
g)	Flash point	6.0 °C (42.8 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or	Upper explosion limit: 12.8 %(V) Lower explosion limit: 9.7 %(V)

	explosive limits	
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.257 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Oxidizing agents, Bases

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 1,235 mg/kg

LD50 Oral - Mouse - 2,122 mg/kg
Remarks: Behavioral:Altered sleep time (including change in righting reflex). Behavioral:Somnolence (general depressed activity). Behavioral:Ataxia.

LC50 Inhalation - Rat - 24100 ppm
Remarks: Behavioral:Somnolence (general depressed activity).

LD50 Dermal - Rabbit - > 5,000 mg/kg
Remarks: Prolonged skin contact may cause skin irritation and/or dermatitis. Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation

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.

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.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: KV9400000

prolonged or repeated exposure can cause:, narcosis, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Kidney -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 220.00 mg/l - 48 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene
Reportable Quantity (RQ): 1000 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1150 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: 1,2-DICHLOROETHYLENE

IATA

UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Fire Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
trans-Dichloroethylene	156-60-5	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
trans-Dichloroethylene	156-60-5	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
trans-Dichloroethylene	156-60-5	1993-04-24

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H332	Harmful if inhaled.
H402	Harmful to aquatic life.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

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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.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.8 Revision Date: 05/27/2016 Print Date: 04/18/2017

Safety Data Sheet

Material Name: Gasoline All Grades

SDS No. 9950
US GHS

Synonyms: Hess Conventional (Oxygenated and Non-oxygenated) Gasoline; Reformulated Gasoline (RFG); Reformulated Gasoline Blendstock for Oxygenate Blending (RBOB); Unleaded Motor or Automotive Gasoline

* * * Section 1 - Product and Company Identification * * *

Manufacturer Information

Hess Corporation
1 Hess Plaza
Woodbridge, NJ 07095-0961

Phone: 732-750-6000 Corporate EHS
Emergency # 800-424-9300 CHEMTREC
www.hess.com (Environment, Health, Safety Internet Website)

* * * Section 2 - Hazards Identification * * *

GHS Classification:

Flammable Liquid - Category 2
Skin Corrosion/Irritation - Category 2
Germ Cell Mutagenicity - Category 1B
Carcinogenicity - Category 1B
Toxic to Reproduction - Category 1A
Specific Target Organ Toxicity (Single Exposure) - Category 3 (respiratory irritation, narcosis)
Specific Target Organ Toxicity (Repeat Exposure) - Category 1 (liver, kidneys, bladder, blood, bone marrow, nervous system)
Aspiration Hazard - Category 1
Hazardous to the Aquatic Environment – Acute Hazard - Category 3

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

DANGER

Hazard Statements

Highly flammable liquid and vapour.
Causes skin irritation.
May cause genetic defects.
May cause cancer.
May damage fertility or the unborn child.
May cause respiratory irritation.
May cause drowsiness or dizziness.
Causes damage to organs (liver, kidneys, bladder, blood, bone marrow, nervous system) through prolonged or repeated exposure.
May be fatal if swallowed and enters airways.
Harmful to aquatic life.

Precautionary Statements

Prevention

Keep away from heat/sparks/open flames/hot surfaces. No smoking
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wear protective gloves/protective clothing/eye protection/face protection.
Wash hands and forearms thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe mist/vapours/spray.
Use only outdoors or in well-ventilated area.
Do not eat, drink or smoke when using this product.
Avoid release to the environment.

Response

In case of fire: Use water spray, fog, dry chemical fire extinguishers or hand held fire extinguisher.
IF ON SKIN (or hair): Wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.
IF exposed or concerned: Get medical advice/attention.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a poison center or doctor/physician if you feel unwell.
Get medical advice/attention if you feel unwell.
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting.

Storage

Store in a well-ventilated place.
Keep cool. Keep container tightly closed.
Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
86290-81-5	Gasoline, motor fuel	100
108-88-3	Toluene	1-25
106-97-8	Butane	<10
1330-20-7	Xylenes (o-, m-, p- isomers)	1-15
95-63-6	Benzene, 1,2,4-trimethyl-	<6
64-17-5	Ethyl alcohol	0-10
100-41-4	Ethylbenzene	<3
71-43-2	Benzene	0.1-4.9

110-54-3	Hexane	0.5-4

A complex blend of petroleum-derived normal and branched-chain alkane, cycloalkane, alkene, and aromatic hydrocarbons. May contain antioxidant and multifunctional additives. Non-oxygenated Conventional Gasoline and RBOB do not have oxygenates (Ethanol). Oxygenated Conventional and Reformulated Gasoline will have oxygenates for octane enhancement or as legally required.

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, immediately flush with clean, low-pressure water for at least 15 min. Hold eyelids open to ensure adequate flushing. Seek medical attention.

First Aid: Skin

Remove contaminated clothing. Wash contaminated areas thoroughly with soap and water or with waterless hand cleanser. Obtain medical attention if irritation or redness develops.

First Aid: Ingestion

DO NOT INDUCE VOMITING. Do not give liquids. Obtain immediate medical attention. If spontaneous vomiting occurs, lean victim forward to reduce the risk of aspiration. Monitor for breathing difficulties. Small amounts of material which enter the mouth should be rinsed out until the taste is dissipated.

First Aid: Inhalation

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.

Vapors may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. Flowing product may be ignited by self-generated static electricity. When mixed with air and exposed to an ignition source, flammable vapors can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.

Hazardous Combustion Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

Extinguishing Media

SMALL FIRES: Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, fire fighting foam, or gaseous extinguishing agent.

LARGE FIRES: Water spray, fog or fire fighting foam. Water may be ineffective for fighting the fire, but may be used to cool fire-exposed containers.

Firefighting foam suitable for polar solvents is recommended for fuel with greater than 10% oxygenate concentration.

Unsuitable Extinguishing Media

None

Fire Fighting Equipment/Instructions

Small fires in the incipient (beginning) stage may typically be extinguished using handheld portable fire extinguishers and other fire fighting equipment. Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing. Isolate area around container involved in fire. Cool tanks, shells, and containers exposed to fire and excessive heat with water. For massive fires the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Major fires may require withdrawal, allowing the tank to burn. Large storage tank fires typically require specially trained personnel and equipment to extinguish the fire, often including the need for properly applied fire fighting foam.

* * * Section 6 - Accidental Release Measures * * *

Recovery and Neutralization

Carefully contain and stop the source of the spill, if safe to do so.

Materials and Methods for Clean-Up

Take up with sand or other oil absorbing materials. Carefully shovel, scoop or sweep up into a waste container for reclamation or disposal. Caution, flammable vapors may accumulate in closed containers.

Emergency Measures

Evacuate nonessential personnel and remove or secure all ignition sources. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to confirm spill areas. Spills may infiltrate subsurface soil and groundwater; professional assistance may be necessary to determine the extent of subsurface impact.

Personal Precautions and Protective Equipment

Response and clean-up crews must be properly trained and must utilize proper protective equipment (see Section 8).

Environmental Precautions

Protect bodies of water by diking, absorbents, or absorbent boom, if possible. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material. The use of fire fighting foam may be useful in certain situations to reduce vapors. The proper use of water spray may effectively disperse product vapors or the liquid itself, preventing contact with ignition sources or areas/equipment that require protection.

Prevention of Secondary Hazards

None

* * * Section 7 - Handling and Storage * * *

Handling Procedures

USE ONLY AS A MOTOR FUEL.
DO NOT SIPHON BY MOUTH

Handle as a flammable liquid. Keep away from heat, sparks, and open flame! Electrical equipment should be approved for classified area. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion.

Special slow load procedures for "switch loading" must be followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil) is loaded into tanks previously containing low flash point products (such as this product) - see API Publication 2003, "Protection Against Ignitions Arising Out Of Static, Lightning and Stray Currents."

Storage Procedures

Keep away from flame, sparks, excessive temperatures and open flame. Use approved vented containers. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition.

Store in a well-ventilated area. This storage area should comply with NFPA 30 "Flammable and Combustible Liquid Code". Avoid storage near incompatible materials. The cleaning of tanks previously containing this product should follow API Recommended Practice (RP) 2013 "Cleaning Mobile Tanks In Flammable and Combustible Liquid Service" and API RP 2015 "Cleaning Petroleum Storage Tanks".

Incompatibilities

Keep away from strong oxidizers.

* * * Section 8 - Exposure Controls / Personal Protection * * *

Component Exposure Limits

Gasoline, motor fuel (86290-81-5)

ACGIH: 300 ppm TWA
500 ppm STEL

Toluene (108-88-3)

ACGIH: 20 ppm TWA
OSHA: 200 ppm TWA; 375 mg/m3 TWA
150 ppm STEL; 560 mg/m3 STEL
NIOSH: 100 ppm TWA; 375 mg/m3 TWA
150 ppm STEL; 560 mg/m3 STEL

Butane (106-97-8)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases: Alkane C1-4)
OSHA: 800 ppm TWA; 1900 mg/m3 TWA
NIOSH: 800 ppm TWA; 1900 mg/m3 TWA

Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: 100 ppm TWA
150 ppm STEL
OSHA: 100 ppm TWA; 435 mg/m3 TWA
150 ppm STEL; 655 mg/m3 STEL

Benzene, 1,2,4-trimethyl- (95-63-6)

NIOSH: 25 ppm TWA; 125 mg/m3 TWA

Ethyl alcohol (64-17-5)

ACGIH: 1000 ppm STEL
OSHA: 1000 ppm TWA; 1900 mg/m3 TWA
NIOSH: 1000 ppm TWA; 1900 mg/m3 TWA

Ethylbenzene (100-41-4)

ACGIH: 20 ppm TWA
OSHA: 100 ppm TWA; 435 mg/m3 TWA
125 ppm STEL; 545 mg/m3 STEL
NIOSH: 100 ppm TWA; 435 mg/m3 TWA
125 ppm STEL; 545 mg/m3 STEL

Benzene (71-43-2)

ACGIH: 0.5 ppm TWA
2.5 ppm STEL
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: 0.1 ppm TWA
1 ppm STEL

Hexane (110-54-3)

ACGIH: 50 ppm TWA
Skin - potential significant contribution to overall exposure by the cutaneous route
OSHA: 500 ppm TWA; 1800 mg/m3 TWA
NIOSH: 50 ppm TWA; 180 mg/m3 TWA

Engineering Measures

Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces.

Personal Protective Equipment: Respiratory

A NIOSH/MSHA-approved air-purifying respirator with organic vapor cartridges or canister may be permissible under certain circumstances where airborne concentrations are or may be expected to exceed exposure limits or for odor or irritation. Protection provided by air-purifying respirators is limited.

Use a positive pressure, air-supplied respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection.

Personal Protective Equipment: Hands

Gloves constructed of nitrile, neoprene, or PVC are recommended.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

Personal Protective Equipment: Skin and Body

Chemical protective clothing such as of E.I. DuPont TyChem®, Saranex® or equivalent recommended based on degree of exposure. Note: The resistance of specific material may vary from product to product as well as with degree of exposure. Consult manufacturer specifications for further information.

* * * Section 9 - Physical & Chemical Properties * * *

Appearance:	Translucent, straw-colored or light yellow	**Odor:**	Strong, characteristic aromatic hydrocarbon odor. Sweet-ether like
Physical State:	Liquid	**pH:**	ND
Vapor Pressure:	6.4 - 15 RVP @ 100 °F (38 °C) (275-475 mm Hg @ 68 °F (20 °C)	**Vapor Density:**	AP 3-4
Boiling Point:	85-437 °F (39-200 °C)	**Melting Point:**	ND
Solubility (H2O):	Negligible to Slight	**Specific Gravity:**	0.70-0.78
Evaporation Rate:	10-11	**VOC:**	ND
Percent Volatile:	100%	**Octanol/H2O Coeff.:**	ND
Flash Point:	-45 °F (-43 °C)	**Flash Point Method:**	PMCC
Upper Flammability Limit (UFL):	7.6%	**Lower Flammability Limit (LFL):**	1.4%
Burning Rate:	ND	**Auto Ignition:**	>530°F (>280°C)

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Hazardous Reaction Potential

Will not occur.

Conditions to Avoid

Avoid high temperatures, open flames, sparks, welding, smoking and other ignition sources.

Incompatible Products

Keep away from strong oxidizers.

Hazardous Decomposition Products

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke). Contact with nitric and sulfuric acids will form nitrocresols that can decompose violently.

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Harmful if swallowed.

B: Component Analysis - LD50/LC50

Gasoline, motor fuel (86290-81-5)

Inhalation LC50 Rat >5.2 mg/L 4 h; Oral LD50 Rat 14000 mg/kg; Dermal LD50 Rabbit >2000 mg/kg

Toluene (108-88-3)

Inhalation LC50 Rat 12.5 mg/L 4 h; Inhalation LC50 Rat >26700 ppm 1 h; Oral LD50 Rat 636 mg/kg; Dermal LD50 Rabbit 8390 mg/kg; Dermal LD50 Rat 12124 mg/kg

Butane (106-97-8)

Inhalation LC50 Rat 658 mg/L 4 h

Xylenes (o-, m-, p- isomers) (1330-20-7)
Inhalation LC50 Rat 5000 ppm 4 h; Inhalation LC50 Rat 47635 mg/L 4 h; Oral LD50 Rat 4300 mg/kg; Dermal LD50 Rabbit >1700 mg/kg

Benzene, 1,2,4-trimethyl- (95-63-6)
Inhalation LC50 Rat 18 g/m3 4 h; Oral LD50 Rat 3400 mg/kg; Dermal LD50 Rabbit >3160 mg/kg

Ethyl alcohol (64-17-5)
Oral LD50 Rat 7060 mg/kg; Inhalation LC50 Rat 124.7 mg/L 4 h

Ethylbenzene (100-41-4)
Inhalation LC50 Rat 17.2 mg/L 4 h; Oral LD50 Rat 3500 mg/kg; Dermal LD50 Rabbit 15354 mg/kg

Benzene (71-43-2)
Inhalation LC50 Rat 13050-14380 ppm 4 h; Oral LD50 Rat 1800 mg/kg

Hexane (110-54-3)
Inhalation LC50 Rat 48000 ppm 4 h; Oral LD50 Rat 25 g/kg; Dermal LD50 Rabbit 3000 mg/kg

Potential Health Effects: Skin Corrosion Property/Stimulativeness

Practically non-toxic if absorbed following acute (single) exposure. May cause skin irritation with prolonged or repeated contact. Liquid may be absorbed through the skin in toxic amounts if large areas of skin are repeatedly exposed.

Potential Health Effects: Eye Critical Damage/ Stimulativeness

Moderate irritant. Contact with liquid or vapor may cause irritation.

Potential Health Effects: Ingestion

Ingestion may cause gastrointestinal disturbances, including irritation, nausea, vomiting and diarrhea, and central nervous system (brain) effects similar to alcohol intoxication. In severe cases, tremors, convulsions, loss of consciousness, coma, respiratory arrest, and death may occur.

Potential Health Effects: Inhalation

Excessive exposure may cause irritations to the nose, throat, lungs and respiratory tract. Central nervous system (brain) effects may include headache, dizziness, loss of balance and coordination, unconsciousness, coma, respiratory failure, and death.

WARNING: the burning of any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Respiratory Organs Sensitization/Skin Sensitization

This product is not reported to have any skin sensitization effects.

Generative Cell Mutagenicity

This product may cause genetic defects.

Carcinogenicity

A: General Product Information

May cause cancer.

IARC has determined that gasoline and gasoline exhaust are possibly carcinogenic in humans. Inhalation exposure to completely vaporized unleaded gasoline caused kidney cancers in male rats and liver tumors in female mice. The U.S. EPA has determined that the male kidney tumors are species-specific and are irrelevant for human health risk assessment. The significance of the tumors seen in female mice is not known. Exposure to light hydrocarbons in the same boiling range as this product has been associated in animal studies with effects to the central and peripheral nervous systems, liver, and kidneys. The significance of these animal models to predict similar human response to gasoline is uncertain.

This product contains benzene. Human health studies indicate that prolonged and/or repeated overexposure to benzene may cause damage to the blood-forming system (particularly bone marrow), and serious blood disorders such as aplastic anemia and leukemia. Benzene is listed as a human carcinogen by the NTP, IARC, OSHA and ACGIH.

B: Component Carcinogenicity

Gasoline, motor fuel (86290-81-5)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

Toluene (108-88-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Xylenes (o-, m-, p- isomers) (1330-20-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 71 [1999]; Monograph 47 [1989] (Group 3 (not classifiable))

Ethyl alcohol (64-17-5)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 100E [in preparation] (in alcoholic beverages); Monograph 96 [2010] (in alcoholic beverages) (Group 1 (carcinogenic to humans))

Ethylbenzene (100-41-4)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 77 [2000] (Group 2B (possibly carcinogenic to humans))

Benzene (71-43-2)

ACGIH: A1 - Confirmed Human Carcinogen
OSHA: 5 ppm STEL (Cancer hazard, Flammable, See 29 CFR 1910.1028, 15 min); 0.5 ppm Action Level; 1 ppm TWA
NIOSH: potential occupational carcinogen
NTP: Known Human Carcinogen (Select Carcinogen)
IARC: Monograph 100F [in preparation]; Supplement 7 [1987]; Monograph 29 [1982] (Group 1 (carcinogenic to humans))

Reproductive Toxicity

This product is suspected of damaging fertility or the unborn child.

Specified Target Organ General Toxicity: Single Exposure

This product may cause drowsiness or dizziness.

Specified Target Organ General Toxicity: Repeated Exposure

This product causes damage to organs through prolonged or repeated exposure.

Aspiration Respiratory Organs Hazard

The major health threat of ingestion occurs from the danger of aspiration (breathing) of liquid drops into the lungs, particularly from vomiting. Aspiration may result in chemical pneumonia (fluid in the lungs), severe lung damage, respiratory failure and even death.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

Very toxic to aquatic life with long lasting effects. Keep out of sewers, drainage areas and waterways. Report spills and releases, as applicable, under Federal and State regulations.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Gasoline, motor fuel (86290-81-5)

Test & Species		Conditions
96 Hr LC50 Alburnus alburnus	119 mg/L [static]	
96 Hr LC50 Cyprinodon variegatus	82 mg/L [static]	
72 Hr EC50 Pseudokirchneriella subcapitata	56 mg/L	
24 Hr EC50 Daphnia magna	170 mg/L	

Toluene (108-88-3)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	15.22-19.05 mg/L [flow-through]	1 day old
96 Hr LC50 Pimephales promelas	12.6 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.89-7.81 mg/L [flow-through]	
96 Hr LC50 Oncorhynchus mykiss	14.1-17.16 mg/L [static]	
96 Hr LC50 Oncorhynchus mykiss	5.8 mg/L [semi-static]	
96 Hr LC50 Lepomis macrochirus	11.0-15.0 mg/L [static]	
96 Hr LC50 Oryzias latipes	54 mg/L [static]	
96 Hr LC50 Poecilia reticulata	28.2 mg/L [semi-static]	
96 Hr LC50 Poecilia reticulata	50.87-70.34 mg/L [static]	
96 Hr EC50 Pseudokirchneriella subcapitata	>433 mg/L	
72 Hr EC50 Pseudokirchneriella subcapitata	12.5 mg/L [static]	
48 Hr EC50 Daphnia magna	5.46 - 9.83 mg/L [Static]	
48 Hr EC50 Daphnia magna	11.5 mg/L	

Xylenes (o-, m-, p- isomers) (1330-20-7)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	13.4 mg/L [flow-through]	

96 Hr LC50 Oncorhynchus mykiss	2.661-4.093 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	13.5-17.3 mg/L
96 Hr LC50 Lepomis macrochirus	13.1-16.5 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	19 mg/L
96 Hr LC50 Lepomis macrochirus	7.711-9.591 mg/L [static]
96 Hr LC50 Pimephales promelas	23.53-29.97 mg/L [static]
96 Hr LC50 Cyprinus carpio	780 mg/L [semi-static]
96 Hr LC50 Cyprinus carpio	>780 mg/L
96 Hr LC50 Poecilia reticulata	30.26-40.75 mg/L [static]
48 Hr EC50 water flea	3.82 mg/L
48 Hr LC50 Gammarus lacustris	0.6 mg/L

Benzene, 1,2,4-trimethyl- (95-63-6)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	7.19-8.28 mg/L [flow-through]
48 Hr EC50 Daphnia magna	6.14 mg/L

Ethyl alcohol (64-17-5)

Test & Species	Conditions
96 Hr LC50 Oncorhynchus mykiss	12.0 - 16.0 mL/L [static]
96 Hr LC50 Pimephales promelas	>100 mg/L [static]
96 Hr LC50 Pimephales promelas	13400 - 15100 mg/L [flow-through]
48 Hr LC50 Daphnia magna	9268 - 14221 mg/L
24 Hr EC50 Daphnia magna	10800 mg/L
48 Hr EC50 Daphnia magna	2 mg/L [Static]

Ethylbenzene (100-41-4)

Test & Species	Conditions
96 Hr LC50 Oncorhynchus mykiss	11.0-18.0 mg/L [static]
96 Hr LC50 Oncorhynchus mykiss	4.2 mg/L [semi-static]
96 Hr LC50 Pimephales promelas	7.55-11 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	32 mg/L [static]
96 Hr LC50 Pimephales promelas	9.1-15.6 mg/L [static]
96 Hr LC50 Poecilia reticulata	9.6 mg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	4.6 mg/L
96 Hr EC50 Pseudokirchneriella subcapitata	>438 mg/L
72 Hr EC50 Pseudokirchneriella subcapitata	2.6 - 11.3 mg/L [static]

96 Hr EC50 Pseudokirchneriella subcapitata	1.7 - 7.6 mg/L [static]
48 Hr EC50 Daphnia magna	1.8 - 2.4 mg/L

Benzene (71-43-2)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	10.7-14.7 mg/L [flow-through]
96 Hr LC50 Oncorhynchus mykiss	5.3 mg/L [flow-through]
96 Hr LC50 Lepomis macrochirus	22.49 mg/L [static]
96 Hr LC50 Poecilia reticulata	28.6 mg/L [static]
96 Hr LC50 Pimephales promelas	22330-41160 µg/L [static]
96 Hr LC50 Lepomis macrochirus	70000-142000 µg/L [static]
72 Hr EC50 Pseudokirchneriella subcapitata	29 mg/L
48 Hr EC50 Daphnia magna	8.76 - 15.6 mg/L [Static]
48 Hr EC50 Daphnia magna	10 mg/L

Hexane (110-54-3)

Test & Species	Conditions
96 Hr LC50 Pimephales promelas	2.1-2.98 mg/L [flow-through]
24 Hr EC50 Daphnia magna	>1000 mg/L

Persistence/Degradability

No information available.

Bioaccumulation

No information available.

Mobility in Soil

No information available.

* * * Section 13 - Disposal Considerations * * *

Waste Disposal Instructions

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

Disposal of Contaminated Containers or Packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

* * * Section 14 - Transportation Information * * *

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

DOT Information

Shipping Name: Gasoline
UN #: 1203 **Hazard Class:** 3 **Packing Group:** II
Placard:



* * * Section 15 - Regulatory Information * * *

Regulatory Information

A: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Toluene (108-88-3)
SARA 313: 1.0 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Xylenes (o-, m-, p- isomers) (1330-20-7)
SARA 313: 1.0 % de minimis concentration
CERCLA: 100 lb final RQ; 45.4 kg final RQ

Benzene, 1,2,4-trimethyl- (95-63-6)
SARA 313: 1.0 % de minimis concentration

Ethylbenzene (100-41-4)
SARA 313: 0.1 % de minimis concentration
CERCLA: 1000 lb final RQ; 454 kg final RQ

Benzene (71-43-2)
SARA 313: 0.1 % de minimis concentration
CERCLA: 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)

Hexane (110-54-3)

SARA 313: 1.0 % de minimis concentration
CERCLA: 5000 lb final RQ; 2270 kg final RQ

SARA Section 311/312 – Hazard Classes

Acute Health	Chronic Health	Fire	Sudden Release of Pressure	Reactive
X	X	X	--	--

Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Gasoline, motor fuel	86290-81-5	DOT regulated marine pollutant

State Regulations

Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Gasoline, motor fuel	86290-81-5	No	No	No	No	Yes	No
Toluene	108-88-3	Yes	Yes	Yes	Yes	Yes	No
Butane	106-97-8	Yes	Yes	Yes	Yes	Yes	No
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	Yes	Yes	Yes	Yes	No
Benzene, 1,2,4-trimethyl-	95-63-6	No	Yes	Yes	Yes	Yes	No
Ethyl alcohol	64-17-5	Yes	Yes	Yes	Yes	Yes	No
Ethylbenzene	100-41-4	Yes	Yes	Yes	Yes	Yes	No
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	No
Hexane	110-54-3	No	Yes	Yes	Yes	Yes	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Toluene	108-88-3	1 %
Butane	106-97-8	1 %
Benzene, 1,2,4-trimethyl-	95-63-6	0.1 %
Ethyl alcohol	64-17-5	0.1 %
Ethylbenzene	100-41-4	0.1 %
Benzene	71-43-2	0.1 %
Hexane	110-54-3	1 %

Additional Regulatory Information

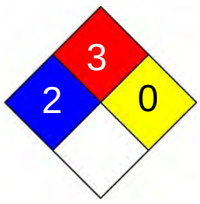
Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Gasoline, motor fuel	86290-81-5	No	DSL	EINECS
Toluene	108-88-3	Yes	DSL	EINECS
Butane	106-97-8	Yes	DSL	EINECS
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	DSL	EINECS
Benzene, 1,2,4-trimethyl-	95-63-6	Yes	DSL	EINECS
Ethyl alcohol	64-17-5	Yes	DSL	EINECS
Ethylbenzene	100-41-4	Yes	DSL	EINECS
Benzene	71-43-2	Yes	DSL	EINECS
Hexane	110-54-3	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

NFPA® Hazard Rating

Health	2
Fire	3
Reactivity	0



HMIS® Hazard Rating

Health	2	Moderate
Fire	3	Serious
Physical	0	Minimal
		*Chronic

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

Literature References

None

Other Information

Information presented herein has been compiled from sources considered to be dependable, and is accurate and reliable to the best of our knowledge and belief, but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

End of Sheet

Hydrogen, compressed

Safety Data Sheet P-4604

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Date of issue: 01/01/1980 Revision date: 10/17/2016 Supersedes: 06/03/2015

SECTION: 1. Product and company identification

1.1. Product identifier

Product form	:	Substance
Name	:	Hydrogen, compressed
CAS No	:	1333-74-0
Formula	:	H2
Other means of identification	:	Dihydrogen, parahydrogen, refrigerant gas R702, water gas

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture	:	Industrial use. Use as directed.

1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
10 Riverview Drive
Danbury, CT 06810-6268 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US classification

Flam. Gas 1 H220
Compressed gas H280

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS02 GHS04

Signal word (GHS-US) : DANGER

Hazard statements (GHS-US) : H220 - **EXTREMELY FLAMMABLE GAS**
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION
CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR
CGA-HG08 - BURNS WITH INVISIBLE FLAME

Precautionary statements (GHS-US) : P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from Heat, Open flames, Sparks, Hot surfaces. - No smoking
P271+P403 - Use and store only outdoors or in a well-ventilated place
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely
P381 - Eliminate all ignition sources if safe to do so
CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG10 - Use only with equipment rated for cylinder pressure
CGA-PG12 - Do not open valve until connected to equipment prepared for use
CGA-PG06 - Close valve after each use and when empty
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

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2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance

Name : Hydrogen, compressed

CAS No : 1333-74-0

Name	Product identifier	%
Hydrogen	(CAS No) 1333-74-0	99.5 - 100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.. Get immediate medical attention.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

No additional information available

4.3. Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, dry chemical powder, water spray, fog.

5.2. Special hazards arising from the substance or mixture

Fire hazard : **EXTREMELY FLAMMABLE GAS**. The hydrogen flame is nearly invisible. Hydrogen has a low ignition energy; escaping hydrogen gas may ignite spontaneously. A fireball forms if the gas cloud ignites immediately after release. Hydrogen forms explosive mixtures with air and oxidizing agents.

Explosion hazard : **EXTREMELY FLAMMABLE GAS**. Forms explosive mixtures with air and oxidizing agents.

Reactivity : No reactivity hazard other than the effects described below.

5.3. Advice for firefighters

Firefighting instructions : If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

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Protection during firefighting	:	Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.
Special protective equipment for fire fighters	:	Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
Specific methods	:	Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems Stop flow of product if safe to do so Use water spray or fog to knock down fire fumes if possible.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : **DANGER: EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents.** See section 5. Evacuate personnel to a safe area. Appropriate self-contained breathing apparatus may be required. Approach suspected leak area with caution. Remove all sources of ignition. if safe to do so. Reduce gas with fog or fine water spray. Stop flow of product if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable gas may spread from leak. Before entering the area, especially a confined area, check the atmosphere with an appropriate device.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

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7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post “No Smoking/No Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Hydrogen, compressed (1333-74-0)		
ACGIH	Not established	
USA OSHA	Not established	

Hydrogen (1333-74-0)		
ACGIH	Remark (ACGIH)	Simple asphyxiant
USA OSHA	Not established	

8.2. Exposure controls

Appropriate engineering controls : Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. MECHANICAL (GENERAL): **Inadequate - Use only in a closed system.** Use explosion proof equipment and lighting.

Eye protection : Wear safety glasses with side shields.

Respiratory protection : An air-supplied respirator must be used while working with this product in confined spaces. The respiratory protection used must conform with OSHA rules as specified in 29 CFR 1910.134. Select per OSHA 29 CFR 1910.134 and ANSI Z88.2.

Thermal hazard protection : None necessary.

Other information : Consider the use of flame resistant anti-static safety clothing. Wear safety shoes while handling containers.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colorless gas.

Molecular mass : 2 g/mol

Color : Colorless.

Odor : Odorless.

Odor threshold : No data available

pH : Not applicable.

Relative evaporation rate (butyl acetate=1) : No data available

Relative evaporation rate (ether=1) : Not applicable.

Melting point : -259.2 °C (-434.56°F)

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Freezing point	:	No data available
Boiling point	:	-252.9 °C (-422.97°F)
Flash point	:	No data available
Critical temperature	:	-239.9 °C (-399.82°F)
Auto-ignition temperature	:	566 °C (1051°F)
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapor pressure	:	Not applicable.
Relative vapor density at 20 °C	:	No data available
Relative density	:	No data available
Density	:	0.089 g/l (0.0056 lb/ft3) (at STP = 0°C and 1atm)
Relative gas density	:	0.07
Solubility	:	Water: 1.6 mg/l
Log Pow	:	Not applicable.
Log Kow	:	Not applicable.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidizing properties	:	None.
Explosion limits	:	4 - 77 vol %

9.2. Other information

Gas group	:	Compressed gas
Additional information	:	BURNS WITH INVISIBLE FLAME

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Can form explosive mixture with air. May react violently with oxidants.

10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

10.5. Incompatible materials

Oxidizing agents. Lithium. Halogens.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Hydrogen, compressed (\f)1333-74-0	
LC50 inhalation rat (ppm)	> 15000 ppm/1h

Hydrogen (1333-74-0)	
LC50 inhalation rat (ppm)	> 15000 ppm/1h

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Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and degradability

Hydrogen, compressed (1333-74-0)	
Persistence and degradability	No ecological damage caused by this product.

Hydrogen (1333-74-0)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Hydrogen, compressed (1333-74-0)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

Hydrogen (1333-74-0)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	Not applicable.
Log Kow	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Hydrogen, compressed (1333-74-0)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

Hydrogen (1333-74-0)	
Mobility in soil	No data available.
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Effect on ozone layer : None

Effect on the global warming : No known effects from this product

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

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SECTION 14: Transport information

In accordance with DOT

Transport document description	:	UN1049 Hydrogen, compressed, 2.1
UN-No.(DOT)	:	UN1049
Proper Shipping Name (DOT)	:	Hydrogen, compressed
Class (DOT)	:	2.1 - Class 2.1 - Flammable gas 49 CFR 173.115
Hazard labels (DOT)	:	2.1 - Flammable gas



DOT Special Provisions (49 CFR 172.102)	:	N89 - When steel UN pressure receptacles are used, only those bearing the “H” mark are authorized

Additional information

Emergency Response Guide (ERG) Number	:	115 (UN1049)
Other information	:	No supplementary information available.
Special transport precautions	:	Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG)	:	1049
Proper Shipping Name (IMDG)	:	HYDROGEN, COMPRESSED
Class (IMDG)	:	2 - Gases
MFAG-No	:	115

Air transport

UN-No. (IATA)	:	1049
Proper Shipping Name (IATA)	:	Hydrogen, compressed
Class (IATA)	:	2
Civil Aeronautics Law	:	Gases under pressure/Gases flammable under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Hydrogen, compressed (1333-74-0)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard Fire hazard

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

This product or mixture does not contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

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15.2. International regulations

CANADA

Hydrogen, compressed (1333-74-0)
Listed on the Canadian DSL (Domestic Substances List)

Hydrogen (1333-74-0)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Hydrogen, compressed (1333-74-0)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Hydrogen, compressed (1333-74-0)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances)

15.3. US State regulations

Hydrogen, compressed(1333-74-0)	
U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

Hydrogen (1333-74-0)				
U.S. - California - Proposition 65 - Carcinogens List	U.S. - California - Proposition 65 - Developmental Toxicity	U.S. - California - Proposition 65 - Reproductive Toxicity - Female	U.S. - California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	No	No	No	

Hydrogen (1333-74-0)
U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List

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SECTION 16: Other information

Other information : When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc, it is the user's obligation to determine the conditions of safe use of the product

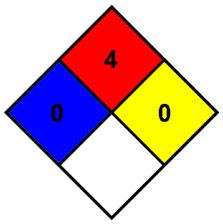
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NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.

NFPA fire hazard : 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 0 Minimal Hazard - No significant risk to health

Flammability : 4 Severe Hazard

Physical : 3 Serious Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

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SAFETY DATA SHEET

Isobutylene

Section 1. Identification

GHS product identifier : Isobutylene

Chemical name : 2-methylpropene

Other means of identification : 1-Propene, 2-methyl-; Isobutene; Isobutylene; 1-Propene, 2-methyl- (isobutene)

Product use : Synthetic/Analytical chemistry.

Synonym : 1-Propene, 2-methyl-; Isobutene; Isobutylene; 1-Propene, 2-methyl- (isobutene)

SDS # : 001031

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : FLAMMABLE GASES - Category 1
GASES UNDER PRESSURE - Liquefied gas

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : Extremely flammable gas.
May form explosive mixtures with air.
Contains gas under pressure; may explode if heated.
May cause frostbite.
May displace oxygen and cause rapid suffocation.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Approach suspected leak area with caution.

Prevention : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response : Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Storage : Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

Disposal : Not applicable.

Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : 2-methylpropene

Other means of identification : 1-Propene, 2-methyl-; Isobutene; Isobutylene; 1-Propene, 2-methyl- (isobutene)

CAS number/other identifiers

CAS number : 115-11-7

Product code : 001031

Ingredient name	%	CAS number
Isobutylene	100	115-11-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Section 4. First aid measures

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Isobutylene	**ACGIH TLV (United States, 3/2015).** TWA: 250 ppm 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Section 8. Exposure controls/personal protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas. [Liquefied compressed gas.]

Color : Colorless.

Molecular weight : 56.12 g/mole

Molecular formula : C4-H8

Boiling/condensation point : -6.9°C (19.6°F)

Melting/freezing point : -140.7°C (-221.3°F)

Critical temperature : 144.75°C (292.6°F)

Odor : Characteristic.

Odor threshold : Not available.

pH : Not available.

Flash point : Closed cup: -76.1°C (-105°F)

Burning time : Not applicable.

Burning rate : Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and oxidizing materials.

Lower and upper explosive (flammable) limits : Lower: 1.8%
Upper: 9.6%

Vapor pressure : 24.3 (psig)

Vapor density : 1.94 (Air = 1)

Specific Volume (ft ^{3}/lb) : 6.6845

Gas Density (lb/ft ^{3}) : 0.1496 (25°C / 77 to °F)

Relative density : Not applicable.

Solubility : Not available.

Solubility in water : 0.263 g/l

Partition coefficient: n-octanol/water : 2.34

Auto-ignition temperature : 465°C (869°F)

Decomposition temperature : Not available.

SADT : Not available.

Section 9. Physical and chemical properties

Viscosity : Not applicable.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

Incompatible materials : Oxidizers

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Isobutylene	LC50 Inhalation Vapor	Rat	550000 mg/m³	4 hours

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Section 11. Toxicological information

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Isobutylene	2.34	-	low

Section 12. Ecological information

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1055	UN1055	UN1055	UN1055	UN1055
UN proper shipping name	ISOBUTYLENE	ISOBUTYLENE	ISOBUTYLENE	ISOBUTYLENE	ISOBUTYLENE
Transport hazard class(es)	2.1 	2.1 	2.1 	2.1 	2.1 
Packing group	-	-	-	-	-
Environment	No.	No.	No.	No.	No.
Additional information	**Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: Forbidden. **Cargo aircraft** Quantity limitation: 150 kg **Special provisions** 19, T50	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2). **Explosive Limit and Limited Quantity Index** 0.125 **ERAP Index** 3000 **Passenger Carrying Ship Index** Forbidden **Passenger Carrying Road or Rail Index** Forbidden **Special provisions** 29	-	-	**Passenger and Cargo Aircraft**Quantity limitation: 0 Forbidden **Cargo Aircraft Only** Quantity limitation: 150 kg

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Section 14. Transport information

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

United States inventory (TSCA 8b): This material is listed or exempted.

Clean Air Act (CAA) 112 regulated flammable substances: isobutylene

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Fire hazard
Sudden release of pressure

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Isobutylene	100	Yes.	Yes.	No.	No.	No.

State regulations

Massachusetts : This material is listed.

New York : This material is not listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

International regulations

International lists

National inventory

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

Europe : This material is listed or exempted.

Japan : This material is listed or exempted.

Malaysia : Not determined.

Section 15. Regulatory information

New Zealand : This material is listed or exempted.

Philippines : This material is listed or exempted.

Republic of Korea : This material is listed or exempted.

Taiwan : This material is listed or exempted.

Canada

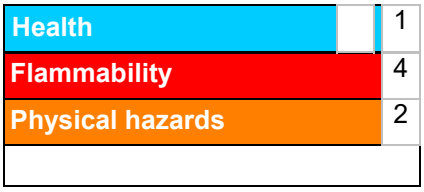
WHMIS (Canada) : Class A: Compressed gas.
Class B-1: Flammable gas.

CEPA Toxic substances: This material is not listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Section 16. Other information

Canada Label requirements : Class A: Compressed gas.
Class B-1: Flammable gas.

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
Flam. Gas 1, H220 Press. Gas Liq. Gas, H280	Expert judgment Expert judgment

History

Date of printing : 7/11/2016

Date of issue/Date of revision : 7/11/2016

Date of previous issue : No previous validation

Section 16. Other information

Version : 0.01

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

MATERIAL SAFETY DATA SHEET

ALCONOX®

Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS, Australian WorkSafe, Japanese Industrial Standard JIS Z 7250:2000, and European Union REACH Regulations

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME:	ALCONOX®
CHEMICAL FAMILY NAME:	Detergent.
PRODUCT USE:	Critical-cleaning detergent for laboratory, healthcare and industrial applications
U.N. NUMBER:	Not Applicable
U.N. DANGEROUS GOODS CLASS:	Non-Regulated Material
SUPPLIER/MANUFACTURER'S NAME:	Alconox, Inc.
ADDRESS:	30 Glenn St., Suite 309, White Plains, NY 10603. USA
EMERGENCY PHONE:	**TOLL-FREE in USA/Canada** 800-255-3924
	International calls 813-248-0585
BUSINESS PHONE:	914-948-4040
DATE OF PREPARATION:	May 2011
DATE OF LAST REVISION:	February 2008

SECTION 2 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This product is a white granular powder with little or no odor. Exposure can be irritating to eyes, respiratory system and skin. It is a non-flammable solid. The Environmental effects of this product have not been investigated.

US DOT SYMBOLS

Non-Regulated

CANADA (WHMIS) SYMBOLS



EUROPEAN and (GHS) Hazard Symbols



Signal Word: **Warning!**

EU LABELING AND CLASSIFICATION:

Classification of the substance or mixture according to Regulation (EC) No1272/2008 Annex 1
EC# 205-633-8 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 268-356-1 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 231-838-7 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 231-767-1 This substance is not classified in the Annex I of Directive 67/548/EEC
EC# 207-638-8 Index# 011-005-00-2
EC# 205-788-1 This substance is not classified in the Annex I of Directive 67/548/EEC

GHS Hazard Classification(s):

Eye Irritant Category 2A

Hazard Statement(s):

H319: Causes serious eye irritation

Precautionary Statement(s):

P260: Do not breath dust/fume/gas/mist/vapors/spray
P264: Wash hands thoroughly after handling
P271: Use only in well ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection/

Hazard Symbol(s):

[Xi] Irritant

Risk Phrases:
R20: Harmful by inhalation
R36/37/38: Irritating to eyes, respiratory system and skin

Safety Phrases:
S8: Keep container dry
S22: Do not breath dust
S24/25: Avoid contact with skin and eyes

HEALTH HAZARDS OR RISKS FROM EXPOSURE:

ACUTE: Exposure to this product may cause irritation of the eyes, respiratory system and skin. Ingestion may cause gastrointestinal irritation including pain, vomiting or diarrhea.

CHRONIC: This product contains an ingredient which may be corrosive.

TARGET ORGANS: ACUTE: Eye, respiratory System, Skin CHRONIC: None Known

SECTION 3 - COMPOSITION and INFORMATION ON INGREDIENTS

HAZARDOUS INGREDIENTS:	CAS #	EINECS #	ICSC #	WT %	HAZARD CLASSIFICATION; RISK PHRASES
Sodium Bicarbonate	144-55-8	205-633-8	1044	33 - 43%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium (C10 – C16) Alkylbenzene Sulfonate	68081-81-2	268-356-1	Not Listed	10 – 20%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium Tripolyphosphate	7758-29-4	231-838-7	1469	5 - 15%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Tetrasodium Pyrophosphate	7722-88-5	231-767-1	1140	5 - 15%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Sodium Carbonate	497-19-8	207-638-8	1135	1 - 10%	HAZARD CLASSIFICATION: [Xi] Irritant RISK PHRASES: R36
Sodium Alcohol Sulfate	151-21-3	205-788-1	0502	1 – 5%	HAZARD CLASSIFICATION: None RISK PHRASES: None
Balance of other ingredients are non-hazardous or less than 1% in concentration (or 0.1% for carcinogens, reproductive toxins, or respiratory sensitizers).					

NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-2004 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR, EU Directives and the Japanese Industrial Standard *JIS Z 7250: 2000*.

SECTION 4 - FIRST-AID MEASURES

Contaminated individuals of chemical exposure must be taken for medical attention if any adverse effect occurs. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to health professional with contaminated individual.

EYE CONTACT: If product enters the eyes, open eyes while under gentle running water for at least 15 minutes. Seek medical attention if irritation persists.

SKIN CONTACT: Wash skin thoroughly after handling. Seek medical attention if irritation develops and persists. Remove contaminated clothing. Launder before re-use.

INHALATION: If breathing becomes difficult, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if breathing dificulty continues.

INGESTION: If product is swallowed, call physician or poison control center for most current information. If professional advice is not available, do not induce vomiting. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or who cannot swallow. Seek medical advice. Take a copy of the label and/or MSDS with the victim to the health professional.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing skin, or eye problems may be aggravated by prolonged contact.

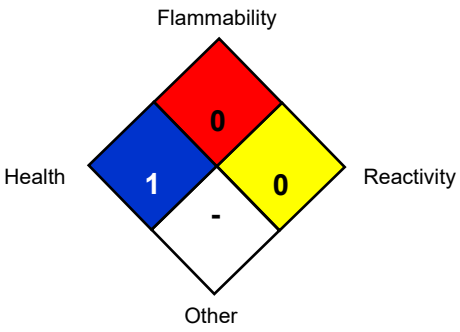
RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and reduce over-exposure.

SECTION 5 - FIRE-FIGHTING MEASURES

FLASH POINT: Not Flammable
AUTOIGNITION TEMPERATURE: Not Applicable
FLAMMABLE LIMITS (in air by volume, %): Lower (LEL): NA Upper (UEL): NA
FIRE EXTINGUISHING MATERIALS: As appropriate for surrounding fire. Carbon dioxide, foam, dry chemical, halon, or water spray.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is non-flammable and has no known explosion hazards.
Explosion Sensitivity to Mechanical Impact: Not Sensitive.
Explosion Sensitivity to Static Discharge: Not Sensitive
SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Isolate materials not yet involved in the fire and protect personnel. Move containers from fire area if this can be done without risk; otherwise, cool with carefully applied water spray. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

NFPA RATING SYSTEM



HMIS RATING SYSTEM

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH HAZARD (BLUE)	1
FLAMMABILITY HAZARD (RED)	0
PHYSICAL HAZARD (YELLOW)	0

PROTECTIVE EQUIPMENT			
EYES	RESPIRATORY	HANDS	BODY
	See Sect 8		See Sect 8

For Routine Industrial Use and Handling Applications

Hazard Scale: **0** = Minimal **1** = Slight **2** = Moderate **3** = Serious **4** = Severe * = Chronic hazard

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Personnel should be trained for spill response operations.
SPILLS: Contain spill if safe to do so. Prevent entry into drains, sewers, and other waterways. Sweep, shovel or vacuum spilled material and place in an appropriate container for re-use or disposal. Avoid dust generation if possible. Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations).

SECTION 7 - HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat, drink, smoke, or apply cosmetics while handling this product. Avoid breathing dusts generated by this product. Use in a well-ventilated location. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: Containers of this product must be properly labeled. Store containers in a cool, dry location. Keep container tightly closed when not in use. Store away from strong acids or oxidizers.

SECTION 8 - EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/GUIDELINES:

Chemical Name	CAS#	ACGIH TWA	OSHA TWA	SWA
Sodium Bicarbonate	144-55-8	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Sodium (C10 – C16) Alkylbenzene Sulfonate	68081-81-2	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Sodium Tripolyphosphate	7758-29-4	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Tetrasodium Pyrophosphate	7722-88-5	5 mg/m³	5 mg/m³	5 mg/m³
Sodium Carbonate	497-19-8	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust
Sodium Alcohol Sulfate	151-21-3	10 mg/m³ Total Dust	15 mg/m³ Total Dust	10 mg/m³ Total Dust

Currently, International exposure limits are not established for the components of this product. Please check with competent authority in each country for the most recent limits in place.

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided below. Use local exhaust ventilation to control airborne dust. Ensure eyewash/safety shower stations are available near areas where this product is used.

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132) or equivalent standard of Canada, or standards of EU member states (including EN 149 for respiratory PPE, and EN 166 for face/eye protection), and those of Japan. Please reference applicable regulations and standards for relevant details.

RESPIRATORY PROTECTION: Based on test data, exposure limits should not be exceeded under normal use conditions when using Alconox Detergent. Maintain airborne contaminant concentrations below guidelines listed above, if applicable. If necessary, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, or EU member states.

EYE PROTECTION: Safety glasses. If necessary, refer to U.S. OSHA 29 CFR 1910.133 or appropriate Canadian Standards.

HAND PROTECTION: Use chemical resistant gloves to prevent skin contact.. If necessary, refer to U.S. OSHA 29 CFR 1910.138 or appropriate Standards of Canada.

BODY PROTECTION: Use body protection appropriate to prevent contact (e.g. lab coat, overalls). If necessary, refer to appropriate Standards of Canada, or appropriate Standards of the EU, Australian Standards, or relevant Japanese Standards.

SECTION 9 - PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL STATE:	Solid
APPEARANCE & ODOR:	White granular powder with little or no odor.
ODOR THRESHOLD (PPM):	Not Available
VAPOR PRESSURE (mmHg):	Not Applicable
VAPOR DENSITY (AIR=1):	Not Applicable.
BY WEIGHT:	Not Available
EVAPORATION RATE (nBuAc = 1):	Not Applicable.
BOILING POINT (C°):	Not Applicable.
FREEZING POINT (C°):	Not Applicable.
pH:	9.5 (1% aqueous solution)
SPECIFIC GRAVITY 20°C: (WATER =1)	0.85 – 1.1
SOLUBILITY IN WATER (%)	>10% w/w
COEFFICIENT OF WATER/OIL DIST.:	Not Available
VOC:	None
CHEMICAL FAMILY:	Detergent

SECTION 10 - STABILITY and REACTIVITY

STABILITY: Product is stable
DECOMPOSITION PRODUCTS: When heated to decomposition this product produces Oxides of carbon (COx)
MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids and strong oxidizing agents.
HAZARDOUS POLYMERIZATION: Will not occur.
CONDITIONS TO AVOID: Contact with incompatible materials and dust generation.

SECTION 11 - TOXICOLOGICAL INFORMATION

TOXICITY DATA: Toxicity data is available for mixture:

CAS# 497-19-8 LD50 Oral (Rat)	4090 mg/kg
CAS# 497-19-8 LD50 Oral (Mouse)	6600 mg/kg
CAS# 497-19-8 LC50 Inhalation (Rat)	2300 mg/m³ 2H
CAS# 497-19-8 LC50 Inhalation (Mouse)	1200 mg/m³ 2H
CAS# 7758-29-4 LD50 Oral (Rat)	3120 mg/kg
CAS# 7758-29-4 LD50 Oral (Mouse)	3100 mg/kg
CAS# 7722-88-5 LD50 Oral (Rat)	4000 mg/kg

SUSPECTED CANCER AGENT: None of the ingredients are found on the following lists: FEDERAL OSHA Z LIST, NTP, CAL/OSHA, IARC and therefore is not considered to be, nor suspected to be a cancer-causing agent by these agencies.
IRRITANCY OF PRODUCT: Contact with this product can be irritating to exposed skin, eyes and respiratory system.
SENSITIZATION OF PRODUCT: This product is not considered a sensitizer.
REPRODUCTIVE TOXICITY INFORMATION: No information concerning the effects of this product and its components on the human reproductive system.

SECTION 12 - ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.
ENVIRONMENTAL STABILITY: No Data available at this time.
EFFECT OF MATERIAL ON PLANTS or ANIMALS: No evidence is currently available on this product's effects on plants or animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on this product's effects on aquatic life.

SECTION 13 - DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations, those of Canada, Australia, EU Member States and Japan.

SECTION 14 - TRANSPORTATION INFORMATION

US DOT; IATA; IMO; ADR:

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.
PROPER SHIPPING NAME: Non-Regulated Material
HAZARD CLASS NUMBER and DESCRIPTION: Not Applicable
UN IDENTIFICATION NUMBER: Not Applicable
PACKING GROUP: Not Applicable.
DOT LABEL(S) REQUIRED: Not Applicable
NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2004): Not Applicable
MARINE POLLUTANT: None of the ingredients are classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B)

U.S. DEPARTMENT OF TRANSPORTATION (DOT) SHIPPING REGULATIONS:
This product is not classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

TRANSPORT CANADA, TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:
This product is not classified as Dangerous Goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA):
This product is not classified as Dangerous Goods, by rules of IATA:

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION:
This product is not classified as Dangerous Goods by the International Maritime Organization.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):

This product is not classified by the United Nations Economic Commission for Europe to be dangerous goods.

SECTION 15 - REGULATORY INFORMATION

UNITED STATES REGULATIONS

SARA REPORTING REQUIREMENTS: This product is not subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act., as follows: None

TSCA: All components in this product are listed on the US Toxic Substances Control Act (TSCA) inventory of chemicals.

SARA 311/312:

Acute Health: Yes Chronic Health: No Fire: No Reactivity: No

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): None

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): None of the ingredients are on the California Proposition 65 lists.

CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: All of the components of this product are on the DSL Inventory

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITIES SUBSTANCES LISTS: No component of this product is on the CEPA First Priorities Substance Lists.

CANADIAN WHMIS CLASSIFICATION and SYMBOLS: This product is categorized as a Controlled Product, Hazard Class D2B as per the Controlled Product Regulations

EUROPEAN ECONOMIC COMMUNITY INFORMATION:

EU LABELING AND CLASSIFICATION:

Classification of the mixture according to Regulation (EC) No1272/2008. See section 2 for details.

AUSTRALIAN INFORMATION FOR PRODUCT:

AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) STATUS: All components of this product are listed on the AICS.

STANDARD FOR THE UNIFORM SCHEDULING OF DRUGS AND POISONS: Not applicable.

JAPANESE INFORMATION FOR PRODUCT:

JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) STATUS: The components of this product are not listed as Class I Specified Chemical Substances, Class II Specified Chemical Substances, or Designated Chemical Substances by the Japanese MITI.

INTERNATIONAL CHEMICAL INVENTORIES:

Listing of the components on individual country Chemical Inventories is as follows:

Asia-Pac:	Listed
Australian Inventory of Chemical Substances (AICS):	Listed
Korean Existing Chemicals List (ECL):	Listed
Japanese Existing National Inventory of Chemical Substances (ENCS):	Listed
Philippines Inventory if Chemicals and Chemical Substances (PICCS):	Listed
Swiss Giftliste List of Toxic Substances:	Listed
U.S. TSCA:	Listed

SECTION 16 - OTHER INFORMATION

PREPARED BY: Paul Eigbrett Global Safety Management, 10006 Cross Creek Blvd. Suite 440, Tampa, FL 33647

Disclaimer: To the best of Alconox, Inc. knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type either express or implied are provided. The information contained herein relates only to this specific product.

ANNEX:

IDENTIFIED USES OF ALCONOX® AND DIRECTIONS FOR USE

Used to clean: Healthcare instruments, laboratory ware, vacuum equipment, tissue culture ware, personal protective equipment, sampling apparatus, catheters, tubing, pipes, radioactive contaminated articles, optical parts, electronic components, pharmaceutical apparatus, cosmetics manufacturing equipment, metal castings, forgings and stampings, industrial parts, tanks and reactors. Authorized by USDA for use in federally inspected meat and poultry plants. Passes inhibitory residue test for water analysis. FDA certified.

Used to remove: Soil, grit, grime, buffing compound, slime, grease, oils, blood, tissue, salts, deposits, particulates, solvents, chemicals, radioisotopes, radioactive contaminations, silicon oils, mold release agents.

Surfaces cleaned: Corrosion inhibited formulation recommended for glass, metal, stainless steel, porcelain, ceramic, plastic, rubber and fiberglass. Can be used on soft metals such as copper, aluminum, zinc and magnesium if rinsed promptly. Corrosion testing may be advisable.

Cleaning method: Soak, brush, sponge, cloth, ultrasonic, flow through clean-inplace. Will foam—not for spray or machine use.

Directions: Make a fresh 1% solution (2 1/2 Tbsp. per gal., 1 1/4 oz. per gal. or 10 grams per liter) in cold, warm, or hot water. If available use warm water. Use cold water for blood stains. For difficult soils, raise water temperature and use more detergent. Clean by soak, circulate, wipe, or ultrasonic method. Not for spray machines, will foam. For nonabrasive scouring, make paste. Use 2% solution to soak frozen stopcocks. To remove silver tarnish, soak in 1% solution in aluminum container. RINSE THOROUGHLY—preferably with running water. For critical cleaning, do final or all rinsing in distilled, deionized, or purified water. For food contact surfaces, rinse with potable water. Used on a wide range of glass, ceramic, plastic, and metal surfaces. Corrosion testing may be advisable.

Safety Data Sheet: **Simple Green® All-Purpose Cleaner** ★

Version No. 13000-14B Issue Date: September 13, 2014 Supersedes Date: January 7, 2014 *OSHA HCS-2012 / GHS*

Section 1: IDENTIFICATION

Product Name: Simple Green® All-Purpose Cleaner
Additional Names:

Manufacturer's Part Number: **Please refer to Section 16*

Recommended Use: Cleaner & Degreaser for water tolerant surfaces.
Restrictions on Use: Do not use on non-rinsable surfaces.

Company: Sunshine Makers, Inc.
15922 Pacific Coast Highway
Huntington Beach, CA 92649 USA

Telephone: 800-228-0709 ● 562-795-6000 *Mon – Fri, 8am – 5pm PST*
Fax: 562-592-3830
Email: info@simplegreen.com

Emergency Phone: Chem-Tel 24-Hour Emergency Service: 800-255-3924

Section 2: HAZARDS IDENTIFICATION

This product is not classified as hazardous under 2012 OSHA Hazard Communication Standards (29 CFR 1910.1200).

OSHA HCS 2012
Label Elements
Signal Word: None **Hazard Symbol(s)/Pictogram(s):** None required

Hazard Statements: None
Precautionary Statements: None
Hazards Not Otherwise Classified (HNOC): None
Other Information: None Known

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS Number	Percent Range
Water	7732-18-5	> 84.8%*
Ethoxylated Alcohol	68439-46-3	< 5%*
Sodium Citrate	68-04-2	< 5%*
Tetrasodium *N,N*-bis(carboxymethyl)-L-glutamate	51981-21-6	< 1%*
Sodium Carbonate	497-19-8	< 1%*
Citric Acid	77-92-9	< 1%*
Isothiazolinone mixture	55965-84-9	< 0.2%*
Fragrance	Proprietary Mixture	< 1%*
Colorant	Proprietary Mixture	< 1%*

**specific percentages of composition are being withheld as a trade secret*

Section 4: FIRST-AID MEASURES

Inhalation: Not expected to cause respiratory irritation. If adverse effect occurs, move to fresh air.
Skin Contact: Not expected to cause skin irritation. If adverse effect occurs, rinse skin with water.
Eye Contact: Not expected to cause eye irritation. If adverse effect occurs, flush eyes with water.
Ingestion: May cause upset stomach. Drink plenty of water to dilute. See section 11.

Most Important Symptoms/Effects, Acute and Delayed: None known.

Indication of Immediate Medical Attention and Special Treatment Needed, if necessary: Treat symptomatically

Section 5: FIRE-FIGHTING MEASURES

Suitable & Unsuitable Extinguishing Media: Use Dry chemical, CO2, water spray or "alcohol" foam. Avoid high volume jet water.
Specific Hazards Arising from Chemical: In event of fire, fire created carbon oxides may be formed.
Special Protective Actions for Fire-Fighters: Wear positive pressure self-contained breathing apparatus; Wear full protective clothing.

This product is non-flammable. See Section 9 for Physical Properties.

Section 6: ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures: *For non-emergency and emergency personnel:* See section 8 – personal protection. Avoid eye contact. Safety goggles suggested.

Environmental Precautions: Do not allow into open waterways and ground water systems.

Methods and Materials for Containment and Clean Up: Dike or soak up with inert absorbent material. See section 13 for disposal considerations.

Section 7: HANDLING AND STORAGE

Precautions for Safe Handling: Ensure adequate ventilation. Keep out of reach of children. Keep away from heat, sparks, open flame and direct sunlight. Do not pierce any part of the container. Do not mix or contaminate with any other chemical. Do not eat, drink or smoke while using this product.

Conditions for Safe Storage including Incompatibilities: Keep container tightly closed. Keep in cool dry area. Avoid prolonged exposure to sunlight. Do not store at temperatures above 109°F (42.7°C). If separation occurs, mix the product for reconstitution.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limit Values: No components listed with TWA or STEL values under OSHA or ACGIH.

Appropriate Engineering Controls: Showers, eyewash stations, ventilation systems

Individual Protection Measures / Personal Protective Equipment (PPE)
Eye Contact: Use protective glasses or safety goggles if splashing or spray-back is likely.
Respiratory: Use in well ventilated areas or local exhaust ventilations when cleaning small spaces.
Skin Contact: Use protective gloves (any material) when used for prolonged periods or dermally sensitive.
General Hygiene Considerations: Wash thoroughly after handling and before eating or drinking.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Green Liquid
Odor: Added sassafras odor
Odor Threshold: Not determined
pH ASTM D-1293**:** 8.5 – 9.5
Freezing Point ASTM D-1177**:** 0-3.33°C (32-38°F)
Boiling Point & Range ASTM D-1120**:** 101°C (213.8°F)
Flash Point ASTM D-93**:** > 212°F
Evaporation Rate ASTM D-1901**:** ½ Butyl Acetate @ 25°C
Flammability (solid, gas): Not applicable
Upper/Lower Flammability or Explosive Limits: Not applicable
Vapor Pressure ASTM D-323**:** 0.60 PSI @77°F, 2.05 PSI @100°F
Vapor Density: Not determined

Partition Coefficient: n-octanol/water: Not determined
Autoignition Temperature: Non-flammable
Decomposition Temperature: 109°F
Viscosity: Like water
Specific Gravity ASTM D-891**:** 1.01 – 1.03
VOCs: ***Water & fragrance exemption in calculation*

SCAQMD 304-91 / EPA 24:	0 g/L	0 lb/gal	0%
CARB Method 310**:	2.5 g/L	0.021 lb/gal	0.25%
SCAQMD Method 313:	Not tested		

VOC Composite Partial Pressure: Not determined
Relative Density ASTM D-4017**:** 8.34 – 8.42 lb/gal
Solubility: 100% in water

Section 10: STABILITY AND REACTIVITY

Reactivity: Non-reactive.
Chemical Stability: Stable under normal conditions 70°F (21°C) and 14.7 psig (760 mmHg).
Possibility of Hazardous Reactions: None known.
Conditions to Avoid: Excessive heat or cold.
Incompatible Materials: Do not mix with oxidizers, acids, bathroom cleaners, or disinfecting agents.
Hazardous Decomposition Products: Normal products of combustion - CO, CO2.

Section 11: TOXICOLOGICAL INFORMATION

Likely Routes of Exposure:
Inhalation - Overexposure may cause headache.
Skin Contact - Not expected to cause irritation, repeated contact may cause dry skin.
Eye Contact - Not expected to cause irritation.
Ingestion - May cause upset stomach.

Symptoms related to the physical, chemical and toxicological characteristics: no symptoms expected under typical use conditions.
Delayed and immediate effects and or chronic effects from short term exposure: no symptoms expected under typical use conditions.
Delayed and immediate effects and or chronic effects from long term exposure: headache, dry skin, or skin irritation may occur.
Interactive effects: Not known.

Numerical Measures of Toxicity

Acute Toxicity:
Oral LD_{50} (rat) > 5 g/kg body weight
Dermal LD_{50} (rabbit) > 5 g/kg body weight
Calculated via OSHA HCS 2012 / Globally Harmonized System of Classification and Labelling of Chemicals

Skin Corrosion/Irritation: Non-irritant per Dermal Irritection® assay modeling. No animal testing performed.
Eye Damage/Irritation: Minimal irritant per Ocular Irritection® assay modeling. No animal testing performed.
Germ Cell Mutagenicity: Mixture does not classify under this category.
Carcinogenicity: Mixture does not classify under this category.
Reproductive Toxicity: Mixture does not classify under this category.
STOT-Single Exposure: Mixture does not classify under this category.
STOT-Repeated Exposure: Mixture does not classify under this category.
Aspiration Hazard: Mixture does not classify under this category.

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity: Volume of ingredients used does not trigger toxicity classifications under the Globally Harmonized System of Classification and Labelling of Chemicals.
Aquatic: Aquatic Toxicity - Low, based on OECD 201, 202, 203 + Microtox: EC_{50} & IC_{50} ≥100 mg/L. Volume of ingredients used does not trigger toxicity classifications under the Globally Harmonized System of Classification and Labelling of Chemicals.
Terrestrial: Not tested on finished formulation.

Persistence and Degradability: Readily Biodegradable per OCED 301D, Closed Bottle Test
Bioaccumulative Potential: No data available.
Mobility in Soil: No data available.
Other Adverse Effects: No data available.

Section 13: DISPOSAL CONSIDERATIONS

Unused or Used Liquid: May be considered hazardous in your area depending on usage and tonnage of disposal – check with local, regional, and or national regulations for appropriate methods of disposal.

Empty Containers: May be offered for recycling.

Never dispose of used degreasing rinsates into lakes, streams, and open bodies of water or storm drains.

Section 14: TRANSPORT INFORMATION

U.N. Number: Not applicable
U.N. Proper Shipping Name: Cleaning Compound, Liquid NOI
Transport Hazard Class(es): Not applicable
NMFC Number: 48580-3
Packing Group: Not applicable
Class: 55
Environmental Hazards: Marine Pollutant - NO
Transport in Bulk (according to Annex II of MARPOL 73/78 and IBC Code): Unknown.
Special precautions which user needs to be aware of/comply with, in connection with transport or conveyance either within or outside their premises: None known.

U.S. (DOT) / Canadian TDG: Not Regulated for shipping.
ICAO/ IATA: Not classified as Hazardous
IMO / IDMG: Not classified as Hazardous
ADR/RID: Not classified as Hazardous

Section 15: REGULATORY INFORMATION

All components are listed on: TSCA and DSL Inventory.

SARA Title III: Sections 311/312 Hazard Categories – Not applicable.
Sections 313 Superfunds Amendments and Reauthorizations Act of 1986 – Not applicable.
Sections 302 – Not applicable.

Clean Air Act (CAA): Not applicable
Clean Water Act (CWA): Not applicable

State Right To Know Lists: No ingredients listed
California Proposition 65: No ingredients listed
Texas ESL:

Ethoxylated Alcohol	68439-46-3	60 µg/m³ long term	600 µg/m³ short term
Sodium Citrate	68-04-2	5 µg/m³ long term	50 µg/m³ short term
Sodium Carbonate	497-19-8	5 µg/m³ long term	50 µg/m³ short term
Citric Acid	77-92-9	10 µg/m³ long term	100 µg/m³ short term

Section 16: OTHER INFORMATION

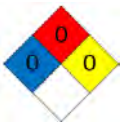
Size	UPC	Size	UPC
2 oz. Pump	043318130366	1 Gallon w/ Dilution Bottle	043318000669
2 oz. Pump	043318131035	1 Gallon	043318000799
4 oz. Pump	043318130014	1 Gallon w/ Dilution Bottle	043318001383
16 oz. Trigger	043318130021	1 Gallon w/ Dilution Bottle	043318002021
22 oz. Trigger	043318130229	1 Gallon	043318130052
24 oz. Trigger, 12 per case	043318000034	1 Gallon w/ Dilution Bottle, 112 per case	043318480140
24 oz. Trigger	043318000300	1 Gallon w/ Dilution Bottle, 4 per case	043318480416
24 oz. Trigger	043318130137	1 Gallon w/ Dilution Bottle, 24 per case	043318480492
32 oz. Trigger	043318000652	1 Gallon w/ laundry	043318002052
32 oz. Trigger	043318130335	1 Gallon w/ towel	043318001222
67.6 oz	043318000393	140 oz.	043318001390
67.6 oz.	043318130144	140 oz., 168 per case	043318561405
1 Gallon w/ Dilution Bottle	043318000539	140 oz. w/ Dilution Bottle	043318001468
1 Gallon w/ Dilution Bottle	043318000645		

USA items listed only. Not all items listed. USA items may not be valid for international sale.

Section 16: OTHER INFORMATION - continued

NFPA:

Health – None
Flammability – Non-flammable
Stability – Stable
Special - None



Acronyms

NTP	National Toxicology Program	IARC	International Agency for Research on Cancer
OSHA	Occupational Safety and Health Administration	CPSC	Consumer Product Safety Commission
TSCA	Toxic Substances Control Act	DSL	Domestic Substances List

Prepared / Revised By: Sunshine Makers, Inc., Regulatory Department.
This SDS has been revised in the following sections: Revised SDS layout

DISCLAIMER: The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

SAFETY DATA SHEET

Hydrogen Chloride

Section 1. Identification

GHS product identifier : Hydrogen Chloride

Chemical name : Hydrogen chloride

Other means of identification :

Product use : Synthetic/Analytical chemistry.

Synonym :

SDS # : 001028

Supplier's details : Airgas USA, LLC and its affiliates
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

24-hour telephone : 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : GASES UNDER PRESSURE - Compressed gas
ACUTE TOXICITY (inhalation) - Category 3
SKIN CORROSION/IRRITATION - Category 1
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : Contains gas under pressure; may explode if heated.
Toxic if inhaled.
Causes severe skin burns and eye damage.
Causes serious eye damage.
May cause respiratory irritation.

Precautionary statements

General : Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction.

Prevention : Wear protective gloves. Wear eye or face protection. Wear protective clothing. Use only outdoors or in a well-ventilated area. Avoid breathing gas. Wash hands thoroughly after handling.

Section 2. Hazards identification

Response : IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. 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 or physician.

Storage : Store locked up. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified : In addition to any other important health or physical hazards, this product may displace oxygen and cause rapid suffocation.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Chemical name : Hydrogen chloride

Other means of identification :

CAS number/other identifiers

CAS number : 7647-01-0

Product code : 001028

Ingredient name	%	CAS number
hydrogen chloride	100	7647-01-0

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Section 4. First aid measures

Eye contact : Causes serious eye damage. Contact with rapidly expanding gas may cause burns or frostbite.

Inhalation : Toxic if inhaled. May cause respiratory irritation.

Skin contact : Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Ingestion : As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:, pain, watering, redness

Inhalation : Adverse symptoms may include the following:, respiratory tract irritation, coughing

Skin contact : Adverse symptoms may include the following:, pain or irritation, redness, blistering may occur

Ingestion : Adverse symptoms may include the following:, stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
halogenated compounds

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

Section 6. Accidental release measures

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Do not breathe gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
hydrogen chloride	**ACGIH TLV (United States, 3/2015).** C: 2 ppm **NIOSH REL (United States, 10/2013).** CEIL: 7 mg/m³ CEIL: 5 ppm **OSHA PEL (United States, 2/2013).** CEIL: 7 mg/m³ CEIL: 5 ppm **OSHA PEL 1989 (United States, 3/1989).** CEIL: 7 mg/m³ CEIL: 5 ppm

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Section 8. Exposure controls/personal protection

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state : Gas. [Liquefied compressed gas.]

Color : Colorless. Yellowish.

Molecular weight : 36.46 g/mole

Molecular formula : Cl-H

Boiling/condensation point : -85°C (-121°F)

Melting/freezing point : -114°C (-173.2°F)

Critical temperature : 51.45°C (124.6°F)

Odor : Pungent.

Odor threshold : Not available.

pH : Not available.

Flash point : [Product does not sustain combustion.]

Burning time : Not applicable.

Burning rate : Not applicable.

Evaporation rate : Not available.

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Not available.

Section 9. Physical and chemical properties

Vapor pressure : 613 (psig)

Vapor density : 1.3 (Air = 1)

Specific Volume (ft ^{3}/lb) : 10.5263

Gas Density (lb/ft ^{3}) : 0.095

Relative density : Not applicable.

Solubility : Soluble in the following materials: cold water.

Solubility in water : Not available.

Partition coefficient: n-octanol/water : 0.25

Auto-ignition temperature : Not available.

Decomposition temperature : Not available.

SADT : Not available.

Viscosity : Not applicable.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
hydrogen chloride	LC50 Inhalation Gas. LC50 Inhalation Gas.	Rat Rat	3124 ppm 1562 ppm	1 hours 4 hours

IDLH : 50 ppm

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
hydrogen chloride	Eyes - Mild irritant Skin - Mild irritant	Rabbit Human	- -	0.5 minutes 5 milligrams 24 hours 4 Percent	- -

Sensitization

Not available.

Mutagenicity

Not available.

Section 11. Toxicological information

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
hydrogen chloride	-	3	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
hydrogen chloride	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye damage. Contact with rapidly expanding gas may cause burns or frostbite.

Inhalation : Toxic if inhaled. May cause respiratory irritation.

Skin contact : Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.

Ingestion : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:, pain, watering, redness

Inhalation : Adverse symptoms may include the following:, respiratory tract irritation, coughing

Skin contact : Adverse symptoms may include the following:, pain or irritation, redness, blistering may occur

Ingestion : Adverse symptoms may include the following:, stomach pains

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Section 11. Toxicological information

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
hydrogen chloride	Acute LC50 240000 µg/l Marine water Acute LC50 282 ppm Fresh water	Crustaceans - Carcinus maenas - Adult Fish - Gambusia affinis - Adult	48 hours 96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
hydrogen chloride	0.25	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

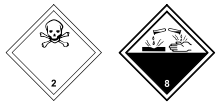
Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1050	UN1050	UN1050	UN1050	UN1050
UN proper shipping name	HYDROGEN CHLORIDE, ANHYDROUS	HYDROGEN CHLORIDE, ANHYDROUS	HYDROGEN CHLORIDE, ANHYDROUS	HYDROGEN CHLORIDE, ANHYDROUS	HYDROGEN CHLORIDE, ANHYDROUS
Transport hazard class(es)	2.3 (8) 	2.3 (8) 	2.3 (8) 	2.3 (8) 	2.3 (8) 
Packing group	-	-	-	-	-
Environment	No.	No.	No.	No.	No.
Additional information	Inhalation hazard zone C **Reportable quantity** 5000 lbs / 2270 kg Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements. **Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: Forbidden. **Cargo aircraft** Quantity limitation: Forbidden. **Special provisions** 3	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2), 2.40-2.42 (Class 8). **Explosive Limit and Limited Quantity Index** 0 **ERAP Index** 25 **Passenger Carrying Ship Index** Forbidden **Passenger Carrying Road or Rail Index** Forbidden **Special provisions** 38	-	-	**Passenger and Cargo Aircraft**Quantity limitation: 0 Forbidden **Cargo Aircraft Only** Quantity limitation: 0 Forbidden

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: Not determined

United States inventory (TSCA 8b): This material is listed or exempted.

Clean Water Act (CWA) 311: Hydrogen chloride

Clean Air Act (CAA) 112 regulated toxic substances: Hydrogen chloride

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Section 15. Regulatory information

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
hydrogen chloride	100	Yes.	500	-	5000	-

SARA 304 RQ : 5000 lbs / 2270 kg

SARA 311/312

Classification : Sudden release of pressure
Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
hydrogen chloride	100	No.	Yes.	No.	Yes.	No.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Hydrogen chloride	7647-01-0	100
Supplier notification	Hydrogen chloride	7647-01-0	100

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : This material is listed.

New York : This material is listed.

New Jersey : This material is listed.

Pennsylvania : This material is listed.

International regulations

International lists

National inventory

Australia : This material is listed or exempted.

Canada : This material is listed or exempted.

China : This material is listed or exempted.

Europe : This material is listed or exempted.

Japan : This material is listed or exempted.

Malaysia : This material is listed or exempted.

New Zealand : This material is listed or exempted.

Philippines : This material is listed or exempted.

Republic of Korea : This material is listed or exempted.

Taiwan : This material is listed or exempted.

Section 15. Regulatory information

Canada

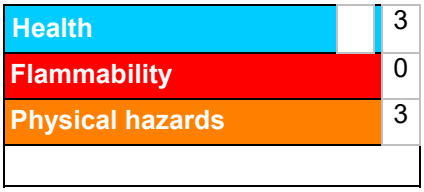
WHMIS (Canada) : Class A: Compressed gas.
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
Class E: Corrosive material

CEPA Toxic substances: This material is not listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Section 16. Other information

Canada Label requirements : Class A: Compressed gas.
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
Class E: Corrosive material

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



Reprinted with permission from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response Copyright ©1997, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association, on the referenced subject which is represented only by the standard in its entirety.

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
Press. Gas Comp. Gas, H280	According to package
Acute Tox. 3, H331	On basis of test data
Skin Corr. 1, H314	Expert judgment
Eye Dam. 1, H318	Expert judgment
STOT SE 3, H335	Expert judgment

History

Date of printing : 6/24/2016

Date of issue/Date of revision : 6/24/2016

Section 16. Other information

Date of previous issue : No previous validation

Version : 0.01

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Hydrochloric Acid, 31 – 36%

Product Name: Hydrochloric Acid, 31 – 36.7%

Identified Uses: acid etching, steel pickling, oil and gas, ore and mineral, food processing, pharmaceutical, organic chemical synthesis

Company Information:
ASHTA Chemicals Inc.
P.O. Box 858
Ashtabula Ohio 44005
Phone: (440) 997-5221
Fax: (440) 998-0286
24-hour Emergency Phone: CHEMTREC: (800) 424-9300

SECTION 2: HAZARDS IDENTIFICATION

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

GHS label elements, including precautionary statements:

Signal Word: **Danger**

Pictogram(s):



Hazard Statements	
H290	May be corrosive to metals.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.

Precautionary Statements	
P234	Keep only in original container.
P261	Avoid breathing dust/ fume/ mist/ vapors/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water. Shower.

P304 + P340 + P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310	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 or doctor/ physician.
P363	Wash contaminated clothing before reuse.
P390	Absorb spillage to prevent material damage.
P403 + P233	Store in a well-ventilated place. Keep container with a resistant inner liner.
P405	Store locked up.
P406	Store in corrosive resistant stainless steel container with a resistant inner liner.
P501	Dispose of contents/ container to an approved waste disposal plant.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms:

CHEMICAL NAME:	Hydrochloric acid
TRADE NAME:	Hydrochloric acid, 31 – 36%
SYNONYMS:	Muriatic acid, Chlorohydric acid, Hydrogen Chloride
C.A.S:	7647-01-0
EC:	231-595-7
WHMIS:	D2A, E
CHEMICAL FORMULA:	HCl (in aqueous solution)
CHEMICAL FAMILY:	Inorganic Acid

SECTION 4 FIRST AID MEASURES

Description of first aid measures:
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. If breathing is difficult, give humidified air. Give oxygen, but only by a certified physician. Consult a physician.

In case of skin contact
Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. 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. Remove contact lenses if present and easy to do. Continue rinsing eyes during transport to medical facility.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth thoroughly with water. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Consult a physician.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point (Method):	Non-combustible.
Extinguishing Media:	Use extinguishing agents compatible with acid and appropriate for the burning material. Use water spray to keep fire-exposed containers cool.
Auto Ignition Temp:	Non-combustible.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus and full protective clothing. In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials.
Unusual Fire/Explosion Hazards:	Releases flammable hydrogen gas when reacting with metals.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions:
Use closed systems when possible. Provide local exhaust ventilation where vapor or mist may be generated. Avoid discharge into drains, water courses or onto the ground.

Containment and Cleaning:
Follow preplanned emergency procedures. Only properly equipped, trained, functional personnel should attempt to contain a leak. All other personnel should be evacuated from the danger area. Using full protective equipment, apply appropriate emergency device or other securement technology to stop the leak if possible.

Small Spill:	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: neutralize the residue with a dilute solution of sodium carbonate.
Large Spill:	Corrosive liquid. Stop leak if without risk. Do not touch spilled material. Use water spray curtain to knock down vapor drift. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that vapor is not present at a concentration level above TLV.

SECTION 7: HANDLING AND STORAGE

Precautions to be taken for handling and storage:
Wear appropriate personal protective equipment. Do not get in eyes, on skin, on clothing. Do not breathe mist or vapor. Observe good industrial hygiene practices. Do not empty into drains. Use caution when combining with water; DO NOT add water to acid, ALWAYS add acid to water while stirring to prevent release of heat, steam and fumes. Store in a well-ventilated place. Store away from incompatible materials. Store closed containers in a clean, cool, open or well ventilated area. Keep out of sun.

SECTION 8: EXPOSURE CONTROL/PERSONAL PROTECTION

Principal Component: Hydrochloric Acid
Occupational Exposure Limits:
Regulatory Limits:

Component	OSHA Final PEL TWA	OSHA Final PEL STEL	OSHA Final PEL Ceiling
Hydrochloric Acid Mixture	---	---	5 ppm 7.59 mg/m^3

ACGIH TLV = 5 ppm (7.59 mg/m^3) TWA

NIOSH IDLH = 50 ppm (as HCl, 2010)

Exposure Controls:

Eye Protection: Tightly fitting safety goggles. Face shield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) 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).

Other 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.

Ventilation Recommended: Exhaust ventilation is required to meet PEL limits.

Glove Type Recommended: Wear neoprene, nitrile, butyl rubber or PVC gloves to prevent exposure.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties:

Appearance	Colorless to light yellow liquid
Odor	Pungent (irritating/strong)
Odor Threshold	0.3ppm (can cause olfactory fatigue)
pH	<1 (in aqueous solution)
Melting point/freezing point	-30°C (-22°F)
Initial boiling point	>100°C (>212°F)
Flash point	Not applicable
Auto-ignition Temp	Not applicable
Evaporation rate	No data available

Decomposition temperature	No data available
Flammability (solid, gas)	Not combustible
Upper/lower flammability or explosive limits	Not combustible
Water solubility	100%
Molecular Weight	36.46
Relative Density (Specific Gravity)	1.16 (32% HCl solution) 1.19 (36.5% HCl solution)
Bulk Density	8.75 lbs/gal (32% HCl solution) 9.83 lbs/gal (36.5% HCl solution)
Vapor Density (air = 1)	1.267 at 20 °C
Vapor Pressure	84 mm Hg @ 20°C
Partition Coefficient: n-octanol/water	No data available

SECTION 10: STABILITY AND REACTIVITY

Stability: Hydrochloric acid is stable under normal conditions and pressures.

Conditions to avoid: Incompatible materials, metals, excess heat, bases.

Incompatibility: Bases, amines, metals, permanganates, (e.g. potassium permanganate), fluorine, metal acetylides, hexalithium disilicide.

Hazardous decomposition products: Hydrogen chloride, chlorine, hydrogen gas.

Polymerization: Hazardous polymerization WILL NOT occur.

SECTION 11: TOXICOGICAL INFORMATION

Information on likely routes of exposure:

Inhalation: Vapors and mist will irritate throat and respiratory system and cause coughing.

Skin contact: Causes skin burns.

Eye contact: Causes eye burns.

Ingestion: Harmful if swallowed. Causes digestive tract burns. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract.

Symptoms related to the physical, chemical and toxicological characteristics:

Contact with this material will cause burns to the skin, eyes and mucous membranes. Permanent eye damage including blindness could result.

Information on toxicological effects:

Acute toxicity: Harmful if swallowed.

Skin corrosion/irritation: Causes severe skin burns and eye damage.

Serious eye damage/eye Irritation: Causes serious eye damage.

Respiratory sensitization: Not available.

Skin sensitization:	No data available.
Germ cell mutagenicity:	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity:	This product is not considered to be a carcinogen by IARC, ACGIH, NTP or OSHA.
Reproductive toxicity:	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure:	May cause respiratory irritation.
Specific target organ toxicity - repeated exposure:	No data available.
Aspiration hazard:	Not available.
Chronic effects:	Prolonged inhalation may be harmful.

Components Species Test Results:
Hydrochloric acid (CAS# 7647-01-0)

Rat - Inhalation LC_{50}:	3124 ppm, (1 hour)
Rabbit - Dermal LD_{50}:	5010 mg/kg

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity:	Because of the low pH of this product, it would be expected produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems.
Aquatic Toxicity:	This material is toxic to fish and aquatic organisms. Most aquatic species do not tolerate pH lower than 5.5 for any extended period.
Fish Toxicity:	Fish LC_{50} Mosquito fish: 282 mg/l, 96 hours Fish LC_{50} Bluegill: 3.6 mg/l, 48 hours
Persistence and degradability:	Not biodegradable. Hydrochloric acid will likely be neutralized to chloride by alkalinity present in natural environment..
Bioaccumulative Potential:	No data available.
Mobility in soil:	Hydrochloric acid will be neutralized by naturally occurring alkalinity. The acid will permeate soil, dissolving some soil material and will then neutralize.
Other adverse effects:	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation

SECTION 13: DISPOSAL CONSIDERATIONS

Collect and reclaim or dispose in sealed containers at a properly licensed waste disposal site. This material , if not neutralized, must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national or international regulations.

SECTION 14: TRANSPORT INFORMATION

Shipping:

Usual Shipping Containers:	Tank cars, bulk tankers.
Usual Shelf Life:	Indefinite (life of containers).
Storage/Transport Temperatures:	Ambient.

Suitable Storage:

Materials/Coatings:	Teflon, Tygon, Rubber, PVC and polypropylene materials.

D.O.T. Information:

Labeling:	Corrosive
D.O.T. Identification Number	UN 1789
D.O.T. Shipping Name:	Hydrochloric Acid
Hazard Class:	8
Packing Group:	II
Hazard Guide:	157
Placard:	UN 1789

SECTION 15 REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:
Hydrochloric Acid CAS#: 7647-01-0

SARA 311/312 Hazards
Acute health hazard, reactive hazard.

Massachusetts Right To Know Components
Hydrochloric Acid CAS#: 7647-01-0
Pennsylvania Right To Know Components
Hydrochloric Acid CAS#: 7647-01-0
New Jersey Right To Know Components
Hydrochloric Acid CAS#: 7647-01-0

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other reproductive harm.

OSHA PSM/RMP Threshold for Accidental Release:
CAS# 7647-01-0 is regulated under OSHA PSM ***only*** if anhydrous HCl.
CAS# 7647-01-0 is regulated under EPA RMP ***only*** if ≥ 37% HCl.

Toxic Substances Control Act (TSCA):
Hydrochloric Acid CAS#: 7647-01-0

Comprehensive Environmental Response Compensation Liability Act: (CERCLA)
Hydrochloric Acid CAS#: 7647-01-0

SECTION 16 OTHER INFORMATION

NFPA Rating:
Health hazard: 3
Fire Hazard: 0
Reactivity Hazard: 1

This information is drawn from recognized sources believed to be reliable. ASHTA Chemicals, Inc. Makes no guarantees or assumes any liability in connection with this information. The user should be aware of changing technology, research, regulations, and analytical procedures that may require changes herein. The above data is supplied upon the condition that persons will evaluate this information and then determine its suitability for their use. Only U.S.A regulations apply to the above.

Version 1.0	For the new GHS SDS Standard	Revision Date: 12/31/2014
Version 1.1	Graphics updated	Revision Date: 3/9/2015
Version 1.2	Title updated	Revision Date: 6/2/2015
Version 1.3	Section 9 changes	Revision Date: 7/30/2015
Version 1.4	Section 1, 15 changes	Revision Date: 4/15/2016

Fisher Scientific

Part of Thermo Fisher Scientific

SAFETY DATA SHEET

Creation Date 12-Mar-2009 **Revision Date** 28-Nov-2016 **Revision Number** 5

1. Identification

Product Name **Nitric acid (65 - 70%)**

Cat No. : **A198C-212, A200-212, A200-212LC, A200-500, A200-500LC, A200-612GAL, A200C-212, A200S-212, A200S-212LC, A200S-500, A200SI-212, A467-1, A467-2, A467-250, A467-500, A483-212; S719721**

Synonyms Azotic acid; Engraver's acid; Aqua fortis

Recommended Use Laboratory chemicals.

Uses advised against No Information available

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Oxidizing liquids	Category 3
Corrosive to metals	Category 1
Skin Corrosion/irritation	Category 1 A
Serious Eye Damage/Eye Irritation	Category 1
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

Label Elements

Signal Word
Danger

Hazard Statements
May intensify fire; oxidizer
May be corrosive to metals
Causes severe skin burns and eye damage
May cause respiratory irritation



Precautionary Statements
Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep/Store away from clothing/ other combustible materials
Take any precaution to avoid mixing with combustibles
Keep only in original container
Response
Immediately call a POISON CENTER or doctor/physician
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Skin
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Ingestion
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting
Fire
In case of fire: Use CO2, dry chemical, or foam for extinction
Spills
Absorb spillage to prevent material damage
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Store in corrosive resistant polypropylene container with a resistant inliner
Store in a dry place
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
None identified

3. Composition / information on ingredients

Component	CAS-No	Weight %
Nitric acid	7697-37-2	65 - 70
Water	7732-18-5	30 - 35

4. First-aid measures

General Advice Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Remove and wash contaminated clothing before re-use. Call a physician immediately.

Inhalation If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Remove from exposure, lie down. Call a physician immediately.

Ingestion Do not induce vomiting. Never give anything by mouth to an unconscious person. Clean mouth with water. Call a physician immediately.

Most important symptoms/effects Causes burns by all exposure routes. Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media CO_2, dry chemical, dry sand, alcohol-resistant foam.

Unsuitable Extinguishing Media No information available

Flash Point Not applicable
Method - No information available

Autoignition Temperature No information available

Explosion Limits
Upper No data available
Lower No data available

Oxidizing Properties Oxidizer

Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors. The product causes burns of eyes, skin and mucous membranes. Oxidizer: Contact with combustible/organic material may cause fire. May ignite combustibles (wood paper, oil, clothing, etc.).

Hazardous Combustion Products
Nitrogen oxides (NOx) Thermal decomposition can lead to release of irritating gases and vapors
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

Health	Flammability	Instability	Physical hazards
4	0	0	OX

6. Accidental release measures

Personal Precautions Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Use personal protective equipment.

Environmental Precautions Should not be released into the environment. Do not flush into surface water or sanitary sewer system. See Section 12 for additional ecological information.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Sweep up and shovel into suitable containers for disposal.

7. Handling and storage

Handling Use only under a chemical fume hood. Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Do not ingest. Do not breathe vapors or spray mist. Keep away from clothing and other combustible materials.

Storage Keep containers tightly closed in a cool, well-ventilated place. Do not store near combustible materials.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Nitric acid	TWA: 2 ppm STEL: 4 ppm	(Vacated) TWA: 2 ppm (Vacated) TWA: 5 mg/m³ (Vacated) STEL: 4 ppm (Vacated) STEL: 10 mg/m³ TWA: 2 ppm TWA: 5 mg/m³	IDLH: 25 ppm TWA: 2 ppm TWA: 5 mg/m³ STEL: 4 ppm STEL: 10 mg/m³

Component	Quebec	Mexico OEL (TWA)	Ontario TWAEV
Nitric acid	TWA: 2 ppm TWA: 5.2 mg/m³ STEL: 4 ppm STEL: 10 mg/m³	TWA: 2 ppm TWA: 5 mg/m³ STEL: 4 ppm STEL: 10 mg/m³	TWA: 2 ppm STEL: 4 ppm

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. Tightly fitting safety goggles. Face-shield.

Skin and body protection Long sleeved clothing.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Keep away from food, drink and animal feeding stuffs. When using, do not eat, drink or smoke. Contaminated work clothing should not be allowed out of the workplace. Provide regular cleaning of equipment, work area and clothing. Avoid contact with skin, eyes and clothing. For environmental protection remove and wash all contaminated protective equipment before re-use. Wear suitable gloves and eye/face protection.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Clear Colorless, Light yellow
Odor	Strong Acrid
Odor Threshold	No information available
pH	< 1.0 (0.1M)
Melting Point/Range	-41 °C / -41.8 °F
Boiling Point/Range	Not applicable
Flash Point	Not applicable

Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	0.94 kPa (20°C)
Vapor Density	No information available
Specific Gravity	1.40
Solubility	miscible
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	HNO3
Molecular Weight	63.02

10. Stability and reactivity

Reactive Hazard Yes

Stability Oxidizer: Contact with combustible/organic material may cause fire.

Conditions to Avoid Incompatible products. Combustible material. Excess heat. Exposure to air or moisture over prolonged periods.

Incompatible Materials Combustible material, Strong bases, Reducing agents, Metals, Powdered metals, Organic materials, Aldehydes, Alcohols, Cyanides, Ammonia, Strong reducing agents

Hazardous Decomposition Products Nitrogen oxides (NOx), Thermal decomposition can lead to release of irritating gases and vapors

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Oral LD50 Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Dermal LD50 Based on ATE data, the classification criteria are not met. ATE > 2000 mg/kg.

Vapor LC50 Based on ATE data, the classification criteria are not met. ATE > 20 mg/l.

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Nitric acid	Not listed	Not listed	LC50 = 2500 ppm. (Rat) 1h
Water	-	Not listed	Not listed

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Causes severe burns by all exposure routes

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Nitric acid	7697-37-2	Not listed	Not listed	Not listed	Not listed	Not listed
Water	7732-18-5	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system
STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. Large amounts will affect pH and harm aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Nitric acid	Not listed	LC50: = 72 mg/L, 96h (Gambusia affinis)	Not listed	Not listed

Persistence and Degradability Miscible with water Persistence is unlikely based on information available.
Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its water solubility.

Component	log Pow
Nitric acid	-2.3

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN2031
Proper Shipping Name NITRIC ACID
Hazard Class 8
Subsidiary Hazard Class 5.1
Packing Group II

TDG

UN-No UN2031
Proper Shipping Name NITRIC ACID
Hazard Class 8
Subsidiary Hazard Class 5.1
Packing Group II

IATA

UN-No UN2031
Proper Shipping Name NITRIC ACID
Hazard Class 8
Subsidiary Hazard Class 5.1
Packing Group II

IMDG/IMO

UN-No	UN2031
Proper Shipping Name	NITRIC ACID
Hazard Class	8
Subsidiary Hazard Class	5.1
Packing Group	II

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Nitric acid	X	X	-	231-714-2	-		X	X	X	X	X
Water	X	X	-	231-791-2	-		X	-	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Nitric acid	7697-37-2	65 - 70	1.0

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	Yes

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Nitric acid	X	1000 lb	-	-

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration

Component	Specifically Regulated Chemicals	Highly Hazardous Chemicals
Nitric acid	-	TQ: 500 lb

CERCLA
This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive

Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Nitric acid	1000 lb	1000 lb

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Nitric acid	X	X	X	X	X
Water	-	-	X	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product contains the following DHS chemicals:

Component	DHS Chemical Facility Anti-Terrorism Standard
Nitric acid	2000 lb STQ

Other International Regulations

Mexico - Grade No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class
C Oxidizing materials
E Corrosive material
D2B Toxic materials



16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 12-Mar-2009
Revision Date 28-Nov-2016
Print Date 28-Nov-2016
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS

Attachment F

Site Orientation

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Attachment F. Site Orientation

URS will conduct a site safety briefing for a person's initial visit to the site. The briefing will be conducted:

- Prior to the start of work;
- For any new URS or subconsultant personnel; and
- At each mobilization, or whenever there is a change in task or significant change in task location.

All personnel working on the project who have received the site briefing (including the HASP review) will sign the Personal Acknowledgement located at the end of the HASP. Visitors may receive a shortened version to address the hazards specific to their visit.

The following items, at minimum, will be discussed during the site safety briefing:

- Contents of this HASP;
- The Emergency Response Plan;
- Contractor SH&E Management expectations;
- Injury management, including notification and hospital and occupational clinic locations;
- The URS 4-Sight program;
- Stop Work authority;
- The THAs (**Attachment B**) for the tasks that will be performed on a given project;
- Types of hazards at the site and means for minimizing exposure to them;
- Instructions for new operations to be conducted, and safe work practices;
- PPE that must be used;
- Lone worker check-in procedures;
- Emergency evacuation routes, muster points, and tornado/storm shelters; and
- Location and use of emergency equipment.

These meetings must be documented and maintained in the project files.

ATTACHMENT 2

GENERIC FIELD ACTIVITY PLAN (FAP)

GENERIC FIELD ACTIVITY PLAN
FOR
WORK ASSIGNMENTS UNDER
CONTRACT D007622
AT
ARTCO INDUSTRIAL LAUNDRIES SITE NO. 828102

Prepared For

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

Prepared By

URS CORPORATION
257 WEST GENESEE STREET, SUITE 400
BUFFALO, NEW YORK 14202

JANUARY 2020

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APPENDICES

Appendix A PFAS Sampling Guidance
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1.0 INTRODUCTION

This Field Activity Plan (FAP) is designed to provide detailed step-by-step procedures for the field activities associated with work activities at the Artco Industrial Laundries Work Assignments (WAs) issued under New York State Department of Environmental Conservation (NYSDEC) Contract D007622. It will serve as the field procedures manual to be strictly followed by all URS Corporation – New York (URS) personnel. Adherence to these procedures will ensure the quality and defensibility of the field data collected. In addition to the field procedures outlined in this document, all personnel performing field activities must do so in compliance with: (1) the appropriate Health and Safety guidelines found in the existing Health and Safety Plan (HASP); (2) the scope of work outlined in the WAs; and (3) the time schedule outlined in the WAs.

2.0 MOBILIZATION

A mobile decontamination trough or temporary decontamination pad will be available at the site to decontaminate equipment used for the subsurface investigations. The decontamination pad will be of sufficient size to allow equipment and materials to be cleaned as needed for the various WA tasks.

Prior to each field phase under the WAs, proposed sampling locations will be staked, labeled and flagged prior to sampling. Utilities in areas designated for intrusive activities will be cleared through Dig Safely New York, at http://www.digsafelynewyork.com. Vehicle access routes to drilling and boring locations shall be determined and cleared prior to any field activities.

If overhead electric is nearby, field staff will coordinate with Rochester Gas and Electric (RG&E) to arrange rubber bumper protection on the overhead wires. The contact number for RG&E is (800) 743-2110.

3.0 SUBSURFACE INVESTIGATION

3.1 General Program

The subsurface investigation programs under the various WAs will provide information that will assist in geologic, geotechnical, hydrogeological and chemical site interpretation. Proposed investigation locations are described in the WAs. Typical field procedures for the various activities are described below. When sampling for per and polyfluoroalkyl substances (PFAS), see Appendix A for special field procedures.

3.2 Surface Soil Sampling

Summary: If areas of exposed surface soil are present, representative soil samples will be collected for chemical analysis of the target compounds.

Procedure:

1. Remove any vegetation and the upper two inches of soil.
2. Using a disposable or decontaminated trowel, excavate soils down to a maximum depth of six inches and place the soil in a decontaminated steel bowl. Collect a sufficient quantity of soil as needed for the intended chemical analyses.
3. Place the desired quantity of soil for the volatile organic compound (VOC) analysis directly into the appropriate laboratory-supplied container.
4. Homogenize the remaining soil and place in the appropriate laboratory-supplied containers.
5. All sample bottles will be labeled in the field using a waterproof permanent marker.
6. Surface soil samples will be placed on ice and shipped overnight to the laboratory under chain of custody (COC) control.

3.3 Soil Probe Sampling and Soil Vapor Screening

Summary: If areas of exposed surface soil are present, representative soil samples will be collected for chemical analysis of the target compounds.

Procedure:

1. Soil samples and soil vapor will be screened with a Photoionization/Flame Ionization

Detector (PID/FID). Soil vapor will also be screened with a PID that reads down to the parts per billion level (e.g., ppbRae) if PID/FID readings are non-detect.

2. The following steps summarize the procedure to conduct soil probe sampling and soil vapor screening:
3. At a select location where bare concrete or asphalt is available, drill a 1-inch diameter hole though the thickness of the slab.
4. Upon completion of the drilling, insert the soil probe down to approximately 2 feet bgs.
5. Retrieve the soil probe and screen the soil with a PID/FID for organic vapors.
6. The recovered soil will be visually identified and classified using the Unified Soil Classification System (USCS) as described in Sections 3.11.1 and 3.11.2.
7. At approximately half the probe locations a soil sample will be collected for laboratory analysis based on the screening results.
8. Once the soil has been sampled, insert a 1/4-inch OD by 1/8-inch ID Teflon tube into the probe hole.
9. Seal the annular space between the 1-inch hole and the Teflon tubing with white Sculpey Brand modeling clay (or equivalent). Bring the clay above the surface and around the tubing in a volcano-like shape.
10. Purge the sampling tube by connecting the Teflon tubing to the inlet of a personal air-sampling pump (i.e., GilAir Plus, etc.) with 3/8-inch OD silicone tubing, and connecting a 1-liter (L) Tedlar bag to the outlet of the pump with silicone tubing. Purge approximately one liter (1L) of gas from the subsurface probe into the Tedlar bag, using the air-sampling pump. Analyze the 1L Tedlar bag containing the purged air with a PID/FID and ppbRae (non-detect on the PID/FID) for VOCs.
11. Remove Teflon tubing, backfill the hole with unused soil and bentonite chips, and seal the hole with a hydraulic cement patch.

3.4 Test Pit Excavation

Summary: Test pits allow for visual inspection and sample collection directly from the subsurface. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Decontaminate backhoe bucket prior to excavation.
2. Maneuver backhoe into position.
3. Remove subsurface materials in 1-foot lifts. Conduct continuous air monitoring with appropriate air monitoring equipment as indicated in the HASP. Screen soil with photoionization detector (PID) and place excavated soil on plastic sheeting adjacent to test pit.

4. Upon completion of test pit, visually inspect the soil horizons for discoloration, perched water zones or staining and photo document the test pit.
5. Record the following information in the fieldbook for each test pit:
    - The total length and width of the excavation
    - The depth and thickness of distinct soil or lithologic units
    - A lithologic description of each unit
    - A description of any man-made materials or apparent impacted soil encountered.
    - A Test Pit Log sheet will be completed for each test pit (Appendix B).
6. Collect necessary soil samples. The excavator will collect a sample from a specific horizon and bring the sample to the ground surface. No personnel will enter the excavation to collect samples. The sampler will remove approximately 2 inches of soil from the outside of the soil sample prior to collecting the sample to prevent cross contamination of the sample.
7. Soil samples will be placed on ice and shipped overnight to the laboratory under COC control.
8. The test pit will be backfilled with excavated material immediately after the required information has been recorded and the samples collected. The first soils out should be the last soils in when filling the test pit. Soils will be compacted in 1-foot lifts using the excavator bucket. No test pits will be left open overnight.
9. Decontaminate sampling equipment and excavator bucket.

3.5 Vac-Tron® Utility Clearance

Summary: Excavation with a Vac-Tron® unit allows for excavation near subsurface utilities with reduced chance of impacting the utilities.

Procedure:

1. Excavate a two-foot square by approximately five-foot deep area manually using post-hole diggers, pry bars, soil knifes, and/or hand digging, along with the Vac-Tron® unit.
2. After the location is cleared for drilling, the hole will be backfilled flush with the sidewalk using the excavated spoils (small rocks and debris removed) and if necessary, temporarily patched with blacktop patch or concrete.
3. Excavated material not returned to the hole will be drummed along with the monitoring well boring spoils for proper disposal.

3.6 Hollow-Stem Auger Drilling Procedures

Summary: A standard method of subsurface drilling which enables the recovery of representative subsurface samples for identification and laboratory testing. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Hollow stem augers (HSAs), drill rods, and the drill rig will be thoroughly decontaminated prior to initial borehole installation and between each borehole at the centralized decontamination area. All decontamination liquids will be collected and placed in DOT-approved 55-gallon drums.
2. The drill rig will be inspected for oil leaks and any leaks reported prior to starting drilling operations.
3. Advance the boring by rotating and advancing the HSAs to the desired depth. The borings will be advanced incrementally to permit continuous or intermittent subsurface soil sampling, as required.
4. Remove center plug from the HSAs and collect a split spoon sample per the method stipulated by the project geologist or hydrogeologist.

References: American Society for Testing and Materials (ASTM) *Standard Practice for Soil Exploration and Sampling by Auger Borings* D1452/D1452M-16, and *Standard Test Method for Standard Penetration Test (SPT) and Split Barrel Sampling of Soils* D1586-11.

3.7 Rotosonic Drilling Procedures

Summary: Rotosonic Drilling (aka. Sonic Drilling, Rotosonic, Rotary Sonic, Sonicore or Resonant Sonic Drilling) is a subsurface drilling method that employs the use of high frequency mechanical vibrations to take continuous core samples of overburden and most bedrock formations using a dual cased drill string. Rotosonic drilling is also used to advance casing in the ground for the installation of monitoring wells and other purposes. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Core barrel and outer casing will be decontaminated prior to advancing boreholes.
2. The core barrel (core barrels are typically 5, 10 or 20 feet in length) is attached to the drill

head. The boring is advanced by rotating the core barrel incrementally to the desired depth. The borings will be advanced incrementally to permit continuous subsurface soil sampling.

3. Once the core barrel is driven to its incremental depth (i.e., 5, 10 or 20 feet), the drill head is disconnected from the core barrel and connected to the outer casing. The outer casing is then driven down over the core barrel. Note: A small amount of water may be used during the driving of the outer casing to flush materials from the annular space between the core barrel and the outer casing.
4. The drill head is disconnected from the outer casing and reattached to the core barrel. The core barrel is brought to the surface and a clear polyethylene tube is attached to the end of the core barrel. The drive head is vibrated which extrudes the soil sample into the polyethylene tube.
5. The core barrel is reinserted into the outer casing and the boring is advanced to the desired depth by repeating Steps 2 through 4.
6. Split the sample lengthwise and screen the soil with a PID for volatile organic vapors
7. Document all properties and sample locations in the field notebook, and later on the Boring Log form (Appendix B).

Reference: ASTM *Standard Practice for Sonic Drilling for Site Characterization and the Installation of Subsurface Monitoring Devices* D6914/D6914M-16.

3.8 NX-Rock Coring Procedures

Summary: NX-Coring is a standard method of subsurface drilling which enables the recovery of bedrock cores for identification. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Advance the boring into the bedrock by core drilling using an NX-size, double-tube, swivel-type core barrel. Continue drilling until core blockage occurs or until the net length of the core barrel has been drilled.
2. Remove the core barrel from the hole and disassemble it as necessary to remove the core. Reassemble the core barrel and return it to the hole. Resume coring.
3. Place recovered core in the core box with the upper (surface) end of the core at the upper-left corner of the core box. Fit fractured, bedded, or jointed pieces of core together as they naturally occurred.
4. Label core box with borehole ID, date, time, and depth interval of core.
5. The following observations will be recorded from the rock core:
   a) Core recovery percent
   b) Color
   c) Rock classification

d) Rock hardness

e) Rock fractures, including descriptions of natural breaks

f) Rock Quality Designation (RQD)

$$RQD = \frac{\text{Sum of core lengths} > 4"}{\text{Total length of core run}} \times 100\%$$

Reference: ASTM *Standard Practice for Rock Core Drilling and Sampling of Rock for Site Exploration* D2113-14.

3.9 Wash/Mud Rotary Drilling Procedures

Summary: Wash/mud rotary drilling is a method of subsurface drilling wherein a drilling fluid (water or drill mud) is circulated through the drill string and drill bit, and up through HSAs or casing, if present, to flush cuttings out of the borehole and lubricate drilling tools. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Connect drilling water supply pump to drill string.
2. Advance the boring by spinning the drill bit the desired distance into the subsurface.
3. Use a recirculating system to collect and separate cuttings rising out of the borehole.
4. Note rate of drilling and volume of water/mud lost down the borehole.

Reference: ASTM *Standard Guide for Use of Direct Rotary Drilling with Water-Based Drilling Fluid for Geoenvironmental Exploration and the Installation of Subsurface Water-Quality Monitoring Devices* D5783-18.

3.10 Air Rotary Drilling Procedures

Summary: Air rotary drilling is a method of subsurface drilling wherein compressed air is circulated through the drill string and drill bit, and up through HSAs or casing, if present, to flush cuttings out of the borehole and lubricate drilling tools. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Connect air compressor discharge hose to drill string.
2. Advance the boring by spinning the drill bit the desired distance into the subsurface.
3. Use a cyclone system to collect and containerize cuttings rising out of the borehole.
4. Note rate of drilling down the borehole.

Reference: ASTM *Standard Guide for Use of Direct Air-Rotary Drilling for Geoenvironmental Exploration and the Installation of Subsurface Water-Quality Monitoring Devices* D5782-95.

3.11 Split-Spoon Sampling Procedures

Summary: Split-spoon sampling is a standard method of soil sampling to obtain representative samples for identification and laboratory testing as well as to serve as a measure of resistance of soil to sampler penetration. Split-spoon samples will be collected during boring advancement at continuous 2 foot intervals. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Measure the sampling equipment lengths to ensure that they conform to specifications. Confirm the weight of the hammer (140 pounds.).
2. Clean out the HSAs to the bottom depth prior to sampling. Select additional components as required (i.e., leaf spring core retainer for clays or a sand trap for non-cohesive sands).
3. Lower the decontaminated 2-inch outside diameter (O.D.) split-spoon to the bottom of the HSAs and check the depth against length of the rods and the split-spoon.
4. Attach the drive head and hammer to the drill rods without the weight of the hammer resting on the rods.
5. Lower the weight and allow the split-spoon to settle up to 6 inches below the bottom of the HSAs. If it settles more, consider use of another type of sampler.
6. Mark four 6-inch intervals on the drill rods relative to a drive reference point on the rig. With the split-spoon resting on the bottom of the hole, drive the split-spoon with the 140-pound hammer falling freely over its 30-inch fall until 24 inches have been penetrated or 50 blows have applied in any 6-inch interval.
7. Record the number of blows required to drive the split-spoon 6 inches into the overburden. Determine the "N" value by adding the blows for the 6-to 12-inch and 12-to 18-inch interval of each sample attempt.
8. After penetration is complete, remove the split-spoon sampler.

9. Open the split-spoon to determine the percent recovery, and describe the soil.
10. Split the sample lengthwise and screen the soil with a PID for volatile organic vapors.
11. Document all properties and sample locations in the field notebook, and later on the Boring Log form (Appendix B).

Reference: ASTM *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils* D1586-18.

3.11.1 Unified Soil Classification System

Soils are classified for engineering purposes according to the Unified Soil Classification System (USCS) adopted by the U.S. Army Corps of Engineers and U.S. Department of the Interior Bureau of Reclamation. Soil properties that form the basis for the USCS are:

- Percentage of gravel, sand, and fines;
- Shape of the grain-size distribution curve; and
- Plasticity and compressibility characteristics.

According to this system, all soils are divided into three major groups: coarse-grained, fine-grained, and highly-organic (peaty). The boundary between coarse-grained and fine-grained soils is taken to be the 200-mesh sieve (0.074 mm). In the field the distinction is based on whether the individual particles can be seen with the unaided eye. If more than 50% of the soil by weight is judged to consist of grains that can be distinguished separately, the soil is considered to be coarse-grained.

The coarse-grained soils are divided into gravelly (G) or sandy (S) soils, depending on whether more or less than 50% of the visible grains are larger than the No. 4 sieve (3/16 inch). They are each divided further into four groups:

W: Well graded; fairly clean (<5% finer than 0.074 mm)

P: Poorly graded (gap-graded); fairly clean (<5% finer than 0.074mm)

C: Clayey (>12% finer than 0.074mm); plastic (clayey) fines. Fine fraction above the A-line with plasticity index above 7.

M: Silty (>12% finer than 0.074 mm); non-plastic or silty fines. Fine fraction below the A-line and plasticity index below 4.

The soils are represented by symbols such as GW or SP. Borderline materials are represented by a double symbol, as GW-GC.

The fine-grained soils are divided into three groups: inorganic silts (M), inorganic clays (C), and organic silts and clays (O). The soils are further divided into those having liquid limits lower than 50% (L), or higher than 50% (H).

The distinction between the inorganic clays (C), the inorganic silts (M), and organic soils (O) is made on the basis of a modified plasticity chart. Soils CH and CL are represented by points above the A-line, whereas soils OH, OL, and MH correspond to positions below the A-line. Soils ML, except for a few clayey fine sands, are also represented by points below the A-line. The organic soils O are distinguished from the inorganic soils M and C by their characteristic odor and dark color.

Reference: ASTM *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)* D2487-17.

3.11.2 Visual Identification

Soil samples collected during boring advancement will be visually identified. Soil properties required to define the USCS classification of a soil and other observed characteristics normally identified in describing a soil are defined below:

a. Color
b. Moisture conditions
c. Grain size
    (1) Estimated maximum grain size
    (2) Estimated percent by weight of fines (material passing No. 200 sieve)
d. Gradation
e. Grain shape
f. Plasticity
g. Predominant soil type
h. Secondary components of soil

i. Classification symbol

j. Other features such as:

- organic, chemical, or metallic content;
- compactness;
- consistency;
- cohesiveness near plastic limit;
- dry strength; and
- source - residual, or transported (aeolian, water borne, glacial deposit, etc.)

Reference: ASTM *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)* D2488-17.

3.12 Shelby Tube Sampling Procedures

Summary: Shelby (thin-wall) tube sampling is commonly used in cohesive soils (where split-spoon sampling results in an "N" value less than 15) to obtain relatively undisturbed samples. The thin-walled tube accepts the least frictional resistance as the soil moves up into the sampler. The sampler is advanced in a continuous and rapid motion without twisting on impact.

Procedure:

1. Clean borehole to the required sampling depth, using care not to disturb the material to be sampled during the cleaning process.
2. Prepare the sampler for use, verifying that the tube is round, smooth, not dented or scratched, rust-free, and that the cutting edge has been honed to proper dimensions.
3. Record dimensions of the sampler. Note that the length and diameter of the sampler can be varied depending on soil conditions.
4. Lower the sampler on the drill rods to the bottom of the hole.
5. Make a reference point on the drilling rig and measure a length on the rods equivalent to the sample tube length, minus 10% (this allows for slough in the hole).
6. Raise the water level in the hole to ground surface or above, if practical (this step likely may be omitted).
7. Push the sampler the required distance into the soil with continuous motion of consistent weight.
8. If the sampler cannot be advanced by pushing, note the length advanced and stop sampling.

9. Rotate the rods three revolutions, using a wrench to shear the sample. Allow the sampler to sit undisturbed for five minutes.
10. Withdraw the sampler slowly and pull rods evenly to retrieve the sample. Measure sample length and calculate recovery.
11. Clean out the rod end of the tube and discard disturbed slough. Trim cutting edge of the sampler. Use the cuttings for onsite description and, if required, a moisture content sample.
12. If sample length is recessed from either end, insert plug and seal with wax. If the tube is full, seal ends with caps and/or wax the ends, including the caps if possible.
13. Label the sample container and prepare sample for shipping and/or storage.
14. Store and transport sample(s) in an upright position.

Reference: ASTM *Standard Practice for Thin-Walled Tube Sampling of Fine-Grained Soils for Geotechnical Purposes* D1587/D1587M-15.

3.13 Direct Push Groundwater Sampling

Summary: A standard method of subsurface boring which enables the recovery of representative subsurface samples for groundwater screening. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. A Screen Point Sampler 15 (SP15) groundwater sampler, or an equivalent unit, will be utilized to collect groundwater samples in direct push borings that intercept the groundwater table.
2. To collect groundwater samples, a clean sampler will be threaded onto the leading end of the probe rod and lowered or driven to the desired sampling interval (approximately 1 foot below the top of the water table). While the sampler is driven to depth, O-ring seals at the drive head and expendable drive point will provide a watertight system.
3. Once at the desired sampling depth, chase rods will be sent down-hole until the leading rod contacts the bottom of the sampler screen. The tool string will then be retracted while the screen is held in place by the chase rods. As the tool string is retracted, the expendable point is released from the sampler sheath. An O-ring on the screen head maintains the seal at the top of the screen. As a result, any liquid entering the sampler during screen deployment must first pass through the screen.
4. The tool string and sheath may be retracted the full length of the screen or as little as a few inches if a small sampling interval is desired. The SP15 Sampler utilizes a screen with a standard slot size of 0.004 inches and an exposed length of 41 inches.

5. A minimum of 1 gallon of water will be purged from the sampler prior to sample collection with dedicated Teflon or polyethylene tubing of laboratory or food grade quality, and a check valve. The groundwater sample will be collected with dedicated Teflon or polyethylene tubing of laboratory or food grade quality, and a check valve.
6. Groundwater samples will be placed on ice and shipped to the laboratory under COC for analysis.
7. Upon the completion of the sampling, the sampler will be removed and the borehole will be backfilled with bentonite pellets and the surface will be repaired with similar material (i.e., concrete, asphalt or topsoil); and marked with spray paint.

Reference: ASTM *Standard Guide for Direct-Push Groundwater Sampling for Environmental Site Characterization* D6001-05(2012).

3.14 Direct-Push Soil Sampling

Summary: A standard method of subsurface boring using hydraulically powered (static force plus percussion) soil-probing equipment that enables the recovery of representative subsurface samples for identification and laboratory testing. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Inspect the sampling equipment to ensure proper working condition.
2. Insert dedicated disposable acetate liner into the sampler and select additional components for the sampler as required (i.e., leaf spring core retainer for clays, or a sand trap for non-cohesive sands).
3. Lower the sampler to the ground surface, or bottom of the hole previously made by the sampler, and check the depth against length of the rods and the sampler.
4. Attach the drive head assembly to the sample rods.
5. Push the sampler in increments up to 5 feet into the subsurface up to the desired depth with a hydraulic press.
6. Rotate the sampling rods clockwise and remove the sampler.
7. Split the sample lengthwise and screen the soil with a PID for volatile organic vapors.
8. Document all properties and sample locations in the field notebook, and later on the Direct-Push Log form (Appendix B).
9. Abandon the direct-push boring by backfilling with bentonite pellets and hydrate with potable water or use concrete patch in impervious areas.

Reference: ASTM *Standard Guide for Direct Push Soil Sampling for Environmental Site Characterizations* D6282/D6282M-14.

3.14.1 Remote Direct-Push Soil Sampling

Summary: Standard equipment used for remote direct push sampling is the 420M Geoprobe® (or similar unit). This is a light weight and durable limited access machine designed to be deployed to hard-to-reach or limited access sampling locations. The machine is powered by a remote hydraulic source which is connected through auxiliary hydraulics. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Read and understand all safety, maintenance and operations instructions regarding this machine before beginning operations.
2. Maneuver the probe unit to place the probe foot near the desired probing location.
3. Position the power source near the unit leaving sufficient distance so as not to be in the way of probing activities.
4. The probe unit is intended for operations on level surfaces. Do not use on slopes greater than 2 degrees due to decreased stability.
5. Connect hydraulic hoses to probe unit and power source.
6. Start the engine of the hydraulic power source to allow engine and hydraulics to warm sufficiently and ensure there is adequate ventilation for exhaust fumes.
7. Make sure everyone is clear of any moving parts before engaging the hydraulics of the probe unit. Check the emergency stop button for proper operation. If the emergency stop button doesn't work, cease operations.
8. Anchor the probe derrick to floor or ground surface as needed based on conditions.
9. Insert dedicated disposable acetate liner into the sampler and select additional components for the sampler as required (i.e., leaf spring core retainer for clays, or a sand trap for non-cohesive sands).
10. Lower the sampler to the ground surface, or bottom of the hole previously made by the sampler, and check the depth against length of the rods and the sampler.
11. Attach the drive head assembly to the sample rods.
12. Push the sampler in increments up to 5 feet into the subsurface up to the desired depth with a hydraulic press.
13. Rotate the sampling rods clockwise and remove the sampler. Split the sample lengthwise and screen the soil with a PID for volatile organic vapors.
14. Document all properties and sample locations in the field notebook, and later on the Direct-Push Log form (Appendix B).
15. Abandon the direct-push boring by backfilling with bentonite pellets and hydrate with potable

water or use concrete patch in impervious areas.

Reference: ASTM *Standard Guide for Direct Push Soil Sampling for Environmental Site Characterizations* D6282/D6282M-14.

3.15 Bucket Auger Sampling

Summary: A standard method of shallow subsurface boring using a bucket auger that enables the recovery of representative subsurface samples for identification and laboratory testing. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Remove stones, vegetation, debris etc. from the ground surface in the sampling area.
2. Lay a section of plastic sheet adjacent to the soil sampling location.
3. Use a clean (decontaminated) bucket auger, required extension rods and "T" handle to collect a soil sample from the desired depth.
4. Monitor VOCs in the ambient air during soil collection.
5. Turn the auger in a clockwise direction with the "T" handle to remove soil until the desired soil sampling depth is reached. Place the excavated soil on the adjacent plastic. If possible lay out the cuttings in stratigraphic order.
6. During auger advancement record observations made of the geologic features of the soil.
7. Stop advancing the auger when the top of the specified sampling depth has been reached. Decontaminate the auger.
8. Insert the auger into the borehole to the sample depth and collect the sample. Place sample on ice and ship overnight to the lab under COC custody.
9. Decontaminate the auger bucket and complete the preceding steps for sample collection from deeper depths.
10. When sampling is complete, place cuttings back in the borehole in the order in which they were removed if possible. Top off with hydrated bentonite pellets.

Reference: ASTM *Standard Practice for Sampling Soils and Contaminated Media with Hand-Operated Bucket Augers* D6907-05(2016).

3.16 Soil Vapor Implant Installation

Summary: A method for construction of soil vapor implants within unconsolidated material, which enables acquisition of soil vapor samples for laboratory testing. The soil vapor implants

will be installed using the procedures described below.

Procedure:

1. Implants shall be 6 inches in length (e. g., Geoprobe® AT86 series) and are to be constructed of double woven stainless steel wire screen. Implants shall have a pore diameter of 0.0057 inch, which is equivalent to a 0.007 slot well screen. The bottom of the implants must have a post run tubing (PRT) style thread; the same fitting style used with Geoprobe® PRT vapor sampling tools. The top connection with the Teflon or polyethylene tubing shall be stainless steel Swagelok® or clamp fitting to prevent leakage during sample collection. The connection to the sampling Summa® canister shall be made through the use of 1/8th inch ID Teflon or polyethylene tubing.
2. Once the rods have been advanced to the desired depth, attach appropriate tubing to the implant to be installed. **Allow at least 48 inches of tubing length longer than the required depth of the implant.** Cover or plug the end of the tubing.
3. Remove the pull cap from the rods and lower the implant and tubing down inside the diameter of the rods until the implant hits the top of the Anchor/Drive Point. Note the length of the tubing to ensure proper depth has been reached.
4. Rotate tubing counterclockwise while exerting a gentle downward force to engage the PRT threads. Pull up on the tubing lightly to test the connection. DO NOT cut excess tubing.
5. Position a probe rod pull plate or manual probe rod jack on the top of the probe rod. Exert downward pressure on the tubing while pulling the probe rods up. Pull up about 12 inches.
6. Thread excess tubing through the bottom of a funnel and position funnel over top of probe rod. The funnel will be used to facilitate installation of sand into the borehole around the screened portion of the implant.
7. Pour sand into the funnel and down the inside diameter of the probe rods around the outside of the tubing and around the screen of the implant. Use tubing to "stir" sand into place. [NOTE: sand and bentonite can only be installed in the vadose zone (unsaturated zone above the water table)].
8. Lift up an additional 18 to 24 inches and insert a bentonite slurry above beads or sand.
9. Pull remaining rods out of the hole and complete with bentonite slurry.
10. Cut any excess tubing to allow approximately 8 to 12 inches to extend above the ground surface. Plug the tubing with a cap or plug.
11. Install a protective casing (road box) over the tubing and set it into concrete.
12. Document well construction in the field notebook and later on a Soil Vapor Implant Construction Detail diagram (Appendix B).

Reference: ASTM *Standard Practice for Active Soil Gas Sampling in the Vadose Zone for Vapor Intrusion Evaluations.* D7663-12(2018).

3.17 Soil Vapor Implant Sampling

Summary: The soil vapor implants will not be sampled until a minimum of 24-hours after installation has passed. To collect representative soil vapor samples, soil vapor implant tubing must be adequately sealed to prevent ambient air from being sampled. A helium tracer gas will be used to verify the integrity of the soil vapor implant seal. The soil vapor implants must be purged prior to sampling. Sampling should commence immediately after purging.

Procedure:

1. Inspect the existing tubing. Check for any signs of cracks, clogging or any other characteristics that may impact the collection of a representative sample.
2. Apply a bentonite slurry to the ground surface in an approximate 2-ft diameter circle. Place an approximately 2 ft. by 2 ft. square of plastic sheeting over the bentonite slurry. Poke a hole, only as large as needed for the sampling tube to penetrate the plastic. Seal the plastic sheeting/tube interface with a small amount of bentonite slurry.
3. Place an enclosure over the well head, run well tubing through in the top outlet. Use plumber's putty to seal the interface between the tubing and the top of the enclosure.
4. Seal enclosure at the ground surface with a bentonite slurry.
5. Connect helium (99.999%) cylinder to side port of enclosure.
6. Release enough helium to displace any ambient air in enclosure. Continue flushing the inside of the enclosure with helium gas.
7. Connect the tubing to the vacuum pump. Use only new Teflon or HDPE tubing if needed for length and new silicone tubing for leak free unions. Do not reuse any tubing between sample locations.
8. Purge the soil vapor implant; remove one to three volumes of soil vapor. Flow rates for purging and sampling must not exceed 0.2 liters per minute (L/min) to minimize outdoor air infiltration during purging/sampling. Record start and stop time on the Summa Canister Sampling Field Data Sheet (Appendix B). Verify air is being drawn from the monitoring well by placing finger on the vacuum pump outlet tube to check for positive pressure. Helium cylinder should be open during the purge time, enough to cause a positive pressure within the enclosure.
9. After purging completed, disconnect the vacuum pump from the tubing.
10. Connect the Mark Helium Detector (Model 9822) to soil vapor implant tubing. Obtain readings. Absence of helium (< 10%) assures that the implant seal is competent and ambient air is not entering the soil vapor implant.

Using Flow Controllers Without a Built in Pressure Gauge:

1. Attach the pressure gauge provided by the laboratory to the Summa® canister, open valve completely, record reading on the Summa Canister Sampling Field Data Sheet (Appendix B), close valve completely, and remove the pressure gauge. If the canister does not show an

initial vacuum of approximately 25 inches of mercury (in. Hg), do not use. Record the canister's serial number on the Summa Canister Sampling Field Data Sheet. Assign sample identification to the canister identification tag and record on the COC (Appendix B), and the Summa Canister Sampling Field Data Sheet.

2. Attach flow controller provided by the laboratory to the Summa® canister inlet (one for each Summa® canister). **Do not reuse flow controllers between locations**. Each flow controller is pre-set by the laboratory to collect the sample over a one hour period.
3. Attach tubing from the soil vapor implant to the flow controller on the Summa® canister. All tubing used in this step should be the same tubing that was used in the purging process.
4. Open canister valve to initiate sample collection and record start time and date on the canister identification tag and on the Summa Canister Sampling Field Data Sheet.
5. The helium cylinder should remain open during sampling set-up to cause a positive pressure in the enclosure. Because of the one-hour sampling time, more than one location may be sampled at the same time (with staggered starting times). When you are ready to move onto the next location, stop the flow of the helium with the valve on the regulator, and seal ports on the enclosure to maintain the helium atmosphere within the enclosure.
6. After one hour, close the Summa® canister valve completely. Record the time on the Summa Canister Sampling Field Data Sheet.
7. Disconnect tubing.
8. Remove the flow controller, attach the pressure gauge to the Summa® canister, open valve completely, record reading, close valve completely, and remove the pressure gauge. Record the pressure reading on the Summa Canister Sampling Field Data Sheet. There should still be a slight vacuum in the Summa® canister. If no vacuum remains in the canister, do not send the canister for analysis. Retake the sample using the same procedure with a fresh canister.
9. If the canister does not show a significant net loss in vacuum after sampling, evaluate and document the problem. If necessary, use another Summa® canister to recollect the sample and **contact the project manager immediately**.
10. Connect the helium detector to soil vapor implant tubing. Obtain and record reading. Absence of helium (< 10%) assures that the conduit seal is competent and ambient air is not entering the soil vapor implant.
11. Ship canister standard overnight, with COC to the laboratory for analyses by USEPA Method TO-15 for VOCs with a minimum-reporting limit of 1 $\mu g/m^3$.

<u>Using Flow Controllers With a Built in Pressure Gauge:</u>

1. Attach the flow controller provided by the laboratory to the Summa® canister inlet (you must have one for each canister). **Do not reuse flow controllers** between locations. Each flow controller is pre-set by the laboratory to collect the sample over a one hour period. Record the canister's serial number on the Summa Canister Sampling Field Data Sheet. Assign sample identification to the canister identification tag and record on the COC and the Summa Canister Sampling Field Data Sheet.

2. Attach tubing from the soil vapor implant to the flow controller on the Summa® canister. All tubing used in this step should be the same tubing that was used in the purging process.
3. Open Summa® canister valve completely and record the time and pressure on the Summa Canister Sampling Field Data Sheet. If the canister does not show an initial vacuum of approximately 25 in. Hg, do not use.
4. The helium cylinder should remain open during sampling set-up to cause a positive pressure in the enclosure. Because of the one hour sampling time, more than one location may be sampled at the same time (with staggered starting times). When you are ready to move onto the next location, stop the flow of the helium with the valve on the regulator, and seal ports on the enclosure to maintain the helium atmosphere within the enclosure.
5. After one hour, close the Summa® canister valve completely and record the time and pressure on the Summa Canister Sampling Field Data Sheet. There should still be a slight vacuum in the Summa® canister. If no vacuum remains in the canister, do not send the canister for analysis. Retake the sample using the same procedure with a fresh canister.
6. If the canister does not show a significant net loss in vacuum after sampling, evaluate and document the problem. If necessary, use another Summa® canister to recollect the sample and **contact the project manager immediately**.
7. Connect the helium detector to soil-gas conduit tubing. Obtain and record readings. Absence of helium (< 10%) assures that the conduit seal is competent and ambient air is not entering the soil-gas conduit.
8. Disconnect tubing.

Reference: ASTM *Standard Practice for Active Soil Gas Sampling in the Vadose Zone for Vapor Intrusion Evaluations.* D7663-12(2018).

3.18 Soil Vapor Implant Decommissioning Procedures

Procedure:

At each location the following will occur:

1. The soil vapor implant will be removed;
2. The flush-mount protective casing will be backfilled with concrete; and,
3. The concrete filled flush-mount protective casing will be removed during sidewalk flag replacement (See Section 3.30).

3.19 Disposal of Drill Cuttings and Soil Boring Spoils

Summary: Disposal of boring spoils will be performed in accordance with New York State

Department of Environmental Conservation Technical and Administrative Guidance Memorandum (TAGM) HWR-89-4032, November 21, 1989.

Procedure:

1. Spoils will be stored on site in 1A2 open head 55-gallon steel drums.
2. These drums will be addressed in accordance with the protocols outlined in Section 3.31.

3.20 Groundwater Monitoring Well Construction Procedures

3.20.1 Overburden Monitoring Well Construction Procedures

Summary: A method for construction of groundwater monitoring wells within unconsolidated material, which enables monitoring of groundwater elevation and acquisition of groundwater samples for laboratory testing. The groundwater monitoring wells and piezometers will be installed during this investigation using the procedures described below.

Procedure:

1. Advance subsurface boring to the desired depth by means of hollow-stem auger drilling.
2. While boring, collect split spoon samples on a continuous basis to geologically log the boring.
3. Remove center plug from augers and verify borehole depth using weighted measuring tape.
4. Add washed and graded medium sand as needed to base of borehole.
5. Insert the well screen and riser pipe into borehole through the hollow stem augers. Cap the riser to prevent well construction materials from entering the well.
6. Add sand to screen section of well while slowly removing augers. Sand pack should extend at least two feet above the top of the screen section. Measure with a tape.
7. Slowly add bentonite pellet seal to borehole as augers are slowly removed. The bentonite seal should extend at least two feet above the top of the sand pack section. Measure with tape.
8. Note: The rate of removal of the auger from the borehole should closely follow the rate that the sand pack and bentonite pellets fill the borehole.
9. If bentonite seal is placed above the groundwater level within the borehole, add water to the borehole to hydrate the bentonite pellets. Allow pellets to hydrate for at least 30 minutes.
10. Mix cement/bentonite grout per Manufacturer's specifications.

11. Add grout to borehole through tremie pipe or hose from the top of the bentonite seal to the ground surface.
12. Remove remaining augers from the borehole.
13. Top off grout in borehole. Grout should extend to approximately two feet below ground surface.
14. Cut well-riser pipe to about three feet above the ground surface for stickup type wells. Flush-mount well risers should be cut off just below surface grade.
15. Backfill the remaining two feet of the borehole with concrete.
16. Install a protective casing over the well riser pipe and set it into the concrete backfill.
17. Lock the protective casing cover.
18. Document well construction in the field notebook and later on a Well Construction Detail diagram (Appendix B).

Reference: ASTM *Standard Practice for Design and Installation of Groundwater Monitoring Wells* D5092/D5092M-16.

3.20.2 Bedrock Monitoring Well Construction Procedures

Summary: A method for construction of monitoring wells within bedrock, which enables monitoring of groundwater elevation and acquisition of groundwater samples for laboratory testing.

Procedure:

1. Collect soil samples while advancing to the top of bedrock. Follow the procedures in Sections 3.6 (HSA drilling), 3.6 (Rotosonic drilling), 3.10 (split-spoon sampling), or 3.13 (direct-push sampling) as applicable for field conditions.
2. Measure the depth to the top of bedrock from the ground surface using a weighted measuring tape.
3. At these boring locations collect a 3- to 5-foot NX- rock core sample from the top of rock.
4. Ream the core hole to approximately 8-inches in diameter.
5. Install a 6-inch carbon steel casing into the borehole and set it at least 3 feet into the bedrock. The casing should extend to the ground surface.
6. Remove the HSAs or casing and grout the annular space between the steel casing and borehole wall. Mix grout following procedures in Section 3.20.3. Allow grout to cure for at least 24 hours before continuing the boring.
7. Collect NX-rock core samples to desired depth in 5- or 10-foot increments. After coring, ream the core hole to approximately 6-inches in diameter.

8. Insert a riser cap (J-plug) into the well riser. Install an 8-inch curb box around the well casing by cementing the protective curb box around the well casing. Install lock on J-plug and seal the curb box.
9. Document well construction details in the field notebook and transfer the data onto the Bedrock Monitoring Well Construction Detail form (Appendix B).

Reference: ASTM *Standard Practice for Design and Installation of Groundwater Monitoring Wells* D5092/D5092M-16.

3.20.3 Monitoring Well Abandonment Procedures

Well abandoning will be performed in accordance with New York State Department of Environmental Conservation (NYSDEC) CP-43, using the following steps:

1. Each well will be tremie grouted from the bottom of the well to within five feet of the ground surface to ensure a continuous grout column. Grout slurry composition should be the following:
    a. 1.5 to 3.0 percent by weight - Bentonite (Quick Gel)
    b. 40 to 60 percent by weight - Cement (Portland Type I)
    c. 40 to 60 percent by weight - Water
2. The well casing will be removed at a depth of five feet below grade (if possible) and the outer protective casing "stick-up" and/or flush-mount curb box will be removed only after the well has been properly filled with grout.
3. A metal marker (PK Survey Spike) will be embedded in the top of the grout to indicate the location of the former monitoring well.
4. The uppermost five feet of the borehole will be filled with approved/clean backfill or topsoil.
5. The surface of the borehole will be restored to the condition of the area surrounding the borehole (crushed stone, asphalt, etc.). If the surrounding surface is a concrete sidewalk flag that flag will be replaced in accordance with Section 3.30 of this plan.
6. The solid waste should be handled is accordance with Section 3.31 of this plan.
7. Document well construction details in the field notebook and transfer the data onto the Well Decommissioning Record form (Appendix B).

Reference: NYSDEC *CP-43: Groundwater Monitoring Well Decommissioning Policy*, November 3, 2009. ASTM *Standard Guide for Decommissioning of Groundwater Wells, Vadose Zone Monitoring Devices, Boreholes, and Other Devices for Environmental Activities* D5299/D5299M-18.

3.20.4 Plugging/Abandoning Borehole and Grout Mixing Procedures

Summary: Boreholes that are not completed as monitoring wells, will be sealed (plugged) prior to abandonment to prevent downhole contamination. In addition, the annular space in monitoring wells need to be sealed after the installation of the sand pack and bentonite seal to prevent any downward migration of surface water into the well. Sealing can be achieved by backfilling the borehole with bentonite below the water table (hole plug or pellets) and/or with a cement/bentonite grout above the water table. The backfill material will be introduced from bottom to top using either a tremie pipe or the drill rods. Shallow borings will be sealed with bentonite (hole plug or pellets) the entire length of the boring.

Procedure:

1. Determine most suitable seal materials. Grout specifications generally have mixture ratios as follows:

   Grout Slurry Composition (Percent Weight)

   1.5 to 3.0 percent - Bentonite (Quick Gel)

   40 to 60 percent - Cement (Portland Type I)

   40 to 60 percent - Water

2. Calculate the volume of the borehole based on the bit or auger head diameter plus 10 percent and determine the volume of grout to be emplaced. Generally, the total mixed volume is the borehole volume plus 20 percent.
3. Identify the equipment to be used for preparing and mixing of the grout. Ensure the volume of the tanks to be used for mixing has been measured adequately. Document these volumes.
1. Identify the source of the water to be used for the grout and determine its suitability for use. In particular, water with high sulfate or chloride levels, or heated water, should not be used. These types of waters can cause operational difficulties or modify the set-up for the grout.
4. Identify the equipment to be used for emplacing the grout. Ensure that the pump to be used has adequate pressure to enable complete return to surface.
5. Identify the volumes to be pumped at each stage or in total if only one stage is to be used.
6. Prepare the borehole plugging plan and discuss the plan and activities with the drilling contractor prior to beginning any mixing activities.
7. Begin mixing the grout to be emplaced.
8. Record the type and amount of materials used during the mixing operation. Ensure that the ratios are within specification tolerance.

9. Begin pumping the grout through the return line bypass system to confirm that all pump and surface fittings are secure.
10. Initiate downhole pumping. Record the times and volumes emplaced on the form.
11. Document the borehole is completely filled with grout.
12. Clear and clean the surface near the borehole. Level the ground to about the pre-existing grade. Add grout or cement as necessary to the area near the borehole.

Note: On occasion, there may be some settling of the grout, which takes place over several days. If this settling occurs, the natural soil from the immediate vicinity is used to put the level at grade. A follow-up check at each site should be made within one week to 10 days of completion. Document the visit and describe any action taken.

3.21 Groundwater Monitoring Well Development Procedures

Summary: Following completion of groundwater monitoring well installation, each monitoring well will be developed by pumping until the discharged water is relatively sediment free and the indicator parameters (pH, temperature, and specific conductivity) have reached steady state. Developing the monitoring well not only removes any sediment but also may improve the hydraulic properties of the formation. The effectiveness of the development measures will be closely monitored in order to keep the volume of discharged water to the minimum necessary to obtain sediment-free samples. A portable turbidimeter will be used to monitor effectiveness of development. A turbidity reading of < 50 Nephelometric Turbidity Units (NTU) and steady state pH, temperature, and specific conductivity readings will be used as a guide for discontinuing well development. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. An appropriate monitoring well development method should be selected, depending on water level depth, well productivity, and sediment content of water. Monitoring well development options include: (a) manual pumping; and (b) powered suction-lift or hydrolift pumping.
2. Equipment should be assembled, decontaminated (if necessary), and installed in the well. Care should be taken not to introduce contaminants to the equipment during installation.
3. Monitoring well development should proceed by repeated removal of water from the well until the discharged water is relatively sediment-free. All development waters will be containerized. Effectiveness of development should be monitored at regular intervals using a portable turbidimeter and water quality meter. Volume of water removed and turbidity, pH,

temperature, and conductivity measurements will be recorded on a Well Development/Purging Log form (Appendix B).

4. Monitoring well development will be discontinued when the turbidity of the discharged water is below 50 NTU and the other indicator parameters have stabilized.

Reference: ASTM *Standard Practice for Design and Installation of Groundwater Monitoring Wells* D5092/D5092M-16.

3.22 Monitoring Well and Soil Vapor Implant Inspection and Maintenance

Summary: Periodic inspection and maintenance of monitoring well protective casings are required to keep the wells in good condition. The following procedure should be employed whenever the monitoring wells are opened for gauging and sampling.

Procedure:

1. Use the Monitoring Well Inspection Form or Soil Vapor Implant Inspection Form (Appendix B) to record the conditions of the various components of the monitoring well and protective casing including lock/hasp, hinge/lid, J-plug, gasket seal, and security bolts.
2. Coat security bolts with never seize to prevent seizure in the cast iron flush mount curb boxes.
3. Replace security bolts of the hexagonal head type with bolts that have pentagonal heads (5 sided) at the earliest opportunity. Pentagonal type bolts help prevent unauthorized access to the wells.
4. In wells, record depth to water, depth to bottom, and depths to the top and bottom of any light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) layers.
5. Record any maintenance performed on the well and stencil as needed.
6. All sections of the inspection form should be completed and photographs taken before and after inspection and maintenance.

3.22.1 Road Box Replacement Procedures

Summary: Often during an inspection, it is determined that a monitoring well's road box is damaged and needs to be replaced. The following procedure should be employed whenever a road box is replaced.

Procedure:

1 Cut the pavement with a jackhammer and hand-excavate the surrounding soil to a depth of approximately 1 ft. below ground surface (bgs). If the surrounding surface is covered with asphalt instead of concrete, then hand cut the asphalt.

2 Any concrete (or asphalt) cuttings will be placed in a 1A2 open head 55-gallon steel drum.

3 Remove the damaged road box and install the new road box. The damaged road box will be placed in a 1A2 open head 55-gallon steel drum.

4 Backfill around the newly installed road box with the excavated soil, leaving enough room for a concrete pad/asphalt patch.

5 Construct a 2 ft. by 2 ft. square concrete pad/asphalt patch surrounding the new road box.

6 If using concrete in freezing temperatures, an anti-freeze agent will be added to the cement mixture and the concrete pad will be covered with a sheet of plastic to prevent the pad from freezing and cracking.

7 An orange cone will be placed near the monitoring well to prevent vehicles from driving over the newly repaired road box.

8 The drums will be addressed in accordance with the protocols outlined in Section 3.31.

3.23 Hydraulic Conductivity Testing

Summary: Hydraulic conductivity tests (slug tests) may be performed in newly installed wells. During any slug testing, gauging of fluid levels will be performed using a data logger/pressure transducer, and stainless steel slugs. Since the water table is shallow, only rising head (slug-out) tests will be performed. This test will consist of inserting a 'slug' of known volume into the well/piezometer, allowing the water level in to return to a steady state, removing the slug allowing the water level to return to static conditions. The transducer/data logger will record changes in water level. This data will be analyzed using the methods of Bouwer and Rice (1976) and Bouwer (1989).

Slug testing is a rapid and inexpensive procedure for estimating the horizontal hydraulic conductivity of an aquifer material screened by a monitoring well. Equipment consists of dedicated/disposable nylon rope, decontaminated stainless steel slug and a data logger/pressure transducer, and a water level indicator.

Procedure:

1. Measure dimensions of the slug to be used to displace water in the monitor and predetermine the volume of water, which will be displaced, and corresponding initial water level change, which will occur by adding or removing the slug.
2. Record initial water level in the wells (static water level).
3. Lower the pre-cleaned data logger/pressure transducer into wells to the wells bottom. Pull transducer up one foot.
4. Insert slug into well, below water table, with nylon rope. Allow water level in well to return to static condition.
5. Simultaneously initiate data logger/pressure transducer and rapidly remove the slug from the wells.
6. Monitor water level recovery in well with data logger/pressure transducer until static water level has been regained.
7. Download data logger/pressure transducer and record data in field notebook. Review data to verify slug test was successful.
8. Remove equipment from well and decontaminate.
9. Analyze data in office using computer.

3.24 Groundwater Sampling

Summary: To collect representative groundwater samples, groundwater wells must be adequately purged prior to sampling. New monitoring wells will not be purged until 72 hours after installation. Purging will require the removal of three to five volumes of standing water in rapidly recharging wells and at least one volume from wells with slow recharge rates. Shallow wells in which the screen intersects the water table should require a minimum amount of purging since the groundwater would flow through the screen and not be entrapped in the casing. Deeper wells should be purged more thoroughly since they may be located in confined aquifers and water may rise up into the casing. A thorough purging would require the removal of several volumes of this trapped water to ensure that representative groundwater is brought into the well for sampling. Sampling should commence immediately after purging as soon as adequate recharge has occurred. When sampling for PFAS, see Appendix A for special field procedures.

3.24.1 Standard Monitoring Well Purging Procedure

Procedure:

1. The well cover will be unlocked and carefully removed to avoid having any foreign material enter the well. The interior of the riser pipe will be monitored for organic vapors using PID.

If a reading of greater than 5 ppm is recorded, the well will be vented until levels are below 5 ppm before purging begins.

2. Using an electronic water level detector, the water level below top of casing will be measured. Knowing the total depth of the well, it will be possible to determine the volume of water in the well. The end of the probe will be soap-and-water-washed and deionized-water-rinsed between wells.
3. Calibrate field instruments (e.g., pH, specific conductance, PID, turbidity).
4. Purge the required water volume (i.e., until stabilization of pH, temperature, specific conductivity, and turbidity). New dedicated equipment will be used for each well.
5. Purge well until the water quality parameters have stabilized. The stabilization criteria are: specific conductivity - 3% full scale range; pH - 0.10 pH unit; temperature - 0.2°C, and turbidity <50 NTU.
6. Purging of three well volumes is not necessary if the indicator parameters are stable. However, at least one (1) well volume must be purged before sampling can begin. During purging, it is permissible to by-pass the flow cell until the groundwater has cleared.
7. Indicator parameters of pH, conductivity, dissolved oxygen, oxygen/reduction potential, turbidity, and temperature must be measured continuously using the flow cell.
8. Well purging data are to be recorded in the field notebook and on the Well Purge Log (Appendix B).
9. Dispose of sampling equipment as per Section 3.31.

3.24.2 Low Flow Sampling Procedures

Summary: To collect representative groundwater samples, monitoring wells must be adequately purged prior to sampling. Low volume sampling equipment and procedures will be used to purge the wells and retrieve groundwater samples. Purging will require the removal of one to three volumes of standing water by pumping at a rate of less than one (1) liter per minute. Drawdown must not exceed ten percent of the standing water column. Sampling should commence immediately after purging.

Procedure: Monitoring well purging will be completed using the low-flow purging technique as follows:

1. The well cover will be unlocked and carefully removed to avoid having any foreign material enter the well. The interior of the riser pipe will be monitored for organic vapors using PID. If a reading of greater than 5 ppm is recorded, the well will be vented until levels are below 5 ppm before purging begins.
2. Using an electronic interface probe/water level detector, the water level below top of casing will be measured. The depth of the well will be measured to determine the volume of water

in the well. The bottom of the well will also be checked for DNAPL using the interface probe/water level indicator. The end of the probe will be decontaminated between wells.

3. Calibrate field instruments (e.g., pH, specific conductance, PID, turbidity).
4. Purge the required water volume (i.e., until stabilization of pH, temperature, specific conductivity, and turbidity) using a low-flow pump (e.g., Solinst or Geopump) and dedicated HDPE tubing. New dedicated tubing will be used for each well.
5. Purge the well until the water quality parameters have stabilized. The stabilization criteria are: specific conductivity - 3% full-scale range; pH - 0.10 pH unit; dissolved oxygen – 10%, Turbidity – 10% and oxidation/reduction (redox) potential - +/- 10 units.
6. Purging of three well volumes is not necessary if the indicator parameters are stable. However, at least one (1) well volume must be purged before sampling can begin. During purging, it is permissible to by-pass the flow cell until the groundwater has cleared.
7. Indicator parameters of pH, conductivity, dissolved oxygen, oxidation/reduction (redox) potential, turbidity, and temperature must be measured continuously using the flow cell.
8. Well purging data are to be recorded in the field notebook and on the Low Flow Purge Log (Appendix B).

3.24.3 Sample Collection Procedures

Procedure:

1. After well purging is completed, a sample will be collected into the appropriate containers.
2. Direct water flow toward the inside wall of the sample container to minimize volatilization. Fill volatile sample containers so no headspace (air bubbles) is present. If containers are pre-preserved, do not overfill sample containers. Note if effervescence is observed.
3. All sample bottles will be labeled in the field using a waterproof permanent marker (Section 7.0).
4. Samples will be collected into sample bottles (containing required preservatives) and placed on ice in coolers for processing (preservation and packing) prior to shipment to the analytical laboratory. A chain-of-custody record will be initiated. The analytical laboratory will certify that the sample bottles are analyte-free prior to shipping.
5. Remove pump and disconnect valves and tubing, as necessary. If a submersible pump was used, it must be decontaminated prior to and between each use. Clean pump by flushing 10 gallons of potable water through the pump. Rinse with deionized water after flushing the pump.
6. Well sampling data are to be recorded in the field notebook and on the Well Purging Log (Appendix B).

Reference: ASTM *Standard Practice for Design and Installation of Groundwater Monitoring Wells* D5092/D5092M-16.

3.24.4 Sampling Through LNAPL

Procedure:

1. Measure the depth and thickness of the LNAPL layer per Section 3.26.
2. The groundwater sample from below the product will be collected through a 1-inch ID tremie pipe immersed below the LNAPL layer.
3. Insert a slip cap or similar device (i.e., J-plug) to plug the end of the 1" ID PVC pipe, and attach a tether to the device so it can be retrieved from the well after sampling is complete. The pipe will be lowered into the well and additional sections of 1" ID PVC pipe will be added as necessary.
4. Lower the 1" ID PVC pipe into the well with the slip cap/J-plug inserted in the bottom of the pipe. The bottom of the pipe should be lowered through and at least 2' below the bottom of the LNAPL layer.
5. Brace the 1" ID pipe at the surface so it cannot fall further into the 2" well casing.
6. Smaller diameter rods or a weighted section of steel pipe attached to a rope will be used to push the slip cap off the end of the 1" ID PVC pipe. The attached tether will allow retrieval of the J-plug when the 1" tubing is retrieved from the well at the conclusion of sampling.
7. Proceed with sampling the well by inserting purging and sampling tubing through the 1" tubing.
8. When sampling is finished remove the 1" tubing and slip cap from the well. The 1" ID PVC pipe will be partially coated with LNAPL and should be discarded. The slip cap can be decontaminated or discarded.

3.24.5 Sampling LNAPL or DNAPL

Summary: When conducting groundwater sampling from monitoring wells, LNAPL and DNAPL may be collected. The following procedure will be used to collect samples of LNAPL and DNAPL.

Procedure:

1. Measure the depth and thickness of the LNAPL/DNAPL layer per Section 3.26.
2. Using a disposable Teflon or Teflon lined bailer attached to disposable poly twine, lower the bailer so the bottom of the bailer is at the same depth as the bottom of the LNAPL/DNAPL layer.
3. Upon reaching its target depth, raise the bailer with the LNAPL/DNAPL product and place the product in the laboratory supplied containers.
4. Repeat steps 2 and 3 until the laboratory supplied containers are full or there is no more product to remove.
5. Upon completion of the sampling, place the used bailer and twine in a 1A2 open head 55-gallon steel drum.

3.25 Water Level Monitoring Procedures

Summary: Determination of groundwater depths in monitoring wells is necessary to calculate required purge volumes prior to groundwater sampling. Determination of groundwater depths in piezometers is necessary to determine the direction of groundwater flow.

Water levels in monitoring wells scheduled to be sampled during the field work will be measured using an electronic water level indicator. Initially, measurements will be taken following well development until the well has recovered to anticipated static conditions. Water levels will also be measured in the piezometers as specified in the Project Management Work Plan. Water level measurement procedures are presented below.

Procedure:

1. Clean the water level probe and the lower portion of cable following standard decontamination procedures (Section 6.0) and test water level meter to ensure that the batteries are charged.
2. Lower the probe slowly into the monitoring well until the audible alarm indicates water.
3. Read the depth to the nearest hundredth of a foot from the graduated cable using the V-notch on the riser pipe as a reference point.
4. Repeat the measurement for confirmation and record the water level.
5. Remove the probe from the well slowly, drying the cable and probe with a clean "Chem Wipe" or paper towel.
6. Replace the well cap and lock protective cap in place.
7. Decontaminate the water level meter (Section 6.0) if additional measurements are to be taken.

Reference: ASTM *Standard Test Method for Determining Subsurface Liquid Levels in a Borehole or Monitoring Well (Observation Well)* D4750-87(2001).

3.26 LNAPL/DNAPL Water Level Monitoring Procedures

Summary: When conducting groundwater measurement from monitoring wells, the presence and thickness of LNAPL and DNAPL will be monitored. The following procedure will be used to determine the presence and thickness of LNAPL and DNAPL. LNAPLs, Light Non-Aqueous Phase Liquids (Lighter than water) are typically measured using an oil/water interface meter.

Procedure:

1. To meet safety requirements and protect electronics from damage, always ground the meter by attaching the ground clamp to the metal well casing.
2. Before beginning any measurement, check the electronics and battery condition by pressing the 'START/OFF' button. A brief tone and red light indicates the meter is functional. A flashing green light indicates the meter is on. NOTE: The meter will automatically shut off after 10 min to conserve battery life and will have to be turned back on.
3. Lower the probe end into the well and slowly lower until water or LNAPL is contacted. A steady tone and light indicates a non-conductive liquid (e.g. product). An intermittent tone and light indicates a conductive liquid (e.g. water).
4. For floating product (LNAPL), take the air/product interface measurement on the way into the liquid and the water/product interface on the way up. When passing through product into water, some product may adhere to the probe sensors due to surface tension. Therefore, when water is detected below the product, the probe should be raised and lowered rapidly in a short vertical motion to remove any product that may have been carried down with the probe.
5. The water/product interface should then be measured as the probe is raised very slowly back up. Once the interface is detected the probe can be raised and lowered in small increments to precisely determine the interface.
6. Repeat measurements to confirm water/product interface.
7. To determine the thickness of product, subtract the water/product interface from the product/air interface.
8. To determine if there is any sinking product (DNAPL) in the well, continue lowering the probe slowly. If steady signals activate, determine the top of the sinking layer by reading directly from the tape. Continue lowering the probe slowly until the tape slackens when the well bottom is reached. Read the level directly from the tape and subtract one from the other to determine thickness.
9. Upon completion of readings clean the tape and the probe.

3.27 Indoor Air Investigation

Indoor air investigations will generally include the following tasks at each residence: 1) conducting interviews with homeowners using air quality questionnaires provided by the New York State Department of Health (NYSDOH) (Appendix B); 2) conducting a brief survey of household chemicals present and evaluating their potential to affect air sample results; 3) collecting one indoor air sample each from the breathing zones of the first floor and basement areas, and; (4) collecting one soil vapor sample from beneath the basement concrete slab. In addition, one or two outdoor air samples will be collected from the residential sampling area for each day that sampling is taking place.

3.27.1 Indoor Air Quality Survey and Questionnaire

Once the homeowners have been contacted by the NYSDEC and/or NYSDOH, appointments will be made to conduct homeowner/occupant interviews and building inventory of household chemicals. Questionnaire and Building Inventory forms provided by the NYSDOH (Appendix B) will be used. Once the questionnaires have been completed, a brief inventory of household chemicals stored in the basement area will be prepared. The inventory will consist of a general description of areas where chemicals are stored and the types and approximate numbers of chemicals present. During this inventory, a ppbRAE photo ionization detector (PID) should be used to measure the presence of volatile organic compounds (VOCs) in those areas where the chemicals are found. Also during the inventory, a handout will be provided to the residents that list home activities that should be avoided prior to and during the air sampling. This handout is provided in Appendix B. The general procedures to be followed during the surveys are summarized below:

- Identify all areas on the basement level that may be used for storage of chemical containers. Also record the general types and approximate quantities of chemicals stored and VOCs present in the atmosphere in the areas of chemical storage.
- Other potential sources that may influence air quality testing that should be noted and scanned with the PID include: new construction/remodeling/painting, new carpeting, and freshly dry-cleaned clothing.

3.27.2 Sub-Slab Air Sampling Procedures

One sub-slab air sample will be collected at each sampled residence. As directed by the NYSDEC, additional samples (up to a total of three) may be collected at some of the residences. A minimum of one sub-slab sample at each residence will be tested for an adequate surface seal before and after testing using the helium tracer gas test procedures outlined below.

The sub-slab air sampling procedures are summarized below:

1. Select and prepare the sub-slab sample collection point by observing the condition of the building floor slab for apparent penetrations such as concrete floor cracks, floor drains, or sump holes. The floor conditions will be noted and a potential location of a subsurface probe will be selected. The location will ideally be central to the building, and away from the foundation walls, apparent penetrations and buried pipes. **Review all locations with the Homeowner prior to drilling any hole!** Photograph and document all sample locations.

2. In locations where bare concrete is available, drill a 5/8-inch diameter hole about one-inch (1") into the concrete using an electric hammer drill. Extend the hole through the remaining thickness of the slab using a ½ -inch drill bit. Lengthen the hole about three inches (3") beyond the sub-slab using the drill bit.
3. Remove the concrete dust within the 5/8-inch drilled hole and around the hole using wire brushes and a brush and dust pan, then dabbing the surface with Sculpey brand clay (see below).
4. Insert a 5/8-inch outside diameter (OD) by ¼-inch inside diameter (ID) rubber stopper onto and three-inches beyond the end of a 1/4-inch OD by 1/8-inch ID Teflon tube. Insert the Teflon tube into the 5/8-inch hole so the stopper is seated into the top of the ½-inch drilled hole.
5. Seal the annular space between the 5/8-inch hole and the Teflon tubing with white Sculpey Brand modeling clay (or equivalent). Bring the clay above the floor's surface and around the tubing in a volcano-like shape.
6. In locations where only linoleum tile is available, **AND THE OWNER AGREES**, drill a small (1/4-inch best) hole through the tile and slab. Place the sample tubing into the hole and seal to the floor with clay.
7. Purge the sampling tube by connecting the Teflon tubing to the inlet of an air-sampling pump (GilAir 300 or 500) with 3/8-inch OD silicone tubing, and connecting a 1 liter (L) Tedlar bag to the outlet of the pump with silicone tubing. Purge approximately one liter (1L) of gas from the subsurface probe into the Tedlar bag, using the air-sampling pump. Analyze the 1L Tedlar bag containing the sub-slab purged air with a gas detector that records the concentrations of CH4, CO2 and O2. Record the purge times (start and stop) and the gas concentrations on a Summa Canister Sampling Field Data Sheet (Appendix B). Purging flow rates must not exceed 0.2 L/min.
8. Assign sample identification to the Summa® canister identification tag and record on chain of custody (COC), and the Summa Canister Sampling Field Data Sheet. Also record the Summa® canister's serial number on the Summa Canister Sampling Field Data Sheet.
9. Remove brass plug from canister fitting.
10. Attach a pre-calibrated/certified 24-hour flow controller, and particulate filter to the Summa® canister. Record the regulator serial number on the Summa Canister Sampling Field Data Sheet.
11. Attach the sample tube to the Summa® canister using a ¼-inch Swagelok® nut with appropriate ferrules, via the flow controller/particulate filter assembly.
12. Open canister valve to initiate sample collection and record sample start time, date and initial vacuum on the canister identification tag and on the Summa Canister Sampling Field Data Sheet. If the canister does not show sufficient vacuum (generally less than 25" Hg), do not use. Take a digital photograph of canister setup and surrounding area. Include in the photograph a dry erase board or similar display which presents sample ID and date.
13. After 24 hours, record sample end time and canister pressure on the Summa Canister Sampling Field Data Sheet, and close valve.
14. Disconnect the Teflon tubing and remove flow controller/particulate filter assembly from canister. Seal canister with brass plug.

15. Seal the hole in the basement slab with hydraulic cement patch.
16. Ship samples with COCs, overnight, to a NYSDOH approved laboratory, for TO-15 analysis.

Using Helium Tracer Gas to Test Floor Seals.

1. Drill the concrete floor and attach and seal the Teflon sample tubing to the floor as described above.
2. Place a 2-quart (or similar size) bucket over the floor seal after threading the Teflon sample tube through a hole in the top of the bucket. Seal the tube to the bucket with clay.
3. The bucket should also have a hole in the top for the injection of helium gas. An additional hole should be present in the side, near the bottom, to measure the concentration of helium gas in the bucket.
4. Connect helium (99.999%) cylinder tubing to the top port of bucket enclosure and seal with clay or other sealing material. Insert a helium detector probe to the bottom port of the bucket.
5. Release enough helium to displace any ambient air in the bucket until the concentration of helium reaches a minimum of 90%. Maintain this minimum concentration by testing with a helium detector. The helium cylinder should be open during the purge time to cause a slight positive pressure within the enclosure.
6. Connect the sample tubing to a GilAir vacuum pump or equivalent using 3/8-inch O.D. silicone tubing. Connect a 1-liter Tedlar bag to the outlet of the pump using silicone tubing and collect a 1-liter sample. Analyze the Tedlar bag for helium using a helium detector, and record the results on the Summa Canister Sampling Field Data Sheet. Also analyze the Tedlar bag for the presence of methane, H2S, CO2 and O2 and record the result on the Summa Canister Sampling Field Data Sheet. A concentration of helium 10% or greater indicates a poor seal of the sample tubing to the basement floor. The tubing must be resealed to the floor and another helium test conducted.
7. Purging flow rates must not exceed 0.2 L/min.
8. After purging, remove the bucket enclosure and assign sample identification to the Summa® canister identification tag and record on the COC, and the Summa Canister Sampling Field Data Sheet. Also record the Summa® canister's serial number on the Summa Canister Sampling Field Data Sheet.
9. Connect the 1/4-inch Teflon OD sample tubing to the Summa® canister regulator inlet using a ¼-inch Swagelok® nut with appropriate ferrules. Open the canister valve to initiate sample collection and record the start time and date and beginning vacuum on the canister identification tag and on the Summa Canister Sampling Field Data Sheet. If the canister does not show sufficient vacuum (generally less than 25" Hg), do not use.
10. After 24 hours, record sample end time and final vacuum on the Summa Canister Sampling Field Data Sheet and close the valve.
11. Disconnect the Teflon tubing from the Summa® canister and remove the flow controller/particulate-filter assembly from canister. Seal canister with brass plug.
12. Thread the Teflon sample tubing through the bucket enclosure and conduct a helium tracer gas test as described above. After purging, test the concentration of helium in the 1 liter

Tedlar bag and record on the Summa Canister Sampling Field Data Sheet.

13. Remove the sample tubing, stopper and clay from the hole in the basement slab and seal with hydraulic cement patch.
14. Ship the samples, with COCs, overnight to Air Toxics, or other selected lab, for TO-15 analysis.

3.27.3 Indoor Air and Outdoor Air Sampling Procedure

Sampling procedures for the indoor samples and outdoor air sample are summarized below:

1. Place the basement and first floor Summa® canisters at breathing height in a high traffic location. The breathing height is defined as three to six feet above the floor. Place the outdoor air sample at least 2 to three feet above the ground.
2. Record the canister's serial number on the Summa Canister Sampling Field Data Sheet.
3. Assign sample identification to the canister identification tag (see Section 7.0 below) and record on the COC and the Summa Canister Sampling Field Data Sheet.
4. Remove brass plug from canister fitting.
5. Attach a pre-calibrated/certified 24-hour flow controller and particulate filter to the Summa® canister, open valve completely to initiate sampling, and record the sample start time and date, and beginning vacuum reading on the canister identification tag and the Summa Canister Sampling Field Data Sheet. Also record the regulator serial number on the Summa Canister Sampling Field Data Sheet. If the canister does not show sufficient vacuum (generally less than 25" Hg), do not use.
6. Take a digital photograph of canister setup and surrounding area. Include a dry erase board or similar display which presents sample ID and date.
7. After 24 hours, record end time and pressure on the Summa Canister Sampling Field Data Sheet, and close valve.
8. Disconnect flow controller/particulate filter assembly from canister.
9. Seal canister with brass plug.
10. Ship canister standard overnight, with COC, to a NYSDOH approved laboratory, for TO-15 analysis.

3.27.4 Quality Control

Field duplicates for structure samples (10 percent) will be collected by attaching the T-fitting supplied by the laboratory to two Summa® canisters with attached regulators. The inlet for the T-fitting will then be attached to the sub-slab sample tubing. Indoor air and outdoor air duplicates will also use T-fittings connected to two Summa® canisters. Tubing will not be required unless needed to the raise the sampling point to the breathing zone. For sampling, both Summa® canister valves are opened and closed

simultaneously.

3.27.5 Field Documentation

Field notebooks will be used during all on-site work. A dedicated field notebook will be maintained by the field technician overseeing the site activities. In addition to the notebook, any and all original sampling forms, purge forms and notebooks used during field activities will be submitted to the NYSDEC as part of the final report. Indoor air sampling procedures should be photo-documented.

The field sampling team will maintain sampling records that include the following data:

1. Sample Identification
2. Date and time of sample collection
3. Identity of samplers
4. Sampling methods and devices
5. Purge volumes (soil vapor)
6. Volume of soil vapor sample extracted
7. The Summa® canister vacuum before and after samples collected
8. Chain of Custody and shipping information

The proper completion of the following forms/logs will be considered correct procedure for documentation during the indoor air-sampling program:

1. Field Log Book - weather-proof hand-bound field book
2. Questionnaire and Building Inventory Form (Appendix B)
3. Summa Canister Sampling Field Data Sheet (Appendix B)
4. Chain of Custody Form (Appendix B)

Reference: NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*.

3.28 Removal of Underground Storage Tanks

3.28.1 General

The contractor shall furnish all labor, materials, tools and equipment and remove an underground storage tank.

3.28.2 Submittals

The following items shall be submitted to the URS Project Manager for review and approval.

A. Detailed Work Plan: This plan shall be submitted by the Underground Storage Tank Contractor to URS and will describe methods, equipment, and sequences of operations including, but not limited to:

   a. Tank contents removal

   b. Spill Prevention

   c. Exploratory excavations

   d. Tank purging procedure

   e. Interior and exterior tank cleaning procedure

   f. Wastewater Collection and Disposal

   g. Removal or permanent closure of underground storage tank

   h. Transportation and disposal of underground storage tank

   i. Anticipated use, recycling or disposal of tank contents

B. Copies of manifests required to transport waste materials. These manifests shall be submitted within 24 hours following their preparation.

C. Documentation of acceptance of waste materials by a facility permitted to treat or dispose of those types of materials. These documentations shall be submitted no later than 7 days following a delivery of waste materials to the permitted facility.

D. Letters of acceptance from the permitted facility and haulers acknowledging agreement to accept the waste materials. These letters shall be submitted not more than 14 days before transporting any waste materials.

3.28.3 Permit and License Requirements

A. Prior to the removal of the underground storage tank, all permits and licenses required to perform the work shall be obtained by the Contractor. Determining license and permit requirements shall be the responsibility of the Contractor.

B. The permit and notification requirements for underground storage tank removal or closure shall include, but not be limited to, the following:

1) Storage tanks greater than 1,100 gallons capacity must be registered with the NYSDEC. If the tank is being closed, and it is not currently registered, the tank must be registered by the contractor before proceeding with his removal or closure activities. Thirty (30) days prior to initiation of closure activities, the contractor shall notify the NYSDEC (Region 2) of the intent to remove or close a storage tank.

2) Storage tanks of 1,100 gallons or less do not require registration, or notification to the NYSDEC when closed unless a spill has occurred (see below).

3) The Contractor shall comply with the requirements of 6 NYCRR Part 612, 6 NYCRR Part 613, 6 NYCRR Part 614, NYSDEC Memo #1, and NYSDEC SPOTS No. 14.

3.28.4 Applicable Standards

The publications are referenced by basic designation only and shall be the latest published version.

- American Petroleum Institute (API)

API Publ 1628	A Guide to the Assessment and Remediation of Underground Petroleum Releases
API Publ 2015	Safe Entry and Cleaning of Petroleum Storage Tanks, Planning and Managing Tank Entry from Decommissioning through Recommissioning
API Publ 2217	Guidelines for Confined Space Work in the Petroleum Industry
API Publ 2219	Safe Operating Guidelines of Vacuum Trucks in Petroleum Service
API Publ 2003	Protection Against Ignitions Arising out of Static, Lightning and Stray Currents

- American Society for Testing and Materials (ASTM)

ASTM C94/C94M-19	Standard Specifications for Ready-Mixed Concrete

- Code of Federal Regulations (CFR)

CFR 40 Part 260	Hazardous Waste Management System: General
CFR 50 Part 261	Identification and Listing of Hazardous Waste
CFR 40 Part 262	Standards Applicable to Generators of Hazardous Waste
CFR 40 Part 263	Standards Applicable to Transporters of Hazardous Waste
CFR 40 Part 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

CFR 40 Part 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
CFR 40 Part 266	Standards for the Management of Specific Hazardous Waste and Specific Types of Hazardous Waste Management Facilities
CFR 40 Part 268	Land Disposal Restrictions
CFR 40 Part 280	Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks

- USEPA

USEPA SW-846	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods

- New York City Fire Department

FP Directive 3-73	Division of Fire Protection

- NYSDEC

6 NYCRR Part 357.6	Remedial Program Soil Cleanup Objectives
6 NYCRR Part 612	Registration of Petroleum Storage Facilities
6 NYCRR Part 613	Handling and Storage of Petroleum
6 NYCRR Part 614	Standards for New and Substantially Modified Petroleum Storage Facilities
NYSDEC CP-51	Soil Cleanup Guidance Policy
NYSDEC SPOTS No.14	NYSDEC Spill Prevention Operations Technology Series (SPOTS) Document No. 14: Site Assessments at Bulk Storage Facilities
6 NYCRR Part 372	Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities

3.28.5 Removal or Permanent Closure of Underground Storage Tanks

The procedures for removing the tank shall include, but not be limited to, the following:

A. All product that can be pumped out shall be removed.

B. Products shall be drained and flushed from the piping into the tanks.

C. Remaining liquid shall be removed from the tanks.

D. If the tank does not have manholes; the Contractor shall excavate in accordance with Section 3.4 and provide access to the tank upon completion of purging activities.

E. All piping and gauge lines, with the exception of any vent lines, shall be disconnected and capped.

F. The tank storage systems, including all tanks and piping, shall be purged of flammable vapors in accordance with Section 3.28.8.

G. The interior of the tank shall be cleaned with a high pressure rinse.

H. As shown on the Contract Drawings, tanks shall be removed and disposed corresponding to the New York State Department of Transportation (NYSDOT) Standard Specifications.

I. For method of cutting tanks, see API RP 2015.

J. The vent lines shall be capped at the tanks, cut flush at the roof and capped or removed and disposed of.

K. All openings to the tanks including, but not limited, to fill boxes, manholes and gauge boxes shall be filled with concrete flush with the finished floor.

3.28.6 Site Assessment

A. General: The Contractor shall perform a site assessment to determine if there is any contamination present at the site. The site assessment shall be conducted in accordance with NYSDEC SPOTS No. 14.

B. Equipment: The Contractor shall select the means and methods for performing drilling/sampling operations. The Contractor is solely responsible for determining the adequacy of his equipment to perform the intended work. If the Contractor's equipment is not adequate to perform the work, the Contractor shall replace it with suitable equipment at no additional cost to the NYSDEC.

C. Sampling Procedure-Tank Removed: In general, URS will direct the Contractor to collect a minimum of five (5) soil samples in accordance with API Publ 1628 from any area around the removed tank that appears to be visually contaminated. Soil samples from the material surrounding piping will be taken at 20-foot intervals and at dispensers and fill boxes. If there are no visible areas of contaminated soil, then the Contractor shall collect 1 sample from each sidewall of the excavation and 2 samples from the bottom of the excavation. All samples collected for contamination will be screened using a PID. The samples showing the highest PID readings shall be sent to the lab for analysis.

D. If groundwater is within 5 feet of the bottom of the tank excavation, a ground water sample shall be collected.

E. Lab Analysis: Samples collected for analysis shall be sent to the URS' standby laboratory. For tanks containing gasoline or solvents, the sample shall be analyzed for VOC's via USEPA method 8260C. For tanks containing diesel fuel or heating oil, samples will be analyzed via USEPA method 8270B.

3.28.7 Notification of Spills

1. Petroleum spills and most hazardous materials spills must be reported to DEC Hotline (1-

800-457-7362) within 2 hours of discovery.

2. Clean closure of excavated Underground Storage Tanks do not require notification to DEC if 1,100 gallons or less in size regardless of contents.

3. Clean closure of tanks of any size that stored motor fuels (gasoline or diesel) must be reported to the NYC Fire Department. The Contractors shall prepare an affidavit of permanent closure for each facility within 7 days of tank closure. The affidavit shall state the Contractor method of tank closure. The affidavit shall be prepared in a form acceptable to the New York City Fire Department and signed by the Contractors licensed underground storage tank system installer. The affidavit shall be submitted to the New York City Fire Department, Buried Tank Unit, Room 412, and 250 Livingston Street, Brooklyn, New York.

3.28.8 Tank Contents Removal and Disposal

1. General:

   The Contractor shall furnish all labor, materials, tools and equipment, and remove and dispose all industrial waste, as required by the Contract Documents.

2. Submittals

   The following items shall be submitted to the Construction Manager for review and approval in accordance with Section 3.28.2.

   A. A detailed work plan describing the Contractor's proposed methods, equipment and sequence of operations for the removal and disposal of industrial waste from the site. The proposed procedures shall provide for safe conduct of the work and careful removal and disposal of materials.

   B. Copies of the analytical test results performed for disposal within five (5) working days after receipt of the results.

3. Removal of Industrial Waste

   A. Salvageable Fuels:

      All salvageable fuels shall be transferred by the Contractor to other tanks designated by the Construction manager. If storage capacity is not available, then salvageable

fuels become property of the Contractor for beneficial use or disposal.

B. Sludge Materials and Contaminated Water:

Sludge and contaminated water shall be collected in new or reconditioned 55-gallon drums or roll-off containers. Drums or containers shall be sealed (water-tight) to prevent rain infiltration and leakage of sludge or water. Chemical sampling and analyses of sludge and contaminated water shall be conducted by the Contractor in accordance with environmental regulatory requirements, as approved by the Construction Manager. Drums or containers shall be labeled in accordance with federal and state regulations.

C. Excavated and Demolished Materials:

Excavated and demolished materials shall be collected in new or reconditioned roll-off containers or similar means as proposed by the Contractor and approved by the Construction Manager. Containers shall be sealed (water-tight) to prevent rain infiltration and leakage. Chemical sampling and analysis of the collected materials shall be conducted by the Contractor in accordance with environmental regulatory requirements, as approved by the Construction manager. Containers shall be labeled in accordance with federal and state regulations.

D. Flammable Vapors

Storage tank systems, including all tanks and piping, shall be purged of flammable vapors. If steam is to be used for either purging or cleaning a tank or other equipment, the steam discharge nozzle and all conductive insulated objects subject to impingement or condensation shall be bonded to the tank or be grounded to prevent static charge build-up on the nozzle of the steam jet. An affidavit of such purging, signed by the Contractor's licensed underground system installer, shall be filed by the Contractor with the Commissioner of the City's Fire Department, Division of Fire Prevention.

3.28.9 Disposal of Industrial Waste

A. All waste materials shall be disposed of in accordance with the requirements of the USEPA, NYSDEC, and New York City Department of Environmental Protection (NYCDEP).

B. Storage of waste materials at the site will not be permitted.

3.29 DNAPL Removal/Recovery

Summary: Some monitoring wells have DNAPL. As part of routine site maintenance, DNAPL may be recovered from these wells. Follow all health and safety requirements in the HASP (URS, May 2017). The following procedure will be used to remove DNAPL.

Procedure:

1. Measure the depth and thickness of the DNAPL layer per Section 3.26.
2. Bailer Method:
   a. Using a disposable bailer attached to disposable nylon twine, lower the bailer so the bottom of the bailer is at the same depth as the bottom of the DNAPL layer.
   b. Upon reaching its target depth, raise the bailer with the DNAPL product and place the product in a 1A2 open head 55-gallon steel drum.
   c. Repeat steps a through b until there is no more product to remove.
   d. Upon completion of the removal, place the used bailer and twine in a separate 1A2 open head 55-gallon steel drum.
   e. These drums will be addressed in accordance with the protocols outlined in Section 3.31.
3. Peristaltic Pump Method (to be used if the bottom of the DNAPL layer is less than 25 feet below grade):
   a. Using disposable poly tubing, place one end at the bottom of the DNAPL layer, and the other end in a 1A2 open head 55-gallon steel drum, with a piece of disposable silicone tubing in the middle, attached to the pump head.
   b. Turn on the pump, and keep pumping until there is no more DNAPL product in the pump's effluent.
   c. Upon completion of the removal, place the used tubing in a separate 1A2 open head 55-gallon steel drum.
   d. These drums will be addressed in accordance with the protocols outlined in Section 3.31.
4. Waterra Pump Method:
   a. Attach a foot valve to one end of disposable poly tubing and place that end at the bottom of the DNAPL layer. Connect the remainder of the tubing to the Waterra pump, with the effluent
   b. Turn on the pump, and keep pumping until there is no more DNAPL product in the pump's effluent.

c. Upon completion of the removal, place the used tubing in a separate 1A2 open head 55-gallon steel drum.

d. These drums will be addressed in accordance with the protocols outlined in Section 3.31.

3.29.1 Surfactant Enhanced DNAPL Recovery

Summary: Surfactant Enhanced Product Recovery (SEPR) technology uses a reagent to mobilize DNAPL, typically a surfactant. The surfactant reduces surface tension between the DNAPL and the groundwater and promotes the formation of micelles that emulsifies the DNAPL, making it more mobile. Follow all health and safety requirements in the approved HASP and subsequent addendums (URS, May 2017). The following procedure will be used to remove DNAPL via SEPR technology.

Procedure:

1. Mix the surfactant solution in accordance with the proportions recommended by the Vendor.
2. Inject the solution into an upgradient well using a transfer pump at approximately 1 to 2 gallons per minute.
3. Groundwater and emulsified DNAPL will be recovered in the downgradient well by pumping out the well contents using peristaltic pump or Waterra hydrolift pump methods discussed above, at the rate of 1 to 2 gallons per minute, into a 1A2 open head 55-gallon steel drum.
4. Nearby wells will be closely monitored for the presence of DNAPL. Based on field observations, these wells may also be pumped or bailed for DNAPL recovery.
5. This process will continue as specified in the approved site-specific project work plan.
6. Upon completion of the removal, place the used tubing in a separate 1A2 open head 55-gallon steel drum.
7. These drums will be addressed in accordance with the protocols outlined in Section 3.31.

3.30 Sidewalk Flag Replacement

Summary:

If a sidewalk flag is damaged during investigation activities (i.e., drilling, etc.), the City of New York requires that it be replaced in accordance with NYSDOT standards.

Procedure:

Prior to removal of a sidewalk flag, the Flag Replacement Contractor will cut the perimeter of each flag to be replaced using a water-cooled pavement saw to reduce fugitive dust. The flags will be

demolished, removed and disposed of by the Contractor. New flags will be replaced in kind with the surrounding flags. All work will be performed in accordance with Section 608 of NYSDOT Standard Specifications of May 6, 2010, specifically all sections that pertain to Portland concrete sidewalks and driveways. At locations where expansion joints were installed, the expansion joints will be covered with a non-shrinking/pliable sealant.

Details on each sidewalk flag replacement will be documented in Daily Construction Report forms (Appendix B).

3.31 Investigation Derived Waste Handling

Summary:

Investigation Derived Waste (IDW) generated during field activities include, but is not limited to, the following:

- Purge water;
- Poly sheeting;
- Spent macrocore liners;
- PPE; and
- Drill cutting and soil boring spoils.

This IDW must be placed in 1A2 open head 55-gallon steel drums pending shipment off site for disposal.

Procedure:

Segregation

Drummed IDW is to be divided into the following categories:

- Drill cuttings and soil boring spoils (see Section 3.19);
- Purgewater from monitoring well development/sampling and DNAPL product; and,
- Solid waste other than drill cuttings and boring spoils (i.e., spent poly tubing, PPE, etc.).

Generator ID

Any IDW generated is assigned USEPA Generator ID Number NYR000163063.

Hazardous/Non-Hazardous Classification

Any liquid waste generated is classified a listed hazardous waste under USEPA waste codes D0039 (DNAPL product – tetrachloroethylene) and/or F002 (spent halogenated solvents). The remaining waste generated from this project is presumed not to be a hazardous waste as defined in 40 CFR Part 261. Therefore, hazardous waste characterization sampling for disposal will only be performed if necessary.

Shipment/Disposal

Klink Cosmo Cleaners (NYSDEC Site ID #224130): Drummed IDW may be staged at its point of origin or along the south side of Division Place, between Vandervoort Ave. and Porter Ave. If drummed IDW is staged at its point of origin, it must be shipped off site on the same day it is generated. If drummed IDW is staged along the south side of Division Place, it must be shipped off site the next business day of being generated (except weekends).

Remaining Sites: Drummed IDW must be staged at its point of origin until it is shipped off site on the same day it's generated.

All IDW must be shipped off site by a permitted contractor to a permitted facility, and may be disposed of at a facility licensed to accept hazardous waste, if necessary.

The information on the waste transporter commonly used on these WAs is provided below:

Island Pump & Tank Corp.
Advanced Waste Water Treatment Corp.
40 Doyle Court
East Northport, NY 11731
Phone: 631-462-2226 x22
Fax: 631-493-9486
Cell : 516-971-7079
EPA ID# NYR000191726

Waste Transporter # NY-1A-1036

Manifests

Waste manifests must accompany the IDW during shipment off site for disposal. For non-hazardous waste, a non-hazardous waste manifest must be completed. For hazardous waste, a

Uniform Hazardous Waste Manifest (USEPA Form 8700-22) must be completed, along with a Land Disposal Restriction Notification Form 1. All IDW manifests must be signed by URS personnel as agents for the generator (NYSDEC).

4.0 FIELD DOCUMENTATION

Field notebooks will be used during all on-site work. A dedicated field notebook will be maintained by the field technician overseeing the site activities. In addition to the notebook, any and all original sampling forms, purge forms and notebooks used during field activities will be submitted as part of the final report.

The field sampling team will maintain a sample log sheet summarizing the following data:

1. Sample Identification
2. Date and time of sample collection
3. Sampling depth
4. Identity of samplers
5. Sampling methods and devices
6. Purge volumes (groundwater)
7. Groundwater purge parameters
8. Chain of custody and shipping information

Each subsurface boring will be logged in a bound field notebook during drilling by the supervising geologist. Field notes will include descriptions of subsurface materials encountered during drilling, sample numbers, and types of samples recovered from the borehole. Additionally, the geologist will note time and material expenditures for later verification of contractor invoices.

Upon completion of daily drilling activities, the geologist will complete the daily drilling record form and initiate chain-of-custody on any samples collected for chemical laboratory testing. Following completion of the drilling program, the geologist will transfer field notes onto standard forms for the Site Characterization Report.

On a weekly basis the project geologist will submit a summary report to the project manager containing at a minimum the following: (1) a summary of the daily drilling records; (2) progress report on field activities; and (3) a record of site visitors.

The supervising geologist will log the time and material expenditures for later verification of

contractor invoices. Upon completion of daily drilling activities, the geologist will complete the Daily Drilling Record form. Following completion of the program, the geologist will transfer field notes onto standard forms for the investigation report.

The proper completion of the following forms/logs will be considered correct procedure for documentation during the drilling program:

1. Field Log Book - weather-proof hard-bound field book
2. Daily Drilling Records (Appendix B)
3. Boring Logs (Appendix B)
4. Overburden Monitoring Well Construction Detail Diagrams (Appendix B)

5.0 SURVEYING AND MAPPING

Project surveying will provide data necessary to plot groundwater monitoring wells, piezometers, and soil-gas monitoring well locations on the existing base map. All surveying will be performed under the supervision of a New York State licensed land surveyor, following the requirements of the Project Management Work Plan, and the HASP.

Control for this project shall be based upon site control which has been established for prior work. This control is referenced to the New York State plane coordinate System and North American vertical Datum of 1988 (NAVD 88).

6.0 SAMPLING EQUIPMENT CLEANING PROCEDURES

Summary: To assure that no outside contamination will be introduced into the samples/data, thereby invalidating the samples/data, the following cleaning protocols will apply for all equipment used to collect samples/data during the field investigations. When sampling for PFAS, see Appendix A for special field procedures.

Procedure:

1. Thoroughly clean equipment with laboratory-grade soap and water, until all visible contamination is gone.
2. Rinse with water, until all visible evidence of soap is removed.
3. Rinse several times with deionized water.
4. Air dry before using.
5. If equipment will not be used immediately, wrap in aluminum foil.
6. Geoprobe equipment will be brush cleaned between locations.

7.0 SAMPLE LABELING

Summary: In order to prevent misidentification and to aid in the handling of environmental samples collected during the field investigation, the following procedures will be used:

Soil and Groundwater Sample Procedure:

1) Affixed to each sample container will be a non-removable (when wet) label. The following information will be written on each label with permanent marker:

- Site name
- Sample identification
- Project number
- Date/time
- Sampler's initials
- Sample preservation
- Analysis required

2) Each sample of each matrix will be assigned a unique identification alpha-numeric code. An example of this code and a description of its components are presented below:

Examples

1. MW-1
   MW-1 = Monitoring Well 1

2. SG-1
   SG-1 = Soil Gas Monitoring Well 1

List of Abbreviations

Monitor Type

PZ = Piezometer

MW = Monitoring Well

Sample Type

SO	=	Soil
GW	=	Groundwater
SG	=	Soil-gas
AB	=	Ambient Blank
TB	=	Trip Blank
RB	=	Rinse Blank
FD	=	Field Duplicate
MS	=	Matrix Spike
MSD	=	Matrix Spike Duplicate
FB	=	Field Blank

Vapor Intrusion Samples Procedure:

Each indoor air sample will have the following information placed on the laboratory supplied sample label:

- Site name
- Sample identification – see below
- Date/time
- Sampler's initials
- Analysis required – **TO-15**

The serial number of the canister and regulator used during sampling will also be noted on the Summa® canister identification tag and on the COC.

The following terminology shall be used for the structure sample identification (using site 704015 as an example):

- Structure Air Samples
- 704015-SS-xx (for sub-slab locations)
- 704015-BA-xx (for basement indoor ambient air)
- 704015-FF-xx (for first floor indoor air)
- 704015-OA-xx (for outdoor ambient air)

Where xx is the NYSDEC assigned structure identification number. Note: If multiple sub-slab samples in a single residence, they are identified as SSA, SSB, SSC, etc.

Field duplicate samples will be assigned a unique identification alphanumeric code that specifies the date of collection, the letters FD (for field duplicate) and an ascending number that records the number of duplicate samples collected that day. For example, the first field duplicate collected on January 22, 2008 would be assigned the following sample number using the code shown below:

YYYYMMDD-FD-1 = 20080122-FD-1

Subsequent duplicates collected on the same day would be assigned FD-2, FD-3 etc. Field sampling crew will record the duplicate sample information on the Summa Canister Sampling Field Data Sheets and also in the field book.

8.0 SAMPLE SHIPPING

Summary: Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The procedures used in this Remedial Design follow the chain-of-custody guidelines outlined in NEIC Policies and Procedures, prepared by the National Enforcement Investigations Center (NEIC) of the U.S. Environmental Protection Agency Office of Enforcement.

Procedure:

1. The chain-of-custody (COC) record (Appendix B) should be completely filled out, with all relevant information.
2. The original COC goes with the samples. It should be placed in a Ziploc bag and taped inside the sample cooler. The sampler should retain a copy of the COC.
3. Place inert cushioning material such as vermiculite or bubble-wrap in the bottom of the cooler.
4. Place the bottles in the cooler in such a way that they do not touch (use cardboard dividers or bubble-wrap).
5. Wrap VOA vials securely in bubble-wrap and tape. Place them in the center of the cooler.
6. With the exception of Summa® canisters, pack the cooler with ice in doubled Ziploc plastic bags.
7. Pack the cooler with cushioning material.
8. Tape the drain shut.
9. Wrap the cooler completely with strapping tape at two locations securing the lid. Do not cover any labels.
10. Place the lab address on top of cooler. For out-of-town laboratory, add the following: Put "This side up" labels on all four sides and "Fragile" labels on at least two sides. Affix numbered custody seals on front right and left of cooler. Cover seals with wide, clear tape.
11. Summa® canisters are shipped in the same boxes the laboratory used for shipping.

12. Ship samples via overnight carrier the same day that they are collected. Samples (except Summa® canisters) must be maintained at 4 degrees Celsius (C) ± 2ºC throughout the shipping duration.

9.0 FIELD SAMPLING INSTRUMENTATION

URS and rented field sampling equipment will require no maintenance beyond decontamination between sampling locations. Calibration procedures for electronic instruments can be found in the equipment operating manuals.

Maintenance procedures for the common instrumentation that will be used during field investigations are discussed in the equipment operating manuals. A copy of the manufacturer's operating manual for each instrument will be kept with the instrument or the operator. All field sampling equipment will be calibrated as recommended by the manufacturer. The calibration procedures and results will be recorded in the field notebook.

9.1 Preventative Maintenance

Table 9-1 presents the URS field instrumentation preventative maintenance summary. In case of an emergency, the equipment rental vendor, other URS offices, and/or the instrument manufacturer will be contacted. Instrumentation rental vendors, which provide overnight UPS/Federal Express service, are listed below.

Vendors

Pine Environmental Services, Inc.: Rochester, NY: 1-800-242-3910

Pine Environmental Services, Inc.: Mattydale, NY: 1-877-903-7463

TABLE 9-1

FIELD INSTRUMENTATION PREVENTATIVE MAINTENANCE SUMMARY

Instrument	Maintenance Details
Photoionization Detector	Initiate factory checkout and calibration, yearly or when malfunctioning or after changing UV light source. Wipe down readout unit after each use. Clean UV light source window every month or as use and site conditions dictate. Clean the ionization chamber monthly. Recharge battery after each use.
TVA	Initiate factory checkout and calibration, yearly or when malfunctioning or after changing UV light source. Wipe down readout unit after each use. Check probe cable and Teflon tubing prior to and after each use. Inspect H_2 tank prior to filling and recharge battery after each use.
Micropurge Flow Cell	Calibrate the required parameters using appropriate factory-supplied standards and buffers on a daily basis. Store the sonde (probe) in a 2M KCl solution at the end of each work day. Factory calibrate annually.
LaMotte Turbidity Meter	Replace 9 volt battery when necessary. Clean lamp after each days use. Clean turbidity tubes after each reading and replace tubes when discoloration of glass occurs.
TSI DustTrak	Perform a zero check before each use. Clean inlet every 350 hours. Clean 2.5 µm calibration impactor before every use. Replace internal filters every 350 hours at 1 mg/m^3, or when indicated by the main screen filter error indicator. Every year, return to the factory for cleaning and calibration, including the replacement of the internal HEPA filters.

APPENDIX A
PFAS SAMPLING GUIDANCE

The Field Crew





Do Not Use	Acceptable Alternatives
Wearing/using personnel hygiene items (cosmetics, lotions, moisturizers)	Do not wear
Sunscreens, insect repellants	Long sleeve, light colored 100% cotton shirts, wide brimmed hats, products that are 100% natural ingredients, DEET, tuck pant legs into socks and/or boots and use duct tape
New or unwashed clothing	Well-washed clothing
Clothing washed in fabric softeners	Clothing not washed with fabric softeners
Treated clothing (waterproof, water resistant, stain-resistant)	Clothing made of synthetic or natural fibers
Treated boots (waterproof, water resistant, stain-resistant)	Steel-toed boots made with polyurethane and polyvinyl chloride (PVC).
Coated Tyvek® suits*	Tyvek® suits
Handing or prepackaged food products	Do not have at the sampling location, wash hands well after handling, wear powderless nitrile gloves

Sunscreens and Insect Repellants

- Many manufactured sunblock and insect repellants contain PFASs and should not be brought or used on-site.

- The following products **are acceptable**:
  - Sunscreens - Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Block, Kiss my face, and baby sunscreens that are “free” or “natural”
  - Insect Repellents - Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellant, Herbal Armor, California Baby Natural Bug Spray, BabyGanics
  - Sunscreen and insect repellant - Avon Skin So Soft Bug Guard Plus – SPF 30 Lotion



“..The highest concentrations of PFOS and PFOA were detected at 0.0671 ng/g and 21.0644 ng/g, respectively. Even though present concentrations are found at ng/g levels, the daily use of sunscreen products is normally several grams. Therefore, a risk assessment of PFOS and PFOA contamination in sunscreen products is an important concern, and more attention needs to be paid to the long-term effects on human health.” - 2015

“The concentrations of total PFCAs ranged from not detected to 5.9 μg g^{-1} for cosmetics and from not detected to 19 μg g^{-1} for sunscreens” – Chemosphere, 2013

AECOM

Sampling Equipment

Do Not Use	Acceptable Alternatives
Fluoropolymer bailers or pump bladders	Disposable Equipment Dedicated Equipment (no PTFE parts)
Fluoropolymer tubing, valves and other parts in pumps	High-density polyethylene (HDPE) and silicon materials (i.e. tubing).
LDPE HydraSleeves	HDPE HydraSleeves
Decon 90	Alconox® and Liquinox® soap for decontamination, if needed
Decontamination water from the site	Water used for the decontamination of sampling equipment will be laboratory certified "PFAS-free" water
Glass containers (due to potential loss of analyte through adsorption	Polypropylene or HDPE sample bottles fitted with an unlined (no PTFE), polypropylene or HDPE screw cap
Waterproof field books	Loose paper on aluminum clipboards
Sharpies (acceptable by EPA checklist)	Ball point pens
Post-it notes	
Blue (chemical) ice*	Ice contained in plastic (polyethylene) bags (double bagged), secured to avoid meltwater from contacting sample containers, overnight shipping
Aluminum foil	Thin HDPE sheeting can be used

Sample Collection

- Prior to collection of samples, field personnel must wash their hands and wear a new set of nitrile gloves
- Do not filter samples
- *Shaker Test: A small portion of the sample (~10-25 mL) should be shaken by the sample collector on site. If foaming is noted within the sample, this should be documented when samples are submitted for analysis*
- Field QA/QC Samples **!!**
  - Field blanks (bottle to bottle)
  - Equipment blanks (rinsate)
  - Trip or travel blank

PFOA Site	FS/DUP	EB/FB	EB hits >RL
A (landfill)	209	32	0
B (landfill)	77	21	2
C (landfill)	99	21	3
D	637	22	0
E	823	34	0

AFFF Site Sample Type	Samples Analyzed	PFAS detected	# detections	PFAS Analytes detected	Result (min-max)
Field Blank	11	No	0	0	0
Equipment Blank	115	Yes	3	PFOS, 6:2 FTS	0.011-0.02 µg/L

AECOM

Drilling, Well Redevelopment, Surface Water Sampling

- Don't use detergent to decon drilling equipment, scrub with a plastic brush and rinse thoroughly in tap water, then triple-rinse in distilled or deionized water
- Use PFAS-free drilling fluids
- Don't re-use PVC well material which has been used previously at sites where PFAS is known or suspected to be present
- Collect representative water sample used during drilling activities
- Purged groundwater must be drummed, transported and managed properly
- Surface water must be collected by inserting a capped sampling container (polypropylene or HDPE) with the opening pointing down to avoid the collection of surface films
- Soil and sediment core samples must be collected directly from single-use PVC liners that must not be decontaminated or reused at different locations

AECOM

Additional Considerations

- No food or drink shall be brought on-site, with the exception of bottled water and hydration drinks (i.e., Gatorade® and Powerade®) and available for consumption only in the staging area.
- When field personnel require a break to eat or drink, they should remove their gloves and coveralls and move to an appropriate location (preferably downwind). When finished, field personnel should then tidy up and put their coveralls and gloves back on prior to returning to the work area.
- Visitors to the site are asked to remain at least 30 feet from sampling areas.

APPENDIX B
FIELD ACTIVITY FORMS

CHAIN OF CUSTODY RECORD

URS

PROJECT NO. | SITE NAME

SAMPLERS (PRINT/SIGNATURE)

LAB _____

COOLER _____ of _____

PAGE _____ of _____

DELIVERY SERVICE: _____ AIRBILL NO.: _____

LOCATION IDENTIFIER	DATE	TIME	COMP/ GRAB	SAMPLE ID	MATRIX	TOTAL NO. # OF CONTAINERS	TESTS / BOTTLE TYPE AND PRESERVATIVE	REMARKS	SAMPLE TYPE	BEGINNING DEPTH (IN FEET)	ENDING DEPTH (IN FEET)	FIELD LOT NO.# (IRPIMS ONLY)

MATRIX CODES

AA - AMBIENT AIR; SE - SEDIMENT; SH - HAZARDOUS SOLID WASTE; SL - SLUDGE; WP - DRINKING WATER; WW - WASTE WATER; WG - GROUND WATER; SO - SOIL; DC - DRILL CUTTINGS; WL - LEACHATE; GS - SOIL GAS; WC - DRILLING WATER; WO - OCEAN WATER; WS - SURFACE WATER; WQ - WATER FIELD QC; LH - HAZARDOUS LIQUID WASTE; LF - FLOATING/FREE PRODUCT ON GW TABLE

SAMPLE TYPE CODES

TB# - TRIP BLANK; SD# - MATRIX SPIKE DUPLICATE; RB# - RINSE BLANK; FR# - FIELD REPLICATE; N# - NORMAL ENVIRONMENTAL SAMPLE; MS# - MATRIX SPIKE

(# - SEQUENTIAL NUMBER (FROM 1 TO 9) TO ACCOMMODATE MULTIPLE SAMPLES IN A SINGLE DAY)

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED FOR LAB BY (SIGNATURE)	DATE	TIME

SPECIAL INSTRUCTIONS

Distribution: Original accompanies shipment, copy to coordinator field files

URSF-075C/1 OF 1/CofCR/GCM

AIR SAMPLE
CHAIN OF CUSTODY RECORD

URS CORPORATION
77 GOODELL STREET
BUFFALO, NY 14203
PHONE: 716-856-5636

URS CONTACT: _____

PROJECT NUMBER | SITE NAME

SAMPLERS (PRINT/SIGNATURE)

DELIVERY SERVICE: _____ AIRBILL NO.: _____

LAB _____

SHIPPING CONTAINER _____ of _____

PAGE _____ of _____

LOCATION IDENTIFIER	SAMPLE DATE	SAMPLE TIME	SAMPLE ID	MATRIX CODE	CANISTER SIZE (LITERS)	SAMPLE INFORMATION: CANISTER ID	FLOW CONTROLLER ID	INITIAL PRESSURE/ VACUUM (" Hg)	FINAL PRESSURE/ VACUUM (" Hg)	PRESSURE/VACUUM UPON LAB RECEIPT (" Hg)	REQUIRED ANALYSIS			REMARKS	SAMPLE TYPE CODE

MATRIX CODES: AA - AMBIENT AIR; AI - INDOOR AIR; AQ - FIELD QC; AS - SUB-SLAB AIR; GS - SOIL GAS

SAMPLE TYPE CODES: N# - NORMAL ENVIRONMENTAL SAMPLE; FD# - FIELD DUPLICATE; MS# - MATRIX SPIKE; (# - SEQUENTIAL NUMBER (FROM 1 TO 9) TO ACCOMMODATE MULTIPLE SAMPLES IN A SINGLE DAY)

RELINQUISHED BY (SIGNATURE)	DATE	TIME	RECEIVED BY (SIGNATURE)	DATE	TIME
RELINQUISHED BY (SIGNATURE)	**DATE**	**TIME**	**RECEIVED FOR LAB BY (SIGNATURE)**	**DATE**	**TIME**

SPECIAL INSTRUCTIONS

Distribution: Original accompanies shipment, copy to project file

DAILY DRILLING RECORD

URS Corporation

PROJECT TITLE: _____ DATE: _____

CLIENT: _____ CONTRACTOR: _____

FROM	TO	PRODUCTIVE HOURS	ACTIVITIES/COMMENTS
TOTAL PRODUCTIVE HOURS			LEVEL B / LEVEL C / LEVEL D (CIRCLE ONE SELCTION)

LABOR:		MATERIALS / SUPPLIES:	
UNITS		UNITS	

WEATHER:

_____ URS ONSITE COORDINATOR	_____ CONTRACTOR REPRESENTATIVE

URS
257 W. Genesee St.
Buffalo, New York 14202

TEST PIT LOG

PROJECT:			Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	
CONTRACTOR:		**LOCATION:**	Brooklyn, New York
DATE STARTED:		**GROUND ELEVATION:**	
DATE COMPLETED:		**OPERATOR:**	
TRENCH NUMBER:		**GEOLOGIST:**	

DEPTH (FT)	DESCRIPTION
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

COMMENTS:

URS Corporation									**TEST BORING LOG**
									BORING NO:
PROJECT:									**SHEET:** 1 of
CLIENT:									**JOB NO.:**
BORING CONTRACTOR:									**BORING LOCATION:**
GROUNDWATER:					**CAS.**	**SAMPLER**	**CORE**	**TUBE**	**GROUND ELEVATION:**
DATE	**TIME**	**LEVEL**	**TYPE**	**TYPE**					**DATE STARTED:**
				DIA.					**DATE FINISHED:**
				WT.					**DRILLER:**
				FALL					**GEOLOGIST:**
				*** POCKET PENETROMETER READING**					**REVIEWED BY:**

	SAMPLE					**DESCRIPTION**			
DEPTH FEET	**TIME**	**NO.**	**TYPE**	**BLOWS PER 6"**	**ROD%**	**COLOR**	**CONSISTENCY HARDNESS**	**MATERIAL DESCRIPTION**	**REMARKS**
5									
10									
15									
20									
25									
30									

COMMENTS:	**PROJECT NO.**
	BORING NO.

URS Corporation									**TEST BORING LOG**
									BORING NO:
PROJECT:									**SHEET:** of
CLIENT:									**JOB NO.:**
BORING CONTRACTOR:									**BORING LOCATION:**
GROUNDWATER:					**CAS.**	**SAMPLER**	**CORE**	**TUBE**	**GROUND ELEVATION:**
DATE	**TIME**	**LEVEL**	**TYPE**	**TYPE**					**DATE STARTED:**
				DIA.					**DATE FINISHED:**
				WT.					**DRILLER:**
				FALL					**GEOLOGIST:**
				*** POCKET PENETROMETER READING**					**REVIEWED BY:**

	SAMPLE					**DESCRIPTION**			
DEPTH FEET	**TIME**	**NO.**	**TYPE**	**BLOWS PER 6"**	**ROD%**	**COLOR**	**CONSISTENCY HARDNESS**	**MATERIAL DESCRIPTION**	**REMARKS**

COMMENTS:	**PROJECT NO.**
	BORING NO.

DRILLING SUMMARY

Geologist:

Drilling Company:

Driller:

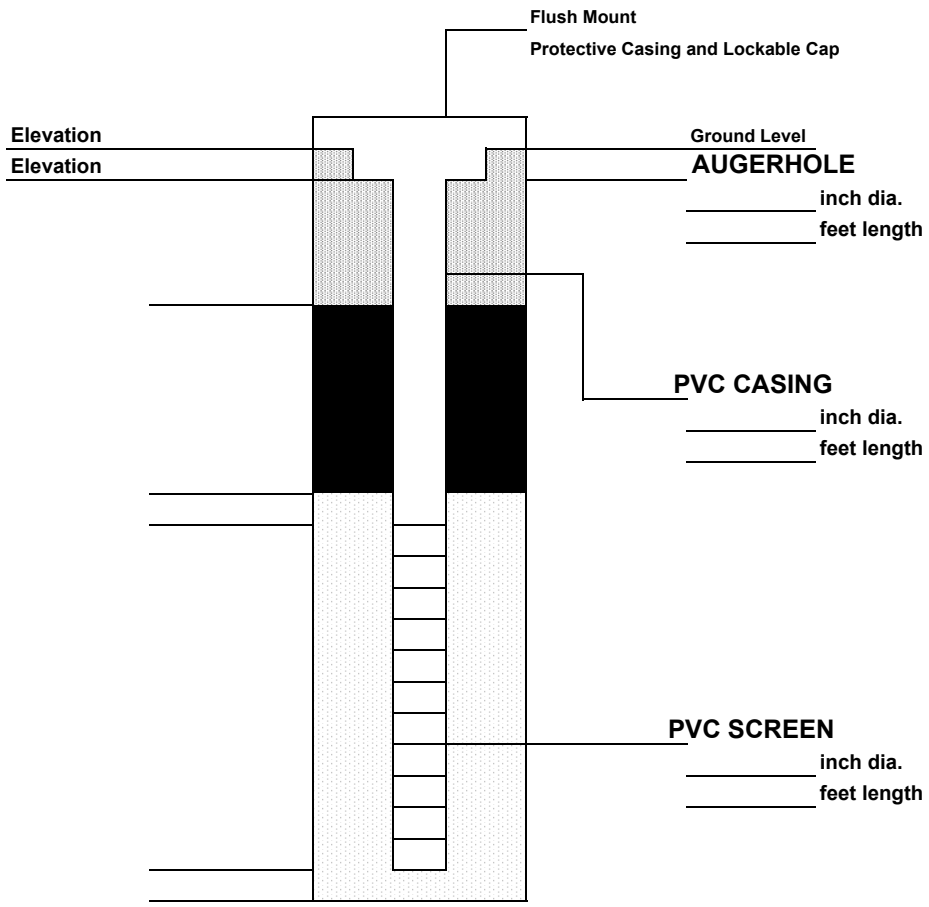
Rig Make/Model:

Date:

GEOLOGIC LOG

Depth(ft.)	Description

WELL DESIGN



CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: Steel grade box	**Type:** 4" PVC	**Type:** #2 Sand **Setting:**
Monitor: 4" PVC	**Slot Size:** .020"	***SEAL MATERIAL***
		Type: Bentonite **Setting:**

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client:	**Location:**	**Project No.:**
URS Corporation	**MONITORING WELL CONSTRUCTION DETAILS**	**Well Number:**

DRILLING SUMMARY

Geologist:

Contractor:

Operator:

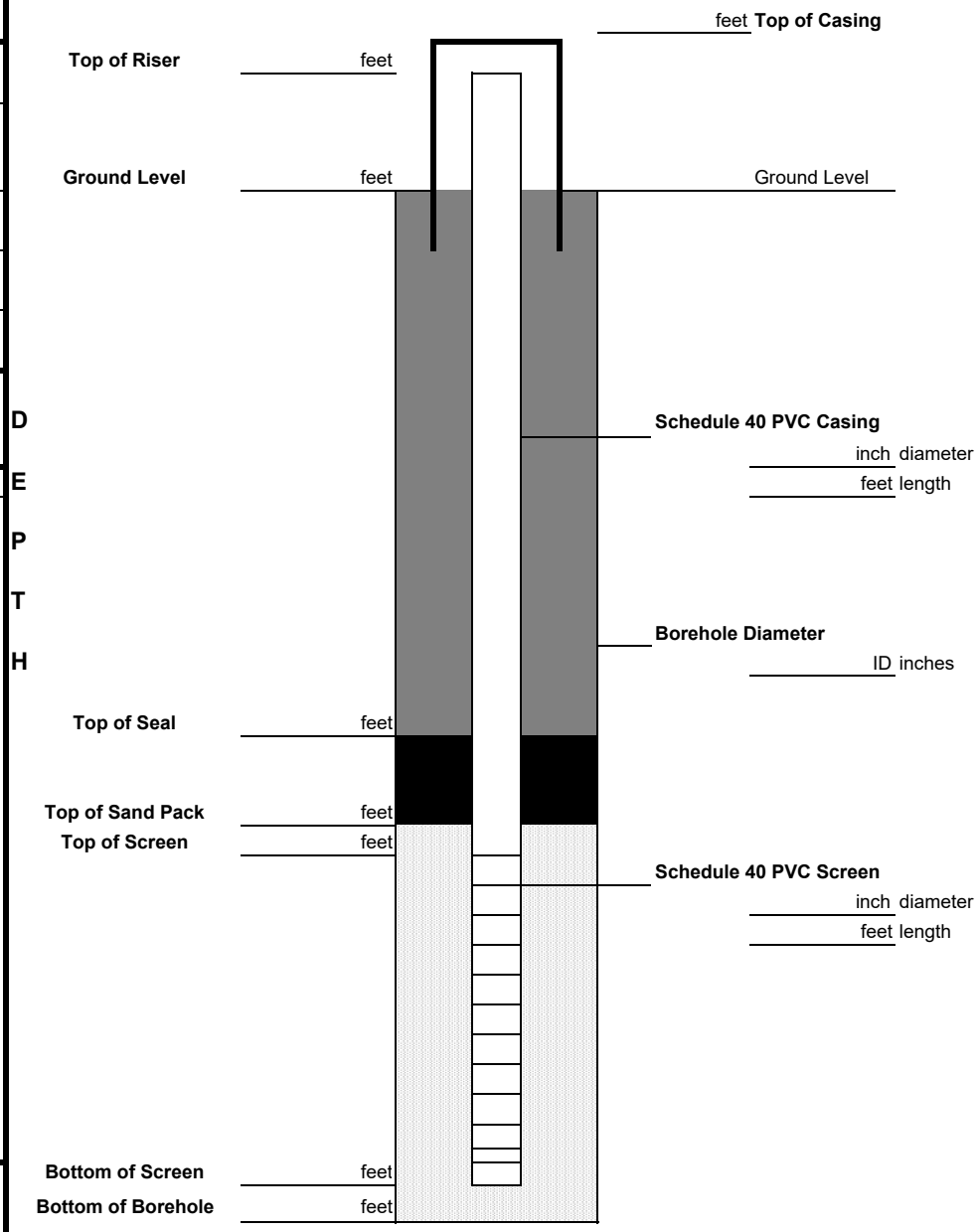
Model:

Date:

GEOLOGIC LOG

Depth(ft.)	Description

WELL DESIGN



CASING MATERIAL

Surface: 12" Steel protective cover (Stick Up)

Monitor: 4" Schedule 40 PVC

SCREEN MATERIAL

Type: 4" Schedule 40 PVC

Slot Size: 0.020"

FILTER MATERIAL

Type: #2 well sand

Setting:

SEAL MATERIAL

Type 1: Bentonite chips

Setting:

Type 1:

Setting:

COMMENTS:

LEGEND

Cement Grout

Bentonite Seal

Sand Pack

Client: NYC	**Location:**	**Project No.:**
URS Corporation	**MONITORING WELL CONSTRUCTION DETAILS**	**Well Number:**

DRILLING SUMMARY

Geologist:

Contractor:

Operator:

Model:

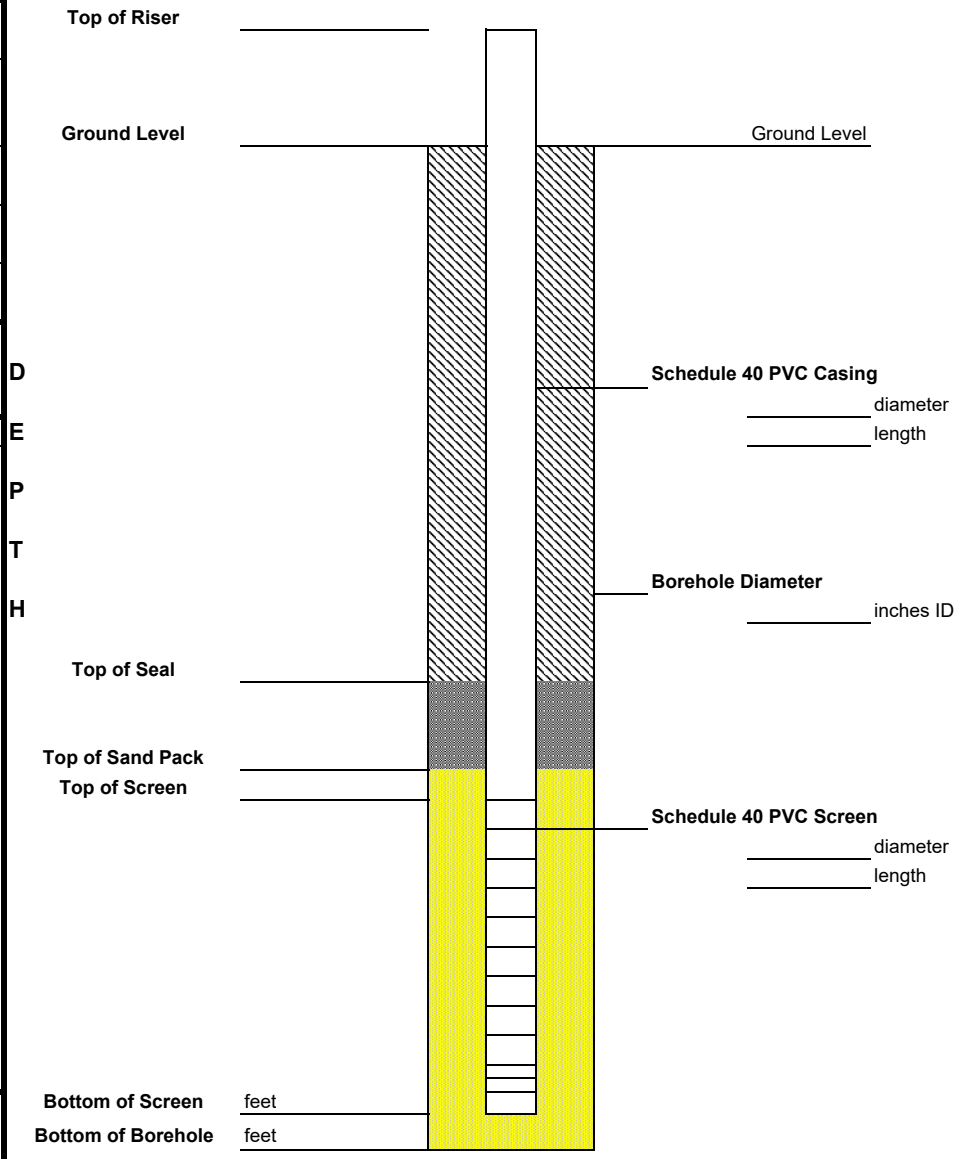
Date:

GEOLOGIC LOG

Depth(ft.)	Description

DEPTH

WELL DESIGN



CASING MATERIAL	SCREEN MATERIAL	FILTER MATERIAL
Surface:	**Type:** 1" Schedule 40 PVC	**Type:** **Setting:**
Monitor:	**Slot Size:**	**SEAL MATERIAL** **Type 1:** **Setting:** **Type 2:** **Setting:**

COMMENTS:

LEGEND

- Cement Grout
- Bentonite Seal
- Sand Pack

Client:	Location:	Project No.:
URS Corporation	**PIEZOMETER CONSTRUCTION DETAILS**	**Well Number:**

::

DRILLING SUMMARY

Geologist:

Drilling Company:

Driller:

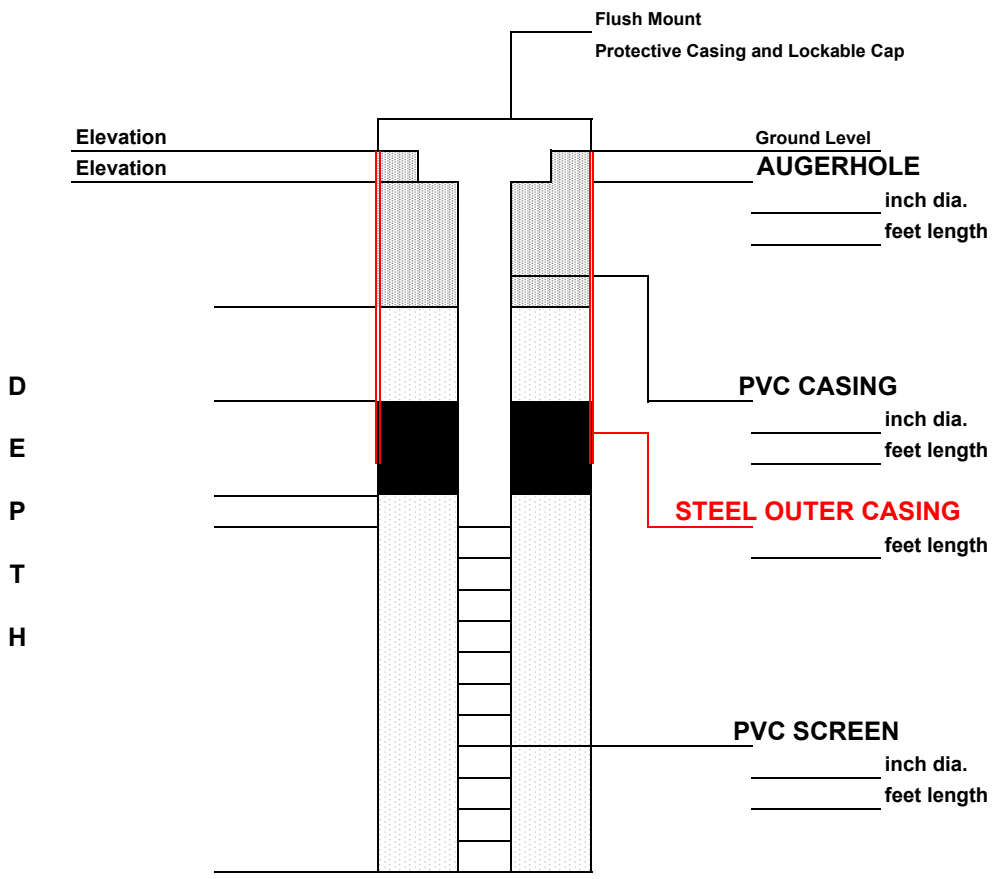
Rig Make/Model:

Date:

GEOLOGIC LOG

Depth(ft.)	Description
	See boring log for lithologic description.

WELL DESIGN



CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface:	**Type:**	**Type:** **Setting:**
Monitor:	**Slot Size:**	***SEAL MATERIAL*** **Type:** Bentonite **Setting:**

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	**Location:**	**Project No.:**
URS Corporation	**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**	**Well Number:** **MW-08**

DRILLING SUMMARY

Geologist:

Drilling Company:

Driller:

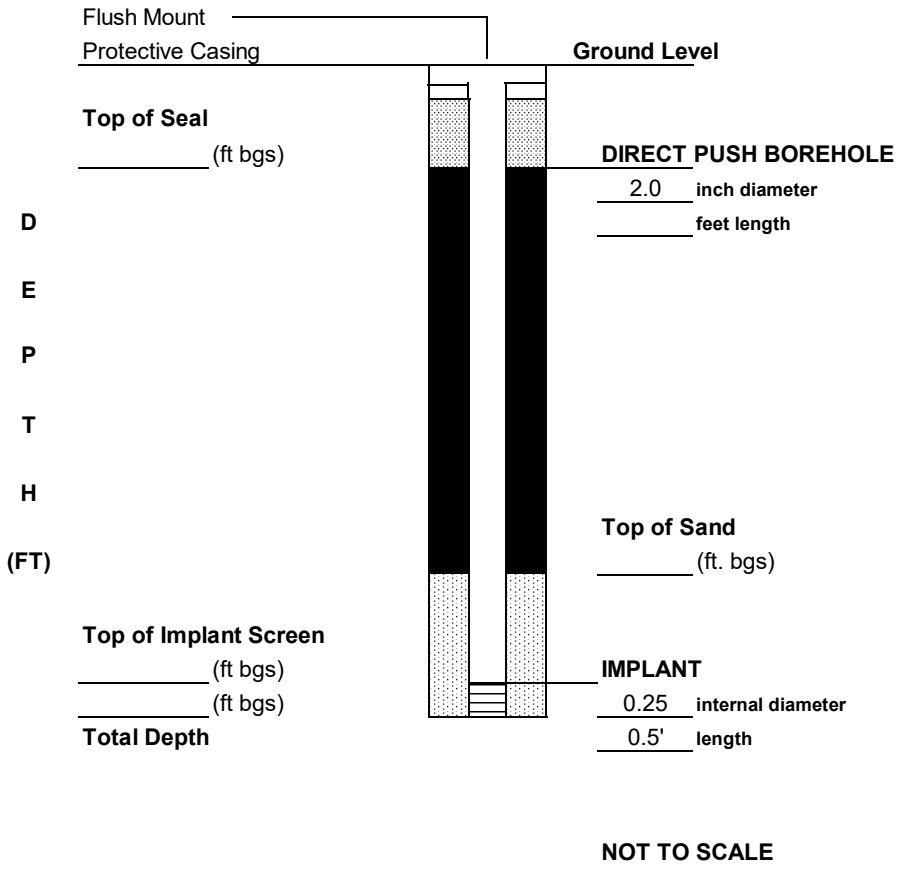
Rig Make/Model:

Date:

GEOLOGIC LOG

Depth(ft.)	Description

WELL DESIGN



CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: Steel grade box	**Type:** 6 inch stainless steel implant	**Type:** #2 Sand
		SEAL MATERIAL
Monitor: 3/8 inch OD polyethylene tubing	**Pore Diameter:** 0.007 inch	**Type:** Bentonite Slurry

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	**Meeker Avenue Plume Trackdown Site - EOA SVI Investigation**	**Project No.: 11176389.00002**
URS Corporation	**SOIL VAPOR IMPLANT CONSTRUCTION DETAILS**	**Well Number:**

WELL DEVELOPMENT LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: _____

PROJECT NO.: _____

STAFF: _____

DATE(S): _____

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=		1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=		2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.0	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.0	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x ___)	=	0	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS											
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											

COMMENTS:

WELL PURGING LOG

URS Corporation

PROJECT TITLE: _____ WELL NO.: _____

PROJECT NO.: _____

STAFF: _____

DATE(S): _____

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=		1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=		2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.00	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.00	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.00	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS											
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											

COMMENTS:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: _____ Site: _____ Well I.D.: _____

Date: _____ Sampling Personnel: _____ Company: URS Corporation

Purging/ Sampling Device: _____ Tubing Type: _____ Pump/Tubing Inlet Location: Screen midpoint

Measuring Point: Below Top of Riser Initial Depth to Water: _____ Depth to Well Bottom: _____ Well Diameter: _____ Screen Length: _____

Casing Type: PVC Volume in 1 Well Casing (liters): _____ Estimated Purge Volume (liters): _____

Sample ID: _____ Sample Time: _____ QA/QC: _____

Sample Parameters: _____

PURGE PARAMETERS

TIME	pH	TEMP (^{0}C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft; 1 inch diameter well = 154 ml/ft; 2 inch diameter well = 617 ml/ft; 4 inch diameter well = 2470 ml/ft ($vol_{cyl} = \pi r^2 h$)

Remarks:

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

Site Name: _____ Site Code: _____ Operable Unit: _____

Building Code: _____ Building Name: _____

Address: _____ Apt/Suite No: _____

City: _____ State: _____ Zip: _____ County: _____

Contact Information

Preparer's Name: _____ Phone No: _____

Preparer's Affiliation: _____ Company Code: _____

Purpose of Investigation: _____ Date of Inspection: _____

Contact Name: _____ Affiliation: _____

Phone No: _____ Alt. Phone No: _____ Email: _____

Number of Occupants (total): _____ Number of Children: _____

☐ Occupant Interviewed? ☐ Owner Occupied? ☐ Owner Interviewed?

Owner Name (if different): _____ Owner Phone: _____

Owner Mailing Address: _____

Building Details

Bldg Type (Res/Com/Ind/Mixed): _____ Bldg Size (S/M/L): _____

If Commercial or Industrial Facility, Select Operations:

If Residential Select Structure Type:

Number of Floors: _____ Approx. Year Construction: _____ ☐ Building Insulated? ☐ Attached Garage?

Describe Overall Building 'Tightness' and Airflows(e.g., results of smoke tests):

Foundation Description

Foundation Type: _____ Foundation Depth (bgs): _____ Unit: FEET

Foundation Floor Material: _____

Foundation Wall Material: _____

Foundation Floor Thickness: _____

Foundation Wall Thickness: _____ Unit: INCHES

☐ Floor penetrations? Describe Floor Penetrations: _____

☐ Wall penetrations? Describe Wall Penetrations: _____

Basement is: _____ Basement is: _____ ☐ Sumps/Drains? Water In Sump?: _____

Describe Foundation Condition (cracks, seepage, etc.) : _____

☐ Radon Mitigation System Installed? ☐ VOC Mitigation System Installed? ☐ Mitigation System On?

Heating / Cooling / Ventilation Systems

Heating System: _____ Heat Fuel Type: _____ ☐ Central A/C Present?

Vented Appliances

Water Heater Fuel Type: _____ Clothes Dryer Fuel Type: _____

Water Htr Vent Location: _____ Dryer Vent Location: _____

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

PRODUCT INVENTORY

Building Name: _____ Bldg Code: _____ Date: _____

Bldg Address: _____ Apt/Suite No: _____

Bldg City/State/Zip: _____

Make and Model of PID: _____ Date of Calibration: _____

Location	Product Name/Description	Size (oz)	Condition *	Chemical Ingredients	PID Reading	COC Y/N?
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐
						☐

* Describe the condition of the product containers as **Unopened (UO)**, **Used (U)**, or **Deteriorated (D)**

** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

Product Inventory Complete? ☐ Were there any elevated PID readings taken on site? ☐ ☐ Products with COC?

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

Site Name: _____ Site Code: _____ Operable Unit: _____

Building Code: _____ Building Name: _____

Address: _____ Apt/Suite No: _____

City: _____ State: _____ Zip: _____ County: _____

Factors Affecting Indoor Air Quailty

Frequency Basement/Lowest Level is Occupied?: _____ Floor Material: _____

☐ Inhabited? ☐ HVAC System On? ☐ Bathroom Exhaust Fan? ☐ Kitchen Exhaust Fan?

Alternate Heat Source: _____ ☐ Is there smoking in the building?

☐ Air Fresheners? Description/Location of Air Freshener: _____

☐ Cleaning Products Used Recently?: Description of Cleaning Products: _____

☐ Cosmetic Products Used Recently?: Description of Cosmetic Products: _____

☐ New Carpet or Furniture? Location of New Carpet/Furniture: _____

☐ Recent Dry Cleaning? Location of Recently Dry Cleaned Fabrics: _____

☐ Recent Painting/Staining? Location of New Painting: _____

☐ Solvent or Chemical Odors? Describe Odors (if any): _____

☐ Do Any Occupants Use Solvents At Work? If So, List Solvents Used: _____

☐ Recent Pesticide/Rodenticide? Description of Last Use: _____

Describe Any Household Activities (chemical use,/storage, unvented appliances, hobbies, etc.) That May Affect Indoor Air Quality:

☐ Any Prior Testing For Radon? If So, When?: _____

☐ Any Prior Testing For VOCs? If So, When?: _____

Sampling Conditions

Weather Conditions: _____ Outdoor Temperature: _____ °F

Current Building Use: _____ Barometric Pressure: _____ in(hg)

Product Inventory Complete? _____ ☐ Building Questionnaire Completed?

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

Building Code: _____ Address: _____

Sampling Information

Sampler Name(s): _____ Sampler Company Code: _____

Sample Collection Date: _____ Date Samples Sent To Lab: _____

Sample Chain of Custody Number: _____ Outdoor Air Sample Location ID: _____

SUMMA Canister Information

Sample ID:					
Location Code:					
Location Type:					
Canister ID:					
Regulator ID:					
Matrix:					
Sampling Method:					

Sampling Area Info

Slab Thickness (inches):					
Sub-Slab Material:					
Sub-Slab Moisture:					
Seal Type:					
Seal Adequate?:	☐	☐	☐	☐	☐

Sample Times and Vacuum Readings

Sample Start Date/Time:					
Vacuum Gauge Start:					
Sample End Date/Time:					
Vacuum Gauge End:					
Sample Duration (hrs):					
Vacuum Gauge Unit:					

Sample QA / QC Readings

Vapor Port Purge:	☐	☐	☐	☐	☐
Purge PID Reading:					
Purge PID Unit:					
Tracer Test Pass:	☐	☐	☐	☐	☐

Sample start and end times should be entered using the following format: MM/DD/YYYY HH:MM

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

LOWEST BUILDING LEVEL LAYOUT SKETCH

Please click the box with the blue border below to upload a sketch of the lowest building level .
The sketch should be in a standard image format (.jpg, .png, .tiff)

Clear Image

Design Sketch

Design Sketch Guidelines and Recommended Symbology

- Identify and label the locations of all sub-slab, indoor air, and outdoor air samples on the layout sketch.
- Measure the distance of all sample locations from identifiable features, and include on the layout sketch.
- Identify room use (bedroom, living room, den, kitchen, etc.) on the layout sket
- Identify the locations of the following features on the layout sketch, using the appropriate symbols:

B or **F**	Boiler or Furnace	o	Other floor or wall penetrations (label appropriately)
HW	Hot Water Heater	**xxxxxxx**	Perimeter Drains (draw inside or outside outer walls as appropriate)
FP	Fireplaces	**######**	Areas of broken-up concrete
WS	Wood Stoves	● SS-1	Location & label of sub-slab samples
W/D	Washer / Dryer	● IA-1	Location & label of indoor air samples
S	Sumps	● OA-1	Location & label of outdoor air samples
@	Floor Drains	● PFET-1	Location and label of any pressure field test holes.

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

FIRST FLOOR BUILDING LAYOUT SKETCH

Please click the box with the blue border below to upload a sketch of the first floor of the building.
The sketch should be in a standard image format (.jpg, .png, .tiff)

Clear Image

Design Sketch

Design Sketch Guidelines and Recommended Symbology

- Identify and label the locations of all sub-slab, indoor air, and outdoor air samples on the layout sketch.
- Measure the distance of all sample locations from identifiable features, and include on the layout sketch.
- Identify room use (bedroom, living room, den, kitchen, etc.) on the layout sket
- Identify the locations of the following features on the layout sketch, using the appropriate symbols:

B or **F**	Boiler or Furnace	o	Other floor or wall penetrations (label appropriately)
HW	Hot Water Heater	**xxxxxxx**	Perimeter Drains (draw inside or outside outer walls as appropriate)
FP	Fireplaces	**######**	Areas of broken-up concrete
WS	Wood Stoves	● SS-1	Location & label of sub-slab samples
W/D	Washer / Dryer	● IA-1	Location & label of indoor air samples
S	Sumps	● OA-1	Location & label of outdoor air samples
@	Floor Drains	● PFET-1	Location and label of any pressure field test holes.

Structure Sampling Questionnaire and Building Inventory

New York State Department of Environmental Conservation

OUTDOOR PLOT LAYOUT SKETCH

Please click the box with the blue border below to upload a sketch of the outdoor plot of the building as well as the surrounding area. The sketch should be in a standard image format (.jpg, .png, .tiff)

Clear Image

Design Sketch

Design Sketch Guidelines and Recommended Symbology

- Identify and label the locations of all sub-slab, indoor air, and outdoor air samples on the layout sketch.
- Measure the distance of all sample locations from identifiable features, and include on the layout sketch.
- Identify room use (bedroom, living room, den, kitchen, etc.) on the layout sket
- Identify the locations of the following features on the layout sketch, using the appropriate symbols:

B or **F**	Boiler or Furnace	o	Other floor or wall penetrations (label appropriately)
HW	Hot Water Heater	**xxxxxxx**	Perimeter Drains (draw inside or outside outer walls as appropriate)
FP	Fireplaces	**######**	Areas of broken-up concrete
WS	Wood Stoves	● SS-1	Location & label of sub-slab samples
W/D	Washer / Dryer	● IA-1	Location & label of indoor air samples
S	Sumps	● OA-1	Location & label of outdoor air samples
@	Floor Drains	● PFET-1	Location and label of any pressure field test holes.

Summa Canister Data Sheet

Site: Hillcrest

Samplers:

Date:

Sample #					
Location					
Summa Canister ID					
Flow Controller ID					
Additional Tubing Added	NO/ YES - How much	NO/ YES - How much	NO/ YES - How much	NO/ YES - How much	NO/ YES - How much
Purge Time (Start)					
Purge Time (Stop)					
Total Purge Time (min)					
Purge Volume					
Initial Tracer Gas Results					
CH4 (ppm)					
O2 (%)					
H2S (ppm)					
CO2 (ppm)					
Pressure Gauge - before sampling					
Sample Time (Start)					
Sample Time (Stop)					
Total Sample Time (min)					
Pressure Gauge - after sampling					
Sample Volume					
Canister Pressure Went To Ambient Pressure?	YES / NO	YES / NO	YES / NO	YES / NO	YES / NO
Final Tracer Gas Results					
Weather 24 hours before and during sampling					

General Comments:

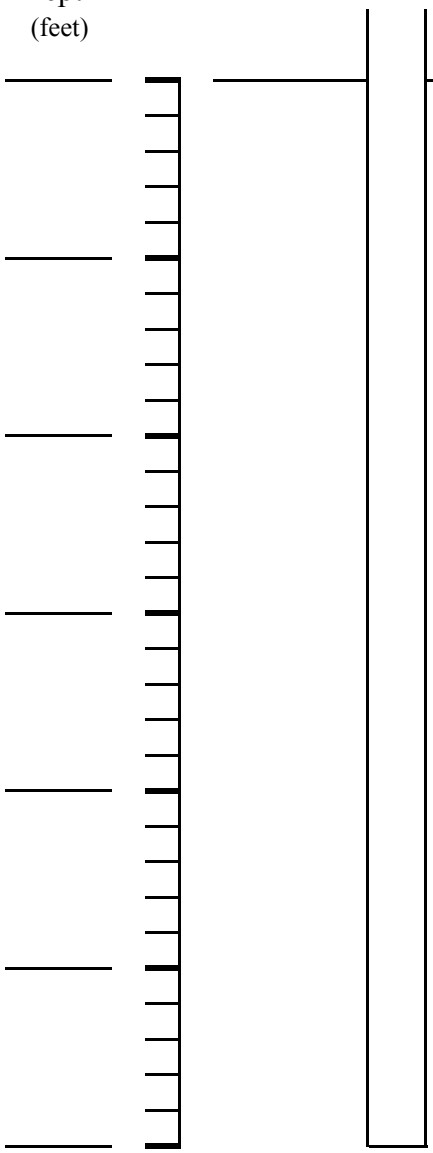
WELL DECOMMISSIONING RECORD

Site Name:	Well I.D.:
Site Location:	Driller:
Drilling Co.:	Inspector:
	Date:

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	
Casing retrieved (feet)	
Casing type/dia. (in)	
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	
# of batches prepared	
For each batch record:	
Quantity of water used (gal.)	
Quantity of cement used (lbs.)	
Cement type	
Quantity of bentonite used (lbs.)	
Quantity of calcium chloride used (lbs.)	
Volume of grout prepared (gal.)	
Volume of grout used (gal.)	

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

URS
257 West Genesee Street, Suite 400
Buffalo, New York 14202-2657
Telephone: (716)-856-5636
Fax: (716)-856-2545

DATE:

DAY	S	M	T	W	TH	F	S

DAILY CONSTRUCTION REPORT

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32	32-50	50-70	70-85	85 and up
WIND	Still	Moder	High	Report No.	
HUMIDITY	Dry	Moder	Humid		

PROJECT:

CONTRACTOR:

URS JOB No.:

URS PROJECT MANAGER:

AVERAGE FIELD FORCE

Name of Contractor	Non-manual	Manual	Remarks

VISITORS

Time	Representing	Representing	Remarks

EQUIPMENT AT THE SITE:

CONSTRUCTION ACTIVITIES:

See attached photos

Sheet: 1 of

☐ X - designates info on backside of page

By: _____ Title: _____

Reviewed by: _____ Title: _____

DAILY CONSTRUCTION REPORT (cont'd)

REPORT No.:_____

PROJECT:
CONTRACTOR:
URS JOB No.: **DATE:**

CONSTRUCTION ACTIVITIES (cont'd):

APPENDIX C

FIELD NOTES

CONTENTS

PAGE	REFERENCE	DATE

- Arco Industrial Laundries Site # 828102
- Address: 331-337 West Main Street Rochester / ~~Monroe~~ Monroe NY
- Project # 60617211

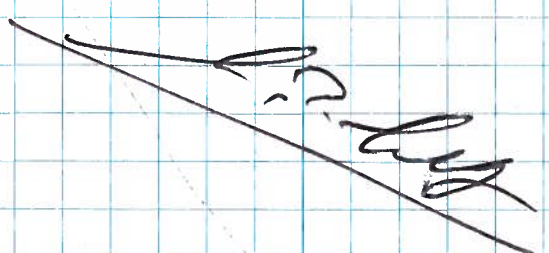
Date: 1/16/20
Weather: 33°F, Snow / Rain, Slight Wind
Personnel: Sean P. Connolly } Aecom
Mike Cutmann }
Zeke Hurd - Pegasus

- 0550 - Left house for job site. Driving personal vehicle (2012 Black Chevy Silverado 1500)
- 0720 - Arrive on N. Side of site. Gates to site are locked
- 0815 - M. Cutmann arrives on site. Opened S. Side gate and building. Began walking around building + site property to prepare to mark out 25x25' grid

Location 331-337 W. Main St. Rochester NY Date 1/16/20
Project / Client 60617211 / NYSDEC

Arco Industrial Laundries (Cont)

- 0900 - Zeke Hurd arrives on site to complete GPR work
  - Using a: GSSI SIR 300 w/ 400 MHz Antenna
- 1340 - Completed mapping grid. 10'x10' grid for a total of 120' x 50'
- 1430 - Zeke Hurd completed GPR work. Began cleaning up site
- (1530) SK
- 1530 - Left site for Pine Environmental to pick up PID
- 1545 - Arrived @ Pine Environmental
- 1550 - Left Pine Environmental. Will stop to fill up before heading home
- 1720 - Arrive back @ house (End of Day)



URS Corporation
257 West Genesee Street, Suite 400
Buffalo, New York 14202-2657
Telephone: (716)-856-5636
Fax: (716)-856-2545

DATE: 1/16/2020

DAY	S	M	T	W	(TH)	FS	

DAILY CONSTRUCTION REPORT

PROJECT: Artco Industrial Laundries
CONTRACTOR: Pegasus
URS JOB No.: 60617211
URS PROJECT MANAGER: Michael Gutmann

WEATHER	Bright Sun	Clear	Overcast	Rain	(Snow)
TEMP	To 32	(32-50)	50-70	70-85	85 and up
WIND	Still	(Moder)	High	Report No.	
HUMIDITY	(Dry)	Moder	Humid		

AVERAGE FIELD FORCE

Name of Contractor	Non-manual	Manual	Remarks
Zeke Hurd w/ Pegasus			

VISITORS

Time	Representing	Representing	Remarks
10:00 – 13:00	Frontira (gas and communications)	UFPO	Marked perimeter for gas, electric and communications.

EQUIPMENT AT THE SITE: GSS1 SIR 3000 w/ 400 MHz Antenna

CONSTRUCTION ACTIVITIES:

- 7:30 - Sean Connelly and Mike Gutmann (AECOM/ URS) arrive on site. Began site walk around and creating a 10’ x 10’ grid (total of 120’ x 50’) for GPR guidance.
- 9:00 - Zeke Hurd (Pegasus) arrives on site to begin GPR work using a GSSI SIR 3000 w/ 400 MHz antenna along with a handheld radio detection utility locator to locate any and all underground anomalies including previously installed SVE Trench within the established grid.
- 14:30 - Zeke Hurd completed GPR work locating the following underground anomalies: Possible underground tanks; previously installed SVE trenching and two underground concrete trenches. See the attached sketch for more detail
- 15:30 – All parties left site.

See attached photos

X - designates info on backside of page

By: Title:
Reviewed by: Title: Project Manager

AECOM

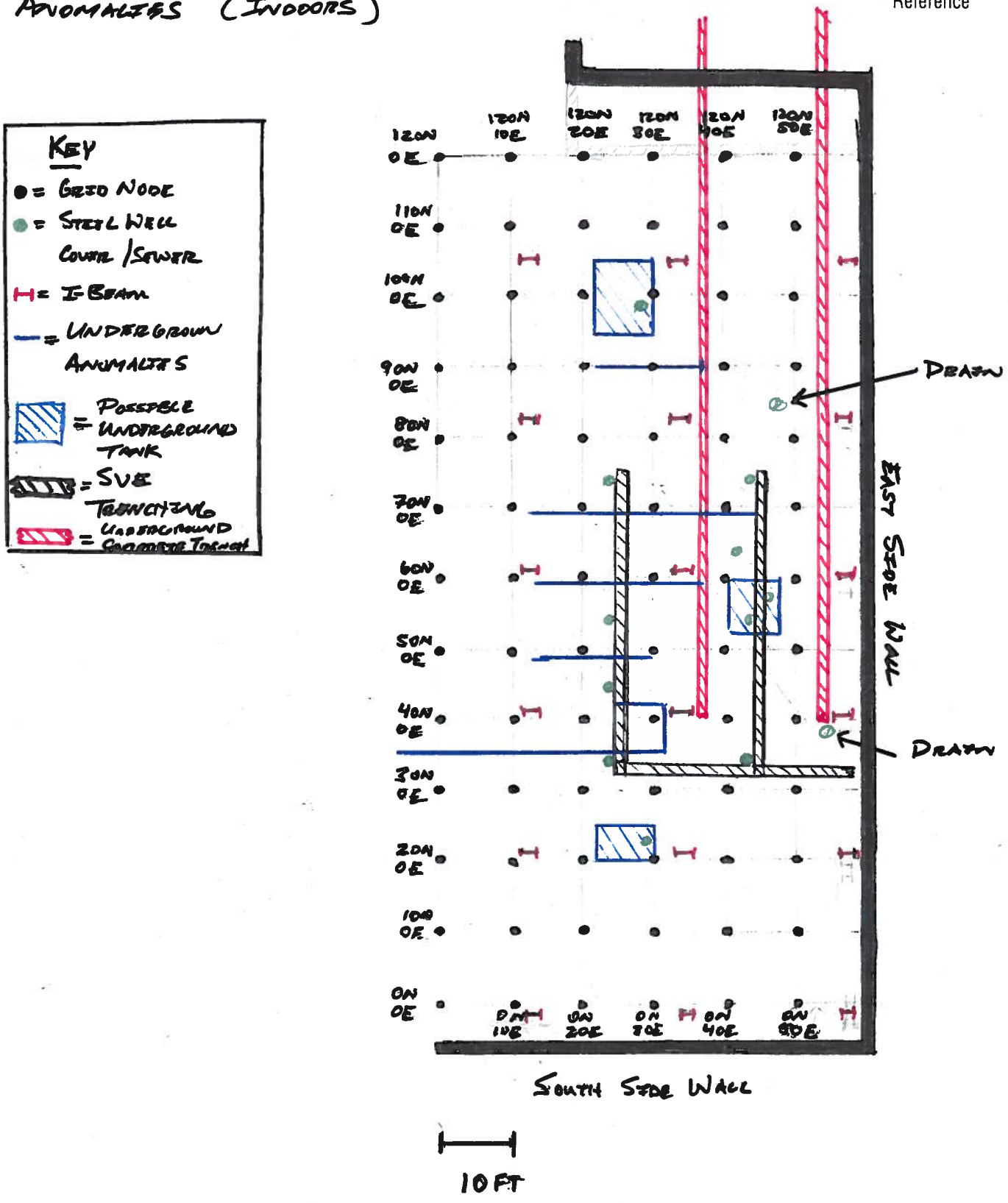
Job ARTCO INDUSTRIAL LAUNDRIES Project No. 60617211 Page 1 of 1

Description 10 x 10 GRID W/ AREA FEATURES + UNDERGROUND ANOMALIES (INDOORS) Computed by S. CONNELLY Date 1/17/20

Checked by MIKE GUTMANN Date 1/18/2020

Reference

Sheet 1 of 1



Location 331-337 W Main St Rochester NY Date 1/23/20

Project / Client 60617211 / NYSDEC

Area of Industrial Laundries

Date: 1/23/20

Weather: 24°F, Mostly Cloudy

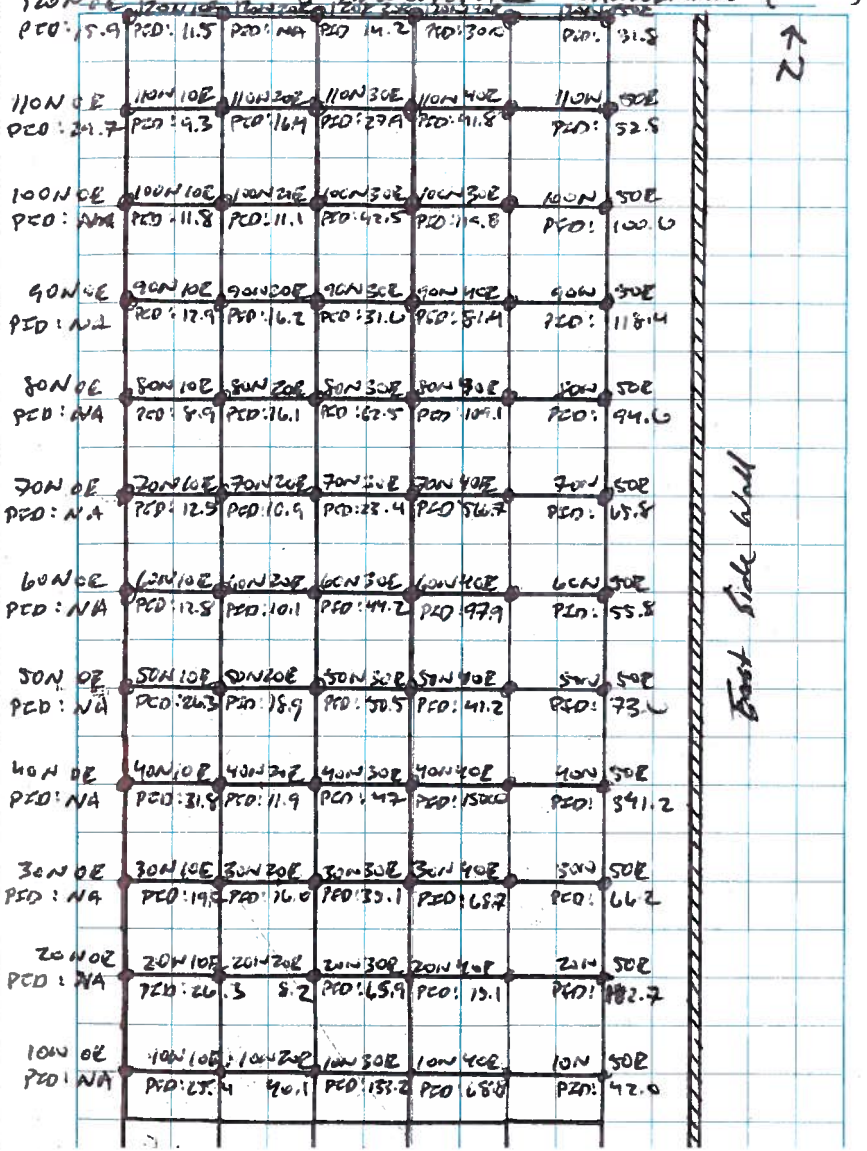
Personnel: Sean P. Connelly, Mike Gutmann } Aecom

- 0620 - Left SRC house, filled up rental truck @ 7-Eleven gas station in South Wales NY
- 0640 - Left gas station and headed to Home Depot in Batavia NY
- 0730 - Arrive @ Home Depot to purchase Extension Chords
  - 2x 100' 14 gauge extension chords
- 0750 - Left Home Depot to site.
- 0830 - Arrive on site. Began opening building and moving equipment into building
  - Performed H/S & began drilling preliminary bore holes to take PID readings to determine extent of VOC's & best spots to take Hand probe soil borings. See

Location 331-337 W Main St Rochester NY Date 1/23/20

Project / Client 60617211 / NYSDEC

Area of Industrial Laundries (Cont'd)



Location 331-337 W. Main St Rochester NY Date 1/23/20

Project / Client 60617211 / NYSDEC

Antco Industrial Laundries (Cont)

-1230 - Completed drilling all PID holes besides 0° West line besides 110N 0E and 120N 0E

-1245 - Determined extent and where to take hand probe soil borings

-1250 - Will leave site to fill up Generator and buy ice for samples

-1315 - Returned to site. Will begin drilling 3/4" holes and taking hand boring soil samples w/ SMC sampler.

Boring ID: 40N 50E

Depth	PID	Rec. %	Description
0-6"	341.2	-	Concrete
6-12"	22.9	24/36 72%	Silty-sand fill w/ red brick pieces
12-24"	29.0		Light brown, silty-sand fill w/ trace clay and gravel

Location 331-337 W. Main St Rochester Date 1/23/20

Project / Client 60617211 / NYSDEC

Antco Industrial Laundries (Cont)

Sample List for 1/23/20

Sample ID	Date Sampled	Time Sampled	Analysis
40N 50E Soil	1/23/20	1355	8260C
20N 50E Soil		1417	
30N 40E Soil		1443	
10N 30E Soil		1455	
70N 40E Soil		1555	
100N 40E Soil		1608	
80N 40E Soil		1620	
80N 30E Soil		1645	

Location 331-337 W. Main St. Rochester NY Date 1/23/20

Project / Client 60617211 / NYSDEC

-1417- Arteo Industrial Laundries (Con't)

Boring ID: 20N 50E

Depth	PID	Rec %	Description
0-6	182.7	—	Concrete
6-12"	12"=2.9	25/36"	- Silty-sand fill w/red
	18"=2.6	69%	brick fragments
12-25"	25=2.3		- Light brown silty-sand
			fill w/trace clay and
			gravel

-1443-

Boring ID: 30N, 40E

Depth	PID	Rec %	Description
0-6"	68.7	—	Concrete
8	5.2	16/36"	6-12 Brown, silty-sand fill w/ ~~gravel~~ trace
10	3.9	44%	gravel
12	4.2		12-16 Brown, silty sand
14	10.1		fill w/gravel and
16	6.8		black staining throughout

Location 331-337 W. Main St Rochester NY Date 1/23/20

Project / Client 60617211 / NYSDEC

-1455- Arteo Industrial Laundries (Con't)

Boring ID: 10N 30E

Depth	PID	Rec %	Description
0-6	133.2	—	Concrete
12	35.7	25/36	6-12" - Light brown
18	318.0	69%	silty sand fill
25	46.5		w/little gravel
			12-25" - Dark brown
			silty sand fill w/
			little gravel and
			black staining
			throughout

-1555-

Boring ID: 70N 40E

Depth	PID	Rec %	Description
0-8"	566.7	—	Concrete
12	1.5	16/36"	8-16" - Light,
16	2.1	22%	reddish brown
			little to no lines
			sand w/some
			gravel, fill

Location 331-337 W. Main St. Rochester NY Date 1/23/20

Project / Client 60617211 / NYSDEC

- 1608 - Arteo Industrial Laundries (Cont)

Boring TD: 100N 40E

Depth	PID	Rec %	Description
0-8"	119.8	-	Concrete
14"	2.9	14/36 39%	8-14 - Brown, fine to medium sand w/ little gravel

- 1620 -

Boring TD: 80N 40E

Depth	PID	Rec %	Description
0-8"	109.1	-	Concrete
12"	2.7	15/36 42%	8-15 - Brown fine to medium sand w/ little gravel
15"	4.2		

- 1645 -

Boring TD: 80N 30E

Depth	PID	Rec %	Description
0-8"	62.5	-	Concrete
12"	27.2	20/36 56%	8-20" - Dark brown fine to medium sand w/ silt, partial black staining throughout
24"	5.6		
36"	5.0		

Location 331-337 W. Main St Rochester NY Date 1/23/20

Project / Client 60617211

Arteo Industrial Laundries (Cont)

- 1645 - Completed logging and sampling boring 80N 30E. Began cleaning up equipment and work area.

- 1710 - Left site and headed home

- 1845 - Returned home. (End of Day)

Location 331-337 W Main St Rochester NY Date 1/24/20

Project / Client 66617211 / NYSDEC

-0846- Antco Industrial Laundries

Date: 1/24/20

Weather: 30°F, Cloudy

Personnel: Sean P. Connelly; Mike Gutmann (Arcadis)

-0500- Left house for Tops in East Aurora to purchase paper towels, DI Water, packing tape, pens/markers

-0535- Left tops for job site

0700 - Arrive @ job site. Opened up gate & building doors. Began preparing for the days activities.

-0825- Began sampling @ 40N 10E

-0833-

Boring: 40N 10E

Depth	PID	Rec %	Description
0-6"	38.1	-	Concrete
12"	0.0	18/36"	6-16" - Dark brown, fine to medium sand w/ little silt and trace gravel
18"	0.0	50%	16-18" - Dark brown → black, medium to coarse sand w/ little silt and

Location 331-337 W. Main St. Rochester NY Date 1/24/20

Project / Client 66617211 / NYSDEC

-0846- Antco Industrial Laundries

Boring #0: 90N 10E

Depth	PID	Rec %	Description
0-6"	12.9	-	Concrete
12	1.2	16/36"	6-16" - Brown, fine to coarse sand w/ silt and some gravel
16	0.3	44%	

-0900-

Boring #0: 100N 20E

Depth	PID	Rec %	Description
0-6	11.1	-	Concrete SRC
15"	8.2	27/36	6-15 - Light brown, fine to medium sand w/ trace silt and gravel
20"	2.2	75%	15-20 - Dark brown → black, fine to medium sand w/ trace silt and brick fragments and gravel
21"	2.3		
27"	0.4		

(Continued on)

Location 331-337 W. Main St Rochester, NY Date 1/24/20

Project / Client 60617211 / NYSDEC

-0900- Arteo Industrial Laundries

Boring ID: 10ON 20E (Continued from previous page)

Depth	PID	Rec %	Description
		27/36	20-21 - Black, dry
		75%	fine to medium sand
			w/ ash and gravel
			21-27 - Dark brown
			fine to medium sand
			w/ little silt and trace
			gravel

-0919-

Boring ID: 70N 20E

Depth	PID	Rec %	Description
0-6"	10.9	-	Concrete
12	1.8	21/36	6-9" - Light brown
18	0.2	58"	silty sand w/ gravel
21	0.5		9-21 - stained black
			silty sand fill w/
			gravel and brick

Location 331-337 W. Main St Rochester, NY Date 1/24/20

Project / Client 60617211 / NYSDEC

-0945- Arteo Industrial Laundries

Boring ID: 40N 40E

Depth	PID	Rec %	Description
0-8"	15.000 197.5 SRC	-	Concrete
12	53+	25/36	8-25 - Dark
18	53.1	69%	Brown, dry
25	48.4		sand w/ little
			silt, little gravel
			and black
			staining throughout

-0950-

Boring ID: 40N 30E

Depth	PID	Rec %	Description
0-6	47.0	-	Concrete
6	1.8	24/36	6-14" - light
10	0.5	77%	brown fine to medium sand
14	5.7		w/ gravel
18	5.3		14-28" - Dark
24	2.2		brown, fine
28	2.4		to medium
			sand w/ little
			silt, trace
			gravel w/
			black staining

Location 331-337 W. Main St. Rochester, NY Date 1/24/20

Project / Client 60617211 / NYSDEC

Arteo Industrial Laundries

-1012-

Boring 20: 50N 50E

Depth	PID	Rec %	Description
0-6	73.6	22/36	Concrete
		61%	6-13 - light brown, dry, fine to medium sand w/ little silt
6	3.0		
10	1.8		
13	14.7		13-22 - Dark brown fine to course sand w/ little silt, trace gravel w/ staining throughout (Black)
18	5.9		
22	6.7		

-1020-

Boring 70: 70N 50E

Depth	PID	Rec %	Description
0-6	65.8	-	Concrete
6	6.7	22/36	6-12 - light brown, dry fine to medium sand w/ little silt
12	6.9	61%	
18	4.1		12-22 - Dark brown fine to course sand w/ little silt, trace gravel
22	5.3		

Location 331-337 W Main St. Rochester Date 1/24/20

Project / Client 60617211 / NYSDEC

Arteo Industrial Laundries

-1036-

Boring 90: 90N 50E

Depth	PID	Rec %	Description
0-6	111.4	-	Concrete
6	9.5	21/36	6-8 - light brown dry fine sand w/ little silt
12	16.7	58%	
18	22.5		
21	11.7		8-21 - Dark brown fine to course sand w/ little silt, trace gravel, w/ staining throughout

-1044-

Boring 110: 110N 50E

Depth	PID	Rec %	Description
0-6	52.8	-	Concrete
6	6.9	26/36	6-14 - light brown dry fine sand w/ little silt
12	9.2	72%	
16	6.8		
18	7.2		14-20 - Dark brown dry, fine to medium sand w/ little silt w/ ash and brick fragments + gravel
24	1.9		
26	1.7		
			20-26 - light brown dry

Location 331-337 W Main St. Rochester NY Date 1/24/20

-1203- Project / Client 606 17211 / NYSDEC

Boring ID: ANTICO INDUSTRIAL LAUNDRIES

30N 20E

Depth	PID	Rec %	Description
0-6	16.0	-	Concrete
6	0	21/36	6-16" light brown, dry fine to medium sand w/little silt ~~underground~~
12	0.3	58%	
16	2.5		
18	1.8		16-21 - Dark brown to black, dry, fine to medium sand w/ash and red brick fragments and gravel
21	1.2		

-1211-

Boring ID: ON 20E

Depth	PID	Rec %	Description
0-6	52.5	-	Concrete
6	1.2	17/36	6-14 - light brown dry, fine to medium sand w/little silt
12	3.6	47%	14-17 - Dark brown to black, dry, fine to medium sand w/ash and red brick fragments and gravel
18	4.5		

Location 331-337 W. Main St. Rochester NY Date 1/24/20

Project / Client 606 17211 / NYSDEC

-1230- ANTICO INDUSTRIAL LAUNDRIES

Boring ID: 110N 30E

Depth	PID	Rec %	Description
0-6	27.9	-	Concrete
6"	0.0		6-7 - light brown, dry fine to medium sand w/little silt
7			7-23 - Dark brown to black, dry fine to medium sand w/ash and red brick fragments and gravel
12			
18			
23			

-1300-

Boring ID: 60N 50E

Depth	PID	Rec %	Description
0-6	55.8	-	Concrete
6	2.8	20/36	6-16 - light brown dry, fine to medium sand w/little silt
12	1.6	72%	
16	2.5		
18	3.2		16-26 - Dark brown to black, dry, fine to medium sand w/ash and red
22	2.7		
26	0.2		

Location 331-337 W. Main Street Rochester NY Date 1/24/20

Project / Client 606 17211 / NYSDEC

-1315 - ARTCO INDUSTRIAL LAUNDRIES

Boring ID: 60N 10E

Depth	PID	Rec %	Description
0-6	97.9	-	Concrete
6	0.9	21/36	6-18 - Light brown
10	7.7	58%	dry, fine to medium
12	4.7		sand w/ little silt
15	14.6		18-13 - Distinctive
18	11.9		gravel layer
21	8.41		13-21 - Dark brown
			to black, dry, fine
			to medium sand w/
			ash and red brick
			fragments and gravel

-1345 -

Boring ID: 20N 10E

Depth	PID	Rec %	Description
0-6	26.3	-	Concrete
6	0.2	22/36	6-16 - light brown,
12	0.0	61%	dry fine to medium
16	0.0		sand
18	0.3		16-22 - Dark brown, dry
22	0.0		dry, fine to medium
			sand w/some

Location 331-337 W. Main St, Rochester NY Date 1/24/20

Project / Client 606 17211 / NYSDEC

-1355 ARTCO INDUSTRIAL LAUNDRIES

Boring ID: 60N 10E

Depth	PID	Rec %	Description
0-6	12.8	—	Concrete
6	0.0	24/36	6-14 - light brown
12	0.0	67%	dry, fine to medium
14	0.0		sand
18	0.0		14-17 - Dark brown
21	0.6		dry, fine to medium
24	0.5		sand w/some gravel
			17-20 - distinct
			gravel layer
			20-24 - Dark brown
			dry, silty sand
			w/ gravel

-1410 - Completed all sampling. Began breaking down equipment, cleaning up work area & packing coolers

-1500 - Left site for home. Will drop off samples Monday morning @ Test America / Eurofins Buffalo

-1635 - Arrived back @ home

(Sample list on)

Location 331-337 W. Main St Rochester NY Date 1/24/20

Project / Client 60617211 / NYSDEC

Attica Industrial Laundries

- 1/24/20 Sampling Log -

Sample ID	Date Sampled	Time Sampled	Analysis
60N 40E Soil	1/24/20	1315	8260C
0N 20E Soil		1211	8260C
20N 10E Soil		1315	8260C
60N 40E MS/MSD		1315	6010C, 7471A
90N 50E Soil		1036	8260C
70N 20E D		0921	8260C
110N 50E Soil		1044	8260C
60N 10E Soil		1355	9012B Cyanide
110N 50E Soil D		1050	9012B Cyanide
100N 20E Soil		0900	8260C
90N 50E Soil MS/MSD		1036	8260C
110N 50E Soil		1045	9012B Cyanide
60N 10E Soil MS/MSD		1355	9012B Cyanide
20N 10E Soil MS/MSD		1345	8270D, 8081B 8082A, 8151A
70N 20E Soil		0919	8260C
20N 10E Soil		1345	8270D, 8081B 8082A, 8151A
60N 50E Soil D		1305	6010C, 7174A
90N 50E Soil MSD		1036	8260C
60N 50E Soil		1300	8260C
40N 10E		0833	8260C

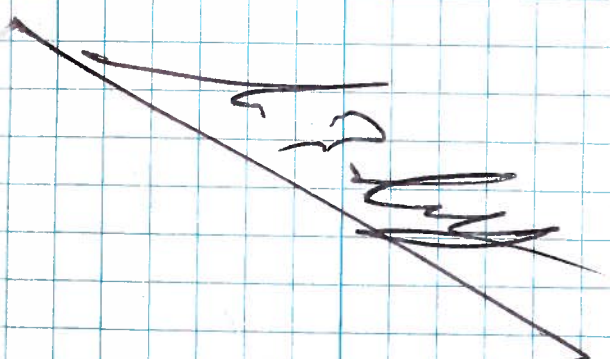
Location 331-337 W. Main St Rochester NY Date 1/24/20

Project / Client 60617211 / NYSDEC

Attica Industrial Laundries

- 1/24/20 Sampling Log (Cont) -

Sample ID	Date Sampled	Time Sampled	Analysis
10N 30E Soil	1/24/20	1235	8270D, 8081B 8082A, 8151A
60N 50E Soil		1300	6010C, 7471A
90N 50E Soil		1012	8260C
110N 30E Soil		1230	8270D, 8081B 8082A, 8151A
110N 30E Soil		1230	8260C
60N 40E Soil		1315	6010C, 7471B
40N 40E Soil		0945	9012, 8270D, 8081B 8082A, 8151A, 8260C, 6010C 7471B
40N 30E Soil		0950	

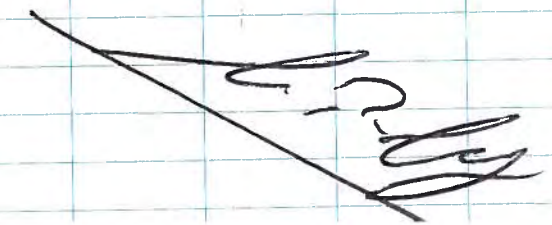


Location 331-337 W. Main St Rochester NY Date 1/27/20

Project / Client 60617211 / NYSDEC

Antico Industrial Conversions

- 1145 - Dropped soil samples from 1/23/20 and 1/24/20 off @ Test America / Eurofins Buffalo.
- 1200 - Left TA for Job site.
- 1350 - Arrived @ job site and began preparing for days activities.
- Good (fill and patch all boring holes)
- Dropped off PID @ Pine Environmental and picked up 55 gallon open-topped drum for waste materials / garbage.
- 1500 - Completed patching all holes + took pictures of all patched holes + waste drum
- 1510 - Left site for home.



Location Date

Project / Client

Location 331-337 W Main St Rochester Date 2/11/20

Project / Client 60617211 / NYSDEC

Attica Industrial Laundries

Date: 2/11/20

Weather: 34°F Cloudy

Personnel: Sean P. Connolly; Mike Gutmann

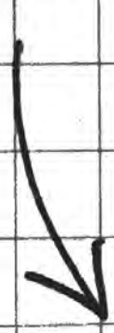
-0700 - Left house for Job site / Eco Rental to pick up monitoring equipment

-0850 - Arrive @ Eco Rental and picked up Min. Rae PID 3000. Left Eco Rental for Job site

-0900 - Arrive on job site. Notice gate parked @ Valero gas station. Drive them / guided them to South side parking lot. Opened building and shoveled out gate entrance

-0945 - Completed H/S → began unloading equipment + rig → mobilizing to first location

-1113 - Began coring @ 40N 40E → hand clearing location



Rite in the Rain.

Location 331-337 W. Main St Rochester Date 2/11/20

Project / Client 60617211 / NYSDEC

Location 40N 40E

Depth	PID	Rec %	Description
0-6"			- Concrete core
6-10"	77.9		- Dark Black, very fine to medium, silty sand w/ red brick fragments + coal
10-16"	598.7		- Dark brown very fine silty sand w/ small to medium rocks (Sample / PFAS taken @ 10-16" @ 1145)
			- Refusal @ 16", will use Probe to bread through
0-4' (16'-4')	Lost SAC	SPC 2 of 2"	
16-19"	1.1		- Boulder
19"-37"			- Light brown, fine to medium sand w/ little silt, trace gravel throughout
			- Dark brown, fine to medium sand w/ little silt, trace gravel throughout

Location 331-337 W. Main St. Rochester Date 2/11/20

Project / Client 60617211 / NYSDEC

Location 40N 40E (Cont)

Depth	PID	Rec%	Description
4.8'			4'-4'11" - Some OS above
4	0.0		
5	2.4		4'11-5' - Pulverized rock layer
6	5.0		
▲ 7	0.0		5'-5'4" - Dark brown fine to medium sand w/ little silt, trace gravel throughout
8			
8-12'		30"	5'4" - 13' - Moist brown, sandy silt w/some gravel. Water / very moist / wet @ 7' Refusal @ 13'
8	1.7	43%	
9	2.5		
10	1.1		
11	0.0		
12	0.5		
12-16'			Took VOC's sample @
12	2.8		
13	14.7		

1232 - Began mobilizing to 10N 36E to hand clear → began hand clearing

Rite in the Rain.

Location 331-337 W. Main St. Rochester Date 2/11/20

Project / Client 60617211 / NYSDEC

Location: 10N 5E

Depth	PID	%Rec	Description
0-6"	-	100%	Concrete (0-6")
6"	2.7		
6-10"			6-10" - Moist light brown fine to medium sand w/ silver bits + little gravel
10"-30"			10"-30" - Dark brown to black sandy silt fill
12"	28.7		w/trace gravel throughout
13"	55.1		w/wood fragments @ 15"
24"	42.2		(natural)
1307 - Used probe to break through wood fragment obstruction → continued to hand clear			
13"-30"			13-30"- Dark brown to
18"	67.2		black sandy silt fill
24"	42.2		w/trace gravel throughout and red brick fragments
30"-60"			30-60" - Light brown,
30"	96.0		moist, vry fine sand
36"	10.7		w/ little silt
54"	6.7		
60"	5.2		

Location 351-357 W. Main St Rochester Date 2/11/20

Project / Client 60617211 / NYSDEC

Location: 10N 36E (Cont)

Depth	PID	% Rec	Description
5-9'			5-13 - Light
5	1.2	50%	brown, moist,
5.5	3.6		very fine sand
6	1.1		w/ little silt.
6.5	2.2		
▲ 7	4.9		Water @ 7'
7.5			
8			Took VOC sample
8.5			@ 7.0' @ 1550
9			
9-13		100%	(Same as
9	0.0		above)
9.5			
10	1.2		
10.5	1.0		
11	2.7		natural @
11.5	0.0		13'
12	0.0		
12.5	0.0		
13	0.7		

-1352- Completed breakdown & cleaning of equipment. Will prepare for next location

-1400- Began coring 40N 50E

Rite in the Rain

Location 331-337 W. Main St Rochester Date 2/11/20

Project / Client 60617211 / NYSDEC

Location: 40N 50E

-1425 - Began hand clearing

Depth	PID	% Rec	Description
0-8"	-	100%	Concrete
8"-22"			8-24" - Dark brown
8"	162.8		fine to medium silt
12"	135.7		w/sand w/trace
			gravel (fill) Brick
			fragments present @ 18"
24-36"			24-30" - Black moist, silt
24"	145.8		w/trace sand, possible
30"	20.3		staining w/some
			gravel / fill
36-60"			
36"	5.6		36-60" - Light brown
42"	3.8		moist, fine to medium
54"	1.1		sandy silt w/trace
60"	3.5		gravel

1451 - Completed hand clearing, Began to drill

Location 331-337 ca Main St · Revised Date 2/11/20

Project / Client 606172.11 / NYSDEC

Location: 40N 50E (Cont)

Depth	PID	% Rec	Description
		50%	5 - 12.2 - Peat brown, moist, fine to medium sandy silt fill w/some gravel · water ~8'
5-9			
5	1.5		
5.5	3.1		
6			
6.5	4.9		
7	3.1		
9-13		38%	
9	0.0		Refusal @ 12.2
9.5	0.0		VOC sample @ 12.0 @ 1500
10	0.0		
10.5	0.0		
11	0.0		
11.5	0.0		
12			
12.2 ~~12.5~~ ~~13~~	1.8		

-1505 - Filled 40N 50E w/ Bentonite → 6" below grade · Began packing up / cleaning up

- Will begin to prep some borings starting @ new locations 25N 50E, 40N 50E

-1600 - Began prepping to leave site

Rite in the Rain.

Location Artco Industrial Laundries Date 2/12/20

Project / Client Louizell / NYSDEC . 331-332

W. Main St. Rochester

Date: 2/12/20

Weather: 27°F, Mostly cloudy

Personnel: SP Connelly; Mike Gutowski

-0730- Arrive on site. Opened building. Performed PFD Calibration → Completed H/S

-0756- Began hand clearing 90N 50E

Depth	PFD	% Rec	Descriptions
0-8"	—	100%	Concrete
1'	8.5		- Moist, brown, fine to medium ~~gravel/fill~~ silty sand w/ some gravel / till (ash)
2'	4.7		
3'	2.1		
3.5'	3.7		
4.0'±	3.6		- Red brick fragments @ ~2'
4.5'	2.4		
5.0'	1.7		- Became dark brown @ 3.5'
			- Multiple cobbles @ 3.5-4'

Location 331-337 W Main St Rochester Date 2/12/20

Project / Client 60017211 / NYSDEC

Location: 90N 50E

Depth	PID	%Rec	Description
5-9'		42%	Moist, brown silt w/ trace sand + gravel. Polarized rock @ 5'4"
5	2.5		
5.5	1.7		
6	0.8		
6.5	0.2		
7			
9-13'		88%	Same as above. Water @ 9.5 Refusal @ 12' - Took VOC sample @ 50' @ 0840
9	0.2		
9.5	0.1		
10	0.2		
10.5	0.0		
11	0.3		
11.5	0.2		
12	0.2		



Rite in the Rain.

Location 331-337 W. Main St Rochester Date 2/12/20

Project / Client 60617211 / NYSDEC

Location: 25N 50E

Depth	PID	% Rec	Description
0-6"	-	100	Concrete
6"	0.6		6" – 72' - Dry, Brown fine to medium sand w/ blacks medium → course sand w/ ash @ 1.0-1.5'. Back to brown after 1.5' (Bill) - Brick fragments @ 2.0' - little clay @ 2.5, boulders after 3.0. Will - will use geoprobe to push through rocks → to 6'
1.0'	3.1		
1.5'	2.9		
2.0	7.8		
2.5'	2.2		
3-6'			
3	0.2	83%	3.0'-3.2' rocks / boulders - Returns to Brown, fine to medium sand w/ traces black medium to course sand w/ ash
3.5	0.5		
4	0.9		
4.5	1.0		
5	1.1		
5.5	1.5		

Location 331-337 W Main St Rochester Date 2/12/20

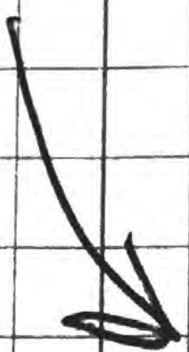
Project / Client 60617211 / NYSDEC

Location: 25N 50E

Depth	PID	% Rec	Description
6-10'		0.75%	Same as 3-6' above. Water @ 7.0' VOC sample @ 8.5 @ 9.25
6	0.0		
6.5	0.7		
A 7.0	0.7		
7.5	0.6		
8.0	2.4		
8.5	3.7		
9.0	2.0		
9.5			
10			
10-14		50%	Same as 3-6' Refusal @ 12.0'
10	0.7		
10.5	0.9		
11			
11.5	0.7		
12	2.2		
	0.1		

-0933 - Begin mobilizing to core 42N 20E

Location 42N 20E



Rite in the Rain.

Location 331-337 W Main St Rochester Date 2/12/20

Project / Client 60617211 / NYSDEC

location: 42N 20E

Depth	PID	% Rec	Description
0-6"	-	100%	Concrete
6-48"			6-24" - Dry, brown medium to coarse sand w/ little silt w/ ground t small to medium cobbles throughout t brick fragments (Fill) 18-24" - Color changes to dark brown to black 24-48" - Color returns to light brown to brown w/ clay present @ 36" forward
	0.2		
12	0.2		
18	0.6		
24	0.4		
30	0.1		
36	0.2		
42	0.3		
48	0.1		
5.9		~~0.35~~ 38%	36" - 8' Same as above (36" forward)
5	4.1		
5.5	1.1		
6	10.3		
6.5			

Location 331-332 W. Main St Rochester Date 2/12/20

Project / Client 60617211 / NYSDEC

location: 42N 20E

Depth	PID	%Rec	Description
9-13'		88%	8'-11.5' Brown moist, silt w/little clay + gravel throughout saturated @ 9'6"-10'8"
9	0.4	42/48	
9.5	0.3		
10	0.3		
10.5	1.0		
11	2.8		
11.5	0.8		
12	2.1		
12.5	16.7		
12.3			11.5-12'3" - ~~Sand~~ Light brown to brown, medium to course sand w/little silt
			- Refusal @ 12.3
			VOC + PFAS Dup @ 11'6" -> 12'3 @ 1100 + Dup @ 1105

1115 - Began coring 70N 20E

1125 - Completed coring, will begin hand clearing

Rite in the Rain.

Location 331-337 W. Main St Rochester Date 2/12/20

Project / Client 60617211 / NYSDEC

Location: 70 N 20E

Depth	PID	% Rec	Description
0-6"	-	100%	Concrete
6"	0.7		Brown, dry, fine to medium silty sand w/ cobbles (fill)
12	0.3		
18	1.9		
24	4.8		
30	4.2		
36	4.0		- Becomes dark brown @ 18"
42			
48	1.8		- Black silt w/ trace clay @ 4' w/ ash - 4.5'
54			
60	8.5		4.5 - 5' Gray heavy black gravel fill
5.9'		30/48	6.5-8.0 - Brown, moist fine silt w/ clay. Black ashy staining throughout & 12.5 (Refusal)
5	1.8		
5.5	2.7	63%	
6	2.6		
6.5	8.0		
7			
7.5	508		
8	4.7		
8.5			Brown, wet, very fine Sandy silt w/ trace clay w/ gravel throughout. Saturated from 9'4" → 11'
9			
9-12		100	
9	1.9		
9.5	1.9		
10	5.6		
10.5	28.2		
11	31.8		- Sample VOC @ 12-12.5' @ 1315
11.5	6.8		
12	19.5		
12.5	55.8		

Location 331-337 W. Main St Rochester Date 2/12/20

Project / Client 6061721 / NYSDEC

Location: SON 35E

-1305 - Began coring SON 35E

Depth	PID	Rec'y	Description
0-6"	-	100%	Concrete
6"	0.8		6-12" Fill
12	2.6		12-18" Moist, brown
18	0.0		medium to course
24	3.3		sand w/ little silt
30			
36			18-48" - Dark brown
42			sandy silt fill w/
48	16.5		gravel and red
54	27.7		brick fragments
60	62.8		48-60" - Black sandy
			silt fill w/ ash
5-9'		42/48	5'-7.8' - Black
		88%	
5			vy fine to fine,
5.5			sandy silt fill w/ red
6			brick fragments +
6.5			pulverized cobbles +
7	14.1		gravel
7.5	353.0		7'8" - 10'6" - Brown
8	1716		
8.5			very fine, silty Sand
9	6825		fill w/ some small
9-13			gravel Becoming
9			saturated @ 10'6"
9.5			gentle refusal
10	337.4	Refusal	(Strong odor throughout)
10.5	1283	@ 12.0	
11	1294		
11.5	1112		
12	2983		
12.5	3524		
13			

Location 331-337 W. Main St Rochester Date 2/12/20

Project / Client 60617211 LOUTSDEC

Location 80N 35E

- Took PFAS sample @ 9' @ 1250 + VOC
- Took Full suite Sample from 11-12 @ 1500

- 1400 - Began coring + hand clearing 60N 40E

Location: 60N 40E

Depth	PID	%Rec	Description
0-7"	-	100%	Concrete
7"	5.6		SPL 7" - 18" - Dark Brown to Black, sandy (fine to coarse) w/ little silt w/ gravel (fill)
12	8.1		
18	4.2		
24	1.3		
30	1.7		18" - 8' - Brown moist, fine to medium sand w/ little silt, little gravel throughout
36	3.7		
42	3.8		
48	2.2		
54			
60			

- 1600 - Began packing up to leave site.

Location 331-337 W. Main St Rochester Date 2/13/20

Project / Client 60617211 / NYSDEC

Location: Artco Industrial Laundries

Date: 2/13/20

Weather:

Personnel: S P Connolly; Mike Gutmann

-0730 - Arrive on site. Drillers on site. Opened up building → performed H/S. Began prep to drill GOW

HOE

(Continued from yesterday)

Depth	PID	↑ To Rec	Description
5-9		6370	6.5 - 7.0
5		30/48	Black moist,
5.5			medium to coarse
6			silty sand fill
6.5	14.9		w/ some gravel
7	38.6		and brick fragments
7.5	21.1		7 - 8
8	39.2		
8.5	34.5		
9	372.6		
9-13		7520	Brown, moist
9	476.5	36/48	silt w/ little clay
9.5	185.2		8 - 8'3" w/ gray
10	540.1		
10.5	164.1		pulverized rock
11	230.8		8'3" - 12' - Brown
11.5	568.1		
12			moist, silty sand
12.5			
13			

Rite in the Rain

Location 331-337 W Main St Rochester Date 2/13/20

Project / Client 60617211 / NYSOBC

Location: 60N 40E (Cont)

Depth	PID	% Rec	Description
			(Cont from pg 41) w/ some gravel. Strong odor. Becoming saturated until 11.5' Possible NAPL from: 10-11' (Black Staining)
	Refusal		
		C, 12'	Sample VOC @ 8.5-9 @ 0838 and @ 10-11' @ 0837

Location 351-337 W. Main St Rochester Date 2/13/20

Project - Client 60017211 / NYSDEC

0845 - Began coring 100N 35E

0900 -- Began hand clearing 100N 35E

Location 100N 35E

Depth	PID	% Rec	Description
0-6"	-	100	Concrete
6	2.1		6-48". Brown
12	1.4		moist, vg fine
18	1.3		sdy slty sand fill
24	0.7		w/ trace gravel
30	0.9		
36	1.1		
42			
48			
54			
60			
4-8'		63%	5.5'-6' - Dark
4			brown → black,
4.5			moist, fine to
5			medium slty sand
5.5	1.9		fill w/ some grav
6	2.2		trace brick fragments
6.5	6.4		6-9'8"- Brown
7	10.7		moist, vg fine
7.5	17.6		slty sand w/
8	7.4		some gravel

Rite in the Rain.

Location 331-337 W Main St Rochester Date 2/13/20

Project / Client 60061711 / NYSDEC

Location 100N 35E (Cont)

Depth	PID	% Rec	Description
	Refusal @ 11.8"		9'8"-11.8" (Refusal): Brown, moist, very fine, silty sand w/ some gravel VOC sample from 7-7.5' @ 9:47

-0945 - Completed 100N 35E. will take warm up break → will begin carry 110N 20E

-1000 - Begin carry 110N 20E

-1015 - Begin carry 90N 10E

Location: 110N 20E

Depth	PID	% Rec	Description
0-8"	—	100	Concrete
8	0.0		8"-60" Brown, dry fine to medium sand w/ little silt trace of some gravel + red brick fragments @ 18"
12	0.0		
18	0.0		
24	0.0		
30			
36			
42			
48			
54			
60			

Location 331-337 W Main St Rochester Date 2/13/20

Project / Client 60617211 / NYSDEC

Location 100 N 20 E (Cont)

Depth	PID	% Rec	Description
8-8.6" (Continued			- 2.5-3' gravel sub base - Concrete pt 5' (possible cavern)
5-9		50%	7-8' - Black, dry medium to coarse sand fill w/ gravel and ash brick fragments throughout 8'-12' (Refusal) Brown, moist fine sand w/ little silt w/ trace gravel throughout. Molding + ash layer from 8-8'3"
9-13		75%	9-12' - same as above / moist
	9 - 6.2		
	9.5 - 4.1		
	10 - 3.2		
	10.5 - 8.1		Sample 10-10.5 for VOCs @ 1707
	11 - 6.9		
	11.5 - 6.9		
	12 - 0.0		

Refusal @ 12'

Rite in the Rain

Location 351-359 W. 14th St Manhattan Date 2/13/20

Project / Client 60617211 / NYSDEC

Location: Room 108

Depth	PID	% Rec	Description
0-9		100%	Concrete
9	0.0		9"-3' - Brown, dry
9.5	0.2		sand w/ little silt,
12	0.6		fill w/ gravel +
18	0.3		brick fragments
24	0.5		throughout
30	0.7		
36	0.8		
42	0.9		
48	1.1		3'-5' - Brown moist
54	8.2		clayey silt fill w/
60	2.3		some gravel
5-9		50%	5' - 11.10 (Native)
5	2.0		Brown, moist, very
5.5	7.7		fine to fine sand
6	69.3		w/ little silt w/
6.5	188.6		some small gravel
7	38.9		throughout becoming
7.5			wet from 9-10.5
8			
8.5			
9			
9-13		100%	
9	28.0		
9.5	71.7		
10	58.2		VOC sample from
10.5	121.9		6-6.5' @ 1120
11	152.8		
11.5	88.1		
12			
12.5			
13			

Location 331357 W Main St Rochester Date 2/15/20

Project / Client 60617211 / NYSDEC

1230 - Completed drilling 90W 10E and began decon of equipment (End of Day)



Location 331-337 W Main St Rochester Date 4/13/20

Project / Client 60617211 /NYSDEC

Date: 4/13/20

Weather: 63°F; showers

Personnel: Scott Connelly / Mike Gutmann (then

0830 - Arrive @ Eco Rental to pick up equipment
- Mini Rae 300 - #FA03016
- Qrae 3 - #FA03807

0840 - Left Eco for Artco Site

0850 - Arrive @ Artco

0853 - M. Gutmann arrive on site.

0858 - Nothnagle Drillers arrive on site.

Personnel: Evan Pressler; Bryan Swartz

- Began moving out locations / setting up and organizing equipment
- Completed H/S + TCM

-1042 - Began coring MW-15-OB well location w/ continued air monitoring. Will be storing waste water in 55 gallon open top drum.

-1100 - Qrae Readings - PID Readings

CO: 9 H_2S: 0.0 0.0

LEL: 0 OXY: 20.9

Location 331-337 W Main St Rochester Date 4/13/20

Project / Client 60617211 /NYSDEC

-1124 - Completed coring MW-15-OB; will relocate to MW-13-OB location

-1134 - Began coring MW-13-OB location

- Qrae Readings - - PID Readings -

CO: 10 H_2S: 0.0 0.0

LEL: 0 OXY: 20.9

-1146 - Qrae Readings - - PID Readings -

CO: 21 H_2S: 0.0 0.0

LEL: 0 OXY: 20.9

- Increase of CO due to truck mounted generator in loading bay. Will open all bay doors and man doors for proper ventilation

-1227 - Break for lunch

-1250 - Returned to work. Will core remaining 4 locations and then begin to haul clear

-1307 - Began coring MW-14-S

- Qrae Readings - - PID -

CO: 10 H_2S: 0.0 0.0

LEL: 0 OXY: 20.9

Location 331-337 W. Main St Rochester Date 4/13/20

Project / Client 60417211 / NYSDEC

Date: 4/13/20 (Cont)

-1325 - Completed coring MW-14-S location. Moving to MW-14I

-1332 - Began coring MW-14I location

- Area Readings - - PID -

CO: 14 H_2S 0.0 0.0

LEL: 0 OXY: 20.9

-1350 - Completed coring MW-14I. Began moving to MW-13I

-1400 - Began coring MW-13I location

- Area Readings - - PID Readings -

CO: 17 H_2S: 0.0 0.0

LEL: 0 OXY: 20.9

-1417 - Completed coring MW-13I. Began moving to MW-13S location

-1420 - Began coring MW-13I

- Area Readings - - PID Readings -

CO: 19 H_2S: 0 0.0

LEL: 0 OXY: 20.9

-1435 - Completed coring 13S. Filled 1x55 gallon drum w/ waste water

-1510 - Began housekeeping MW-13I

Location 331-337 W. Main St Rochester Date 4/13/20

Project / Client 60417211 / NYSDEC

Date: 4/13/20 (Cont)

- MW-13I (Continued)

Depth	PID	Description
0.7'	-	(0.7) Concrete
1'	7.4	7" - 1.5' - Moist.
1.5'	9.4	brown, medium to
2.0'	17.3	course sand w/ little
2.5'	9.1	silt (Fill) w/ small
3.0'	11.8	to medium rocks
3.5'	4.5	1.5' - 5.0' Becoming
4.0'	3.2	black w/ wood fragments
4.5'	3.7	around 1.5 - 2.0'
5.0'	4.8	

-1345 - Began packing up site/equipment will continue to haul clear tomorrow

-1600 - Drillers off site.

-1625 - SPC off site (End of Day)

4/13/20

Rain on the Rain

Location 331-337 W. Main St Rochester Date 4/14/20

Project / Client 60617211 / NYSDEC

Date: 4/14/20
Weather: 37°F, Mostly Cloudy
Personnel: S. Connelly (Arcadis)
Bryan Swartz / Ben Rossler (Nothnagle)

-0730- Arrive on site. Drillers already on site. Began opening up building
-0745- Performed H/S at DTM
-0800- Calibrated PID/QRae unit drillers began organizing / prepping for days activities / Continue MW-135 hand clearing
-0920- Completed MW-135 hand clearing to 5' (see pg 51)
-0939- Began hand clearing MW-150S (see next page)

Location 331-337 W. Main St Rochester Date 4/14/20

Project / Client 60617211 / NYSDEC

MW-150S (Hand Clearing)

Depth	PID	Description
0-7"	-	0-7 - Concrete
1.01	8.9	7"-2.5 - Moist brown
1.5	11.1	medium to coarse
2.0	38.6	silty sand FILL w/
2.5	22.1	small to medium
3.0	19.7	rocks (compact)
3.5	12.4	with red brick
4.0	0.8	fragments
4.5	10.5	2.5-3.5 - Moist, brown
5.0	4.8	to black, fine sandy
		silt w/ little clay
		w/ rocks + brick fragments
		throughout
		3.5-5.0 - Moist,
		brownish red, fine
		to medium sand
		w/ little silt

-1020- Completed of MW-150S hand clearing
-1035- Began hand clearing MW-131

Location 331-337 W. Main St Rochester Date 4/14/20

Project / Client 60617211 / NYSDEC

Date: 4/14/20 (Cont)

MW-13I Hand clearing

Depth	PID	Description
0-7	-	0-7" - Concrete
1.0	2.2	7" - 4.0' - Brown to dark
1.5	8.6	brown, fine to medium sand
2.0	14.1	w/ little silt w/ small rocks
2.5	19.5	FILL w/ concrete / red
3.0	7.6	brick fragments
3.5	39.7	4.0'-5.0' - Light brown.
4.0	2.9	moist sand w/ little silt.
4.5	3.6	
5.0	4.5	

-1250- Completed hand clearing MW-13S. Will move to MW-13D3

-1257- Begin hand clearing MW-13D3 (See next page)

Location 331-337 W. Main St Rochester Date 4/14/20

Project / Client 60617211 / NYSDEC

DATE: 4/14/20 (Cont)

MW-13D3 Hand Clearing

Depth	PID	Description
0"-7"	-	0.-7" - Concrete
7"	5.8	
1.0	11.4	7" - 2.0 - Brown
1.5	39.4	moist, fine to
2.0	68.7	medium silty sand
2.5	52.6	w/ small to medium
3.0	48.0	rocks.
3.5	22.9	2.0 - 3.0 - Dark
4.0	7.4	brown to black
4.5	11.8	(possible staining)
5.0	8.6	medium to coarse
		sand w/ little silt
		Took sample
		between 1.5 - 2.0
		@ 1300
		3.0 - 5.0 - Dark
		brown, fine to
		medium silty sand
		FILL w/ small rocks
		+ red brick fragments

Location 321-337 W Main St Rochester Date 4/14/20

Project / Client 60617211 / NYSDEC

Date: 4/14/20 (Cont)

-1330 - Completed MW-130B hand clearing

-1350 - Began hand clearing MW-14I

MW-14I Hand Clearing

Depth	PID	Description
0-7	-	0-7" - Concrete
1.0	5.0	7" - 5.0' - Brown, moist fine to medium sand w/ little silt w/ small to medium rocks FILL.
1.5	6.7	
2.0	13.4	
2.5	20.5	
3.0	15.2	Becoming dark brown @ 2.0'. Brick (Rel) fragments @ 2.5
3.5	13.4	
4.0	16.0	
4.5	14.9	
5.0	13.1	

-1435 - Completed MW-14I Hand Clearing will move to MW-14S to begin hand clearing.

-1440 - Began hand clearing MW-14S

Location 331-357 W. Main St Rochester 4/14/20

Project / Client 60617211 / NYSDEC

Date: 4/14/20 (Cont)

MW-14S Hand Clearing

Depth	PID	Description
0-7"	-	0-7" Concrete
7"	10.5	7" - 5.0' - Brown, moist, medium to course sand w/ little silt w/ small rocks (FILL)
1.0	18.9	
1.5	17.7	
2.0	16.5	
2.5	11.2	
3.0	13.5	
3.5	6.6	
4.0	1.5	
4.5	3.8	
5.0	0.6	

-1525 - Began cleaning up equipment. Will finish MW-14S hand clearing tomorrow.

-1600 - off site.

4/14/20

Rain on and Rain

Location 331-337 W. Main St Rochester Date 4/15/20

Project / Client 60617211 / NYSDEC

Date: 4/15/20

Weather: 34°F; Partly Cloudy

Personnel: Sean P. Connelly (Arcom)
Erin Prossler / Bryan Swanke (Nothnagle)

-0730 - Arrive on site. Opened building began H/S and DTM

-0830 - Began calibrating equipment - Drillers continued to hand clear MW-14S (See pg 57)

-0950 - Completed hand clearing MW-14S. Will prepare to start drilling

-1010 - Began drilling / sampling MW-14S w/ continuous air monitoring

- Area Readings - - PID Readings -

CO: 0.0 H_2S: 0.0 0.7

LEL: 0.0 O_2: 20.9

Location 331-337 W Main St Rochester Date 4/15/20

Project / Client 60617211 / NYSDEC

Date: 4/15/20 (Cont)

MW-14S

Depths	PID	% Rec	Description
0-5	See Previous Logs	100%	Hand cleared (see previous logs)
5-7'		1.5/2	5-5.5' - Brown moist, fine to medium silty sand w/ small to medium gravel
5	16.7	95%	
5.5	16.1		
6	63.4		
6.5	39.5		
7	24.5		5.5-7' - Rock / gravel Fill
4/16/20			7' - Refusal
7-9'	* Broke through w/ air rotary. Reset w/ augers.		Used air rotary bit to break through rock.
7			
7.5			
8	20.7		7-8.4' - Pulverized rock
8.5	388.7	sample taken	8.4 - ~~11.8~~ see 9.7
9	3818		
		8.5-9	Moist brown, fine to medium sand w/ little silt, small to medium gravel
		@ 11:16	Strong product

@ 8.8-9.0' Refusal

Location 331-337 W Main St Rochester Date 4/15/20

Project / Client 60417211 NYSDOT

1130 - Refusal @ 7'. will return to MW-14S to complete drilling

MW-15S Continued - 4/16/20

Depth	PID	% Rec	Description
9-11		1.5/2.0	9.7-9.8 - Hard Rock layer
9			
9.8	410.5		7.8-11.8' same as ~~11.8~~ 8.4-9.7
10	657.8	Sample	
10.5	377.5	1041	
11	4250	@ 1125	
11-13		1.5/2.0	
11	925.2		
11.5	2748		
11.8	2241		

Refusal / Bedrock @ 11.8

Location 331-337 W Main St Rochester Date 4/15/20

Project / Client 60417211 NYSDOT

CO: 4 H_2S: 0.0

1150 - Zero air readings CO2: 0 O2%: 20.9

1200 - Begin drilling MW-13S

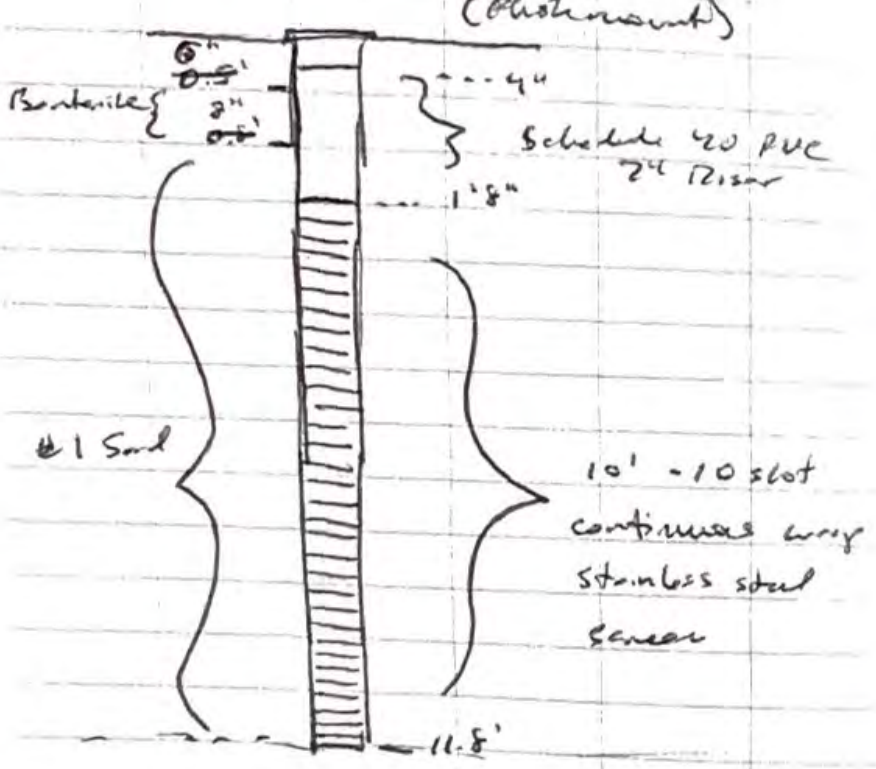
MW-13S

Depth	PID	% Rec	Description
0-5			Hand cleared (See previous logs)
5-7		100%	5-5.4 - Black, moist fine to medium silty sand w/small to medium gravel
5	34.7		
5.5	17.2		
6	31.6		
6.5	122.4		5.4-6 - Pulverized rock layer w/light brown, very fine sand to fine sand
7	371.8	(Zoom Sample 6-6.5 @ 1215)	
7-9		75%	6-9.0 - Brown moist, very fine to fine sand w/silt w/gravel (small to medium
7	52.8	(Zoom Sample 7.5-8.5 @ 1229 Full suite w/PFAS)	
7.5	3220		
8	8041		
8.5	4528		
9			
9-11		4 Vials @ 7-9.5 Sample 9.5-10.5 @ 1243	9-9.5' - Black, medium to coarse sand (possible staining, wet - saturated 9.5 - 11.8 Same @ 6'-8.0
9	26.0		
9.5	73.4		
10	102.8		
10.5	293.4		
11	429.8		

Location 331-337 w/Main St Rochester Date 4/15/20

Project / Client 60617211 NYSDEC

-1300 - Completed drilling MW-130B. Began installing well.



-1305 Air reading: CO: 7 H2S: 0.0 PID 0.1
LEL: 0 OXY: 20.9

* During install strong odor coming from well: 1632 ppm PID Unit

Total Bags of Sand used 5.5 (50 lbs)

Location 331-337 w/Main St. Rochester Date 4/15/20

Project / Client 60617211 NYSDEC

-1414 - Completed installing MW-130B. Will relocate drilling + equipment to MW-14S.

-1420 - Began cleaning up site. Will construct decon pad

-1500 - Departed site

4/15/20

Rotate as Req'd

Location 331-337 W/Main St Rochester Date 4/16/20

Project / Client 60617211 NYSDEC

Date: 4/16/20

Weather: 27°F, Mostly Sunny

Personnel: S. Connelly (Arcadis)
Bryan Swartz (NDI)
Zain Preslar (NDI)

-0730 - Arrived on site. Performed H/S + TCM. Bryan + Zain have minor headaches + sore throats / coughs. If symptoms worsen, immediate stop work will occur.

-0800 - Bryan + Zain begin preparations to continue drilling MW-14S.

-1015 - Resumed drilling MW-14S w/ air rotary drill due to previous rebound

Background Readings

CO: 7 H_2S: 0.0 PID: 6.7

LEL: 0 OXY: 20.9

- Drilling log continued on pg 59

-1146 - Completed drilling MW-14S. Preparing to put in casing.

-1200 - Took lunch

-1220 - Resumed - Augers maneuvered crooked hole.

Location 331-337 W/Main St Rochester Date 4/16/20

Project / Client 60617211 NYSDEC

-1300 - Moving to begin drilling MW-14I

-1316 - Began drilling MW-14I

MW-14I

Depth	PID	% Rec	Description
0-5'		100%	Hand cleared
5-7'	soil	50%	5-7' - Moist. dark brown w/ black staining. very fine to fine silty sand Fill w/ little sand + brick fragments
5	~~21.2~~		
5.5			
6	21.2		
6.5	24.5		
7	26.7		
~~7.5~~			
7-9'		100%	7-9 - same as 5-7' (no staining)
7	23.7		
7.5	26.9	Took sample	
8	31.4	8-8.5' @	
8.5	28.7	1320 for VOCs	
~~8.5~~ 9	22.9		
9-11		100%	9-11 - same as above. No brick fragments
9	31.5		
9.5	22.8		
10	24.7		
10.5	25.6		Refusal @ 11.5'
11	32.4		

Rain on the Rain

Location 331-337 W Main St Rochester Date 4/16/20

Project / Client 60617211 NYSDEC

- 1340- Completed augering up to 11'. Only sampled up to 9'. Due to spike of PID readings in breathing zone during augering through 10-11' (Range ND- 7.7 ppm) contaminated zone. Cuttings were cleaned up and containerized / drummed immediately. Will bring shop fans to further mitigate VOCs in breathing zone while drilling.
- 1400- All parties depart site.

4/16/20

Location 331-337 W. Main St Rochester NY Date 4/17/20

Project / Client 60617211 NYSDEC

Date: 4/17/20

Weather: 30°F, Partly Cloudy

Personnel: S. Connelly (Arcom)
Bryan Swartz (NDI)
Brian Prosser (NDI)

-0730- Arrive on site. Began opening up building

-0745- Drillers arrive on site. Performed H/S meeting + began setting up shop fans for VOC mitigation

-0818- Began calibrating equipment

Background: 4.0 ppm

CO: 4 H_2S: 0.0

LEL: 2 OXY: 20.9

-13.7 ppm coming out of MW-14I

-22.9 ppm " " MW-14I Drum

-0830- Resumed drilling / sampled

-0850- Refusal @ 11.8'

-0857- Began drilling 5' Casing (Rock Socket) w 5 1/2 Hammer.

Return to Rain

Location 331-357 W. Main St Rochester Date 4/17/20

Project / Client 60617211 NYSDEC

-0910 - Completed drilling 5' rock socket → 16'10" PID: 9.6 | Cut 4" steel casing → 16'7"
CO: 11 OXY: 20.9
LEL: 3 H_2S: 0.0
- Total Depth: 16'10"
- Installed 4" steel casing to 16'7"

-0948 - Began mixing grout for MW-14I

-1000 - Began grouting MW-14I. Used total 7 bags portland cement

-1030 - Decomed augers then moved to MW-14S to complete drilling/set casing

-1105 - Began drilling/redrilling for straight hole

-1137 - Reached bedrock @ 11'8".

1250 - Completed drilling rock socket to casing to 16'8" + installed casing

1305 - Could only set casing to a total depth of 15' due to some sort of obstruction.

-1330 - Steam cleaned augers + will begin setting MW-14S casing

-1375 - Completed setting MW-14S. Used 4 bags of portland cement

Location 331-357 W. Main St Rochester Date 4/17/20

Project / Client 60617211 NYSDEC

-1355 - Began drilling MW-150B w/ 6¼ HSA + sampling w/ macro-barrel

MW-150B

Depth	PID	% Rec	Description
0-5		100%	Hand Cleared
5-7		0%	5-7 - Brown, moist, fine to medium silty sand
5			
5.5	← 9.8		
6	← 12.4		FILL w/ small to medium gravel
6.5	← 11.6		
7	← 11.8		
7-9		100%	7-8 - Pulverized rock larger possible silt/sandstone
7	9.6		
7.5	0.0		
8	0.0		8-9 - Brown, moist fine to medium silty sand
8.5	6.9		
9	5.3		
9-11		75%	9-11 Same as 5-9 w/ possible staining @ 9.8-10
9			
9.5	4.8		
9.8	12.4		
10	8.9		
10.5	4.4		
11	2.9		

Location 331-337 W. Main St Rochester Date 4/17/20

Project / Client 60617211 NYSDEC

MW-150B Continued

Depth	PID	% Rec	Description
11-13			
11	12.8		11-12 Same as above / No staining
11.5	13.6		
12	20.9		
12.5			Refusal @ 12' BGS
13			

-1356- Refusal @ 12'0 BGS. Will install well.
10' screen (stainless steel) → Riser

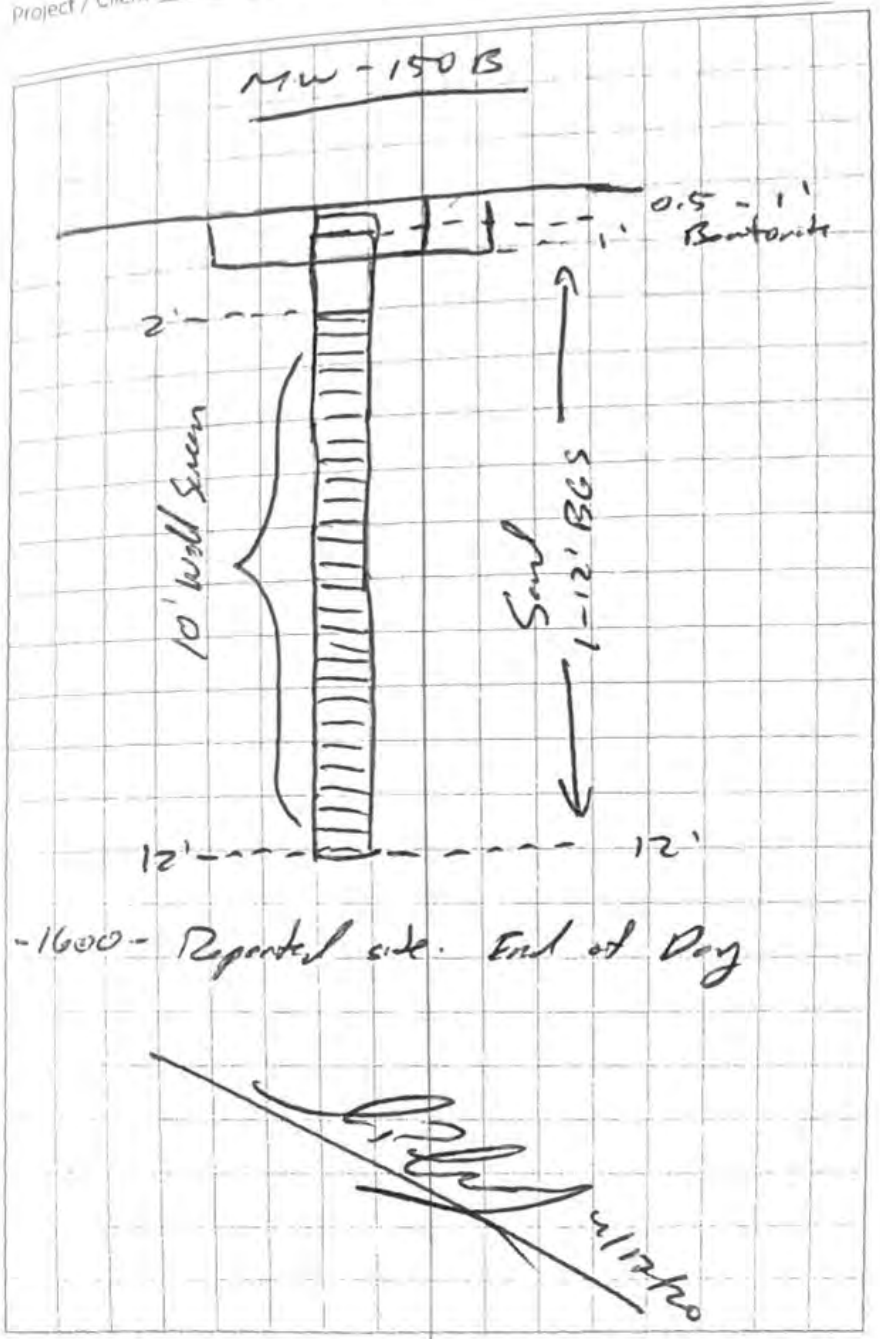
-1430- Completed well install
11' Sand w/ 6" Bentonite

-1530- Began steam cleaning augers.

Location 331-357 W. Main St Rochester Date 4/17/20

Project / Client 60617211

MW-150B



-1600- Reported site. End of Day

4/17/20

Rite in the Rain

Location 331-337 W. Main St Rochester Date 4/20/20

Project / Client 60617211 NYSDEC

Date: 4/20/20

Weather: 32°F, Partly Cloudy

Personnel: S. Connelly (Arcom)
Bryan Swarts (NOI)
Zane Proctor (NOI)

-0740- Arrive on site. Drillers already on site.

-0808- Completed calibrating equipment

-0830- Began drilling MW-13I w/ 6¼ HSA

MW-13I

Depth	PID	% Recov	Description (Hand Cleared)
0-5		100%	
5-7		50%	5-7 - Brown to black, moist very fine to fine silty SAND FILL w/small to medium sized gravel.
5			
5.5			
6	9.4		
6.7	12.4		
7	18.7		

Location 331-337 W. Main St Rochester Date 4/20/20

Project / Client 60617211 NYSDEC

MW-13I Cont

Depth	PID	% Rec	Description
7-9		100%	7-9 - Brown, moist, fine silty sand w/ little gravel
7	29.9		
7.5	26.5		
8	6.7	Sample 7-7.5	
8.5	4.3		
9	5.8		
9-11		50%	9-11 - Same as above (Wet)
9			
9.5			
10	10.1		
10.5	9.0		
11	8.3		
11-13		50%	11-12 - Same as above, becoming saturated 11.5-12
11	6.7		
11.5	7.9		
12	8.9		
12.5			Refusal @ 12'
13			

Location 331-337 W Main St. Rochester Date 4/20/20

Project / Client 60617211 NYSDEC

-0930- Retrieved of MW-13I @ 12'. Will begin drilling rock socket.

-1058- Completed drilling rock socket to a total depth of 17'. Will cut casing 16' 9" + install

-1130- Reconnect augers will take quick lunch then

-1150- Relocated to begin drilling MW-13S w/out sampling / characterization. w/6 1/4 augers to 12' then w/ 5 7/8 augers to 17' BGS for 5' rock socket.

-1358- Completed drilling MW-13S. Will cut casing 16.7'. 2" off from 16.9"

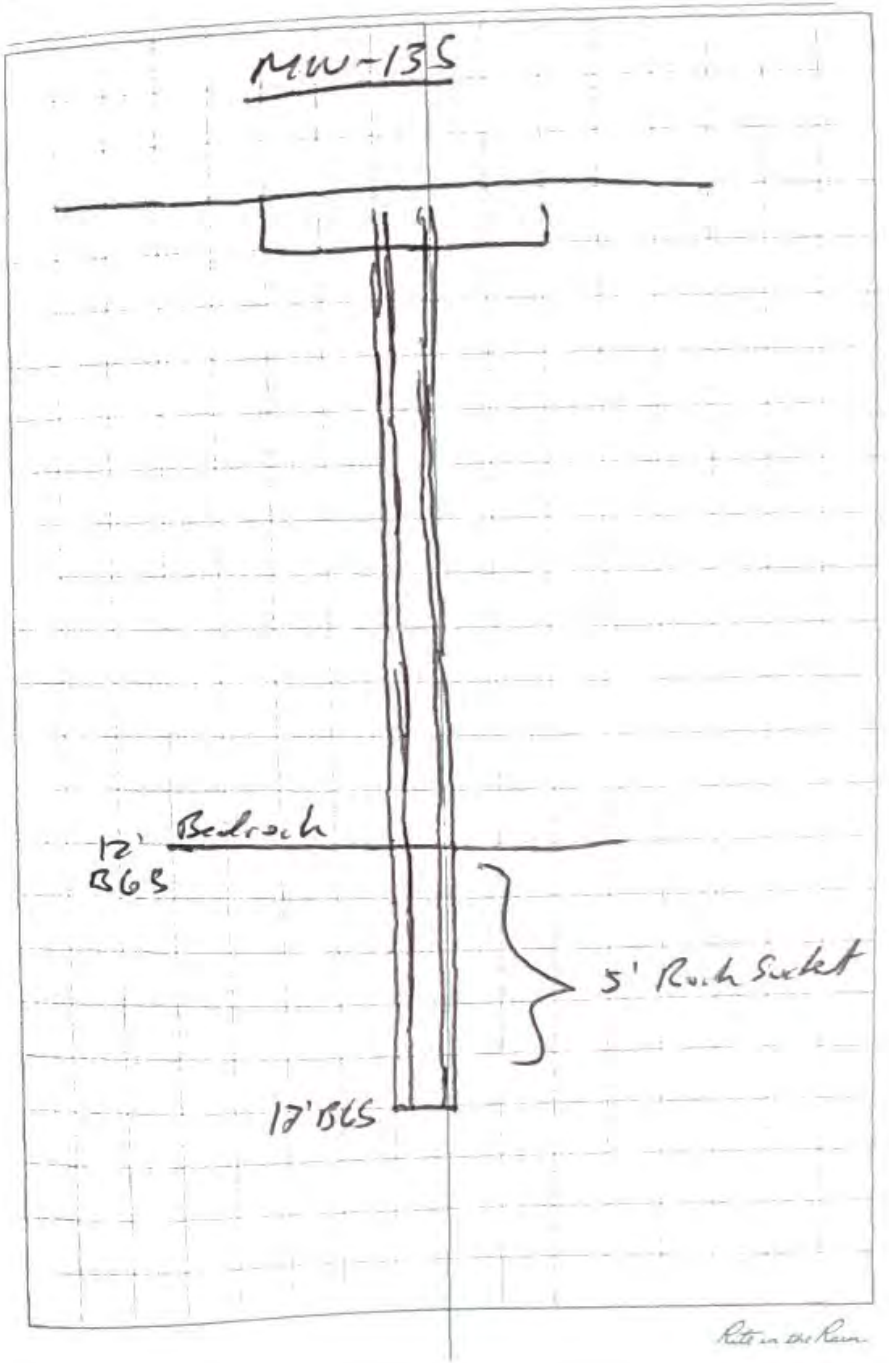
-1445- Completed setting MW-13S. Will begin to grout. Used 6 bags of portland.

-1500- Will decon augers

-1525- Depart site. End of Day

Location 331-337 W Main St Rochester Date 4/20/20

Project / Client 60617211 NYSDEC



Location 331-337 W. Main St Rochester Date 4/21/20

Project / Client 60617211 NYSDEC

Date: 4/21/20

Weather: 45°F, showers, slight wind.

Personnel: Sean P. Connelly (Arcadis)
Bryan Swartz (NDI)
Zain Pressler (NDI)

-0730- Arrive on site. Open building. H/S meeting. Bryan Swartz's wife has Covid symptoms. Waiting to hear back about test results / proper procedure

-0800- MW-13I casing did not set properly (cracked). Will pull casing + redrill a new + brace + secure casing then regrout. Drilled @ 12'. Rock socket → 17'

-1230- Began regrouting MW-13I

-1430- Completed regrouting MW-13I + properly bracing

-1530- Depart site. End of Day

4/21/20

Location 331-337 W. Main St Rochester Date 4/22/20

Project / Client 60617211 NYSDEC

Date: 4/22/20

Weather: 36°F, Mostly Cloudy

Personnel: Sean P. Connelly (Arcadis)
Bryan Swartz (NDI)
Zain Pressler (NDI)

-0945- Arrive @ Eco Rental Solutions to pick up well development equipment

-0955- Arrive @ Arcadis. Nothing to on site. Opened building + will perform H/S meeting. Results from Bryan's wife's covid test were negative.

-1030- Begin to set up to core MW-14S

-1630- Cored a total of 10' for 28 total feet

-1600- Depart site

4/22/20

Location 331-337 W Main St Rochester Date 4/23/20

Project / Client 60617211 NYSDEC

Date: 4/23/20

Weather: 34°F, Mostly Cloudy

Personnel: Sean P. Connelly (Arcon)
Bryan Swarts (NDI)
Zain Pressler (NDI)

-0730 - Arrive on site, opened up building. Completed H/S meeting. Began setting up to complete MW-14S

-0808 - Calibrated equipment

-0815 - Began to core (continue coring) MW-14S. Will Develope MW-15OB simultaneously

-0842 - Core block @ 11.5' = ~~28.3~~ 29.9' total depth. lost ~ 100 gallons

-0900 - Core block @ 13.1' = 29.9' total depth

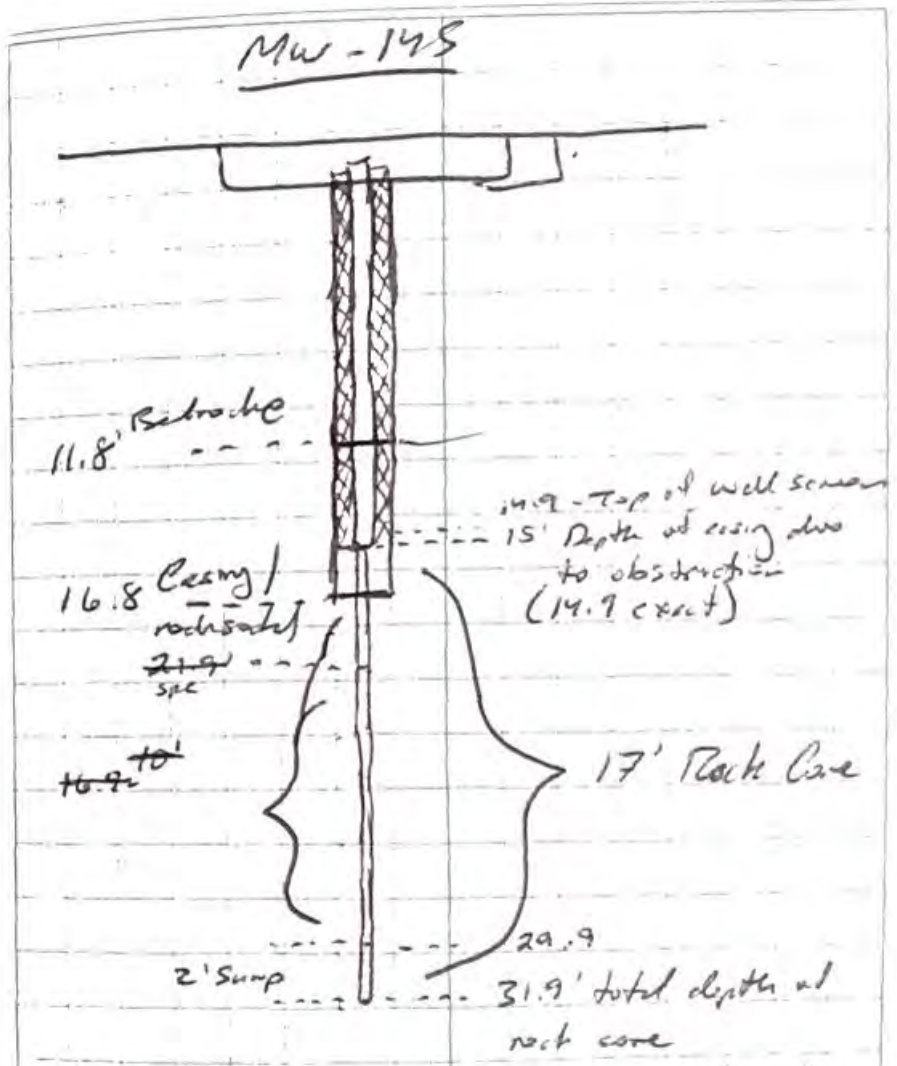
-0932 - Reached total 17' core = 31.9' = Target depth for well/screen - lost total ~ 600 gallons. Visible current of water can be seen flowing NW-SE

-1010 - Steam cleaned rock core + began to prep to core MW-14I

Location 331-337 W. Main St. Rochester Date 4/23/20

Project / Client 60617211 NYSDEC

MW-14S



-15' - 2" 20# 10 slot stainless steel continuous wrap screen w/ 2' sump. Total = 17'

-0.0 size sand pack around sump

-#2 size sand from bottom well screen up to 2' above well screen (29.9 - 12.9)

- 1' Bentonite seal (12.9 - 11.9)

- Grout (11.9 - 1.0' GS)

Location 331-357 N. Main St Rochester Date 4/23/20

Project / Client 60617211 NYSDEC

-1020 - Began coring MW-14I

-1400 - Cored ~18' into bedrock for MW-14I for a total of ~27' + purged ~18 gallons from MW-150B.

-1600 - Depart site. End of Day

* C 1430 - Zane cut finger on break-out wrench. Stopped work, applied first aid. Began to take Zane to Hospital



Location 331-357 W Main St Rochester Date 4/24/21

Project / Client 60617211 NYSDEC

Date: 4/24/21

Weather: 45°F Cloudy

Personnel: Sean P. Connelly (Arcom)
Bryan Swartz (NDI)
~~Zaino Prestia~~ (NDI)
Tom Mongetrisla

-0745 - Arrive on site. Opened building + performed H/S meeting. New Driller Thomas Mongetrisla. Performed drill rig maintenance

-0930 - Continued MW-14I rock coring

-1000 - 14.9 PID reading + 22 CO reading. Put on masks.

-1003 - Resumed drilling
Steady background of 10.3 ppm
CO: 14 H_2S: 0.0
LEL: 2 OXY: 20.9

-1020 - 32' cored depth
420.1 ppm coming out of MW-14I hole / pipe 12.7 ppm breathing zone

-1049 - CO spike at 28 ppm w/ PID C 20.5 ppm - Cease work. Turn off generators + let air / building vent

Return to Room

Location 331-337 W Main St Rochester Date 4/24/20

Project / Client 60617211 NYSDEC

-1155- Resumed coring w/ masks
VOC C 15.9
CO C 20

-1240- Core depth 34-39'.

-1600- Cored to depth of 44.3'. Target depth = 44'. Developed total 35 gallons out at MW-150S

-1630- Depart site. End of day

4/24/20

Location 331-337 W. Main St Rochester Date 4/27/20

Project / Client 60617211 NYSDEC

Date: 4/27/20

Weather: 45°F, showers

Personnel: Sean P. Connelly (Accom)
Bryan Swartz (NOT)
Corg Diller (NOT)
Mike Gutmann (Accom)

-0730- Arrive on site. Opened building / organized and prepare for day

-0800- Calibrated PID / QRAE + performed H/S

-0815- Began drilling @ MW-14I. 4.7' left to core.

-0820- Began developing MW-150S

-0825- Checked depths of MW-13S and MW-13I to gauge target depths. Will switch locations

MW-13S	MW-13I
- 12' Bedrock. Cut Casing 16.7' 16.9'. Will become MW-13I	- Depth of casing 14.9' to top of concrete. - Bedrock @ 12'. Will become MW-13S

Location 331-337 W. Main St Rochester Date 4/27/20

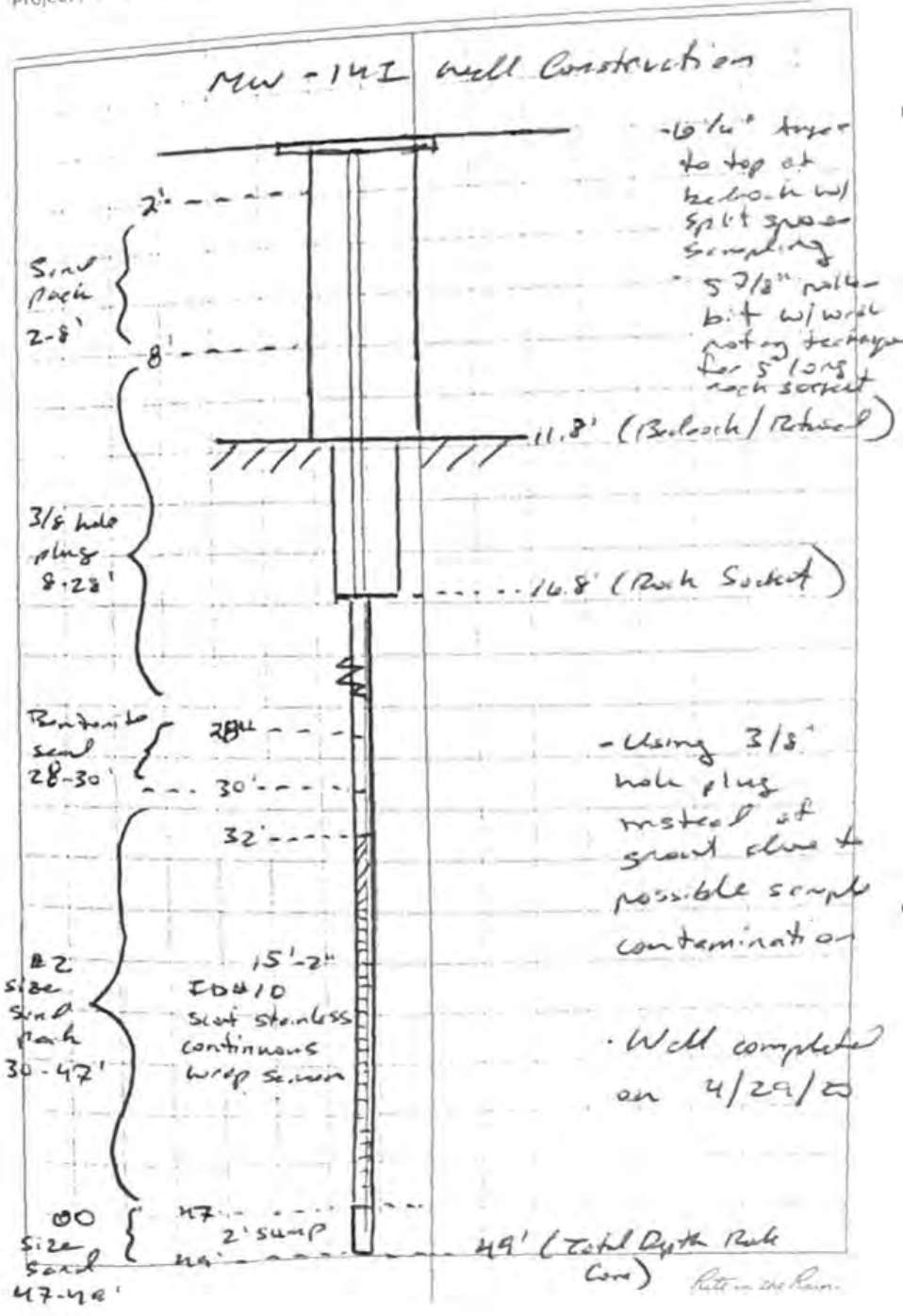
Project / Client 60617211 NYSDEC

Date: 4/27/20

- 0935 - Completed 44'3" → 49' rock core for MW-14I
- 1000 - Installing MW-14S/I wells total depth = 31.9' Casing / well construction pg 79 for MW-14S. MW-14I pg 85
- 1135 - Began setting up on MW-13S originally will become MW-13I due to uncertainty of 4" steel casing straightness
- 1230 - Began coring MW-13I (Previous MW-13S)
  - Casing depth = 17'
  - Target depth = 51'
- 1320 - Pulling first core run. Lost 1'3" went back down to retrieve the rest of the core.
  - From 3'2" → 4'10" at core run (20'2" → 21'10") there is a gravel layer. Medium to large washed sub angular to rounded gravel.
- 1525 - Completed coring to 27'
- 1600 - Departed site.

Location 331-337 W. Main St Rochester Date 4/27/20

Project / Client 60617211 NYSDEC



Location 331-337 W Main St Rochester Date 4/28/20

Project / Client 60617211 NYSDEC

Date: 4/28/20

Weather: 43°F. Cloudy

Personnel: Sean P Connelly (Aecom)
Bryan Swartz (NDI)
Corey Dillon (NDI)

-0740 - Arrive on site, drillers arrived @ 0730. Opened building + performed Tailgate meeting. Will continue MW-13I rock coring beginning @ 27-32' interval

-1500 - Completed MW-13I rock coring. Reached target depth of 51'

-1600 - Departed site

4/28/20

Location 331-337 W. Main St. Rochester Date 4/29/20

Project / Client 60617211 NYSDEC

Date: 4/29/20

Weather: 48°F. Light showers

Personnel: Sean P. Connelly (Aecom)
Bryan Swartz (NDI)
Corey Dillon (NDI)

-0730 - Arrive on site. Opened building. performed Tailgate meeting

-0745 - Drillers begin to prep to core MW-13S. Target depth: 34'

-1030 - Cored 4'. Spindel contracted.

-1300 - Nathaniel mechanic (Chad Valenthio) arrives on site to perform maintenance. Will complete setting MW-14I, MW-14S MW-130B and MW-13I to specified design in workplan.

-1500 - Unable to fix spindel. Organized drums and equipment

-1530 - Departed site

5/29/20

Rain in the Rain

Location 331-337 W. Main St Rochester Date 4/30/20

Project / Client 60617211 NYSDEC

Date 4/30/20

Weather: 54°F, cloudy

Personnel: Sean P. Connelly (Arcadis)
Bryan Swantek (NDI)
Cory Dillon (NDI)

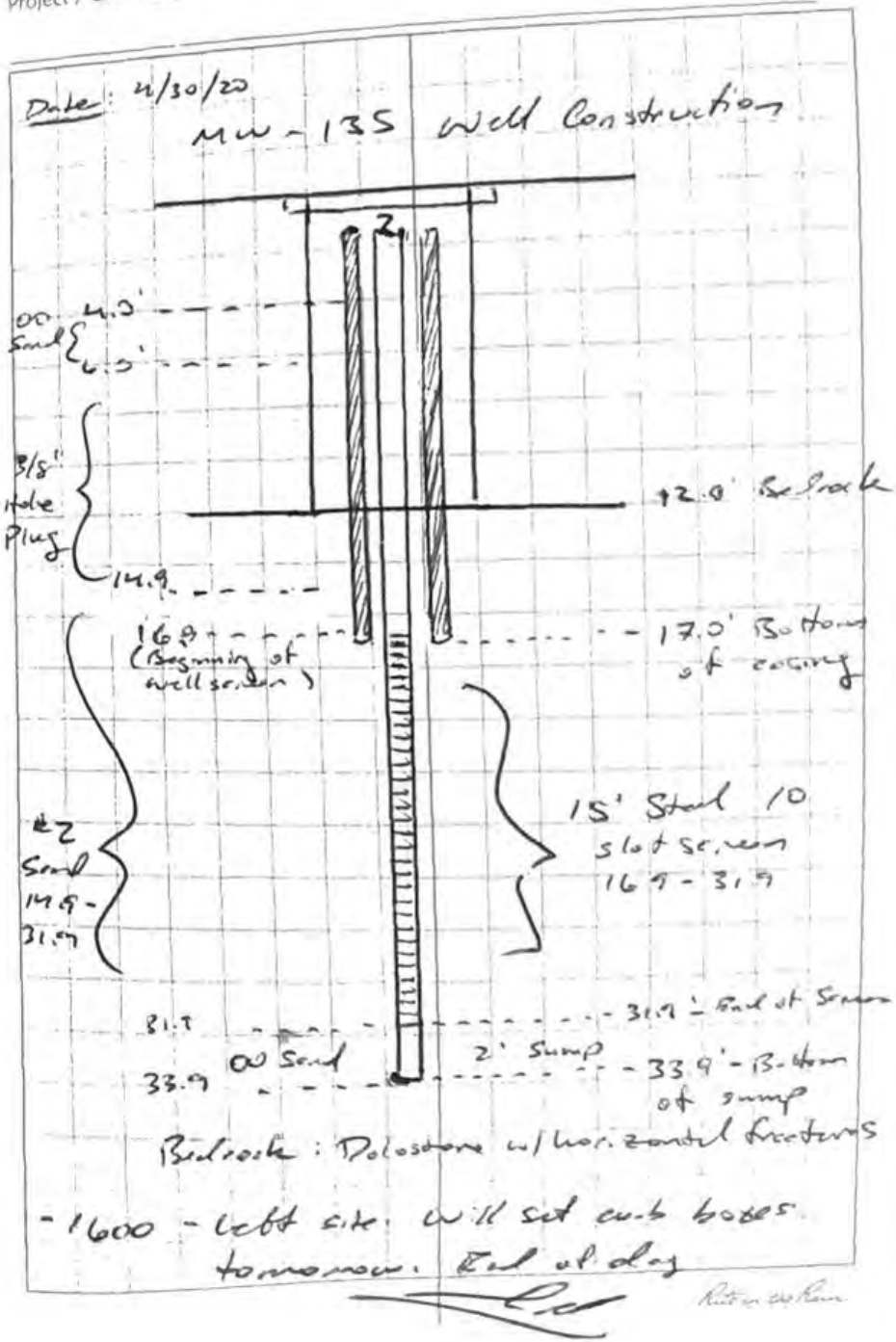
- 0740 - Arrive on site
- 0900 - Drillers on site. Began working / Rising rig.
- 1020 - Repairs complete. Attempting to resume coring MW-135. 17.21' complete will core 21.22 for last section of 5' run then complete 22.27.
- 1053 - Replaced drill bit, continued coring
  - Exact depths / Times:
  - 16'3" → 21'3" @ 1155
  - 21.3" → 26.3" @ 1250
  - 26.3" → 32.3" @ 1347 * 37 rpm coming out of core barrel
  - 32.3" → 34' @ 1440 * 222.8 rpm coming out of core barrel. Exact depth 33.9" (All measurements in decimals. SPC 4/30/20)
- 1500 - Began setting MW-135 well. Tone depth = 33.9" - possible core mud / rock @ bottom

Location 331-337 W Main St. Rochester Date 4/30/20

Project / Client 60617211 NYSDEC

Date: 4/30/20

MW-135 Well Construction



- 1600 - Left site. Will set curb boxes tomorrow. End of day

Location 331-337 W. Main St Rochester Date 5/1/20

Project / Client 60617211 NYSDEC

Date: 5/1/20

Weather: 46°F, mostly cloudy

Personnel: Sean P. Connelly (Stearns)
Bryan Swartz (NDI)
Greg Dillon (NDI)

-0740- Arrive on site. Will set MW-150B and MW-135 curb box

-0845- Completed setting curb boxes. Continued cleaning up site. Will take monitoring

- 12x cover boxes
- 6x 8 curb boxes
- 8x drums for development
- 16x drums for waste

-0900- Steam cleaned all remaining augers/tools

-1000- Returned backflow preventer / left site.

-1030- Returned to site

-1130- Drillers left site

-1200- Began developing MW-150S further

-1330- developed ~15 more gallons. Left site.

Location 331-337 W. Main St Rochester Date

Project / Client 60617211 NYSDEC

Final Drum Count

- water / development H2O : 10
- Drill water (Concrete Coring H2O): 1
- Soil Cuttings: 10
- PPE / Soil Sample Waste: 1
- Concrete: 1
- Steam cleaner waste / water: 1

Total drums: 24

Rain on and Rain

Location 331-357 W. Main St Rochester Date 5/6/20

Project / Client 60617211 NYSDEC

Date: 5/6/20

Weather: 43°F, cloudy

Personnel: Sean P. Connolly + Chris Bowe

- 0815 - Arrive @ Geo Rental to pick up well development equipment
  - 2 water spouts / ~~water~~
  - 2 water pumps / YSI
  - tubing + misc. battery
- 0830 - Arrive @ Artes site. Perform H/S + site orientation. Prepped to start developing wells. Took headspace readings + WL's / TD depth readings on all wells

Well ID	PID	WL	DTP	DTB
MW-130B	982.4	8.69	N/A	10.81
MW-150B	352.7	8.53	9.13	11.40
MW-135	2623	21.52	22.10	33.11
MW-13I	809.6	29.29	33.79	51.34
MW-145	8412	19.26	19.26	31.88
MW-14I	244.6	29.80	31.73	49.42

Location 331-357 W. Main St Rochester Date 5/6/20

Project / Client 60627211 NYSDEC

Date: 5/6/20

Weather: 45°F, cloudy

Personnel: Sean P. Connolly / Chris Bowe

- 1000 - Completed PID + WL / Product readings, will begin development starting w/ wells on MW-130B and water spouts on 13 S/I
- 1133 - Pumped total 51 gallons on MW-13S
  - drum headspace = 7.6 ppm
  - well headspace = 548.1 ppm
  - final WL = 20.60
  - product level = 21.57
  - final depth = 33.11'
  - Disconnect pump to move to MW-14S
- 1152 - Reached 50 gallons on MW-13I
  - drum headspace: 8.6 ppm
  - well headspace 100.9 ppm
  - DTW: 29.78
  - DTP: 33.90
  - Disconnect pump + moved to MW-14I

Location 331-337 W. Main St Rochester Date 5/6/20
Project / Client 60617211 NYSDEC

Date: 5/6/20

- 1215 - Took lunch
- 1258 - Began developing MW-141
- 1302 - Began developing MW-145
- 1331 - Completed developing MW-145 & 50 gallons removed.
  - Drum headspace: 95.4
  - DTW 18.51
  - DTP: 19.12
- 1342 - Completed developing MW-141 w/ 50 gallons removed
  - Drum headspace: 67.4 ppm
  - DTW 30.0
  - DTP: 31.45

* will develope 50+ gallons from each well again tomorrow w/ continuous development of MW-150B. 10 gallons removed so far

- 1500 - Off site.

Location 331-337 W. Main St Rochester Date 5/7/20
Project / Client 60617211 NYSDEC

Date: 5/7/20
Weather: 45°F, Mostly Cloudy
Personnel: Sam R. Connelly / Chris Bourne

- 0800 - Arrive on site, opened building, completed H/S → calibrated new PID
- 0830 - Will take WL's, PID readings on all wells

Well ID	WL	DTP	DTB	PID
MW-150B	8.79	10.48	10.81	7.4
MW-150B	8.63	9.26	11.43	19.1
MW-13S	18.28	18.84	33.10	647
MW-13I	29.71	33.46	50.74	450.8
MW-14S	17.71	18.34	31.99	830.2
MW-14I	29.91	31.42	48.48	73.5

- 0858 - Resumed development on MW-150B
- 0939 - Completed MW-14S development
  - DTW: 18.22
  - DTP: 18.55
  - DTB: 31.85
  - PID Drum Head: 5.07 ppm
  - PID well head: 440.5 ppm

Location 331-337 W. Main St Rochester Date 5/7/20

Project / Client 60617211 NYSDEC

Date: 5/7/20

- 0946 - Completed MW-14I development w/ 100 gallons removed
  - DTW: 30.18 - Well head PID: 105.2 ppm
  - DTP: 30.79 - Drum head: 12.2 ppm
  - DTB: 48.68
- 1005 - Began decanning to relocate to MW-13 I/S
- 1013 - Began / continued developing MW-13I
- 1017 - Began / continued developing MW-13S
- 1047 - Completed developing MW-13S
  - DTW: 18.46 - Well head PID: 284.9 ppm
  - DTP: 19.00 - Drum head PID: 7.4 ppm
  - DTB: 33.10
- 1101 - Completed MW-13I development
  - DTW: 29.91 - Well head PID: 933 ppm
  - DTP: 39.95 - Drum head PID: 2.9 ppm
  - DTB: 51.45
- 1111 - Began decanning / putting away equipment
- 1500 - Completed developing MW-18DB w/ 25 gallons

Location 331-357 W. Main St Rochester Date 5/7/20

Project / Client 60617211 NYSDEC

Date: 5/7/20

- MW-18DB final readings
  - DTW: 8.91 - Well head PID: 763.2
  - DTP: 10.49 - Drum head PID: 15.9
  - DTB: 11.15
- 1520 - Left site for Eco Rental to drop off equipment
- 1535 - Arrive @ Eco Rental
- 1545 - Depart Eco Rental. End of Day

Location 331-337 W. Main St Rochester Date

Project / Client 60617211 NYSDEC

MW-13S / MW-13I Well Construction

- MW-13I and MW-13S both reached bedrock @ 12' BGS. Drilled 5' rock socket → 17' BGS. and set steel casings. On 4/21/20, MW-13I casing didn't set straight in grout. Re-drilled and reset casing however casing only set to 14.9' BGS. decided to switch MW-13S and MW-13I locations due to uncertainty of MW-13I original's casing straightness.

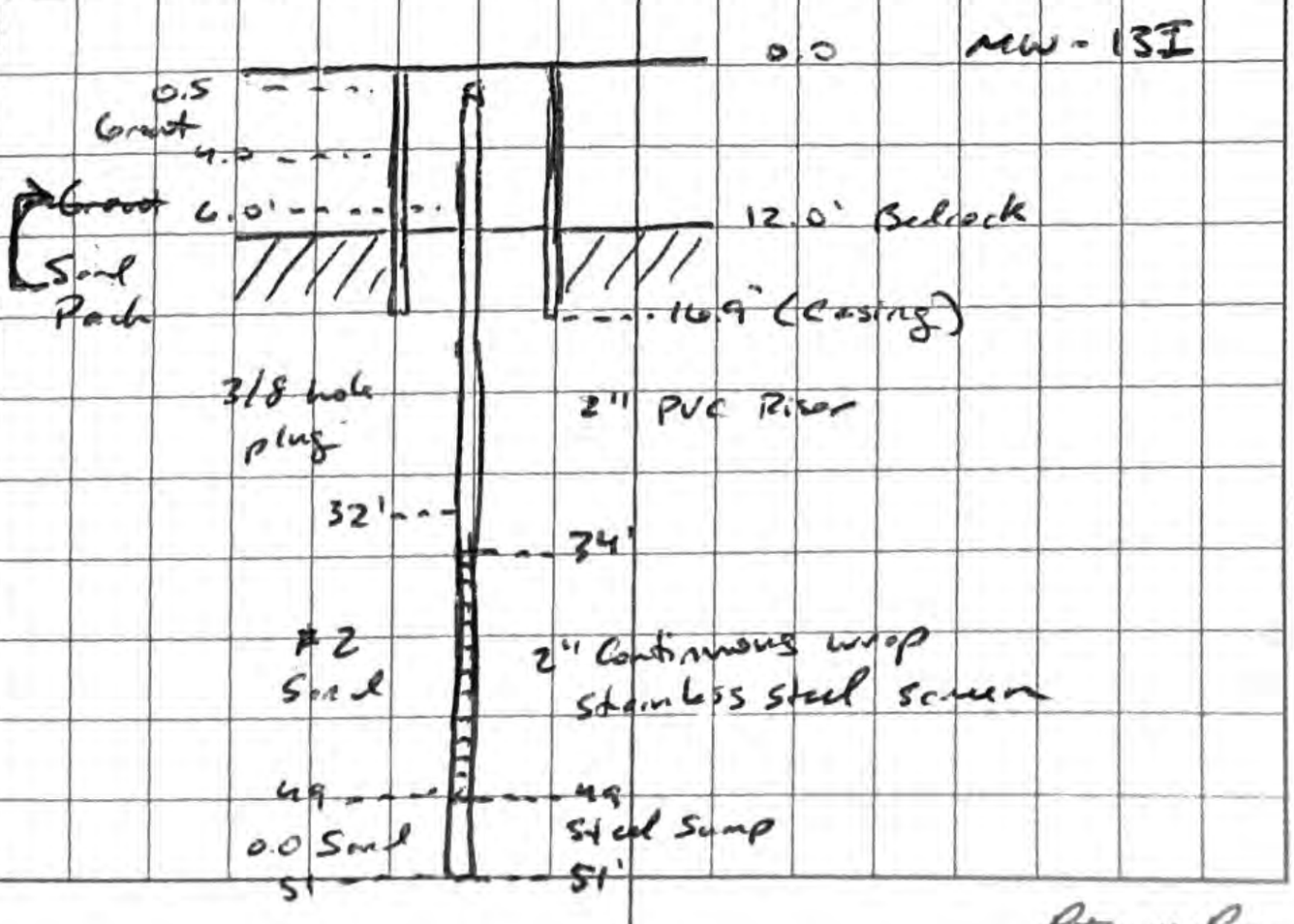
- MW-13I original became MW-13S. Cored to depth of 33.9'. 2'(2") sump w/ 15' stainless steel continuous wrap screen and 16.9' PVC riser. 6" steel casing went to 14.9'. 0.0 sand pack around sump. #2 sand 14.9'→ 31.9'. 3/8" hole plug from 6.0'→ 14.9'. 0.0 sand from 4.0-6.0'. Grout/Cement from ~0.5-4.0'

Location 331-337 W Main St Rochester Date _____

Project / Client 60617211 NYSDEC

MW-13S / MW-13I Well Construction

- MW-13S original became MW-13I due to more reliable casing. Bedrock @ 12'. Cored to 17' for rock socket and cut casing to 16.7'. Cored to a total depth of 51'. MW-13S/13I to have the same lithology/soil characterization as depicted for MW-13I original 3/4"/0-34': 2" PVC Riser. 34-49' 2" Stainless steel continuous wrap screen. 49-51' 2" steel sump. 49-51, #0 sand pack. 32-49 #2 sand. 8'-32, 3/8 hole plug. 6-8' Sand pack. 0.5-6, Grout.



Rite in the Rain

CONTENTS

PAGE	REFERENCE	DATE

Location _____ Date 4/8/21

Project / Client _____

~~Progress~~

~~Progress~~

Progress

WELL ID	DTW	DTB	SAMPLE TIME	COMMENTS
MW-9				DESTROYED
MW-903	7.85	8.85	NA	NO WATER
MW-95	BLOCKED @ 0.2' FROM TOC			
MW-9II	BLOCKED @ 1.52' FROM TOC			
MW-97	11.01	35.50	11:30	
MW-75	BLOCKED @ 2.7'			
MW-7II	BLOCKED @ TOC			
MW-70	NA	32.6	NA	THICK MUD
MW-8I	NA	15.5'	NS	RESISTANCE @ 13'
MW-85	14.5'			RESISTANCE @ ~~14~~ 14.5'
MW-86	0.85	37.5	12:15	

14:30 ~~USTC~~ ~~REMOVING~~ CONES

USTC REMOVING CONES/TRAFFIC BARRICADES

14:52 USTC FINISHED REMOVING TRAFFIC BARRICADES

15:03 - USTC + [illegible] OFF-SITE

Location _____ Date _____

Project / Client _____

APPENDIX D

SOIL PROBE LOGS

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	0N 20E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand, little Silt
	PID = 52.5 ppm @ 6"; 0.6 ppm @ 12"; 2.5ppm @ 16"; 4.5 ppm @ 18"
12	
15	14-36": Dark brown to black fine to medium Sand, w/ Ash, Gravel and Brick fragments
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/23/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/23/2020	**SAMPLER:**	S. Connelly
Location ID:	10N 30E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown silty Sand, little Gravel
	PID = 133.2 ppm @ 6"; 35.7 ppm @ 12"; 318 ppm @ 18"; 46.5 ppm @ 25"
12	
15	12-36":P Dark brown and staining
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	20N 10E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand
	PID = 26.3 ppm @ 6"; 0.0 ppm @ 12"; 0.0 ppm @ 16"; 0.3 ppm @ 18"; 0.0 ppm @ 22"
12	
15	
18	16-36": Dark brown
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/23/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/23/2020	**SAMPLER:**	S. Connelly
Location ID:	20N 50E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown silty Sand, trace Clay, Gravel and Red Brick Fragments
12	PID = 182.7 ppm @ 6"; 2.9 ppm @ 12"; 2.6 ppm @ 18"; 2.3 ppm @ 25"
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	30N 20E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand, little Silt
	PID = 16 ppm @ 6"; 0.3 ppm @ 12"; 2.5ppm @ 16"; 1.8 ppm @ 18"; 1.2 ppm @ 21"
12	
15	
18	16-36": Dark brown to black fine to medium Sand, w/ Ash, Gravel and Brick fragments
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/23/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/23/2020	**SAMPLER:**	S. Connelly
Location ID:	30N 40E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Brown silty Sand, trace Gravel,
	PID = 68.7 ppm @ 6"; 5.2 ppm @ 8"; 3.9 ppm @ 10"; 4.2 ppm @ 12"; 10.1 ppm @ 14"; 6.8 ppm @ 16"
12	
15	12-36": Black staining
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	40N 10E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Dark brown fine to medium Sand, little Silt, trace Gravel
12	PID = 38.1 ppm @ 6"; 0.0 ppm @ 12"
15	
18	16-36": Dark brown to black medium to coarse Sand, little Silt, PID = 0.0 ppm
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	40N 30E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand and Gravel
	PID = 47 ppm @ 6"; 0.5 ppm @ 10"; 5.7 ppm @ 12"; 5.3 ppm @ 18"; 2.2 ppm @ 24"; 2.4 ppm @ 28"
12	
15	12-36": Dark brown w/ black staining
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	40N 40E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-8": CONCRETE
6	
9	8-36": FILL: Dark brown w/ black staining Sand, little Gravel
12	PID = 15000 ppm @ 8"; 197.5 ppm @ 12" ; 53.1 ppm @ 18"; 48.4 @ 21"
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/23/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/23/2020	**SAMPLER:**	S. Connelly
Location ID:	40N 50E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown silty Sand, trace Clay, Gravel and Red Brick Fragments
12	PID = 341.2 ppm @ 6"; 22.9 ppm @ 12"; 29.0 ppm @ 26"
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	50N 50E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand, little Silt
	PID = 73.6 ppm @ 6"; 1.8 ppm @ 10"; 14.7 ppm @ 13"; 8.9 ppm @ 18"; 6.7 ppm @ 22"
12	
15	13-36": Dark brown w/ black staining
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	60N 10E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand
	PID = 12.8 ppm @ 6"; 0.0 ppm @ 12"; 0.0 ppm @ 14"; 0.0 ppm @ 18"; 0.0 ppm @ 21"; 0.5 ppm @ 24"
12	
15	14-17": Dark brown, some Gravel
18	17-20": Gravel layer
21	20-36": Dark brown silty fine Sand and Gravel
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	60N 40E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand, little Silt
	PID = 97.9 ppm @ 6"; 7.7 ppm @ 10"; 4.7 ppm @ 12"; 14.6 ppm @ 15"; 11.9 ppm @ 18"; 8.4 ppm @ 21"
12	11-13": Dolostone gravel layer
15	13-36": Dark brown to black fine to medium Sand, w/ Ash, Gravel and red Brick fragments
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	60N 50E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand, little Silt
	PID = 2.8 ppm @ 6"; 1.6 ppm @ 12"; 2.5 ppm @ 16"; 3.2 ppm @ 18"; 2.7 ppm @ 22"; 0.2 ppm @ 26"
12	
15	
18	16-36": Dark brown to black fine to medium Sand, w/ Ash, Gravel and red Brick fragments
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	70N 20E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown silty Sand and Gravel
	PID = 10.9 ppm @ 6"; 1.8 ppm @ 12" ; 0.2 ppm @ 18"; 0.5 @ 21"
12	9-36"": Black staining w/ Brick Fragments
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/23/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/23/2020	**SAMPLER:**	S. Connelly
Location ID:	70N 40E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-8": CONCRETE
6	
9	8-36": FILL: Light reddish brown fine to medium Sand, some Gravel
12	PID = 566.7 ppm @ 8"; 1.5 ppm @ 12"; 2.1 ppm @ 16"
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	70N 50E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand, little Silt
	PID = 65.8 ppm @ 6"; 6.9 ppm @ 12"; 4.1 ppm @ 18"; 8.3 ppm @ 22"
12	
15	13-36": Dark brown w/ black staining
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/23/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/23/2020	**SAMPLER:**	S. Connelly
Location ID:	80N 30E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-8": CONCRETE
6	
9	8-36": FILL: Dark brown fine to medium Sand, some Silt, Black staining throughout
12	PID = 62.5 ppm @ 8"; 27.2 ppm @ 12"; 5.6 ppm @ 24"; 5.0 ppm @ 36"
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/23/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/23/2020	**SAMPLER:**	S. Connelly
Location ID:	80N 40E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-8": CONCRETE
6	
9	8-36": FILL: Brown fine to medium Sand, little Gravel
12	PID = 109.1 ppm @ 8"; 2.7 ppm @ 12"; 4.2 ppm @ 15"
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	90N 10E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Brown fine to coarse Sand, little Silt, trace Gravel
12	PID = 12.9 ppm @ 6"; 1.2 ppm @ 12" ; 0.3 ppm @ 16"
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	90N 50E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine Sand, little Silt
	PID = 11.4 ppm @ 6"; 16.7 ppm @ 12"; 22.5 ppm @ 18"; 11.7 ppm @ 21"
12	8-36": Dark brown fine to coarse Sand, w/ black staining
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	100N 20E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand, trace Silt and Gravel
	PID = 12.9 ppm @ 6"; 1.2 ppm @ 12" ; 0.3 ppm @ 16"
12	
15	
18	15-20": Dark brown to black and Brick Fragments
21	20-21": Black with Ash
	21-36": Dark brown
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/23/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/23/2020	**SAMPLER:**	S. Connelly
Location ID:	100N 40E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-8": CONCRETE
6	
9	8-36": FILL: Brown fine to medium Sand, little Gravel
12	PID = 119.8 ppm @ 8"; 2.9 ppm @ 14"
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	110N 30E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine to medium Sand, little Silt
	PID = 27.9 ppm @ 6"; 0.0ppm @ 7-28"
12	7-36": Dark brown to black fine to medium Sand, w/ Ash, Gravel and red Brick fragments
15	
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

AECOM

SOIL PROBE LOG

PROJECT:	Artco Industrial Laundries		Sheet 1 of 1
CLIENT:	NYSDEC	**JOB NUMBER:**	60644874
CONTRACTOR:	N/A	**LOCATION:**	Rochester, NY
DATE STARTED:	1/24/2020	**GROUND ELEVATION:**	512.00
DATE COMPLETED:	1/24/2020	**SAMPLER:**	S. Connelly
Location ID:	110N 50E	**GEOLOGIST:**	S. Connelly

DEPTH (in)	DESCRIPTION
3	0-6": CONCRETE
6	
9	6-36": FILL: Light brown fine Sand, little Silt
	PID = 52.8 ppm @ 6"; 9.2 ppm @ 12"; 6.8 ppm @ 16"; 2.2 ppm @ 24"; 1.7 ppm @ 26"
12	
15	14-36": Dark brown fine to medium Sand, w/ black Ash & Brick fragments
18	
21	
24	
27	
30	
33	
36	
	End of Boring @ 36"

COMMENTS:

APPENDIX E

SOIL BORING LOGS

AECOM

TEST BORING LOG

BORING NO. : 10N 36E

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 1**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150320.76849 **EASTING:** 1404957.42164

GROUNDWATER: 7 ft bgs | **GROUND ELEVATION:** 512.00

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 2/11/2020

DATE FINISHED: 2/11/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE			
					Lt. Brn				2.7	Dry, No Odor, No Staining
					Dk. Brn to Blk		FILL: Fine to medium Sand w/ Red Brick & Wood Fragments, trace Gravel		28.7	
					Light Brown				42.2	
							Very fine SAND, little Silt	SP	96.0	
									10.7	
-5									6.7	
		1		50					1.2	Moist
									3.6	
									1.1	
									2.2	
									6.9	Wet
-10		2		100					0.0	
									1.2	
									1.0	
									2.7	
									0.0	
									0.0	
									0.0	
-15							Refusal @ 13' bgs			
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs
Boring advanced by Geoprobe® Model 6620DT
Collected soil sample at 7' for VOCs

AECOM

TEST BORING LOG

BORING NO. : 25N 50E

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 1**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150336.0319 **EASTING:** 1404971.10527

GROUNDWATER: 7 ft bgs | **GROUND ELEVATION:** 512.00

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 2/12/2020

DATE FINISHED: 2/12/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE		0.6	Dry, No Odor, No Staining
					Brn to Blk Brown		FILL: Fine to medium Sand, little Clay and Brick fragments		3.1	
									2.9	
									7.8	
									2.2	
		1		83			Rocks and Boulders	SW	0.2	
									0.5	
-5							Fine to medium SAND, trace coarse Sand & Ash		0.9	
									1.0	
									1.1	
									1.5	
		2		25					0.0	
									0.7	
									0.7	Wet
									0.6	
									2.4	
									3.7	
-10		3		50					2.0	
									0.7	
									0.9	
									0.7	
									0.2	
							Refusal @ 12' bgs			
-15										
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs
Boring advanced by Geoprobe® Model 6620DT
Collected soil sample at 8.5' for VOCs

AECOM

TEST BORING LOG

BORING NO. : 40N 40E

PROJECT/PROJECT LOCATION: Artco Site

SHEET: 1 **OF** 1

CLIENT: New York State Department of Environmental Conservation

JOB NO. : 60644874

BORING CONTRACTOR: Nothnagle Drilling

NORTHING: 1150350.83926 **EASTING:** 1404960.84931

GROUNDWATER: 7 ft bgs

GROUND ELEVATION: 512.00

				CAS.	SAMPLER	CORE	TUBE
DATE	TIME	LEVEL	TYPE	TYPE	Macrocore		
				DIA.	2"		
				WT.			
				FALL			
				* POCKET PENETROMETER READING			

DATE STARTED: 2/11/2020

DATE FINISHED: 2/11/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE			Dry, No Odor, No Staining
					Dk Blk to Brn		FILL: Fine to medium Silty Sand w/ Red Brick Fragments	SW		
					Light Brown		BOULDER			
					Dark Brown				0.0	
-5							Fine to medium SAND, little Silt, trace Gravel		2.6	Moist
		1		50%	Brown		Pulverized Rock Layer 4.9-5'	ML	5.0	
									0.0	Wet
							Sandy SILT, some Gravel		1.7	
									2.8	
-10		2		63%					1.1	
		3		50%					0.5	
									14.7	
							Refusal @ 13' bgs			
-15										
-20										
-25										

COMMENTS: Precleared by hand to 4' bgs

Boring advanced by Geoprobe® Model 6620DT

Collected soil sample at 10-16"' for PFAS

AECOM

TEST BORING LOG

BORING NO. : 40N 50E

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 1**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150351.02979 **EASTING:** 1404970.8475

GROUNDWATER: 8 ft bgs | **GROUND ELEVATION:** 512.00

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 2/11/2020

DATE FINISHED: 2/11/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE		162.8	Dry, No Odor, No Staining
					Dark Brown				138.7	
					Black		FILL: Fine to medium Sand and Silt, trace Gravel and Brick fragments		145.8	Moist, Possible Staining
					Light Brown		Silt, some Gravel, trace Sand	MH	20.3	
-5									5.6	
									3.8	No staining @ 3'
							Fine to medium Sandy SILT, trace to some Gravel		1.1	
					Dark Brown				3.5	
		1		50					3.1	
									4.9	
									3.1	
										Wet
-10		2		38					0.0	
									0.0	
									0.0	
									0.0	
									0.0	
									1.8	
-15							Refusal @ 12.2' bgs			
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs
Boring advanced by Geoprobe® Model 6620DT
Collected soil sample at 12' for VOCs

AECOM

TEST BORING LOG

BORING NO. : 42N 20E

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 1**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150352.45783 **EASTING:** 1404940.81484

GROUNDWATER: 9.5 ft bgs | **GROUND ELEVATION:** 512.00

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 2/12/2020

DATE FINISHED: 2/12/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0					Brn to Dk Brown		CONCRETE		0.2	Dry, No Odor, No Staining
									0.2	
							FILL: Medium to coarse Sand, little Silt, Gravel & Cobbles, Brick fragments.		0.6	
									0.4	
									0.1	
									0.2	
									0.3	
									0.1	
-5		1		38	Light Brown to Brown				4.1	
									1.1	
									10.3	
							SILT, little Gravel and Clay	ML		Moist
									0.4	
-10		2		88					0.3	Wet
									0.3	
									1.0	
									2.8	
							Medium to coarse SAND, little Silt	SW	16.7	
							Refusal @ 12.3' bgs			
-15										
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs
Boring advanced by Geoprobe® Model 6620DT
Collected soil sample at 11.5' for VOCs & PFAS

AECOM

TEST BORING LOG

BORING NO. : 60N 40E

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 1**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150370.83563 **EASTING:** 1404960.46825

GROUNDWATER: 11.5 ft bgs | **GROUND ELEVATION:** 512.00

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 2/12/2020

DATE FINISHED: 2/13/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE		5.6	Dry, No Odor, No Staining Moist
					Dk. Brn-Blk		FILL: Fine to coarse Sand, little Silt ang Gravel		8.1	
					Brown				4.2	
									1.3	
									1.7	
									3.7	
-5		1		63					3.8	
							Silty Sand, some Gravel and Brick fragments		2.2	
					Black				14.9	
					Brown		SILT, little Clay	ML	33.6	Strong Odor @ 8.25'. Black staining @ 10', becoming saturated @ 11.5'. Possible NAPL from 10-11'
							Pulverized rock @ 8-8.25'		21.1	
									39.2	
								SM	34.5	
-10		2		75			Silty SAND, some Gravel		476.5	
									185.2	
									540.1	
									164.1	
									230.9	
									568.1	
							Refusal @ 12' bgs			
-15										
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs
Boring advanced by Geoprobe® Model 6620DT
Collected soil samples at 8.5-9' and 10-11' for VOCs

AECOM

TEST BORING LOG

BORING NO. : 70N 20E

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 1**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150380.45275 **EASTING:** 1404940.28135

GROUNDWATER: 9.5 ft bgs | **GROUND ELEVATION:** 512.00

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 2/12/2020

DATE FINISHED: 2/12/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE		0.7	Dry, No Odor, No Staining
					Brown (Dk)				0.3	
					Black		FILL: Fine to medium Silty Sand w/ Cobbles		1.9	
									4.8	
									4.2	
									4.0	
-5					Gray to Black		trace Clay and Ash		1.8	
		1		63					8.5	
									2.7	
									2.6	
					Brown		CLAY and SILT	ML/ CL	8.0	Ashy Staining
									50	
							Fine Sandy SILT, trace Clay and Gravel	ML	4.7	Wet, No Staining
-10		2		100					1.9	
									1.9	
									5.6	
									18.2	
									31.8	
									6.8	
									55.8	
-15							Refusal @ 12.5' bgs			
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs
Boring advanced by Geoprobe® Model 6620DT
Collected soil sample at 12-12.5' for VOCs

AECOM

TEST BORING LOG

BORING NO. : 80N 35E

PROJECT/PROJECT LOCATION: Artco Site

SHEET: 1 **OF** 1

CLIENT: New York State Department of Environmental Conservation

JOB NO. : 60644874

BORING CONTRACTOR: Nothnagle Drilling

NORTHING: 1150390.73673 **EASTING:** 1404955.08809

GROUNDWATER: 10.5 ft bgs

GROUND ELEVATION: 512.00

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 2/12/2020

DATE FINISHED: 2/12/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE			Dry, No Odor, No Staining Moist
					Brown				0.8	
							FILL: Medium to coarse Sand, little Silt		2.6	
					Dark Brown				0.0	
							Sandy Silt with Ash, Gravel and Brick fragments			
					Black				16.5	
-5							Pulverized cobbles @ 5-7.8'		27.7	
		1		88					67.3	
									14.1	
					Brown				353.0	Strong Odor
							Silty Sand, some small Gravel		171.6	
									6825	
-10		2		100					331.4	
									1283	Wet, Strong Odor
									1294	
									2913	
							Refusal @ 12' bgs			
-15										
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs

Boring advanced by Geoprobe® Model 6620DT

Collected soil sample at 9' for PFAS and 11-12' for VOCs

AECOM

TEST BORING LOG

BORING NO. : 90N 10E

PROJECT/PROJECT LOCATION: Artco Site

SHEET: 1 **OF** 1

CLIENT: New York State Department of Environmental Conservation

JOB NO. : 60644874

BORING CONTRACTOR: Nothnagle Drilling

NORTHING: 1150400.25858 **EASTING:** 1404929.9021

GROUNDWATER: 9 ft bgs

GROUND ELEVATION: 512.00

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 2/13/2020

DATE FINISHED: 2/13/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE		0.0	Dry, No Odor, No Staining
					Brown		FILL: Sand, little Silt, Gravel and Brick Fragments		0.6	
									0.3	
									0.5	
									0.7	
							Clayey Silt, some Gravel		0.8	Moist
									0.9	
									1.1	
-5									5.3	
		1		50			Very fine to fine SAND, some Gravel, little Silt	SM	2.3	
									7.7	
									69.5	
									188.6	
									35.9	
									28.0	
-10		2		100					41.7	Wet
									58.2	
									121.9	
									156.8	
							Refusal @ 11.1' bgs			
-15										
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs

Boring advanced by Geoprobe® Model 6620DT

Collected soil sample at 6-6.5' for VOCs

AECOM

TEST BORING LOG

BORING NO. : 90N 50E

PROJECT/PROJECT LOCATION: Artco Site

SHEET: 1 **OF** 1

CLIENT: New York State Department of Environmental Conservation

JOB NO. : 60644874

BORING CONTRACTOR: Nothnagle Drilling

NORTHING: 1150401.02072 **EASTING:** 1404969.89483

GROUNDWATER: 9.5 ft bgs

GROUND ELEVATION: 512.00

DATE	TIME	LEVEL	TYPE	CAS.	SAMPLER	CORE	TUBE
			TYPE		Macrocore		
			DIA.		2"		
			WT.				
			FALL				
			* POCKET PENETROMETER READING				

DATE STARTED: 2/12/2020

DATE FINISHED: 2/12/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE			Dry, No Odor, No Staining
					Brown		FILL: Fine to medium Silty Sand, some Gravel, ash and brick fragments		8.5	
									4.7	
									2.1	
					Dark Brown				3.7	
									3.6	
-5									2.4	
					Brown				2.5	
		1		42			SILT, trace Sand and Gravel	ML	1.7	
									0.8	
									0.8	
									0.2	
									0.2	
-10		2		88					0.1	Wet
									0.2	
									0.0	
									0.3	
									0.2	
							Refusal @ 12' bgs			
-15										
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs

Boring advanced by Geoprobe® Model 6620DT

Collected soil sample at 5' for VOCs

AECOM

TEST BORING LOG

BORING NO. : 100N 35E

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 1**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150410.7331 **EASTING:** 1404954.70702

GROUNDWATER: ~11 ft bgs | **GROUND ELEVATION:** 512.00

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 2/13/2020

DATE FINISHED: 2/13/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0					Brown		CONCRETE			Dry, No Odor, No Staining Moist @ 0.5'
							FILL: Very fine Silty SAND		2.1	
									1.4	
									1.3	
									0.7	
									0.9	
									1.1	
-5							Medium silty Sand, some Gravel, trace Brick fragments			
		1		63	Dk. Brn-Blk				1.9	
							Very fine Silty SAND, some Gravel	SM	2.2	
					Brown				6.4	
									10.7	
-10		2		100					17.6	
									7.4	
							Refusal @ 11.7' bgs			
-15										
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs
Boring advanced by Geoprobe® Model 6620DT
Collected soil sample at 7-7.5' for VOCs

AECOM

TEST BORING LOG

BORING NO. : 110N 20E

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 1**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150410.4473 **EASTING:** 1404939.70975

GROUNDWATER: ~11 ft bgs | **GROUND ELEVATION:** 512.00

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Macrocore		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 2/13/2020

DATE FINISHED: 2/13/2020

DRILLER: J. Schwerter

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE			Dry, No Odor, No Staining
					Brown		FILL: Fine to medium Sand, some Gravel and Brick fragmanets, little Silt		0.0	
									0.0	
									0.0	
									0.0	
-5		1		50			Gravel subbase @ 2.5-3'			
					Black				0.2	
									0.2	
					Brown		Fine SAND, little Silt, trace Gravel	SM	0.2	Moist
									2.3	
-10		2		75					6.2	
									4.1	
									3.2	
									8.1	
									4.9	
									0.0	
							Refusal @ 12' bgs			
-15										
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs
Boring advanced by Geoprobe® Model 6620DT
Collected soil sample at 10-10.5' for VOCs

BORING NO. : 110N 20E

AECOM

TEST BORING LOG

BORING NO. : MW-13OB

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 1**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150361.506 **EASTING:** 1404966.431

GROUNDWATER: 9 ft bgs | **GROUND ELEVATION:** 514.36

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Split Spoon		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 4/14/2020

DATE FINISHED: 4/15/2020

DRILLER: B. Swartz

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE			
					Brown		FILL: Fine to medium silty Sand and small to medium cobbles, and Brick fragments		5.8	No Odor, No Staining, Moist
									11.4	
									39.4	
					Dk. Brn-Blk				68.7	
					Dark Brown				52.6	Possible staining @ 2-3'
									42.0	
									22.9	
									7.4	
-5									11.8	
					Black		Pulverized rock layer		36.9	Moist
									17.2	
		1		100	Brown		Very fine to fine SAND, some Gravel, little Silt	SM	31.6	
									127.4	
									341.8	
		2		100					3220	
									8011	
							Medium to coarse SAND	SW	4578	
					Black				26.0	Wet.
-10		3		100	Brown		Very fine to fine SAND, some Gravel, little Silt	SM	73.4	Possible staining @ 9-9.5'
									107.8	
									793.4	
									478.8	
							Refusal @ 11.8' bgs (Bedrock)			
-15										
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs
Boring advanced by CME-55LC Tracked Drill Rig
Collected soil sample at 7.5-8.5' for VOCs & PFAS

AECOM

TEST BORING LOG

BORING NO. : MW-13S

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 2**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150345.851 **EASTING:** 1404966.591

GROUNDWATER: 11.5 ft bgs | **GROUND ELEVATION:** 514.38

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Split Spoon	HQ	
				DIA.		2"	2.5"	
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 4/14/2020

DATE FINISHED: 4/29/2020

DRILLER: B. Swartz

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE			No Odor, No Staining, Moist
					Brown to Dark Brown		FILL: Fine to medium Sand, little Silt, Cobbles, Concrete and Red Brick Fragments		2.2 8.6 14.1 19.5 7.6 39.7 2.9 3.6 4.5	
-5					Light Brown		Very fine to fine silty Sand, some coarse to medium Gravel			
							Silty fine SAND, little Gravel	SM		
-10					Blue Gray	Medium Hard	DOLOSTONE (Lockport/Penfield Member): Very thin bedding, broken to very broken. Horizontal fractures 1-12" apart. No vertical fractures. No vugs.			Wet to Saturated @ 11.5'
-15		R1		87/ 62			17-18": Broken. 4 x Horizontal fractures) 18-20': Blocky. Fractures @ 18.5-18.75' 20-21': Very Broken. 21-22': Broken			
-20		R2		93/ 72			Broken to blocky. Horizontal fractures 1-12" apart. No vertical fractures. No vugs. Horizontal fractures between 23.6-24'			
-25		R3		100/ 88			Broken-Blocky. 8 x Horizontal fractures.		37 PPM coming out of core hole	

COMMENTS: Precleared by hand to 5' bgs. Advanced 6" steel casing (rock socket) to 5' below top of rock.
Boring advanced by CME-55LC Tracked Drill Rig
Collected soil sample at 7.5-8.5' for VOCs. Description from 5-12' taken from MW-13I

AECOM

TEST BORING LOG

BORING NO. : MW-13S

PROJECT: Artco Site | **SHEET: 2 OF 2**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. :60644874**

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC % / RQD %	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
-30		R4		100/ 92			Broken. 6 x Horizontal fractures		222.8 PPM coming out of core hole	
-35							End of Boring @ 34' bgs			
-40										
-45										
-50										
-55										
-60										

COMMENTS: Precleared by hand to 5' bgs. Advanced 6" steel casing (rock socket) to 5' below top of rock.
Boring advanced by CME-55LC Tracked Drill Rig
Collected soil sample at 7.5-8.5' for VOCs. Description from 5-12' taken from MW-13I

AECOM

TEST BORING LOG

BORING NO. : MW-13I

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 2**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150351.681 **EASTING:** 1404966.682

GROUNDWATER: 11.5 ft bgs | **GROUND ELEVATION:** 514.36

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Split Spoon	HQ	
				DIA.		2"	2.5"	
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 4/13/2020

DATE FINISHED: 4/28/2020

DRILLER: B. Swartz

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0					Brown		CONCRETE			No Odor, No Staining, Moist
					Black		FILL: Coarse to medium Sand, little Silt, Cobbles Wood fragments @ 1.5-2'		7.4 9.4 17.3 9.1 11.8 4.5 3.2 3.7	
-5		1		50	Brown to Black		Very fine to fine silty Sand, some coarse to medium Gravel		4.8 9.4 12.4	
		2		100	Brown		Silty fine SAND, little Gravel	SM	29.9 26.5 6.7 4.3	
-10		3		50					5.8 10.1 9.0	
		4		100					8.3 8.9	Wet to Saturated @ 11.5'
					Blue Gray	Medium Hard	DOLOSTONE (Lockport/Penfield Member): Very thin bedding, broken to very broken. Horizontal fractures 1-9" apart. No vertical fractures. No vugs.			
-15		R1		98/ 67			Horizontal fractures @ 17.2', 17.8', 18', 18.5', 19', 19.4-19.5', 20.2', 20.5', 20.6', 22'. Most fractures @ shaley partings w/ some enterolithic structures			
-20		R2		95/ 82						
-25		R3		100/ 88			Broken to blocky. Horizontal fractures 1-12" apart. No vertical fractures. No vugs.			

COMMENTS: Precleared by hand to 5' bgs. Advanced 6" steel casing (rock socket) to 5' below top of rock.
Boring advanced by CME-55LC Tracked Drill Rig
Collected soil sample at 7-7.5' for VOCs

AECOM

TEST BORING LOG

BORING NO. : MW-13I

PROJECT: Artco Site | **SHEET: 2 OF 2**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. :60644874**

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC % / RQD %	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
-30							Very broken 27.5-28' & 30-30.5' Low angle vertical fracture @ 30.5'			
		R4		100/ 90			32-34': Blocky.			
-35							34-34.5': Very broken. 45º angle vertical fracture.			
		R5		92/ 75			Blocky 37-38.75'. Horizontal fractures 4-13" apart. No vertical fractures. No vugs. 11 x Horizontal fractures in Run 5 (37-37.2', 37.75', 38.25-38.5')			
-40										
		R6		100/ 87			42-43': Broken (5 x Horizontal fractures).			
-45							44-44.5': Broken. 44.5-51': Blocky (6 fractures).			
		R7		100/ 92						
-50										
							End of Boring @ 51' bgs			
-55										
-60										

COMMENTS: Precleared by hand to 5' bgs, Advanced 6" steel casing (rock socket) to 5' below top of rock.
Boring advanced by CME-55LC Tracked Drill Rig
Collected soil sample at 7-7.5' for VOCs

AECOM

TEST BORING LOG

BORING NO. : MW-14S

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 2**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150383.196 **EASTING:** 1404956.473

GROUNDWATER: 9 ft bgs | **GROUND ELEVATION:** 514.39

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Split Spoon	HQ	
				DIA.		2"	2.5"	
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 4/14/2020

DATE FINISHED: 4/23/2020

DRILLER: B. Swartz

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0					Brown		CONCRETE		10.5	No Odor, No Staining, Moist
							FILL: Coarse to medium Sand, little Silt, Cobbles		18.9	
									17.7	
									16.5	
									11.2	
									13.5	
									6.6	
									1.5	
-5									3.8	
		1		100			Rock and Gravel, Pulverized Rock		16.7	
									16.1	
									63.4	
		2		75					39.5	
									24.5	
									20.7	
							Fine to medium SAND, little Silt and medium to fine Gravel	SW	388.7	
		3		75					3818	Black Staining/ Product @ 8.8-9'
-10							Hard rock layer @ 9.7-9.8'		410.5	
									657.8	
		4		75					377.5	
									4250	
									2748	
					Blue Grey	Medium Hard	DOLOSTONE(Lockport/Penfield Member): Very thin bedding, broken to very broken. Horizontal fractures 1-9" apart. No vertical fractures. No vugs. Very thin bedding, broken.			
-15										
		R1		100/ 73			17-18.5': Very broken, Horizontal fractures 1-3" apart. 18.5'-22': Blocky. 5 x Horizontal fractures 3-10" apart. 4" vertical fracture @ 20.5'.			
-20							22': Iron staining. 22-25': Broken.			
-25							25-25.5': Very broken. 25.5-27: Broken to Blocky			
		R2		100/ 73			27-27.7': Blocky. 27.7-28.5: Broken.			~100 gallons of water loss

COMMENTS: Precleared by hand to 5' bgs. Advanced 6" steel casing (rock socket) to 5' below top of rock.
Boring advanced by CME-55LC Tracked Drill Rig
Collected soil samples at 8.5-9' for VOCs, and at 10-11' for VOCs, SVOCs, Pest, PCBs, Metals and PFAS

AECOM

TEST BORING LOG

BORING NO. : MW-14S

PROJECT: Artco Site | **SHEET: 2 OF 2**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. :60644874**

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC % / RQD %	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
-30							28.5-34': Blocky. 15 x Horizontal fractures 3-10" apart.			~600 gallons of water loss
-35							End of Boring @ 34' bgs			
-40										
-45										
-50										
-55										
-60										

COMMENTS: Precleared by hand to 5' bgs, Advanced 6" steel casing (rock socket) to 5' below top of rock.
Boring advanced by CME-55LC Tracked Drill Rig
Collected soil samples at 8.5-9' for VOCs, and at 10-11' for VOCs, SVOCs, Pest, PCBs, Metals and PFAS

BORING NO. : MW-14S

AECOM

TEST BORING LOG

BORING NO. : MW-14I

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 2**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150377.552 **EASTING:** 1404957.001

GROUNDWATER: 9 ft bgs | **GROUND ELEVATION:** 514.38

DATE	TIME	LEVEL	TYPE		CAS.	SAMPLER	CORE	TUBE
				TYPE		Split Spoon	HQ	
				DIA.		2"	2.5"	
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 4/14/2020

DATE FINISHED: 4/27/2020

DRILLER: B. Swartz

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0					Brown		CONCRETE			No Odor, No Staining, Moist
					Dark Brown		FILL: Fine to medium Sand, little Silt, Cobbles and Brick fragments		5.0 6.7 13.4 2.5 15.2 13.4 16.0 14.9	
-5		1		50			No Brick fragments		13.1 21.2 26.5	Black Staining
		2		100					26.7 26.4 31.4 28.7	No Staining
-10		3		100					31.5 22.8 24.7 25.6 39.4	
					Blue Gray	Medium Hard	DOLOSTONE (Lockport/Penfield Member): Very thin bedding, broken. No vertical fractures. No vugs.			
-15		R1		93/ 67			17-23.5': Very broken. Horizontal fractures @ 17.8-18', 18.8-19', 19-21'.		14.9 PPM out of core hole.	
-20		R2		98/ 77			21-23': 3 x Horizontal fractures			
-25		R3		93/ 85			23.5-24.25': Blocky. 24.25-25': Very broken. 25-32': Broken (21 x horizontal fractures 2-6" apart).			
							Very broken @ 27.8-27.9', 28.25-28.5' & 30-30.25'			

COMMENTS: Precleared by hand to 5' bgs, Advanced 6" steel casing (rock socket) to 5' below top of rock.
Boring advanced by CME-55LC Tracked Drill Rig
Collected soil sample at 8-8.5' for VOCs

AECOM

TEST BORING LOG

BORING NO. : MW-14I

PROJECT: Artco Site | **SHEET: 2 OF 2**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. :60644874**

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC % / RQD %	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
-30										
		R4		98/ 78			3" Vugs @ 32.75' & 36.2'. 33-33.5': Broken (4 x horizontal fractures, 1 x 30º vertical fracture) 33.5-37': Blocky.		420 PPM out of core hole.	
-35										
		R5		93/ 73			37-38': Broken (4 x Horizontal fractures). 38-39': Blocky. 39-40': Broken (6 x Horizontal fractures). 40-42': Blocky (3 x Horizontal fractures).			
-40										
		R6		100/ 100			Blocky. 5 x Horizontal fractures 8-14" apart. No vertical fractures.			
-45										
		R7		92/ 81						
-50							End of Boring @ 49' bgs			
-55										
-60										

COMMENTS: Precleared by hand to 5' bgs. Advanced 6" steel casing (rock socket) to 5' below top of rock.
Boring advanced by CME-55LC Tracked Drill Rig
Collected soil sample at 8-8.5' for VOCs

AECOM

TEST BORING LOG

BORING NO. : MW-15OB

PROJECT/PROJECT LOCATION: Artco Site | **SHEET: 1 OF 1**

CLIENT: New York State Department of Environmental Conservation | **JOB NO. : 60644874**

BORING CONTRACTOR: Nothnagle Drilling | **NORTHING:** 1150334.087 **EASTING:** 1404965.233

GROUNDWATER: 9 ft bgs | **GROUND ELEVATION:** 514.44

DATE	TIME	LEVEL	TYPE	TYPE	CAS.	SAMPLER	CORE	TUBE
						Split Spoon		
				DIA.		2"		
				WT.				
				FALL				
				* POCKET PENETROMETER READING				

DATE STARTED: 4/14/2020

DATE FINISHED: 4/17/2020

DRILLER: B. Swartz

GEOLOGIST: S. Connelly

REVIEWED BY: M. Gutmann

DEPTH FEET	STRATA	SAMPLE NO.	SAMPLE BLOW COUNT	REC% / RQD%	COLOR	SOIL CONSISTENCY / ROCK HARDNESS	MATERIAL DESCRIPTION	USCS	PID	REMARKS
0							CONCRETE			No Odor, No Staining, Moist
					Brown		FILL: Coarse to medium silty Sand and small to medium cobbles, and Brick fragments		8.9	
					Brn to Blk				11.1	
					Brownish Red		Fine to medium Sand, little Silt		38.6	
-5									22.1	
		1		75	Brown				19.7	
									12.4	
									0.8	
									10.5	
									4.8	
							Pulverized rock layer @ 7-8' (Silt/ Sandstone)		9.8	
		2		100					12.4	
									11.6	
									11.8	
									0.0	
							Fine to medium Silty SAND	SM	0.0	
-10		3		100					6.9	
									5.3	
									4.8	
									8.9	Possible staining @ 9.8-10'
		4		100					4.6	
									12.8	
									20.9	
-15							Refusal @ 12' bgs			
-20										
-25										

COMMENTS: Precleared by hand to 5' bgs

Boring advanced by CME-55LC Tracked Drill Rig

APPENDIX F

MONITORING WELL CONSTRUCTION LOGS

DRILLING SUMMARY

Geologist:
Sean Connelly

Drilling Company:
Nothnagle Drilling

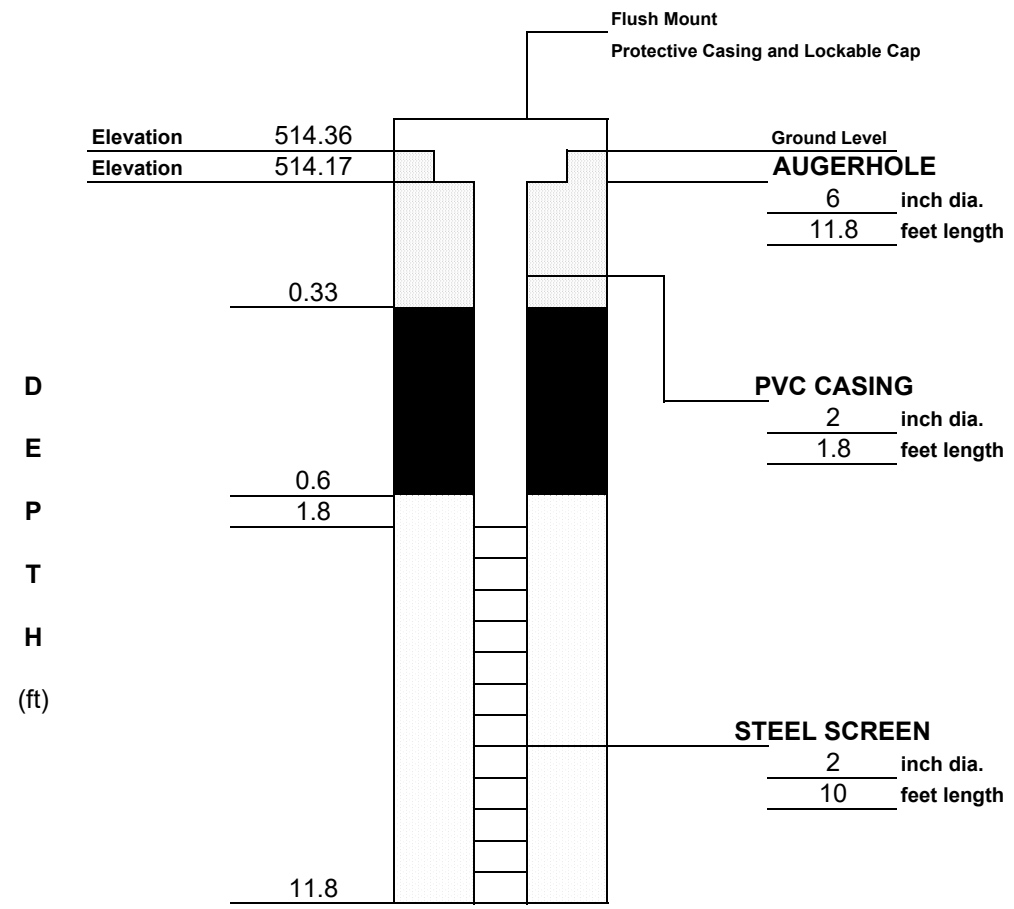
Driller:
B. Swartz

Rig Make/Model:
CME-55LC

Date:
4/15/2020

GEOLOGIC LOG

Depth(ft.)	Description
	See boring log for lithologic description.



WELL DESIGN

CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: Steel grade box	**Type:** 2" Continuous Wrap Stainless Steel	**Type:** #1 Sand **Setting:** 0.6' - 11.8'
Monitor: 2" SCH 40 PVC	**Slot Size:** .010"	***SEAL MATERIAL***
		Type: Bentonite **Setting:** 0.33' - 0.6'

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	**Location: Artco Site**	**Project No.: 60644874**
AECOM	**MONITORING WELL CONSTRUCTION DETAILS**	**Well Number: MW-13OB**

DRILLING SUMMARY

Geologist:
Sean Connelly

Drilling Company:
Nothnagle Drilling

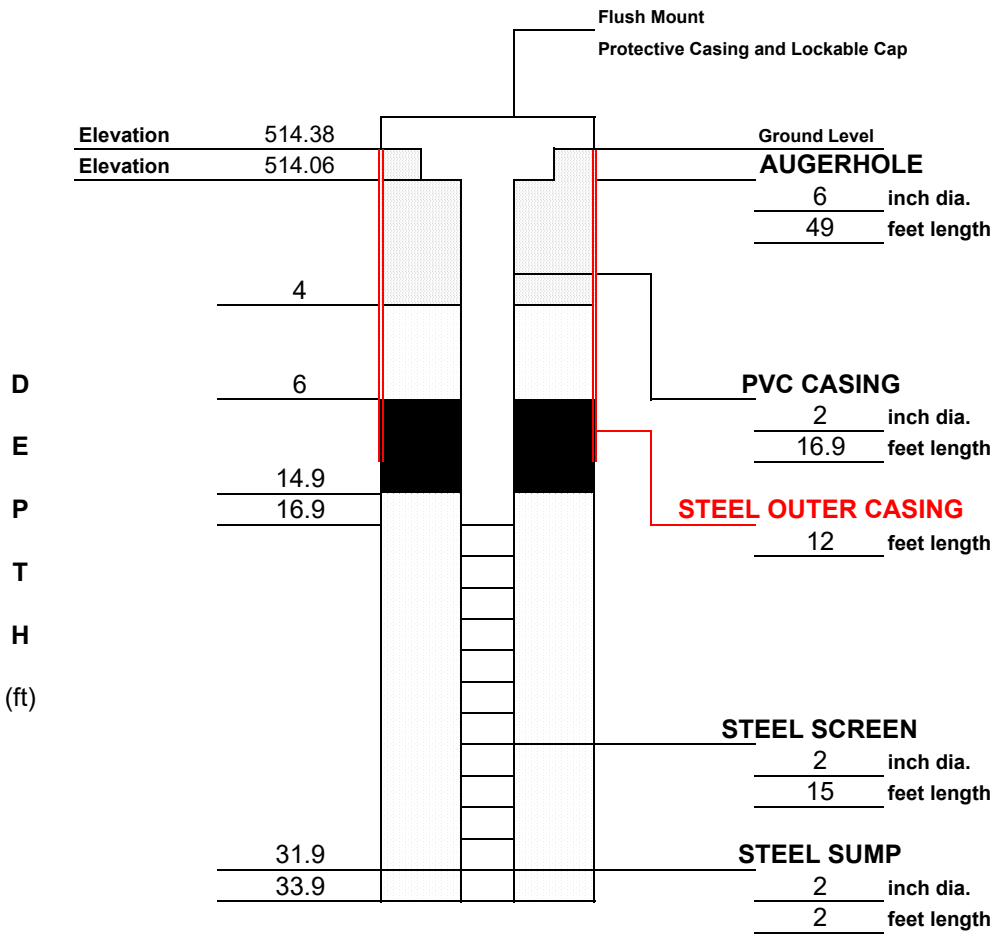
Driller:
B. Swartz

Rig Make/Model:
CME-55LC

Date:
4/30/2020

GEOLOGIC LOG

Depth(ft.)	Description
	See boring log for lithologic description.



WELL DESIGN

CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: Steel grade box	**Type:** 2" Continuous Wrap Stainless Steel	**Type:** 00 Sand **Setting:** 4' - 6' #2 Sand **Setting:** 14.9' - 31.9' 00 Sand **Setting:** 31.9' - 33.9'
Monitor: 2" SCH 40 PVC	**Slot Size:** .010"	***SEAL MATERIAL*** **Type:** Bentonite **Setting:** 14.9' - 16.9' 3/8 Hole Plug **Setting:** 6' - 14.9'

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	**Location: Artco Site**	**Project No.: 60644874**
AECOM	**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**	**Well Number:** MW-13S

DRILLING SUMMARY

Geologist:
Sean Connelly

Drilling Company:
Nothnagle Drilling

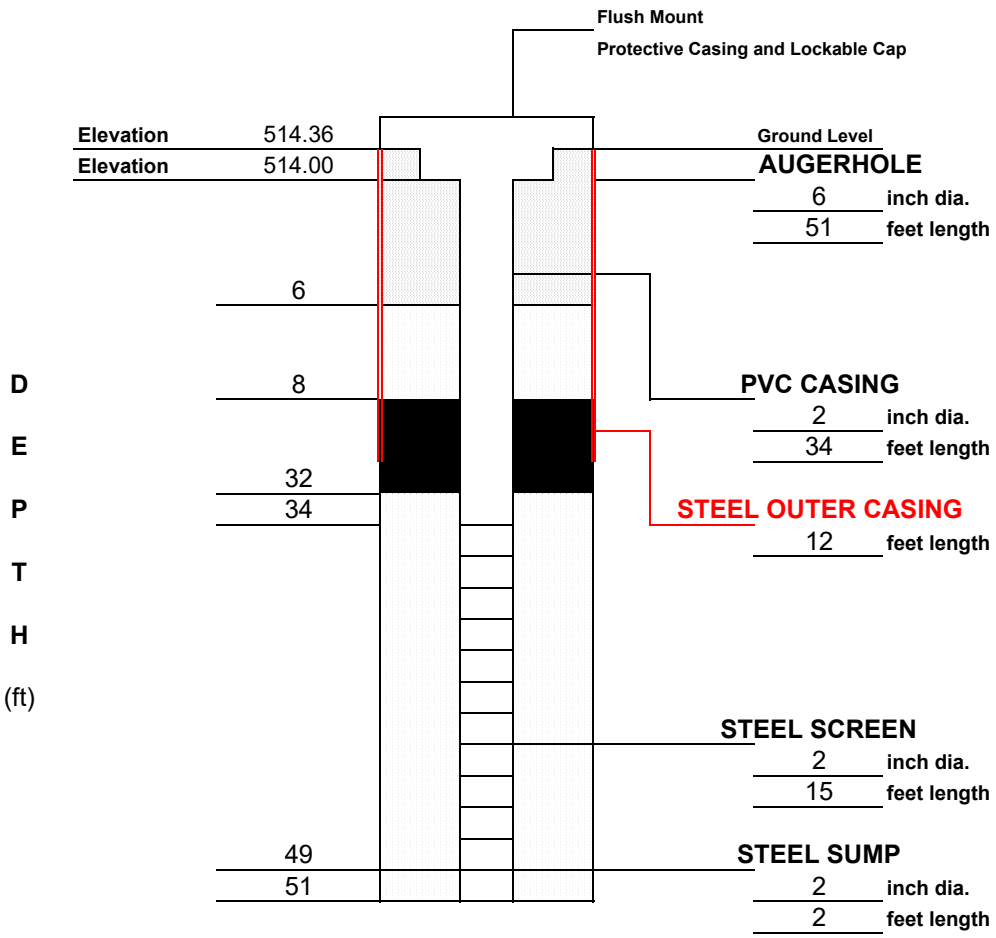
Driller:
B. Swartz

Rig Make/Model:
CME-55LC

Date:
5/8/2020

GEOLOGIC LOG

Depth(ft.)	Description
	See boring log for lithologic description.



WELL DESIGN

CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: Steel grade box	**Type:** 2" Continuous Wrap Stainless Steel	**Type:** 00 Sand **Setting:** 6' - 8' #2 Sand **Setting:** 32' - 49' 00 Sand **Setting:** 49' - 51'
Monitor: 2" SCH 40 PVC	**Slot Size:** .010"	***SEAL MATERIAL*** **Type:** 3/8 Hole Plug **Setting:** 8' - 32'

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	**Location: Artco Site**	**Project No.: 60644874**
AECOM	**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**	**Well Number:** MW-13I

DRILLING SUMMARY

Geologist:
Sean Connelly

Drilling Company:
Nothnagle Drilling

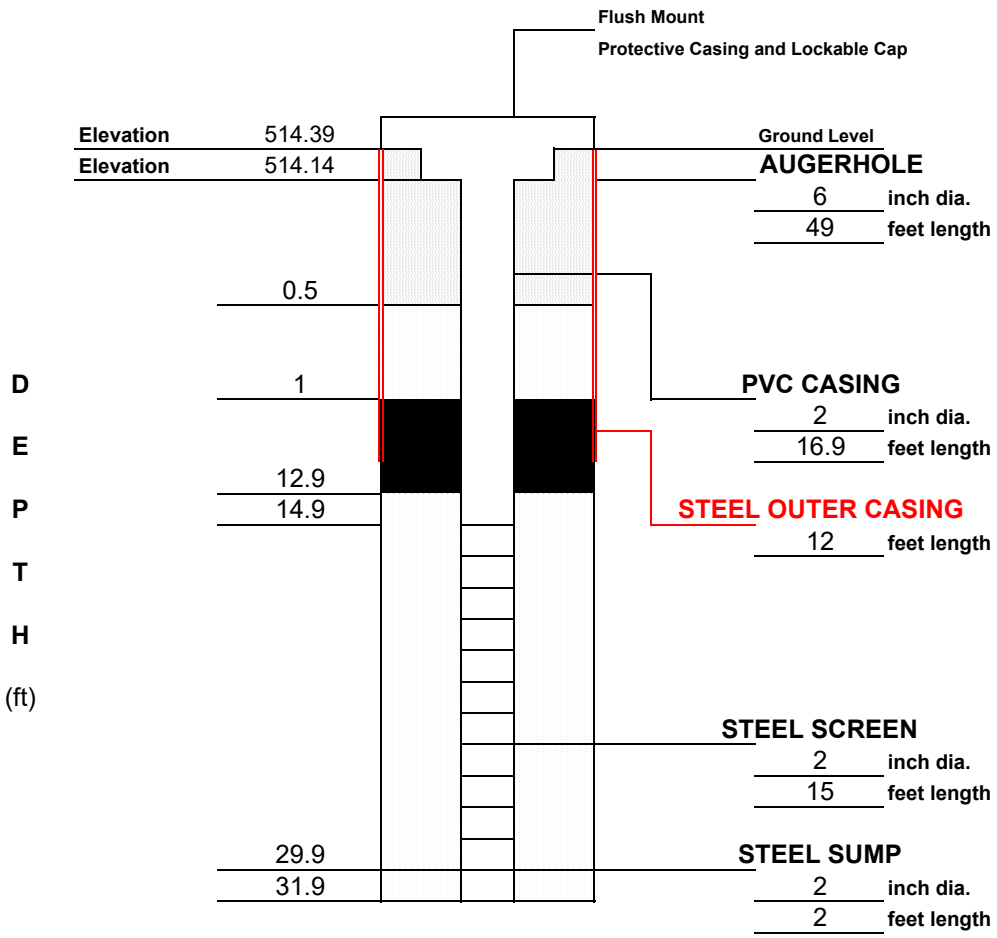
Driller:
B. Swartz

Rig Make/Model:
CME-55LC

Date:
4/23/2020

GEOLOGIC LOG

Depth(ft.)	Description
	See boring log for lithologic description.



WELL DESIGN

CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: Steel grade box	**Type:** 2" Continuous Wrap Stainless Steel	**Type:** 00 Sand **Setting:** 0.5' - 1' #2 Sand **Setting:** 12.9' - 29.9' 00 Sand **Setting:** 29.9' - 31.9'
Monitor: 2" SCH 40 PVC	**Slot Size:** .010"	***SEAL MATERIAL*** **Type:** Bentonite **Setting:** 11.9' - 12.9' 3/8 Hole Plug **Setting:** 1' - 11.9'

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	**Location: Artco Site**	**Project No.: 60644874**
AECOM	**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**	**Well Number:** MW-14S

DRILLING SUMMARY

Geologist:
Sean Connelly

Drilling Company:
Nothnagle Drilling

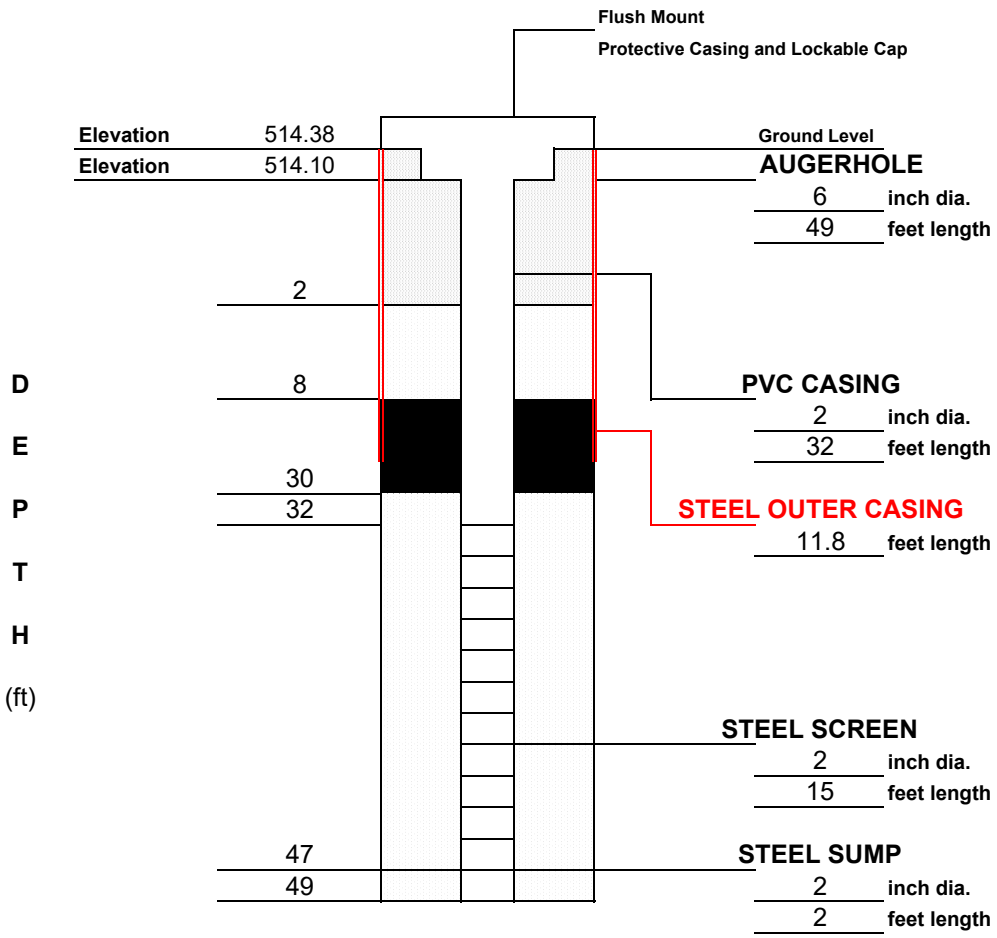
Driller:
B. Swartz

Rig Make/Model:
CME-55LC

Date:
4/29/2020

GEOLOGIC LOG

Depth(ft.)	Description
	See boring log for lithologic description.



WELL DESIGN

CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: Steel grade box	**Type:** 2" Continuous Wrap Stainless Steel	**Type:** 00 Sand **Setting:** 2' - 8' #2 Sand **Setting:** 30' - 47' 00 Sand **Setting:** 47' - 49'
Monitor: 2" SCH 40 PVC	**Slot Size:** .010"	***SEAL MATERIAL*** **Type:** Bentonite **Setting:** 28' - 30' 3/8 Hole Plug **Setting:** 8' - 28'

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	**Location: Artco Site**	**Project No.: 60644874**
AECOM	**BEDROCK MONITORING WELL CONSTRUCTION DETAILS**	**Well Number:** MW-14I

DRILLING SUMMARY

Geologist:
Sean Connelly

Drilling Company:
Nothnagle Drilling

Driller:
B. Swartz

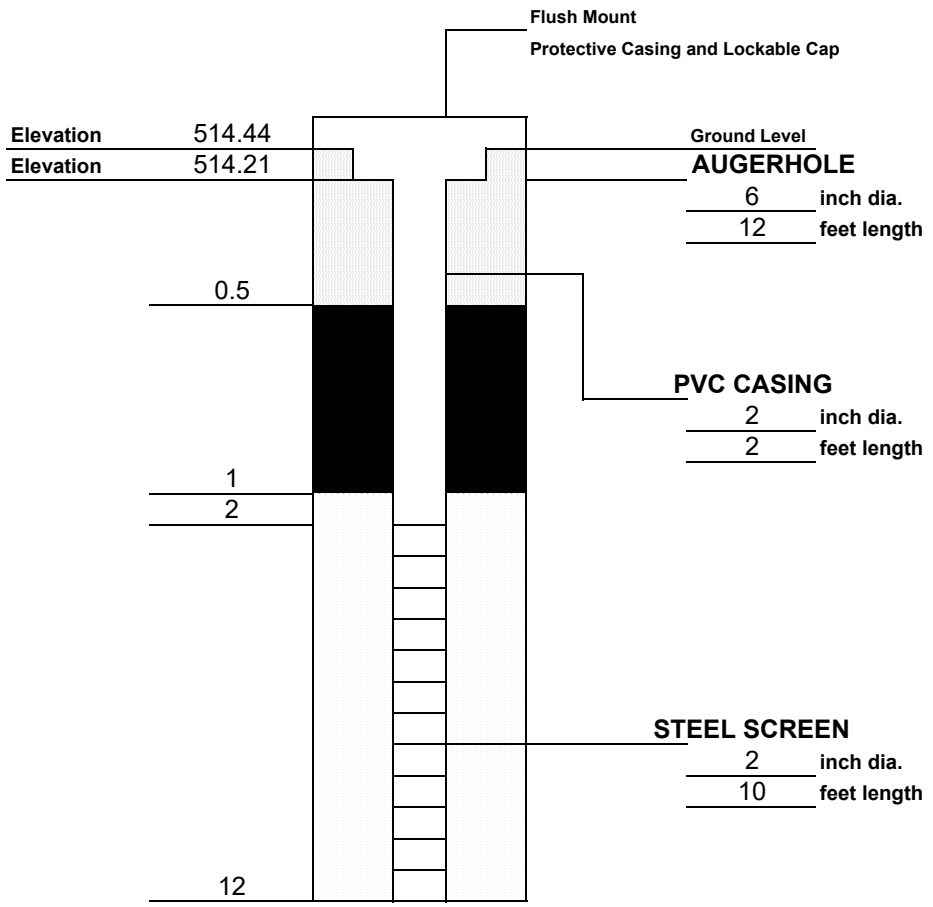
Rig Make/Model:
CME-55LC

Date:
4/17/2020

GEOLOGIC LOG

Depth(ft.)	Description
	See boring log for lithologic description.

DEPTH (ft)



WELL DESIGN

CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: Steel grade box	**Type:** 2" Continuous Wrap Stainless Steel	**Type:** #1 Sand **Setting:** 1' - 12'
Monitor: 2" SCH 40 PVC	**Slot Size:** .010"	***SEAL MATERIAL*** **Type:** Bentonite **Setting:** 0.5' - 1'

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

Client: NYSDEC	**Location: Artco Site**	**Project No.: 60644874**
AECOM	**MONITORING WELL CONSTRUCTION DETAILS**	**Well Number: MW-15OB**

APPENDIX G

MONITORING WELL DEVELOPMENT LOGS

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: NYSDEC Former Artco Industrial Laundries WELL NO.: MW-15OB

PROJECT NO.: 60644874

STAFF: Sean P. Connelly

DATE(S): 4/23/2020, 4/24/2020, 4/27/2020

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	11.74	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	7.72	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	4.0	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.68	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	3.4	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	45	0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
	Init.	5	10	15	20	25	30	35	40	45		
PARAMETERS TIME	0840	0935	1110	1320	4/24, 0915	1040	1409	1530	4/27, 0910	1200		
pH	6.89	7.26	7.32	7.39	7.28	7.41	7.33	7.36	7.31	7.31		
TEMPERATURE (°C)	9.3	9.9	9.8	10.3	10.0	10.3	10.2	10.2	10.5	10.4		
COND. (mS/cm)	1.421	2.279	2.667	2.630	2.089	2.578	2.774	2.815	2.522	2.681		
DO (mg/l)	3.89	10.13	8.70	6.25	7.91	5.83	6.60	5.92	4.29	6.17		
TURBIDITY (NTU)	> 3400	4300.0	418.4	630.9	2209.1	620.8	581.7	599.2	604.6	574.2		
ORP (mV)	186.7	123.5	82.9	-17.8	38.7	-29.4	-86.0	-98.3	21.5	-77.1		

COMMENTS:

Dry @ 0905. WL: 10.69 ~4 gallons removed. WL: 9.69 @ 0907. WL: 8.41 @ 0925, resumed development. Fine sand (0.25") at bottom of purge bucket in 1st 5 gallons purged.

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: NYSDEC Former Artco Industrial Laundries WELL NO.: MW-13OB

PROJECT NO.: 60644874

STAFF: Sean P. Connelly, Chris Bourne

DATE(S): 5/6/2020, 5/7/2020

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	10.81	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	8.69	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	2.1	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.36	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.8	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	25	0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
	Init.	5	10	15	20	25						
PARAMETERS TIME	1052	1211	1422	5/7, 1030	1310	1500						
pH	7.82	7.72	7.56	7.43	7.45	7.36						
TEMPERATURE (°C)	10.9	11.9	11.7	1.5	11.5	11.7						
COND. (mS/cm)	1.095	1.680	1.829	1.919	1.736	1.799						
DO (mg/l)	5.56	8.29	8.43	8.07	8.21	8.17						
TURBIDITY (NTU)	`5000	910.8	219.9	93.3	501.7	578.1						
ORP (mV)	176.4	-37.1	17.7	-19.8	34.9	50.8						

COMMENTS:

1051 - Began development. 1211 - purged5-gal. Will turn off & let recharge. WL: 10.22 @ 1212. Returned @ 1300, WL: 8.85. Development resumed on 5/7 @ 0858.

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: NYSDEC Former Artco Industrial Laundries WELL NO.: MW-13S

PROJECT NO.: 60644874

STAFF: Sean P. Connelly, Chris Bourne

DATE(S): 5/6/2020

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	33.11	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	21.52	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	11.6	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	1.97	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	9.9	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	51	0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
	Init.	5	10	15	20	25	30	35	40	45	50	
PARAMETERS TIME	1104	1107	1111	1113	1117	1119	1121	1125	1127	1130	1133	
pH	6.81	3.81	6.95	7.01	6.92	6.83	6.91	6.89	6.89	7.25	6.80	
TEMPERATURE (°C)	13.0	13.1	13.3	13.1	13.3	13.1	13.2	13.1	13.2	12.8	13.2	
COND. (mS/cm)	3.825	4.269	4.208	4.265	4.245	4.256	4.179	4.173	4.124	4.103	4.104	
DO (mg/l)	3.39	2.78	6.26	4.87	7.97	3.04	3.18	2.58	2.63	3.18	2.41	
TURBIDITY (NTU)	25.0	48.6	57.2	49.4	47.7	39.7	45.3	30.2	26.9	22.2	13.1	
ORP (mV)	-43.2	-35.2	-74.9	-59.3	-111.3	-92.6	-124.2	-103.8	-125.7	-87.7	-120.8	

COMMENTS:

Post: Well head 578.1 ppm, drum head 7.6 ppm, DTW = 20.60, DTP = 21.57, TD = 33.11.

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: NYSDEC Former Artco Industrial Laundries WELL NO.: MW-13S

PROJECT NO.: 60644874

STAFF: Sean P. Connelly, Chris Bourne

DATE(S): 5/7/2020

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=		1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=		2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.0	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.00	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
	55	60	65	70	75	80	85	90	95	100	105	
PARAMETERS TIME	1019	1021	1023	1027	1031	1035	1039	1042	1045	1047	1049	
pH	6.87	6.80		6.86	6.83	6.81	6.79	6.76			6.75	
TEMPERATURE (°C)	12.8	13.0		12.9	13.1	13.0	12.7	13.0			13.0	
COND. (mS/cm)	3.565	3.661		3.677	3.748	3.800	3.795	3.884			3.913	
DO (mg/l)	2.55	2.52		3.05	20.50	2.38	3.91	2.94			2.33	
TURBIDITY (NTU)	168.2	62.4		34.3	37.5	39.2	24.3	17.9			11.8	
ORP (mV)	-36.5	-39.5		-35.0	-36.3	-40.3	-22.5	-45.4			-48.6	

COMMENTS:

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: NYSDEC Former Artco Industrial Laundries WELL NO.: MW-13I

PROJECT NO.: 60644874

STAFF: Sean P. Connelly, Chris Bourne

DATE(S): 5/6/2020

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	51.34	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	29.29	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	22.1	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	3.75	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	18.7	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	50	0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
	Init.	5	10	15	20	25	30	35	40	45	50	
PARAMETERS TIME	1056	1100	1105	1115	1120	1125	1131	1136	1142	1147	1152	
pH	6.97	6.83	6.80	6.96	6.83	6.91	6.88	6.96	6.86	6.89	6.85	
TEMPERATURE (°C)	14.6	14.2	14.3	14.3	14.0	14.1	14.0	14.1	14.1	14.1	14.2	
COND. (mS/cm)	3.931	3.780	4.038	4.182	4.261	4.245	4.204	4.176	3.935	3.727	3.545	
DO (mg/l)	2.90	2.60	2.86	3.85	3.42	4.13	3.39	2.61	2.54	2.12	2.05	
TURBIDITY (NTU)	395.3	2166.2	192.3	160.5	23.3	23.1	10.3	8.2	9.7	40.0	44.2	
ORP (mV)	-59.6	-58.6	-124.9	-138.7	-151.0	-151.4	155.4	156.0	-173.6	-189.9	-191.1	

COMMENTS:

Post: Well head 100.9 ppm, drum head 8.4 ppm, DTW = 29.78, DTP = 33.90, TD = 51.45. Strong odor @ 5 gal purge, sulfur odor throughout 50 gal purge.

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: NYSDEC Former Artco Industrial Laundries WELL NO.: MW-13I

PROJECT NO.: 60644874

STAFF: Sean P. Connelly, Chris Bourne

DATE(S): 5/7/2020

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	50.74	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	29.71	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	21.0	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	3.58	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	17.9	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	50	0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
	55	60	65	70	75	80	85	90	95	100	105	
PARAMETERS TIME	1014	1019		1026	1030		1040	1045	1050	1055	1100	
pH	7.01	6.93		6.87	6.81		6.83	6.90	6.83	6.85	6.84	
TEMPERATURE (°C)	13.6	13.7		13.9	13.8		13.7	13.7	13.8	13.9	14.0	
COND. (mS/cm)	3.238	3.349		3.508	3.568		3.674	3.747	3.779	3.652	3.571	
DO (mg/l)	2.67	2.42		2.22	2.19		2.23	2.64	2.51	2.25	2.11	
TURBIDITY (NTU)	81.1	135.1		83.9	38.6		24.3	21.7	6.0	3.6	13.2	
ORP (mV)	-52.1	-46.0		-46.5	-47.4	PID = 97.3 ppm	-53.7	-55.1	-74.6	-95.5	-110.8	

COMMENTS:

Post: Well head 93.3 ppm, drum head 2.9 ppm, DTW = 29.91, DTP = 33.95, TD = 51.45. Strong odor @ 5 gal purge, sulfur odor throughout 50 gal purge.

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: NYSDEC Former Artco Industrial Laundries WELL NO.: MW-14S

PROJECT NO.: 60644874

STAFF: Sean P. Connelly, Chris Bourne

DATE(S): 5/6/2020

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	31.88	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	19.26	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	12.6	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.15	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	10.7	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	105	0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
	Init.	5	10	15	20	25	30	35	40	45	50	
PARAMETERS TIME	1305	1307	1309	1312	1315	1317	1320	1323	1326	1328	1331	
pH	6.81	6.91	6.85	6.57	6.85	6.83	6.77	6.77	6.78	6.81	6.79	
TEMPERATURE (°C)	13.1	13.2	13.0	13.1	13.0	13.1	13.1	13.0	13.1	13.0	13.1	
COND. (mS/cm)	5.609	5.673	5.560	5.506	5.594	5.960	5.530	5.521	5.441	5.527	5.782	
DO (mg/l)	2.89	3.28	3.30	2.38	2.87	2.89	2.73	2.21	2.98	2.74	2.13	
TURBIDITY (NTU)	183.4	556.1	178.3	140.2	154.0	100.4	61.2	37.5	22.1	16.0	19.2	
ORP (mV)	-59.3	-54.1	-44.0	-43.9	-45.2	-53.7	-46.8	-40.9	-49.8	-42.9	-44.1	

COMMENTS:
Post: DTW = 18.51, DTP = 19.12. TD = 31.84

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: NYSDEC Former Artco Industrial Laundries WELL NO.: MW-14S

PROJECT NO.: 60644874

STAFF: Sean P. Connelly, Chris Bourne

DATE(S): 5/7/2020

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	31.88	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	17.71	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	14.2	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.41	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=		6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	105	0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
	55	60	65	70	75	80	85	90	95	100	105	
PARAMETERS TIME	0917	0919	0921	0923	0925	0927	0929	0931	0933	0935	0937	
pH	6.88		6.90		6.92	6.93	6.83		6.84		6.84	
TEMPERATURE (°C)	13.1		13.1		13.1	13.2	13.0		13.1		13.1	
COND. (mS/cm)	5.166		5.609		5.713	5.766	5.892		5.767		5.746	
DO (mg/l)	3.47		2.26		2.02	2.10	1.99		2.07		1.78	
TURBIDITY (NTU)	367.5		88.4		26.4	24.6	25.6		30.4		21.0	
ORP (mV)	-36.2		-37.5		-33.5	-30.3	-28.7		-33.1		-40.6	

COMMENTS:
Began @ 0915, End @ 0939

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: NYSDEC Former Artco Industrial Laundries WELL NO.: MW-14I

PROJECT NO.: 60644874

STAFF: Sean P. Connelly, Chris Bourne

DATE(S): 5/6/2020

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	49.42	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	29.80	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	19.6	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	3.34	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	16.7	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	50	0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
	Init.	5	10	15	20	25	30	35	40	45	50	
PARAMETERS TIME	1258	1301	1306	1310	1315	1320	1324	1329	1334	1339	1344	
pH	6.89	6.86	6.96	6.90	6.88	7.02	6.87	6.90	6.96	7.03	6.97	
TEMPERATURE (°C)	13.6	14.1	14.2	14.2	14.1	14.1	14.2	14.0	14.1	14.1	14.3	
COND. (mS/cm)	3.787	3.857	3.904	3.931	3.966	3.905	3.921	3.964	3.919	3.835	3.821	
DO (mg/l)	3.30	2.56	2.42	2.71	2.54	3.21	2.27	2.62	2.52	2.92	2.99	
TURBIDITY (NTU)	392.0	225.1	83.2	38.3	20.2	9.7	12.4	9.7	3.0	2.3	1.2	
ORP (mV)	-87.0	-91.1	-87.7	-80.3	-80.1	-80.6	-76.5	-74.2	-75.9	-71.1	-70.5	

COMMENTS:

Post: DTW = 30.00, DTP = 31.45, TD = 49.50. Minor surface odor throughout purge.

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: NYSDEC Former Artco Industrial Laundries WELL NO.: MW-14I

PROJECT NO.: 60644874

STAFF: Sean P. Connelly, Chris Bourne

DATE(S): 5/7/2020

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	48.65	1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	29.91	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	18.7	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	3.19	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	15.9	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	50	0.75"	0.02

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)											
	55	60	65	70	75	80	85	90	95	100	105	
PARAMETERS TIME	0906	0910	0914	0918	0922	0926	0930	0924	0938	0942	0946	
pH	6.97	7.06	7.05	6.92	7.28	7.01	7.01	6.93	6.92	6.87	6.87	
TEMPERATURE (°C)	13.5	14.0	14.2	14.2	14.1	14.3	14.1	14.2	14.2	14.1	14.4	
COND. (mS/cm)	3.613	3.658	3.652	3.714	3.729	3.733	3.789	..757	3.747	3.752	3.656	
DO (mg/l)	3.11	2.21	2.01	1.95	1.90	1.91	2.41	2.07	2.03	1.97	1.99	
TURBIDITY (NTU)	342.2	88.4	38.7	28.2	12.7	10.9	9.7	7.2	5.5	5.1	2.9	
ORP (mV)	-72.2	-68.8	-69.1	-70.0	-70.2	-69.2	-72.1	-76.4	-77.1	-82.9	-101.1	

COMMENTS:

Post: Well head 105.2 ppm, drum head 12.2 ppm, DTW = 30.18, DTP = 30.79, TD = 48.68.

APPENDIX H

MONITORING WELL PURGE LOGS

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: BMW-102S

Date: 2/8/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 12.87 Depth to Well Bottom (ft): 20.16 Well Diameter: 2" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 4.50 Estimated Purge Volume (liters): 6.3

Sample ID: BMW-102S Sample Time: 1125 QA/QC: None

Sample Parameters: VOCs

Comments: Began purge @ 1059

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1100	8.81	9.7	2.142	1.78	19.72	141.7	250	13.22
1105	7.91	10.3	1.166	0.43	5.03	-109.1	250	13.22
1110	7.70	10.5	1.155	0.33	4.90	-103.4	250	13.22
1115	7.46	10.5	1.159	0.25	3.11	96.6	250	13.22
1120	7.40	10.5	1.165	0.23	3.57	-95.8	250	13.22
1125	7.33	10.7	1.166	0.19	3.49	-94.1	250	13.22
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: BMW-102I

Date: 2/8/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 28.49 Depth to Well Bottom (ft): 31.60 Well Diameter: 2" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 1.92 Estimated Purge Volume (liters): 5.6

Sample ID: BMW-102I Sample Time: 1200 QA/QC: None

Sample Parameters: VOCs

Comments: Began purging @ 1130. Dry @ 1156 w/ 5.6 liters. Will let recharge then grab sample.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1135	7.73	9.4	1.534	1.91	21.85	-49.6	280	29.32
1140	7.30	10.9	1.596	0.91	114.61	-40.5	280	30.09
1145	7.22	10.6	1.600	0.78	17.76	-36.9	280	30.80
1150	7.18	10.7	1.601	0.59	13.90	-40.4	280	31.24
1155	7.14	10.9	1.612	0.56	5.68	-63.6	280	31.51
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: BMW-102D

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	45.30	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	28.44	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	16.86	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.17	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.87	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	8.60	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	3.5	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	13:15	13:27	13:31	15:40							
pH	13.89	12.36									
TEMPERATURE (°C)	10.9	10.3									
COND. (mS/cm)	3.949	4.361									
DO. (mg/l)	2.68	3.86									
TURBIDITY (NTU)	13.31	75.56									
ORP (mV)	-316.5	-290.3									
DTW (ft below TOC)	28.44	42.00	Dry	44.50							
Gallons Purged	initial	3.0	3.5								

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample BMW-102D @ 1540 for VOC analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: BMW-103S

Date: 2/8/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 15.60 Depth to Well Bottom (ft): 25.63 Well Diameter: 2" Screen Length: 10'

Casing Type: PVC Volume in 1 Well Casing (liters): 6.19 Estimated Purge Volume (liters): 12.0

Sample ID: BMW-103S Sample Time: 1147 QA/QC: None

Sample Parameters: VOCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1057	11.15	10.7	1.829	4.12	55.93	-143.5	240	15.60
1102	9.63	10.9	1.879	3.27	51.13	-105.9	240	15.65
1107	9.12	11.7	1.902	1.90	30.03	-107.4	240	15.65
1112	8.80	11.5	1.723	1.73	26.64	-110.3	240	15.65
1117	8.58	11.5	1.471	1.67	31.21	-112.1	240	15.65
1122	8.38	11.6	1.412	1.63	21.68	-111.4	240	15.65
1127	8.23	11.5	1.390	1.60	20.42	-112.5	240	15.65
1132	8.15	11.5	1.380	1.59	23.61	-109.2	240	15.65
1137	7.98	11.6	1.377	1.57	24.00	-111.5	240	15.65
1142	7.97	11.2	1.374	1.57	11.63	-112.4	240	15.65
1147	7.95	11.3	1.371	1.56	12.70	-112.1	240	15.65
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: BMW-104S

Date: 2/3/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 14.35 Depth to Well Bottom (ft): 18.78 Well Diameter: 2" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 2.73 Estimated Purge Volume (liters): 7.0

Sample ID: BMW-104S Sample Time: 1520 QA/QC: None

Sample Parameters: VOCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1435	8.45	9.6	1.870	6.69	7.75	6.8	155	14.35
1440	8.55	10.4	1.930	5.80	29.12	21.7	155	14.82
1445	8.35	10.6	2.635	3.41	4.80	19.5	155	14.85
1450	8.13	10.7	3.088	2.09	1.59	-35.2	155	14.90
1455	7.99	10.8	3.234	1.92	2.51	-49.9	155	14.92
1500	7.88	10.9	3.296	1.89	2.95	-53.6	155	14.96
1505	7.75	10.9	3.418	1.80	3.17	-56.3	155	14.98
1510	7.68	10.9	3.469	1.71	2.99	-57.7	155	15.00
1515	7.62	10.9	3.570	1.68	2.91	-58.5	155	15.02
1520	7.60	11.0	3.582	1.65	3.04	-54.2	155	15.04
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: BMW-104I

Date: 2/3/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 29.05 Depth to Well Bottom (ft): 29.55 Well Diameter: 2" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.31 Estimated Purge Volume (liters): 1.0

Sample ID: BMW-104I Sample Time: 1400 QA/QC: None

Sample Parameters: VOCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1339	8.77	10.2	1.157	3.56	210.89	-13.2	175	29.05
1344	8.56	11.8	1.798	2.28	40.93	-45.9	175	29.40
1347								Dry
1357								29.05
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-1S

Date: 2/10/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 13.93 Depth to Well Bottom (ft): 21.97 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.70 Estimated Purge Volume (liters): 4.2

Sample ID: MN-1S Sample Time: 1035 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1005	9.07	6.6	1.282	6.12	13.11	-122.8	140	13.93
1010	11.64	8.8	1.499	1.53	3.93	-208.1	140	--
1015	10.84	9.6	1.484	0.46	1.93	-22.5	140	--
1020	9.19	10.1	1.642	0.27	1.46	-246.7	140	--
1025	8.16	10.0	1.710	0.22	1.38	-22.1	140	--
1030	8.11	10.0	1.718	0.21	1.71	-218.9	140	--
1035	8.09	9.8	1.730	0.25	1.20	-212.7	140	--
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-1I

Date: 2/10/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 29.80 Depth to Well Bottom (ft): 32.24 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.21 Estimated Purge Volume (liters): 2.8

Sample ID: MN-1I Sample Time: 1125 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1100	7.91	6.7	1.456	1.45	10.62	-24.4	110	29.80
1105	7.50	8.8	1.474	0.65	6.17	-21.4	110	--
1110	7.26	9.6	1.484	0.37	2.93	-33.9	110	--
1115	7.16	9.7	1.452	0.31	2.39	-37.7	110	--
1120	7.12	9.7	1.422	0.39	2.87	-14.2	110	--
1125	7.11	9.5	1.412	0.40	2.62	-43.5	110	--
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-1D

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/9/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	51.87	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	31.38	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	20.49	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.41	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.23	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.4	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	1340	1415	1450								
pH	7.51	7.56	7.58								
TEMPERATURE (°C)	9.5	9.6	9.8								
COND. (mS/cm)	10.171	10.031	11.249								
DO. (mg/l)	2.22	3.57	3.48								
TURBIDITY (NTU)	44.98	521.24	612.08								
ORP (mV)	-294.9	-284.8	-279.6								
DTW (ft below TOC)	31.38	--	--								
Gallons Purged	Initial	0.75	1.40								

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample MN-1D @ 1450 for VOC analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-2S

Date: 2/10/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 10.41 Depth to Well Bottom (ft): 15.84 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.47 Estimated Purge Volume (liters): 3.8

Sample ID: MN-2S Sample Time: 0926 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.
Began purge @ 0848

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0901	11.44	6.5	0.525	4.43	255.36	-168.0	130	--
0906	10.38	10.0	0.523	2.14	27.04	-178.5	130	--
0911	9.81	9.7	0.524	1.96	5.47	-178.2	130	--
0916	9.45	10.0	0.526	1.82	1.60	-175.6	130	--
0921	9.42	10.0	0.526	1.79	0.39	-174.2	130	--
0926	9.39	10.1	0.526	1.78	0.31	-174.1	130	--
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-2I

Date: 2/10/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 14.01 Depth to Well Bottom (ft): 24.17 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.88 Estimated Purge Volume (liters): 5.7

Sample ID: MN-2I Sample Time: 0954 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.
Began purging @ 0927

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0928	8.77	9.7	1.026	2.88	127.74	-118.7	190	--
0933	8.42	11.3	1.083	1.81	11.60	-132.1	190	--
0938	8.31	11.6	1.088	1.69	0.00	-139.0	190	--
0943	8.21	11.6	1.089	1.66	0.00	-140.8	190	--
0948	8.12	12.0	1.088	1.62	0.00	-141.9	190	--
0953	8.11	11.7	1.090	1.62	0.00	-142.1	190	--
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-2D

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/9/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	48.08	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	31.58	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	16.50	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.33	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.99	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.08	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	14:45	15:05	15:25	15:45							
pH	8.90	8.36	8.12	7.92							
TEMPERATURE (°C)	9.4	9.4	10.0	11.2							
COND. (mS/cm)	7.035	5.303	6.760	6.939							
DO. (mg/l)	1.59	1.78	1.74	1.69							
TURBIDITY (NTU)	359.28	594.12	426.15	318.43							
ORP (mV)	-354.5	-339.5	-340.6	-341.9							
DTW (ft below TOC)	31.58	32.27	32.85	33.16							
Gallons Purged	Initial	0.36	0.72	1.08							

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample MN-2D @ 1545 for VOC analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-3S

Date: 2/10/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 12.32 Depth to Well Bottom (ft): 16.29 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.35 Estimated Purge Volume (liters): 4.8

Sample ID: MN-3S Sample Time: 0953 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0923	7.69	7.8	0.899	2.65	429.32	-57.0	160	15.49
0928	7.26	8.7	0.880	1.34	40.33	-24.4	160	--
0933	7.11	8.8	0.898	1.07	11.39	-16.1	160	--
0938	7.06	9.2	0.895	0.79	4.56	-17.7	160	--
0943	7.03	9.4	0.897	0.56	3.48	-20.5	160	--
0948	7.00	9.3	0.894	0.53	8.09	-25.5	160	--
0953	7.00	9.6	0.889	0.51	11.12	-30.3	160	--
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-3I

Date: 2/10/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 15.49 Depth to Well Bottom (ft): 23.40 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.69 Estimated Purge Volume (liters): 3.8

Sample ID: MN-3I Sample Time: 0918 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0848	8.90	8.0	1.848	1.75	348.68	-133.0	125	12.32
0853	8.13	8.1	1.871	0.88	75.01	-124.3	125	N/A
0858	7.67	8.9	1.835	0.53	13.31	-120.7	125	N/A
0903	7.48	8.8	1.844	0.41	16.71	-119.1	125	N/A
0908	7.36	9.4	1.867	0.24	12.36	-122.2	125	N/A
0913	7.31	9.4	1.863	0.24	4.00	-122.4	125	N/A
0918	7.28	9.1	1.878	0.23	2.92	-123.0	125	N/A
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-3D

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/9/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	45.16	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	32.93	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	12.23	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.24	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.73	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.5	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	12:45	13:05	13:34	13:56							
pH	9.26	8.08	7.82	7.77							
TEMPERATURE (°C)	8.9	10.5	8.9	8.5							
COND. (mS/cm)	5.988	6.399	6.684	6.813							
DO. (mg/l)	2.56	1.51	1.52	1.55							
TURBIDITY (NTU)	121.45	287.03	240.63	249.02							
ORP (mV)	-359.9	-358.5	-351.9	-355.0							
DTW (ft below TOC)	32.93	40.45	40.47	40.58							
Gallons Purged	Initial	0.5	1.0	1.5							

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample MN-3D @ 1356 for VOC analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-4S

Date: 2/10/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 12.68 Depth to Well Bottom (ft): 21.81 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.79 Estimated Purge Volume (liters): 5.6

Sample ID: MN-4S Sample Time: 1057 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.
Began purging @ 1019

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1022	9.17	8.9	1.354	3.09	68.35	-132.4	150	--
1027	8.66	10.7	1.343	1.92	32.48	-143.2	150	--
1032	8.51	11.0	1.340	1.82	27.56	-148.5	150	--
1037	8.34	11.2	1.336	1.73	26.28	-153.5	150	--
1042	8.20	11.1	1.338	1.68	30.32	158.3	150	--
1047	8.11	11.1	1.336	1.67	5.15	-160.8	150	--
1052	8.07	11.6	1.336	1.68	6.73	-163.0	150	--
1057	8.06	11.5	1.338	1.65	4.22	-163.1	150	--
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-4I

Date: 2/10/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 28.59 Depth to Well Bottom (ft): 32.43 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.33 Estimated Purge Volume (liters): 5.7

Sample ID: MN-4I Sample Time: 1129 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.
Began purging @ 1101

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1104	8.14	10.3	1.591	2.63	49.40	-57.4	230	--
1109	8.06	11.6	1.638	1.83	15.98	-94.4	230	--
1114	8.04	11.7	1.640	1.73	13.45	-109.2	230	--
1119	8.00	11.6	1.642	1.71	12.67	-114.8	230	--
1124	7.95	11.7	1.642	1.69	18.55	-117.5	230	--
1129	7.95	11.7	1.643	1.68	14.51	-118.1	230	--
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-4D

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/10/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	44.35	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	30.19	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	14.16	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.28	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.85	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0.97	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	12:41	13:00	13:15	13:36							
pH	9.61	9.45	8.81	9.06							
TEMPERATURE (°C)	9.7	9.6	9.5	10.8							
COND. (mS/cm)	2.394	1.648	1.637	2.548							
DO. (mg/l)	3.22	3.41	3.36	2.87							
TURBIDITY (NTU)	68.43	75.72	95.63	40.44							
ORP (mV)	-283.4	-297.6	-312.9	-319.8							
DTW (ft below TOC)	30.19	30.19	30.19	30.19							
Gallons Purged	Initial	0.32	0.65	0.97							

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample MN-4D @ 1336 for VOC analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-5S

Date: 2/4/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 11.63 Depth to Well Bottom (ft): 20.60 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.78 Estimated Purge Volume (liters): 5.2

Sample ID: MN-5S Sample Time: 1110 QA/QC: FD-20210204-1

Sample Parameters: VOCs, 8081B, 8082A, 8270D, 9012B, 6010C, 7470A, PFAS, 1,4-Dioxane

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1025	10.23	10.7	1.892	3.36	5.97	-88.5	170	11.63
1030	9.49	11.8	1.634	1.91	0.31	-134.8	170	N/A
1035	9.13	12.2	1.479	1.73	7.64	-147.2	170	N/A
1040	8.82	12.5	1.374	1.62	23.65	-151.5	170	N/A
1045	8.64	12.4	1.332	1.57	60.12	-153.7	170	N/A
1050	8.49	11.8	1.318	1.59	71.25	-153.4	90	N/A
1055	8.36	11.8	1.324	1.59	89.27	-152.2	90	N/A
1100	8.21	11.8	1.295	1.58	75.30	-152.6	90	N/A
1105	8.20	12.0	1.289	1.55	77.43	-154.6	90	N/A
1110	8.17	12.2	1.285	1.53	72.44	-154.8	90	N/A
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-5I

Date: 2/10/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 27.65 Depth to Well Bottom (ft): 31.65 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.35 Estimated Purge Volume (liters): 4.2

Sample ID: MN-5I Sample Time: 1323 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1248	7.99	9.5	1.694	1.76	17.68	-142.1	140	27.65
1253	7.31	11.6	1.802	0.42	8.20	-168.0	140	--
1258	7.16	11.9	1.795	0.28	4.47	-182.5	140	--
1303	7.05	12.3	1.783	0.20	45.45	-206.5	140	--
1308	6.98	12.4	1.777	0.16	3.09	-219.3	140	--
1313	6.95	12.5	1.776	0.14	3.93	-228.9	140	--
1318	6.94	12.6	1.774	0.13	3.98	-232.2	140	--
1323	6.93	12.7	1.775	0.12	6.03	-236.7	140	--
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-5D

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/10/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	45.10	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	29.15	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	15.95	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.32	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.96	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.2	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	14:00	14:15	14:30	14:45							
pH	9.33	8.75	8.33	8.32							
TEMPERATURE (°C)	10.2	10.7	12.1	12.1							
COND. (mS/cm)	1.880	2.825	3.327	3.391							
DO. (mg/l)	3.54	3.71	1.76	1.98							
TURBIDITY (NTU)	38.52	54.75	62.58	66.92							
ORP (mV)	-304.4	-319.7	-319.9	-315.0							
DTW (ft below TOC)	29.15	29.75	29.51	29.69							
Gallons Purged	Initial	0.40	0.80	1.20							

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample MN-5D @ 1445 for VOC analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-6OB

Date: 2/4/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 10.68 Depth to Well Bottom (ft): 11.94 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.11 Estimated Purge Volume (liters): 1.0

Sample ID: MN-6OB Sample Time: 1355 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.
Began purge @ 1331. Dry @ 1342. Will let recharge and then grab sample.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1334	7.83	8.2	0.724	3.32	143.17	-35.2	NM	N/A
1339	7.27	8.2	0.793	6.53	18.39	-27.8	NM	N/A
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-6S

Date: 2/4/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 14.59 Depth to Well Bottom (ft): 18.12 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.31 Estimated Purge Volume (liters): 3.7

Sample ID: MN-6S Sample Time: 1410 QA/QC: None

Sample Parameters: VOCs, 1,4-Dioxane, PFAS

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1330	10.02	9.8	0.768	3.29	87.32	-17.0	135	14.59
1335	9.90	9.4	0.757	3.78	19.48	-10.3	135	-
1340	8.92	9.7	0.753	2.55	3.13	-1.7	135	-
1345	9.79	9.4	0.753	2.44	0.07	-1.1	135	-
1350	8.63	9.4	0.750	2.36	1.00	-0.5	135	-
1355	8.55	8.5	0.752	2.26	2.89	2.8	120	-
1358								Dry
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-6I

Date: 2/4/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 28.39 Depth to Well Bottom (ft): 30.13 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.15 Estimated Purge Volume (liters): 0.5

Sample ID: MN-6I Sample Time: 1425 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.
Began purge @ 1401. Dry @ 1410. Will let recharge.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1409	7.55	9.1	1.441	4.77	1104.89	39.5	-	-
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-6D

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/4/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	46.97	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	34.53	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	12.44	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.25	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.75	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.6	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	15:00	15:20	15:40	16:00							
pH	7.54	7.50	7.52	7.50							
TEMPERATURE (°C)	11.1	11.6	11.3	10.8							
COND. (mS/cm)	3.515	3.567	3.746	3.626							
DO. (mg/l)	6.03	5.35	3.80	3.68							
TURBIDITY (NTU)	448.56	318.21	169.57	114.69							
ORP (mV)	-228.8	-261.2	-281.1	-288.1							
DTW (ft below TOC)	34.53	34.53	34.53	34.53							
Gallons Purged	0.0	0.5	1.0	1.6							

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample MN-6D @ 1600 for VOC analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-11S

Date: 2/3/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 15.77 Depth to Well Bottom (ft): 21.10 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.46 Estimated Purge Volume (liters): 7.6

Sample ID: MN-11S Sample Time: 1102 QA/QC: FD-20210203-2

Sample Parameters: VOCs

Comments: Began purge @ 1022. High amount of iron bacteria. Will purge w/o parameters until it clears up enough as not to foul water quality meter.
Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1032	9.03	11.0	0.547	0.76	106.15	105.4	150	N/A
1037	7.63	11.2	0.553	0.56	87.39	56.2	150	N/A
1042	7.28	11.0	0.553	0.39	89.56	38.0	150	N/A
1047	7.10	10.8	0.555	0.31	138.65	22.5	175	N/A
1052	7.00	10.8	0.555	0.23	82.81	17.8	175	N/A
1057	7.01	10.7	0.554	0.27	81.13	12.6	175	N/A
1102	7.01	10.8	0.553	0.24	84.20	12.2	175	N/A
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-11I

Date: 2/3/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 26.35 Depth to Well Bottom (ft): 33.95 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.66 Estimated Purge Volume (liters): 7.6

Sample ID: MN-11I Sample Time: 1149 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.
Began purge @ 1104

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1119	7.03	12.0	5.492	1.23	86.09	-6.5	250	N/A
1124	6.98	12.5	5.744	0.33	47.28	-35.0	250	N/A
1129	6.97	11.8	5.760	0.28	53.42	-38.1	250	N/A
1134	6.96	11.8	5.772	0.28	59.64	-38.9	250	N/A
1139	6.95	12.1	5.771	0.17	42.63	-39.5	250	N/A
1144	6.95	21.1	5.766	0.17	55.64	-39.5	250	N/A
1149	6.95	12.1	5.757	0.20	43.58	-39.2	250	N/A
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-11D

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/5/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	45.10	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	32.03	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	13.07	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.26	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.78	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.6	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	10:30	10:55	11:10	11:35							
pH	7.53	7.14	7.18	7.21							
TEMPERATURE (°C)	10.6	10.5	11.3	11.2							
COND. (mS/cm)	2.811	4.148	4.417	4.622							
DO. (mg/l)	1.89	2.08	1.68	1.51							
TURBIDITY (NTU)	144.24	76.48	43.68	32.97							
ORP (mV)	-290.6	-292.7	-298.5	-301.7							
DTW (ft below TOC)	32.16	32.35	32.41	32.54							
Gallons Purged	0.0	0.5	1.1	1.6							

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample MN-11D @ 1135 for VOC analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-12S

Date: 2/3/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 10.20 Depth to Well Bottom (ft): 17.96 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.7 Estimated Purge Volume (liters): 4.9

Sample ID: MN-12S Sample Time: 1050 QA/QC: FD-20210203-1

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1015	9.00	8.3	0.783	3.71	13.90	6.0	140	N/A
1020	8.78	9.8	0.750	2.49	0.12	-107.2	140	N/A
1025	8.59	10.2	0.807	2.39	3.43	-114.5	140	N/A
1030	8.23	10.6	0.861	2.50	4.01	-116.7	140	N/A
1035	8.10	10.8	0.865	2.57	3.59	-113.0	140	N/A
1040	7.99	10.9	0.877	2.46	4.23	-113.7	140	N/A
1045	7.95	10.5	0.868	2.50	4.21	-109.8	140	N/A
1050	7.91	10.5	0.869	2.53	4.26	-106.4	140	N/A
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MN-12I

Date: 2/3/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 28.10 Depth to Well Bottom (ft): 30.05 Well Diameter: 0.75" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.17 Estimated Purge Volume (liters): 2.0

Sample ID: MN-12I Sample Time: 1145 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.
@ 1123 - lots of air bubbles - increase flow. Dry @ 1125

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1107	7.30	8.8	4.038	4.28	85.82	-18.2	120	N/A
1112	7.07	10.9	4.679	2.11	11.90	-60.1	120	N/A
1117	7.21	10.5	3.694	1.87	2.72	-82.9	120	N/A
1122	7.27	10.8	3.114	1.74	0.53	-93.0	120	N/A
1145								28.10
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-12D

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/5/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	45.18	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	32.65	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	12.53	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.25	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.75	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.6	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	09:15	09:45	10:00	10:15							
pH	7.63	7.31	7.18	7.15							
TEMPERATURE (°C)	10.2	10.1	11.2	11.5							
COND. (mS/cm)	4.431	4.804	4.964	5.116							
DO. (mg/l)	3.10	2.62	2.36	1.18							
TURBIDITY (NTU)	21.22	34.98	55.64	27.54							
ORP (mV)	-193.7	-254.9	-279.6	-293.8							
DTW (ft below TOC)	32.65	32.65	32.65	32.65							
Gallons Purged	0.0	0.5	1.0	1.6							

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample MN-12D @ 1015 for VOC analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-1

Date: 2/9/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 8.00 Depth to Well Bottom (ft): 12.25 Well Diameter: 4" Screen Length: 6.7'

Casing Type: PVC Volume in 1 Well Casing (liters): 10.50 Estimated Purge Volume (liters): 12.9

Sample ID: MW-1 Sample Time: 1055 QA/QC: None

Sample Parameters: VOCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1025	8.44	11.0	2.484	2.27	152.81	53.0	430	8.00
1030	7.70	11.3	2.417	0.38	92.08	59.9	430	8.22
1035	7.55	11.1	1.983	0.63	78.28	61.4	430	8.30
1040	7.40	10.5	1.642	1.46	62.01	95.8	430	8.44
1045	7.35	10.6	1.599	1.50	34.17	68.3	430	8.52
1050	7.33	10.5	1.615	1.45	10.71	68.7	430	8.60
1055	7.33	10.6	1.621	1.46	5.54	66.8	430	8.72
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-2

Date: 2/3/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 8.72 Depth to Well Bottom (ft): 13.49 Well Diameter: 4" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 11.78 Estimated Purge Volume (liters): 14.2

Sample ID: MW-2 Sample Time: 1538 QA/QC: None

Sample Parameters: VOCs

Comments: Began purge @ 1457

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1458	7.33	10.9	4.897	4.46	153.37	27.5	500	9.07
1503	7.44	11.8	5.046	2.67	77.51	41.6	500	9.84
1508	7.47	12.0	4.986	2.52	55.72	51.8	500	10.84
1513	7.49	12.1	5.111	2.97	73.95	60.9	500	12.00
1518	7.50	11.7	5.168	3.59	96.83	64.3	350	12.30
1522	7.54	11.0	5.147	4.85	94.23	69.7	350	12.39
1528	7.60	11.5	5.044	6.37	59.76	75.0	350	12.30
1533	7.66	11.6	5.091	6.21	60.01	86.2	350	12.22
1538	7.62	11.1	5.279	6.26	60.19	87.2	350	12.20
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-3

Date: 2/5/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 0.71 Depth to Well Bottom (ft): 9.50 Well Diameter: 4" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 21.71 Estimated Purge Volume (liters): 19.3

Sample ID: MW-3 Sample Time: 1424 QA/QC: None

Sample Parameters: VOCs

Comments: Began purging @ 1327. No J-Plug on well. Middle of parking lot.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1329	5.84	7.0	152.441	5.16	229.81	-84.0	350	1.15
1334	6.72	7.4	155.790	3.81	215.67	-26.3	350	1.82
1339	7.41	7.2	155.928	3.83	115.70	-67.0	350	3.06
1344	7.68	6.4	155.564	4.34	52.51	-58.8	350	3.74
1349	7.89	5.1	151.047	5.63	61.14	-5.7	350	4.35
1354	8.14	4.1	139.565	6.55	242.58	-44.5	350	5.20
1359	8.27	3.7	120.862	7.10	316.80	-44.5	350	5.71
1404	8.43	3.1	73.822	8.89	189.27	-51.2	350	6.40
1409	8.42	3.0	61.562	9.40	115.06	-50.1	350	7.17
1414	7.70	7.9	154.577	3.94	230.09	-41.5	350	7.70
1419	7.78	7.7	154.345	3.63	258.65	-46.4	350	8.00
1424	7.81	7.7	154.749	3.60	242.61	-46.1	350	8.35
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-4

Date: 2/5/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 9.05 Depth to Well Bottom (ft): 9.05 Well Diameter: 4" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.00 Estimated Purge Volume (liters):

Sample ID: Sample Time: QA/QC:

Sample Parameters: VOCs

Comments: No sample - Dry

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-4R

Date: 2/5/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 12.40 Depth to Well Bottom (ft): 25.50 Well Diameter: 4" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 32.36 Estimated Purge Volume (liters): 28.0

Sample ID: MW-4R Sample Time: 1400 QA/QC: None

Sample Parameters: VOCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1250	10.67	13.0	3.454	3.10	840.10	-52.9	400	12.40
1255	9.38	14.0	4.310	1.67	2249.10	-69.5	400	13.15
1300	8.99	14.0	4.209	2.15	300.41	-35.2	400	13.20
1305	8.72	14.1	3.961	1.61	264.02	-47.6	100	13.40
1310	8.46	14.1	3.968	1.53	84.08	-50.3	400	13.60
1315	8.30	14.2	3.974	1.51	128.32	-50.4	400	13.80
1320	8.17	14.2	3.987	1.46	145.21	-50.4	400	13.90
1325	8.09	14.0	4.100	1.53	250.48	-34.9	400	13.90
1330	7.99	14.1	4.386	1.50	391.61	-30.8	400	13.90
1335	7.88	14.0	4.868	1.49	1809.10	-28.9	400	13.90
1340	7.82	14.0	5.200	1.47	1990.80	-28.6	400	13.90
1345	7.73	14.0	5.691	1.44	239.80	-28.7	400	13.90
1350	7.64	14.0	6.112	1.42	56.68	-29.1	400	13.90
1355	7.65	14.0	6.134	1.40	48.78	-29.3	400	13.90
1400	7.64	14.0	6.199	1.43	47.24	-29.7	400	13.90
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-6

Date: 2/5/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 7.61 Depth to Well Bottom (ft): 10.55 Well Diameter: 1" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 0.45 Estimated Purge Volume (liters): 1.2

Sample ID: MW-6 Sample Time: 1302 QA/QC: None

Sample Parameters: VOCs

Comments: Can't measure DTW during purge because well diameter too thin to accommodate both tubing and interface probe.
Began purge @ 1236. Dry @ 1240. Resumed @ 1246. Dry @ 1248. Resumed @ 1254. Dry @ 1256
Will let recharge, then sample.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1238	8.54	9.8	0.682	4.31	203.80	-175.1	150	N/A
1240	8.05	9.3	0.659	4.98	158.93	-124.3	150	N/A
1246	7.75	8.6	0.662	5.48	109.75	-121.3	150	N/A
1255	7.54	8.6	0.695	5.48	47.61	-167.1	150	N/A
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-11

Date: 2/3/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 11.76 Depth to Well Bottom (ft): 22.75 Well Diameter: 4" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 27.15 Estimated Purge Volume (liters): 15.1

Sample ID: MW-11 Sample Time: 1402 QA/QC: None

Sample Parameters: VOCs

Comments: Began purge @ 1318. Very dark brown silty water at first. Let pump w/o flow through cell until water cleared up.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1332	7.91	11.7	2.166	2.01	578.34	-78.1	500	13.31
1337	7.33	12.7	2.145	0.37	85.29	-62.0	500	14.65
1342	7.22	12.6	2.129	0.41	62.50	-57.6	500	14.73
1347	7.16	12.4	2.031	1.06	92.18	-52.4	500	14.99
1352	7.14	12.5	2.051	1.04	116.21	-53.4	500	15.03
1357	7.09	12.5	2.083	0.86	105.02	-54.4	500	15.14
1402	7.08	12.6	2.091	0.77	101.63	-56.2	500	15.22
Tolerance:	0.1	---	3%	10%	10%	+ or - 10	---	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-12

Date: 2/9/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 10.69 Depth to Well Bottom (ft): 24.47 Well Diameter: 4" Screen Length: 5'

Casing Type: Steel Volume in 1 Well Casing (liters): 34.04 Estimated Purge Volume (liters): 24.6

Sample ID: MW-12 Sample Time: 1024 QA/QC: None

Sample Parameters: VOCs

Comments: Began purge @ 0926. Very dark silty water. Will let purge w/o flow through cell until water clears up.

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0929	10.45	12.4	2.655	3.73	180.51	9.4	425	11.41
0934	10.27	12.9	2.695	1.80	87.36	-1.4	425	11.82
0939	9.96	12.9	2.682	1.64	65.43	21.7	425	12.06
0944	9.52	12.8	2.669	1.63	52.20	22.3	425	12.09
0949	9.36	12.9	2.663	1.62	43.76	23.4	425	12.11
0954	9.19	12.9	2.605	1.57	42.43	24.1	425	12.13
0959	9.05	12.9	2.353	1.55	30.68	1.6	425	12.14
1004	8.92	12.9	2.091	1.52	34.71	-25.4	425	12.17
1014	8.56	13.1	2.015	1.50	27.61	-26.5	425	12.18
1019	8.48	13.1	1.976	1.51	37.86	-22.4	425	12.20
1024	8.43	13.1	1.979	1.51	26.25	-27.4	425	12.21
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-13

Date: 2/4/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 11.59 Depth to Well Bottom (ft): 14.18 Well Diameter: 4" Screen Length: 5'

Casing Type: Steel Volume in 1 Well Casing (liters): 6.40 Estimated Purge Volume (liters): 18.9

Sample ID: MW-13 Sample Time: 1110 QA/QC: MS/MSD

Sample Parameters: VOCs, 8081B, 8082A, 8270D, 9012B, 6010C, 7470A, PFAS, 1,4-Dioxane

Comments:

Began purge @ 1019

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1021	9.73	10.4	0.425	2.46	89.36	2.7	400	11.62
1026	8.47	11.5	0.792	1.06	49.70	-33.0	400	11.64
1031	7.54	11.8	1.399	0.54	12.02	-15.0	400	11.65
1036	7.30	12.0	1.372	0.33	17.68	-28.5	400	11.65
1041	7.21	12.0	1.331	0.28	28.91	-38.2	400	11.65
1046	7.14	12.0	1.252	0.26	38.59	-44.5	400	11.65
1051	7.10	12.1	1.285	0.18	16.27	-48.7	400	11.65
1056	7.07	12.1	0.936	0.21	17.13	-50.8	400	11.65
1101	7.05	12.1	1.218	0.18	12.79	-52.9	400	11.65
1106	7.04	12.3	1.218	0.20	10.56	-53.1	400	11.65
1110	7.03	12.2	1.218	0.17	11.04	-53.2	400	11.65
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-13OB

Date: 2/11/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 8.53 Depth to Well Bottom (ft): 11.09 Well Diameter: 2" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 1.58 Estimated Purge Volume (liters): 9.5

Sample ID: MW-13OB Sample Time: 0953 QA/QC: None

Sample Parameters: VOCs, 8081B, 8082A, 8270D, 9012B, 6010C, 7470A,

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0908	10.59	10.7	1.825	4.04	34.62	-77.1	200	9.11
0913	10.05	11.8	1.450	3.12	36.63	-92.0	200	9.55
0918	9.65	11.8	1.599	2.59	15.69	-112.5	200	9.79
0923	9.39	11.8	1.631	2.40	6.37	-128.4	200	9.85
0928	8.42	12.1	1.927	1.95	21.78	-143.7	200	9.89
0933	9.18	11.8	1.232	1.89	20.49	-143.4	200	10.01
0938	9.00	11.8	1.616	1.85	5.07	-156.5	200	10.06
0948	8.96	12.0	1.795	1.85	3.91	-158.3	200	10.08
0953	8.95	12.0	1.801	1.83	3.72	-158.3	200	10.10
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-13S

Date: 2/11/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 15.02 Depth to Well Bottom (ft): 33.05 Well Diameter: 2" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 11.12 Estimated Purge Volume (liters): 11.3

Sample ID: MW-13S Sample Time: 1100 QA/QC: None

Sample Parameters: VOCs

Comments: Began purge @ 1012

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1025	8.68	9.6	4.831	3.86	774.02	-33.4	290	15.27
1030	8.40	13.9	5.008	1.83	351.22	-87.3	290	15.33
1035	8.27	13.9	4.687	1.63	313.46	-88.9	290	15.34
1040	8.18	13.9	4.655	1.58	317.47	-90.6	290	15.35
1045	8.08	13.9	4.579	1.55	296.10	-93.6	290	15.41
1050	7.99	13.9	4.588	1.52	62.50	-94.6	290	15.41
1055	7.93	13.9	4.603	1.50	55.71	-96.3	290	15.41
1100	7.83	14.0	4.650	1.49	61.39	-97.2	290	15.41
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MW-13I

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/11/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	51.08	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	30.45	2"	0.16
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	20.63	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.16	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	3.38	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	10.15	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	10.1	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	12:25	12:33	12:47	13:00							
pH	10.35	8.81	8.73	8.11							
TEMPERATURE (°C)	11.5	13.6	13.6	13.7							
COND. (mS/cm)	3.008	3.704	3.898	3.948							
DO. (mg/l)	2.71	3.95	4.21	5.35							
TURBIDITY (NTU)	9.24	99.47	77.01	33.11							
ORP (mV)	-118.8	-80.5	-68.7	-61.1							
DTW (ft below TOC)	30.45	31.44	31.07	31.00							
Gallons Purged	Initial	3.5	7.0	10.0							

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample MW-13I @ 1300 for VOCs, 8081B, 8082A, 8270D, 9012B, 6010C, 7470A analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-14

Date: 2/8/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 12.32 Depth to Well Bottom (ft): 23.72 Well Diameter: 4" Screen Length: 5'

Casing Type: Steel Volume in 1 Well Casing (liters): 28.16 Estimated Purge Volume (liters): 19.0

Sample ID: MW-14 Sample Time: 1530 QA/QC: None

Sample Parameters: VOCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1440	10.33	9.7	1.110	2.93	252.13	-216.1	380	12.32
1445	8.67	11.4	1.129	0.33	832.30	-153.2	380	12.32
1450	8.15	11.7	1.111	0.20	878.23	-128.7	380	12.32
1455	7.91	11.6	1.109	0.16	476.41	-122.4	380	12.32
1500	7.70	11.6	1.107	0.13	157.40	116.5	380	12.32
1505	7.51	11.5	1.112	0.12	138.44	-113.3	380	12.32
1510	7.36	11.6	1.120	0.09	114.09	-113.3	380	12.32
1515	7.30	11.5	1.124	0.09	102.86	-116.4	380	12.32
1520	7.24	11.5	1.123	0.08	50.69	-117.4	380	12.32
1525	7.21	11.5	1.120	0.08	44.84	-115.2	380	12.32
1530	7.19	11.4	1.120	0.08	46.12	-115.4	380	12.32
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-14S

Date: 2/11/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 14.88 Depth to Well Bottom (ft): 20.72 Well Diameter: 2" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 3.60 Estimated Purge Volume (liters): 4.5

Sample ID: MW-14S Sample Time: 0938 QA/QC: None

Sample Parameters: VOCs, 8081B, 8082A, 8270D, 9012B, 6010C, 7470A

Comments: Iron bacteria initially. Water appears closer to 10-20 NTU range at sample time

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
0908	8.16	11.3	2.679	0.95	1188.27	22.8	150	14.88
0913	7.76	12.2	2.727	0.49	587.03	34.4	150	15.04
0918	7.52	12.5	2.751	0.34	492.04	37.2	150	15.04
0923	7.35	12.6	2.789	0.26	195.12	35.3	150	15.04
0928	7.29	12.7	2.781	0.24	118.53	32.8	150	15.04
0933	7.23	12.6	2.777	0.22	88.79	28.2	150	15.04
0938	7.21	12.5	2.778	0.22	48.12	25.6	150	15.04
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MW-14I

PROJECT NO.: 60644874

STAFF: Sean Connelly & Tom Urban

DATE(S): 2/11/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	49.00	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	30.74	2"	0.16
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	18.26	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.16	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	2.99	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	8.98	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	9	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	13:22	13:33	13:44	13:50							
pH	8.67	8.12	7.93	7.82							
TEMPERATURE (°C)	12.8	13.0	13.4	13.6							
COND. (mS/cm)	2.179	2.318	2.343	2.296							
DO. (mg/l)	3.72	5.04	5.86	6.24							
TURBIDITY (NTU)	24.92	52.36	27.34	47.00							
ORP (mV)	-75.8	-67.0	-55.6	-57.5							
DTW (ft below TOC)	30.74	31.60	31.10	31.72							
Gallons Purged	Initial	3.0	6.0	9.0							

COMMENTS: Well too deep for peristaltic pump, used bailer to purge/ sample.
Collected sample MW-14I @ 1350 for VOC analysis.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-15

Date: 2/8/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 13.21 Depth to Well Bottom (ft): 23.48 Well Diameter: 4" Screen Length: 5'

Casing Type: Steel Volume in 1 Well Casing (liters): 25.37 Estimated Purge Volume (liters): 13.8

Sample ID: MW-15 Sample Time: 1512 QA/QC: None

Sample Parameters: VOCs

Comments:

Began purge @ 1440

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1442	10.99	9.5	1.573	4.46	131.02	-2.6	430	13.52
1447	10.83	11.5	1.602	2.20	38.57	-10.2	430	14.32
1452	10.47	11.5	1.583	1.92	27.41	-16.1	430	14.99
1457	10.25	11.6	1.557	1.85	24.22	-20.6	430	15.75
1502	9.92	11.8	1.526	1.78	26.63	-25.6	430	15.92
1507	9.77	11.7	1.475	1.75	22.25	-29.1	430	16.21
1512	9.31	12.0	1.476	1.72	20.25	-29.4	430	16.48
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-15OB

Date: 2/11/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 8.51 Depth to Well Bottom (ft): 11.38 Well Diameter: 2" Screen Length: 5'

Casing Type: PVC Volume in 1 Well Casing (liters): 1.77 Estimated Purge Volume (liters): 3.5

Sample ID: MW-15OB Sample Time: 1104 QA/QC: None

Sample Parameters: VOCs

Comments:

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1005	7.64	10.5	1.900	1.59	70.45	51.9	140	8.51
1010	7.51	10.8	1.700	1.34	62.63	55.0	140	9.15
1015	7.39	11.0	1.637	1.21	52.47	59.1	140	9.50
1020	7.35	11.1	1.614	0.93	67.81	60.1	140	9.91
1025	7.34	11.2	1.600	0.82	59.33	59.8	140	10.18
1030	7.32	10.7	1.726	1.80	190.82	66.1	140	10.20
1034	--	--	--	--	--	--	--	Dry @ 11.38
1104	--	--	--	--	--	--	--	9.44
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: 60644874 Site: NYSDEC Artco Well I.D.: MW-101

Date: 2/9/2021 Sampling Personnel: T. Urban & Sean Connelly Company: AECOM

Purging/ Sampling Device: Peristaltic Pump Tubing Type: HDPE & Silicone Pump/Tubing Inlet Location: Midpoint of Screen

Measuring Point: Top of Riser Initial Depth to Water (ft): 8.20 Depth to Well Bottom (ft): 9.85 Well Diameter: 2" Screen Length: 7'

Casing Type: PVC Volume in 1 Well Casing (liters): 1.02 Estimated Purge Volume (liters): 3.8

Sample ID: MW-101 Sample Time: 1126 QA/QC: None

Sample Parameters: VOCs

Comments: Began purge @ 1048

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O_2 (mg/l)	TURB. (NTU)	Eh (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
1101	9.41	6.8	1.797	4.75	619.74	49.8	130	8.41
1106	8.85	8.0	1.617	2.52	58.75	44.4	130	8.69
1111	8.72	7.5	1.566	2.41	21.04	47.5	130	8.78
1116	8.56	7.8	1.585	2.27	22.45	52.4	130	8.83
1121	8.46	7.9	1.550	2.18	16.36	55.2	130	8.92
1126	8.45	7.9	1.543	2.16	14.37	55.5	130	9.07
Tolerance:	**0.1**	**---**	**3%**	**10%**	**10%**	**+ or - 10**	**---**	

Information: WATER VOLUMES--0.75 inch diameter well = 87 ml/ft.; 1 inch diameter well = 154 ml/ft.; 2 inch diameter well = 617 ml/ft.; 4 inch diameter well = 2470 ml/ft. ($vol_{cyl} = \pi r^2 h$)

Remarks:

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-7S

PROJECT NO.: 60644874

STAFF: Kevin McGovern & Tom Urban

DATE(S): 4/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	0.00	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	0.00	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.00	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.00	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.00	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0	8"	2.60
			OR	
			$V=0.0408 \times (\text{CASING DIAMETER})^2$	

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS											
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
DTW (ft below TOC)											
Time											

COMMENTS: Well cap buried in sediment
Well blocked at 2.7' below TOC

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-7I

PROJECT NO.: 60644874

STAFF: Kevin McGovern & Tom Urban

DATE(S): 4/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	0.00	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	0.00	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.00	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.00	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.00	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS											
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
DTW (ft below TOC)											
Time											

COMMENTS: Well cap buried in sediment
Well blocked at TOC

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-7D

PROJECT NO.: 60644874

STAFF: Kevin McGovern & Tom Urban

DATE(S): 4/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	32.60	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	NA	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	NA	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	NA	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	NA	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS											
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
DTW (ft below TOC)											
Time											

COMMENTS: Well cap buried in sediment
Thick mud in well, started getting thick at 23' below TOC.
DTB is 7.4' above top of screen, suggesting that water in well casing (if present) not connected to aquifer.
Could not collect sample due to excessive mud in well casing.

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-8S

PROJECT NO.: 60644874

STAFF: Kevin McGovern & Tom Urban

DATE(S): 4/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	NA	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	14.50	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	NA	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	NA	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	NA	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS											
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
DTW (ft below TOC)											
Time											

COMMENTS: Well cap buried in sediment
Water level indicator did not signal until 14.5' below TOC.
Resistance with water level indicator at 9.5' below TOC, with excessive mud on indicator after retrieval suggesting that mud is present in well casing, preventing sample collection.

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-8I

PROJECT NO.: 60644874

STAFF: Kevin McGovern & Tom Urban

DATE(S): 4/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	0.00	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	0.00	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.00	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.00	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.00	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0	8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS											
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
DTW (ft below TOC)											
Time											

COMMENTS: Well cap buried in sediment
Resistance with water level indicator at 13' below TOC, and stops at 15.3' below TOC, with no indication of water in well casing.

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-8D

PROJECT NO.: 60644874

STAFF: Kevin McGovern & Tom Urban

DATE(S): 4/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	37.55	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	0.85	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	36.70	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.73	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	2.20	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	0.5	8"	2.60
			OR	
			$V=0.0408 \times (\text{CASING DIAMETER})^2$	

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	0	0.5	0.5								
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
DTW (ft below TOC)	0.85	9.70	9.70								
Time	11:58	12:03	12:11								

COMMENTS:
Well cap buried in sediment
Collected VOC sample @ 12:15
Purgewater dark gray and very turbid.
Water quality parameters not collected due to lack of purgewater volume.
DTB is 7.45' above top of screen, suggesting that water in well casing not connected to aquifer.
This was confirmed when water was exiting the well during DTW collection and no change in water level with an 8 minute pause in purging.

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-9OB

PROJECT NO.: 60644874

STAFF: Kevin McGovern & Tom Urban

DATE(S): 4/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	8.85	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	7.85	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	1.00	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.02	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.06	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS											
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
DTW (ft below TOC)											
Time											

COMMENTS: Well cap buried in sediment
Not enough water to sample

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-9S

PROJECT NO.: 60644874

STAFF: Kevin McGovern & Tom Urban

DATE(S): 4/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=		0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=		2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.00	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.00	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.00	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS											
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
DTW (ft below TOC)											
Time											

COMMENTS: Well cap buried in sediment
Well blocked at 0.2' below TOC

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-9I

PROJECT NO.: 60644874

STAFF: Kevin McGovern & Tom Urban

DATE(S): 4/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=		0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=		2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	0.00	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.00	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	0.00	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=		8"	2.60

OR

$V=0.0408 \times (\text{CASING DIAMETER})^2$

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS											
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
DTW (ft below TOC)											
Time											

COMMENTS: Well cap buried in sediment
Well blocked at 1.32' below TOC

WELL PURGING LOG

AECOM

PROJECT TITLE: NYSDEC Artco WELL NO.: MN-9D

PROJECT NO.: 60644874

STAFF: Kevin McGovern & Tom Urban

DATE(S): 4/8/2021

			WELL ID.	VOL. (GAL/FT)
1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	35.50	0.75"	0.02
			1"	0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	4.01	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	31.49	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	0.02	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	0.63	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	1.89	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	1.7	8"	2.60
			OR	
			$V=0.0408 \times (\text{CASING DIAMETER})^2$	

	ACCUMULATED VOLUME PURGED (GALLONS)										
PARAMETERS	0	0.7	1.7								
pH											
SPEC. COND. (umhos)											
APPEARANCE											
TEMPERATURE (°C)											
DTW (ft below TOC)	4.01	13.60	17.00								
Time	10:34	10:39	10:49								

COMMENTS: Well cap buried in sediment
Collected VOC sample @ 11:00
Purgewater dark gray and very turbid.
Water quality parameters not collected due to lack of purgewater volume.
DTB is 4.5' above top of screen, suggesting that water in well casing not connected to aquifer.

APPENDIX I

INVESTIGATION DERIVED WASTE (IDW) DISPOSAL DOCUMENTS

Invoice

SUN ENVIRONMENTAL CORP.

Process as non-po

4655 Crossroads Park Drive
Liverpool, NY 13088

Phone: (315) 218-6995 **Fax:** (315) 214-8598

Date	Invoice #
2/25/2020	11657

Bill To

AECom
4 North Park Drive
Suite 300
Hunt Valley, Maryland 21030

Ship To

ARTCO INDUSTRIAL LAUNDRIES

Terms	Due Date	P.O. No.	Project
Net 30	3/26/2020	121475	AECM.1005.4578

Quantity	Description	Rate	Amount
	PROJECT NUMBER - 60617211 PURCHASE ORDER - 121475 AECOM PROJECT MANAGER - GEORGE KISLUCK FEBRUARY 24, 2020 MOBILIZED TO SITE, LABEL AND LOAD DRUMS FOR DISPOSAL		
1	PICK UP FROM SITE AND TRANSPORTATION TO DISPOSAL FACILITY		
1	NON HAZ - SOLID DRUM DISPOSAL IN 55 GALLON STEEL DRUM		
1	NON HAZ - LIQUID DRUM DISPOSAL IN 55 GALLON STEEL DRUM		
1	HAZARDOUS - SOLID DRUM DISPOSAL IN 55 GALLON STEEL DRUM		
	****JOB COMPLETE***		

Thank you for your business.

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
NYD981130032	1	800-807-7455	008595752 JJK

5. Generator's Name and Mailing Address
FORMER ARTCO INDUSTRIAL LAUNDRIES
625 BROADWAY - 12TH FLOOR
ALBANY NY 12233-7012
Generator's Phone:

Generator's Site Address (if different than mailing address)
FORMER ARTCO INDUSTRIAL LAUNDRIES
333 WEST MAIN STREET
ROCHESTER NY 14608

6. Transporter 1 Company Name — **U.S. EPA ID Number**
SUN ENVIRONMENTAL CORP. — NYR000176958

7. Transporter 2 Company Name — **U.S. EPA ID Number**

8. Designated Facility Name and Site Address — **U.S. EPA ID Number**
CYCLE CHEM, INC.
550 INDUSTRIAL DR.
LEWISBERRY PA 17339
Facility's Phone: 717 938-4700
PAD067098822

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. NA3077, HAZARDOUS WASTE SOLID, N.O.S. (TETRACHLOROETHENE, TRICHLOROETHENE), 9, PGIII ERG#171	001	DM	00500	P	F001 F002 D0 D040 D028
	2. NON RCRA, NON DOT REGULATED LIQUIDS (DECON WATER)	001	DM	00450	P	NONE
	3. NON RCRA, NON DOT REGULATED MATERIALS (PPE)	001	DM	00350	P	NONE
	4.					

14. Special Handling Instructions and Additional Information
JOB# AECOM.1005 SUN P.O.# 040914 HAZ-2056 SIGNED PROFILES & LOA ATTACHED
1. 106824-POS70 (55 GALLON)
2. 106823-LS (55 GALLON)
3. 106825-LD (55 GALLON)
Aeccom PO# 121475

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Michael Gorman — Signature: AS AGENT OF NYSDEC — Month 02 Day 24 Year 20

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: John Haverbeck — Signature — Month 2 Day 24 Year 20

Transporter 2 Printed/Typed Name — Signature — Month Day Year

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name — Signature — Month Day Year

GENERATOR | INT'L | TRANSPORTER | DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Generator acknowledges that no material change has occurred either in the characteristics or in the process generating the material

Please print or type. Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
NYD981130032	1	(800) 483-3718	015264753 FLE

GENERATOR

5. Generator's Name and Mailing Address
ARICO-FORMER
625 Broadway, 12th Floor Attn: Benjamin Rung
Albany, NY 12233
Generator's Phone:

Generator's Site Address (if different than mailing address)
333 W MAIN ST
ROCHESTER, NY 14608

6. Transporter 1 Company Name: Clean Harbors Environmental Services, Inc.
U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
Spring Grove Resource Recovery Inc
4879 Spring Grove Avenue
Cincinnati, OH 45232
Facility's Phone: (513) 681-5738
U.S. EPA ID Number: OHD000816629

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. UN3082, WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S., (TRICHLOROETHENE, TETRACHLOROETHENE), 9, PG III	002	DM	900	P	D039	D040	B
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1EB2169134 EXEMPT 2x55 1x55, 1x85

Contract retained by generator confers agency authority on initial transporter to add or substitute additional transporters on generator's behalf for purposes of transportation efficiency, convenience, or safety

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Michael Gautreaux
Signature: Michael Gautreaux As Agent of NYSEG
Month: 05 Day: 06 Year: 21

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: JOHN MORRILL
Signature:
Month: 05 Day: 06 Year: 21

Transporter 2 Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H141			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name
Signature
Month Day Year

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping. 722102310511 PPW

GENERATOR'S INITIAL COPY

Clean Harbors
ENVIRONMENTAL SERVICES

Land Disposal Restriction Notification Form

Printed Date :May 6, 2021

MANIFEST INFORMATION

Generator : ARTCO - FORMER

Address: 333 W MAIN ST
ROCHESTER,NY 14608

EPA ID #: NYD981130032

Manifest Tracking Info.

015264753FLE

Sales Order No: 2102310311

LINE ITEM INFORMATION

Line Item:	Page No:	Profile No:	Treatability Group:	LDR Disposal Category
1.	1	CH2169254	WASTEWATER	2 (This is subject to LDR.)

EPA Waste Code	EPA Waste SubCategory
D039D040	NONE

LDR Chemical Data

Chemical	Underlying Hazardous Constituents	Constituents of Concern	Contaminants Subject to Treatment
TETRACHLOROETHYLENE	Y	N	N
TRICHLOROETHYLENE	Y	N	N

Certification	Applies to Manifest Line Items
Pursuant to 40 CFR 268.7(a), I hereby notify that this shipment contains waste restricted under 40 CFR Part 268.	1.

Waste analysis data, where available, is attached.

Signature : Michael Artmire

Print Name Michael Artmire

Title : Sr. Proj Mgr

Date : 5/6/2021

APPENDIX J

DATA USABILITY SUMMARY REPORTS

DATA USABILITY SUMMARY REPORT

SOIL SAMPLING
ARTCO INDUSTRIAL LAUNDRIES SITE
ROCHESTER, MONROE COUNTY, NEW YORK
WORK ASSIGNMENT D007622-59
SITE #828102

Analyses Performed by:
EUROFINS TESTAMERICA
AMHERST, NEW YORK and SACRAMENTO, CALIFORNIA

Prepared for:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

Prepared by:
URS CORPORATION
257 WEST GENESEE STREET, SUITE 400
BUFFALO, NY 14202-2657

JUNE 2020

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1.0 INTRODUCTION 1

2.0 ANALYTICAL METHODOLOGIES/DATA VALIDATION PROCEDURES 1

3.0 DATA DELIVERABLE COMPLETENESS 3

4.0 SAMPLE RECEIPT/PRESERVATION/HOLDING TIMES 3

5.0 NON-CONFORMANCES 3

6.0 SAMPLE RESULTS AND REPORTING 5

7.0 SUMMARY 5

TABLES
(Following Text)

Table 1 Summary of Data Qualifications

Table 2 Validated Soil Sample Results

Table 3 Validated Field QC Sample Results

ATTACHMENTS

Attachment A Validated Form I's

Attachment B Support Documentation

1.0 INTRODUCTION

This Data Usability Summary Report (DUSR) has been prepared following the guidelines provided in New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation *DER-10 Technical Guidance for Site Investigation and Remediation*, *Appendix 2B, Guidance for Data Deliverables and the Development of Data Usability Summary Reports,* May 2010. Discussed in this DUSR are analytical data for 47 soil samples, 3 matrix spike/matrix spike duplicate (MS/MSD) pairs, 3 field duplicates (FD), and 1 equipment blank collected by URS personnel on January 23 – April 23, 2020 at the ARTCO Industrial Laundries site (Site #828102), located in Rochester, New York as part of work assignment D007622-59.

2.0 ANALYTICAL METHODOLOGIES/DATA VALIDATION PROCEDURES

The analytical laboratories that performed the analyses is Eurofins TestAmerica located in Amherst, NY and Sacramento, CA. The samples were analyzed for the following parameters. Not all samples were analyzed for all parameters.

Parameter	Method
Volatile Organic Compounds (VOCs)	SW8260C
Semivolatile Organic Compounds (SVOCs)	SW8270D
Polychlorinated Biphenyls (PCBs)	SW8082A
Pesticides	SW8081B
Herbicides	SW8151A
Metals/Mercury	SW6010C/SW7471B
Cyanide	SW9012B
Per- and Polyfluoroalkyl Substances (PFAS)	Method 537-Modified

A limited data validation was performed following the guidelines in the following USEPA Region II documents:

- *Validating Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry, SW-846 Method 8260B & 8260C, SOP HW-24, Rev. 4,* October 2014;
- *Validating Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry, SW-846 Method 8270D, SOP HW-22, Rev. 5*, December 2010;
- *Polychlorinated Biphenyl (PCB) Aroclor Data Validation, SOP HW-37A, Rev. 0,* February 2018.
- *Validating Chlorinated Herbicides GC, SW-846, Method 8151A, SOP HW-17, Rev. 3.1*, December 2010;
- *Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) analyzed using EPA Method 537, EPA 910-R-18-001*, November 2018;
- *Guidelines for Sampling and Analysis of PFAs under NYSDEC Part 375 Remedial Programs Appendix I,* January 2020;
- *ICP-AES Data Validation, SOP HW-3a, Rev. 1*, September 2016; and
- *Mercury and Cyanide Data Validation, SOP HW-3c, Rev. 1*, September 2016.

The limited validation included: a review of completeness of all required deliverables; holding times; a review of quality control (QC) results [blanks, instrument tunes, calibration standards, MS/MSD recoveries, and laboratory control sample (LCS) recoveries] to determine if the data are within the protocol-required limits and specifications; a determination that all samples were analyzed using established and agreed upon analytical protocols; an evaluation of the raw data to confirm the results provided in the data summary sheets; and a review of laboratory data qualifiers.

Qualifications applied to the data during the limited data validation include 'J' (estimated concentration), 'NJ' (tentatively identified, estimated concentration), and 'UJ' (estimated quantitation limit). Definitions of USEPA data qualifiers are presented at the end of this text. The validated analytical results are presented on Table 2 (soil) and Table 3 (field QC). Validated Form I's are presented in Attachment A on an sample delivery group (SDG) basis. Documentation supporting the qualification of data is presented in Attachment B. Only analytical deviations affecting data usability are discussed in this report.

3.0 DATA DELIVERABLE COMPLETENESS

Full deliverable data packages (i.e., NYSDEC ASP Category B or equivalent) were provided by the laboratory, which included all reporting forms and raw data necessary to fully evaluate and verify the reported analytical results.

4.0 SAMPLE RECEIPT/PRESERVATION/HOLDING TIMES

All samples were received by the laboratory intact, properly preserved, and under proper chain-of-custody (COC). All samples were analyzed within the required holding times.

5.0 NON-CONFORMANCES

- **Instrument Calibration**

  The percent difference (%D) between the VOC initial calibration (ICAL) average relative response factor (RRF) and the RRF in one or more of the continuing calibration standards (CCALs) associated with the samples exceeded the QC limit of 20% and exhibited a decreasing response (i.e., low bias) for 1,2-dichloroethane and/or acetone. The results for these compounds in the associated samples, as listed on Table 1, were qualified 'UJ'.

  The %D between the SVOC ICAL average RRF and the RRF in one or more of the CCALs associated with the samples exceeded the QC limit of 20% and exhibited a decreasing response (i.e., low bias) for hexachlorocyclopentadiene. The results for this compound in the associated samples, as listed on Table 1, were qualified 'UJ'.

- **Surrogates**

  The percent recovery (%R) of PFAS surrogate 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2) was above the QC limit in the sample listed on Table 1. The detected results in the associated sample, as listed on Table 1, have been qualified 'J'.

- **Method Blanks/Equipment Blanks**

  Chloroform, methylene chloride (MeCl), and 4,4'-DDT were detected in the laboratory method blanks below the reporting limit (RL). The results for these compounds in the associated samples, as listed on Table 1, have been qualified 'U' at the RL.

  Several metals were detected in the laboratory method blanks below the RL. Since the associated sample results were greater than the RL, the 'B' flag applied by the laboratory has been removed.

Endrin aldehyde was detected in the laboratory method blank below the RL. The results for endrin aldehyde in the associated samples, as listed on Table 1, have been qualified 'U' at the RL. Those samples that exhibited results greater than the RL were not qualified, and the 'B' qualifier applied by the laboratory was removed.

Perfluorobutanoic acid (PFBA), Perfluorohexanesulfonic acid (PFHxS), and Perfluorooctanesulfonic acid (PFOS) were detected in the laboratory method blank and/or EB below the RL. The detected results in the associated samples, as listed on Table 1, have been qualified 'U' at the RL.

- **Matrix Spike/Matrix Spike Duplicate**

  The %Rs of metals copper (Cu), lead (Pb), and zinc (Zn) were below the lower QC limit of 75% in the MS/MSD performed on sample 60N 40E. The post-digestion spike was within acceptable limits for these metals. The results for Cu, Pb, and Zn in this sample have been qualified 'J'.

  The %R of cyanide was below the lower QC limit in the MS/MSD performed on sample 60N 40E Soil. The non-detect results for cyanide in this sample have been qualified 'UJ'.

- **Serial Dilution**

  The percent difference (%Ds) of metals barium (Ba), calcium (Ca), iron (Fe), manganese (Mn), sodium (Na), and Zn were greater than the QC limit of 15% in the serial dilution performed on soil sample 60N 40E. The results for these metals in this sample have been qualified 'J'.

- **Chromatography**

  The %Ds between the dual-column analyses for the samples listed on Table 1 exceeded QC limits (>25%) for the pesticides/PCBs. The pesticides/PCBs results for the affected samples have been qualified in accordance with the following validation guidelines.

Parameter	% Difference	Qualifier
Pesticides/PCBs	26-70%	'J'
	>50% and concentration <RL	'U' at RL
	>101% and possible matrix interference	'JN'

- **Field Duplicates**

Field duplicates were collected at locations 42N 20E 11.5-12.3, 80N35E 4-5, and MW-14S 10-11. The results between the sample and field duplicate exhibited good field and analytical precision [i.e., relative percent difference (RPD) < 50% for results greater than the reporting limit] with any exceedances listed on Table 1.

6.0 SAMPLE RESULTS AND REPORTING

All quantitation/detection limits were reported in accordance with method requirements and were adjusted for sample volume, percent solids, and dilution factors.

7.0 SUMMARY

All sample analyses were found to be compliant with the method criteria, except where previously noted. Those results qualified 'J', "JN' or 'UJ' are considered conditionally usable. All results qualified 'U' should be considered non-detect. All other sample results are usable as reported. URS does not recommend the recollection of any samples at this time.

Prepared By: Ann Marie Kropovitch, Chemist **Date:** 6/25/20

Reviewed By: Peter R. Fairbanks, Senior Chemist **Date:** 6/25/20

DEFINITIONS OF USEPA DATA QUALIFIERS

U –	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J –	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J + –	The result is an estimated quantity, but the result may be biased high.
UJ –	The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R –	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.
D –	The sample result was reported from a secondary dilution analysis.
NJ –	The analysis indicates the presence of an analyte that has been "tentatively identified´ and the associated numerical value represents its approximate concentration.

TABLE 1
SUMMARY OF DATA QUALIFICATIONS
ARTCO INDUSTRIAL LAUNDRIES SITE

SAMPLE ID	FRACTION	ANALYTICAL DEVIATION	QUALIFICATION
60N 10E SOIL	VOCs	CCAL %D > 20% (low bias) for acetone.	Qualify non-detect result 'UJ'.
60N40E 10-11, 60N40E 8.5-9, 80N35E 11-12, and 80N35E 9	VOCs	CCAL %D > 20% (low bias) for 1,2-dichloroethane.	Qualify non-detect results 'UJ'.
20N 10E SOIL, 80N 40E SOIL, and 100N 40E SOIL	VOCs	Chloroform detected in MBLK > MDL but < RL.	Qualify detected results 'U' at RL.
60N 10E SOIL, MW-13I 7-7.5, MW-13OB 7.5-8.5, and MW-14I 8-8.5	VOCs	MeCl detected in MBLK > MDL but < RL.	Qualify detected results 'U' at RL.
20N 10E SOIL and 60N 40E SOIL	SVOCs	CCAL %D > 20% (low bias) for hexachlorocyclopentadiene.	Qualify non-detect results 'UJ'.
80N 35E 4-5 and FD-200212-2	SVOCs	FD %RPD > 50% for anthracene, benzo(a)anthracene, and phenanthrene.	Qualify detected results 'J'.
20N 10E SOIL and 60N 10E SOIL	PEST	4,4-DDT detected in the MBLK > MDL but < RL.	Qualify detected results 'U' at RL.
80N 35E 4-5 and FD-200212-2 (80N 35E 4-5)	PEST	Endrin aldehyde detected in the MBLK > MDL but < RL.	Qualify detected results 'U' at RL.
20N 10E SOIL and 60N 10E SOIL	PEST	%D between columns >50%, result < RL for methoxychlor	Qualify detected results 'U' at RL.
80N 35E 4-5	PEST	%D between columns >50%, result < RL for delta-BHC.	Qualify detected result 'U' at RL.
FD-200212-2 (80N 35E 4-5)	PEST	%D between columns >50%, result < RL for gamma-BHC.	Qualify detected result 'U' at RL.
20N 10E SOIL	PEST	%D between columns >25% for endrin and endrin aldehyde.	Qualify detected results 'J'.
80N 35E 4-5	PEST	%D between columns >25% for 4,4-DDT and endrin ketone.	Qualify detected results 'J'.
FD-200212-2 (80N 35E 4-5)	PEST	%D between columns >25% for endrin ketone.	Qualify detected result 'J'.
MW-14S 10-11	PEST	%D between columns >25% for methocychlor.	Qualify detected result 'J'.
MW-14S 10-11	PEST	%D between columns >101% with matrix interference for endrin ketone.	Qualify detected result 'JN'.
60N 40E SOIL	METALS	MS/MSD%R < QC limit, post digestion spike acceptable for Cu, Pb, and Zn.	Qualify detected results 'J'.
60N 40E SOIL	METALS	Serial dilution %D>15% for Ba, Ca, Fe, Mn, Na, and Zn.	Qualify detected results 'J'.
60N 40E SOIL	WET CHEMISTRY	%R cyanide< QC limit in MS/MSD.	Qualify non-detect result 'UJ'.

TABLE 1
SUMMARY OF DATA QUALIFICATIONS
ARTCO INDUSTRIAL LAUNDRIES SITE

SAMPLE ID	FRACTION	ANALYTICAL DEVIATION	QUALIFICATION
42N 20E 11.5-12.3, DUP-200212-1 (42N 20E 11.5-12.3), 80N 35E 9, MW-14S 10-11, FD-20200416-1 (MW-14S 10-11), and MW-13OB 7.5-8.5	PFAS	PFBA detected in the MBLK > MDL but < RL.	Qualify detected results 'U' at RL.
MW-13OB 7.5-8.5	PFAS	PFOS detected in the MBLK > MDL but < RL.	Qualify detected result 'U' at RL.
MW-14S 10-11	PFAS	PFHxS detected in the MBLK > MDL but < RL.	Qualify detected result 'U' at RL.
40N 40E 14-16	PFAS	Surrogate %R 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2) > QC limit.	Qualify detected results 'J'.

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		0N 20E	10N 30E	10N 36E	20N 10E	20N 50E
Sample ID		0N 20E SOIL	10N 30E SOIL	10N36E 7	20N 10E SOIL	20N 50E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	7.0-7.0	0.0-3.0	0.0-3.0
Date Sampled		01/24/20	01/23/20	02/11/20	01/24/20	01/23/20
Parameter	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,1,2,2-Tetrachloroethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,1,2-Trichloro-1,2,2-trifluoroethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,1,2-Trichloroethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,1-Dichloroethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,1-Dichloroethene	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,2,4-Trichlorobenzene	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,2-Dibromo-3-chloropropane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,2-Dibromoethane (Ethylene dibromide)	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,2-Dichlorobenzene	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,2-Dichloroethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,2-Dichloroethene (cis)	MG/KG	0.47 U	25 U	0.0061 U	0.011	2.3 U
1,2-Dichloroethene (trans)	MG/KG	0.47 U	25 U	0.0061 U	0.0011 J	2.3 U
1,2-Dichloropropane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,3-Dichlorobenzene	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,3-Dichloropropene (cis)	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,3-Dichloropropene (trans)	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
1,4-Dichlorobenzene	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
2-Hexanone	MG/KG	2.4 U	120 U	0.03 U	0.026 U	11 U
4-Methyl-2-pentanone	MG/KG	2.4 U	120 U	0.03 U	0.026 U	11 U
Acetone	MG/KG	2.4 U	120 U	0.0064 J	0.026 U	11 U
Benzene	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Bromodichloromethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20

Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		0N 20E	10N 30E	10N 36E	20N 10E	20N 50E
Sample ID		0N 20E SOIL	10N 30E SOIL	10N36E 7	20N 10E SOIL	20N 50E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	7.0-7.0	0.0-3.0	0.0-3.0
Date Sampled		01/24/20	01/23/20	02/11/20	01/24/20	01/23/20
Parameter	**Units**					
Volatile Organic Compounds						
Bromoform	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Bromomethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Carbon disulfide	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Carbon tetrachloride	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Chlorobenzene	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Chloroethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Chloroform	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Chloromethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Cyclohexane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Dibromochloromethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Dichlorodifluoromethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Ethylbenzene	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Isopropylbenzene (Cumene)	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Methyl acetate	MG/KG	2.4 U	120 U	0.03 U	0.026 U	11 U
Methyl ethyl ketone (2-Butanone)	MG/KG	2.4 U	120 U	0.03 U	0.026 U	11 U
Methyl tert-butyl ether	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Methylcyclohexane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Methylene chloride	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Styrene	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Tetrachloroethene	MG/KG	48 D	820	0.063	0.074	94
Toluene	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Trichloroethene	MG/KG	0.57	25 U	0.0061 U	0.0039 J	2.8
Trichlorofluoromethane	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		0N 20E	10N 30E	10N 36E	20N 10E	20N 50E
Sample ID		0N 20E SOIL	10N 30E SOIL	10N36E 7	20N 10E SOIL	20N 50E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	7.0-7.0	0.0-3.0	0.0-3.0
Date Sampled		01/24/20	01/23/20	02/11/20	01/24/20	01/23/20
Parameter	Units					
Volatile Organic Compounds						
Vinyl chloride	MG/KG	0.47 U	25 U	0.0061 U	0.0053 U	2.3 U
Xylene (total)	MG/KG	0.95 U	49 U	0.012 U	0.011 U	4.6 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

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[LOGDATE] > #1/1/2020# AND [LOCID] <> 'FIELDQC' AND [PRCCODE] = 'VOA

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		25N 50E	30N 20E	30N 40E	40N 10E	40N 30E
Sample ID		25N50E 8.5	30N 20E SOIL	30N 50E SOIL	40N 10E	40N 30E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		8.5-8.5	0.0-3.0	0.0-3.0	0.0-3.0	0.0-3.0
Date Sampled		02/12/20	01/24/20	01/23/20	01/24/20	01/24/20
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,1,2,2-Tetrachloroethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,1,2-Trichloro-1,2,2-trifluoroethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,1,2-Trichloroethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,1-Dichloroethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,1-Dichloroethene	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,2,4-Trichlorobenzene	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,2-Dibromo-3-chloropropane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,2-Dibromoethane (Ethylene dibromide)	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,2-Dichlorobenzene	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,2-Dichloroethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,2-Dichloroethene (cis)	MG/KG	0.014	0.25	5.6 U	0.034 J	0.27
1,2-Dichloroethene (trans)	MG/KG	0.0066 U	0.10 J	5.6 U	0.11 U	0.23 U
1,2-Dichloropropane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,3-Dichlorobenzene	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,3-Dichloropropene (cis)	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,3-Dichloropropene (trans)	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
1,4-Dichlorobenzene	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
2-Hexanone	MG/KG	0.033 U	1.1 U	28 U	0.54 U	1.1 U
4-Methyl-2-pentanone	MG/KG	0.033 U	1.1 U	28 U	0.54 U	1.1 U
Acetone	MG/KG	0.033 U	1.1 U	28 U	0.54 U	1.1 U
Benzene	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Bromodichloromethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		25N 50E	30N 20E	30N 40E	40N 10E	40N 30E
Sample ID		25N50E 8.5	30N 20E SOIL	30N 50E SOIL	40N 10E	40N 30E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		8.5-8.5	0.0-3.0	0.0-3.0	0.0-3.0	0.0-3.0
Date Sampled		02/12/20	01/24/20	01/23/20	01/24/20	01/24/20
Parameter	**Units**					
Volatile Organic Compounds						
Bromoform	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Bromomethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Carbon disulfide	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Carbon tetrachloride	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Chlorobenzene	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Chloroethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Chloroform	MG/KG	0.00051 J	0.22 U	5.6 U	0.11 U	0.23 U
Chloromethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Cyclohexane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Dibromochloromethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Dichlorodifluoromethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Ethylbenzene	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Isopropylbenzene (Cumene)	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Methyl acetate	MG/KG	0.033 U	1.1 U	28 U	0.54 U	0.38 J
Methyl ethyl ketone (2-Butanone)	MG/KG	0.033 U	1.1 U	28 U	0.54 U	1.1 U
Methyl tert-butyl ether	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Methylcyclohexane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Methylene chloride	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Styrene	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Tetrachloroethene	MG/KG	1.2	14	180	1.9	21
Toluene	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Trichloroethene	MG/KG	0.021	0.46	5.2 J	0.10 J	0.61
Trichlorofluoromethane	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		25N 50E	30N 20E	30N 40E	40N 10E	40N 30E
Sample ID		25N50E 8.5	30N 20E SOIL	30N 50E SOIL	40N 10E	40N 30E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		8.5-8.5	0.0-3.0	0.0-3.0	0.0-3.0	0.0-3.0
Date Sampled		02/12/20	01/24/20	01/23/20	01/24/20	01/24/20
Parameter	Units					
Volatile Organic Compounds						
Vinyl chloride	MG/KG	0.0066 U	0.22 U	5.6 U	0.11 U	0.23 U
Xylene (total)	MG/KG	0.013 U	0.44 U	11 U	0.22 U	0.46 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		40N 40E	40N 40E	40N 50E	40N 50E	42N 20E
Sample ID		40N 40E	40N40E 13	40N 50E SOIL	40N50E 12	42N 20E 11.5-12.3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	13.0-13.0	0.0-3.0	12.0-12.0	11.5-12.3
Date Sampled		01/24/20	02/11/20	01/23/20	02/11/20	02/12/20
Parameter	**Units**					
Volatile Organic Compounds						
1,1,1-Trichloroethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,1,2,2-Tetrachloroethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,1,2-Trichloro-1,2,2-trifluoroethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,1,2-Trichloroethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,1-Dichloroethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,1-Dichloroethene	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,2,4-Trichlorobenzene	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,2-Dibromo-3-chloropropane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,2-Dibromoethane (Ethylene dibromide)	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,2-Dichlorobenzene	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,2-Dichloroethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,2-Dichloroethene (cis)	MG/KG	1.6 J	0.0053 U	4.9 J	0.0058 U	0.0059 U
1,2-Dichloroethene (trans)	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,2-Dichloropropane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,3-Dichlorobenzene	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,3-Dichloropropene (cis)	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,3-Dichloropropene (trans)	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
1,4-Dichlorobenzene	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
2-Hexanone	MG/KG	15 U	0.027 U	69 U	0.029 U	0.029 U
4-Methyl-2-pentanone	MG/KG	15 U	0.027 U	69 U	0.029 U	0.029 U
Acetone	MG/KG	15 U	0.0085 J	69 U	0.029 U	0.029 U
Benzene	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Bromodichloromethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

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[LOGDATE] > #1/1/2020# AND [LOCID] <> 'FIELDQC' AND [PRCCODE] = 'VOA

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		40N 40E	40N 40E	40N 50E	40N 50E	42N 20E
Sample ID		40N 40E	40N40E 13	40N 50E SOIL	40N50E 12	42N 20E 11.5-12.3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	13.0-13.0	0.0-3.0	12.0-12.0	11.5-12.3
Date Sampled		01/24/20	02/11/20	01/23/20	02/11/20	02/12/20
Parameter	**Units**					
Volatile Organic Compounds						
Bromoform	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Bromomethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Carbon disulfide	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Carbon tetrachloride	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Chlorobenzene	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Chloroethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Chloroform	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Chloromethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Cyclohexane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Dibromochloromethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Dichlorodifluoromethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Ethylbenzene	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Isopropylbenzene (Cumene)	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Methyl acetate	MG/KG	15 U	0.027 U	69 U	0.029 U	0.029 U
Methyl ethyl ketone (2-Butanone)	MG/KG	15 U	0.027 U	69 U	0.029 U	0.029 U
Methyl tert-butyl ether	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Methylcyclohexane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Methylene chloride	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Styrene	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Tetrachloroethene	MG/KG	450 D	0.16	640	0.2	0.077
Toluene	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Trichloroethene	MG/KG	4.3	0.0053 U	11 J	0.0018 J	0.0059 U
Trichlorofluoromethane	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		40N 40E	40N 40E	40N 50E	40N 50E	42N 20E
Sample ID		40N 40E	40N40E 13	40N 50E SOIL	40N50E 12	42N 20E 11.5-12.3
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	13.0-13.0	0.0-3.0	12.0-12.0	11.5-12.3
Date Sampled		01/24/20	02/11/20	01/23/20	02/11/20	02/12/20
Parameter	Units					
Volatile Organic Compounds						
Vinyl chloride	MG/KG	2.9 U	0.0053 U	14 U	0.0058 U	0.0059 U
Xylene (total)	MG/KG	5.9 U	0.011 U	28 U	0.012 U	0.012 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By _____

Detection Limits shown are PQL

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		50N 50E	60N 10E	60N 40E	60N 40E	60N 40E
Sample ID		50N 50E SOIL	60N 10E SOIL	60N 40E SOIL	60N40E 8.5-9	60N40E 10-11
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	0.0-3.0	8.5-9.0	10.0-11.0
Date Sampled		01/24/20	01/24/20	01/24/20	02/13/20	02/13/20
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,1,2,2-Tetrachloroethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,1,2-Trichloro-1,2,2-trifluoroethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,1,2-Trichloroethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,1-Dichloroethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,1-Dichloroethene	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,2,4-Trichlorobenzene	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,2-Dibromo-3-chloropropane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,2-Dibromoethane (Ethylene dibromide)	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,2-Dichlorobenzene	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,2-Dichloroethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 UJ	0.25 UJ
1,2-Dichloroethene (cis)	MG/KG	0.54	0.43	2.1	0.55 U	0.16 J
1,2-Dichloroethene (trans)	MG/KG	0.48 U	0.034 J	1.1 U	0.55 U	0.25 U
1,2-Dichloropropane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,3-Dichlorobenzene	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,3-Dichloropropene (cis)	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,3-Dichloropropene (trans)	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
1,4-Dichlorobenzene	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
2-Hexanone	MG/KG	2.4 U	0.57 U	5.7 U	2.7 U	1.3 U
4-Methyl-2-pentanone	MG/KG	2.4 U	0.57 U	5.7 U	2.7 U	1.3 U
Acetone	MG/KG	2.4 U	0.57 UJ	5.7 U	2.7 U	1.3 U
Benzene	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Bromodichloromethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		50N 50E	60N 10E	60N 40E	60N 40E	60N 40E
Sample ID		50N 50E SOIL	60N 10E SOIL	60N 40E SOIL	60N40E 8.5-9	60N40E 10-11
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	0.0-3.0	8.5-9.0	10.0-11.0
Date Sampled		01/24/20	01/24/20	01/24/20	02/13/20	02/13/20
Parameter	Units					
Volatile Organic Compounds						
Bromoform	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Bromomethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Carbon disulfide	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Carbon tetrachloride	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Chlorobenzene	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Chloroethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Chloroform	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Chloromethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Cyclohexane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Dibromochloromethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Dichlorodifluoromethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Ethylbenzene	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Isopropylbenzene (Cumene)	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.98
Methyl acetate	MG/KG	0.64 J	0.24 J	5.7 U	2.7 U	1.3 U
Methyl ethyl ketone (2-Butanone)	MG/KG	2.4 U	0.57 U	5.7 U	2.7 U	1.3 U
Methyl tert-butyl ether	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Methylcyclohexane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Methylene chloride	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Styrene	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Tetrachloroethene	MG/KG	79 D	4.3	100	11	24
Toluene	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Trichloroethene	MG/KG	1.2	0.078 J	2.0	0.55 U	1.1
Trichlorofluoromethane	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		50N 50E	60N 10E	60N 40E	60N 40E	60N 40E
Sample ID		50N 50E SOIL	60N 10E SOIL	60N 40E SOIL	60N40E 8.5-9	60N40E 10-11
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	0.0-3.0	8.5-9.0	10.0-11.0
Date Sampled		01/24/20	01/24/20	01/24/20	02/13/20	02/13/20
Parameter	Units					
Volatile Organic Compounds						
Vinyl chloride	MG/KG	0.48 U	0.11 U	1.1 U	0.55 U	0.25 U
Xylene (total)	MG/KG	0.95 U	0.23 U	2.3 U	1.1 U	0.51 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

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[LOGDATE] > #1/1/2020# AND [LOCID] <> 'FIELDQC' AND [PRCCODE] = 'VOA

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		60N 50E	70N 20E	70N 20E	70N 20E	70N 40E
Sample ID		60N 50E SOIL	70N 20E	70N 20E	70N20E 12-12.5	70N 40E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	0.0-3.0	12.0-12.5	0.0-3.0
Date Sampled		01/24/20	01/24/20	01/24/20	02/12/20	01/23/20
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,1,2,2-Tetrachloroethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,1,2-Trichloro-1,2,2-trifluoroethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,1,2-Trichloroethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,1-Dichloroethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,1-Dichloroethene	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,2,4-Trichlorobenzene	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,2-Dibromo-3-chloropropane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,2-Dibromoethane (Ethylene dibromide)	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,2-Dichlorobenzene	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,2-Dichloroethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,2-Dichloroethene (cis)	MG/KG	0.25	2.8	1.7	0.0014 J	0.094 J
1,2-Dichloroethene (trans)	MG/KG	0.11 U	0.42	0.28	0.0056 U	0.32 U
1,2-Dichloropropane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,3-Dichlorobenzene	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,3-Dichloropropene (cis)	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,3-Dichloropropene (trans)	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
1,4-Dichlorobenzene	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
2-Hexanone	MG/KG	0.57 U	1.2 U	0.57 U	0.028 U	1.6 U
4-Methyl-2-pentanone	MG/KG	0.57 U	1.2 U	0.57 U	0.028 U	1.6 U
Acetone	MG/KG	0.57 U	1.2 U	0.57 U	0.028 U	1.6 U
Benzene	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Bromodichloromethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By _____

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		60N 50E	70N 20E	70N 20E	70N 20E	70N 40E
Sample ID		60N 50E SOIL	70N 20E	70N 20E	70N20E 12-12.5	70N 40E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	0.0-3.0	12.0-12.5	0.0-3.0
Date Sampled		01/24/20	01/24/20	01/24/20	02/12/20	01/23/20
Parameter	**Units**					
Volatile Organic Compounds						
Bromoform	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Bromomethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Carbon disulfide	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Carbon tetrachloride	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Chlorobenzene	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Chloroethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Chloroform	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Chloromethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Cyclohexane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Dibromochloromethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Dichlorodifluoromethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Ethylbenzene	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Isopropylbenzene (Cumene)	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Methyl acetate	MG/KG	0.18 J	0.91 J	0.60	0.028 U	1.6 U
Methyl ethyl ketone (2-Butanone)	MG/KG	0.57 U	1.2 U	0.57 U	0.028 U	1.6 U
Methyl tert-butyl ether	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Methylcyclohexane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Methylene chloride	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Styrene	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Tetrachloroethene	MG/KG	5.2	15	15 D	1.4	9.6
Toluene	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Trichloroethene	MG/KG	0.21	0.52	0.35	0.009	0.32 U
Trichlorofluoromethane	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		60N 50E	70N 20E	70N 20E	70N 20E	70N 40E
Sample ID		60N 50E SOIL	70N 20E	70N 20E	70N20E 12-12.5	70N 40E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	0.0-3.0	12.0-12.5	0.0-3.0
Date Sampled		01/24/20	01/24/20	01/24/20	02/12/20	01/23/20
Parameter	Units					
Volatile Organic Compounds						
Vinyl chloride	MG/KG	0.11 U	0.24 U	0.11 U	0.0056 U	0.32 U
Xylene (total)	MG/KG	0.23 U	0.47 U	0.23 U	0.011 U	0.64 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

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[LOGDATE] > #1/1/2020# AND [LOCID] <> 'FIELDQC' AND [PRCCODE] = 'VOA

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		70N 50E	80N 30E	80N 35E	80N 35E	80N 35E
Sample ID		70N 50E	80N 30E SOIL	80N35E 4-5	FD-200212-2	80N35E 9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled		01/24/20	01/23/20	02/12/20	02/12/20	02/12/20
Parameter	Units				Field Duplicate (1-1)	
Volatile Organic Compounds						
1,1,1-Trichloroethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,1,2,2-Tetrachloroethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,1,2-Trichloro-1,2,2-trifluoroethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,1,2-Trichloroethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,1-Dichloroethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,1-Dichloroethene	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,2,4-Trichlorobenzene	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,2-Dibromo-3-chloropropane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,2-Dibromoethane (Ethylene dibromide)	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,2-Dichlorobenzene	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,2-Dichloroethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 UJ
1,2-Dichloroethene (cis)	MG/KG	0.12	0.53	0.014	0.015	3 U
1,2-Dichloroethene (trans)	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,2-Dichloropropane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,3-Dichlorobenzene	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,3-Dichloropropene (cis)	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,3-Dichloropropene (trans)	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
1,4-Dichlorobenzene	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
2-Hexanone	MG/KG	0.62 U	1.2 U	0.028 U	0.028 U	15 U
4-Methyl-2-pentanone	MG/KG	0.62 U	1.2 U	0.028 U	0.028 U	15 U
Acetone	MG/KG	0.62 U	1.2 U	0.0068 J	0.028 U	15 U
Benzene	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Bromodichloromethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		70N 50E	80N 30E	80N 35E	80N 35E	80N 35E
Sample ID		70N 50E	80N 30E SOIL	80N35E 4-5	FD-200212-2	80N35E 9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled		01/24/20	01/23/20	02/12/20	02/12/20	02/12/20
Parameter	Units				Field Duplicate (1-1)	
Volatile Organic Compounds						
Bromoform	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Bromomethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Carbon disulfide	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Carbon tetrachloride	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Chlorobenzene	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Chloroethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Chloroform	MG/KG	0.12 U	0.24 U	0.00097 J	0.0011 J	3 U
Chloromethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Cyclohexane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Dibromochloromethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Dichlorodifluoromethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Ethylbenzene	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Isopropylbenzene (Cumene)	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Methyl acetate	MG/KG	0.62 U	1.2 U	0.028 U	0.028 U	15 U
Methyl ethyl ketone (2-Butanone)	MG/KG	0.62 U	1.2 U	0.028 U	0.028 U	15 U
Methyl tert-butyl ether	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Methylcyclohexane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Methylene chloride	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Styrene	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Tetrachloroethene	MG/KG	8.4	48 D	200	190	170
Toluene	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Trichloroethene	MG/KG	0.14	0.75	0.021	0.021	3 U
Trichlorofluoromethane	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		70N 50E	80N 30E	80N 35E	80N 35E	80N 35E
Sample ID		70N 50E	80N 30E SOIL	80N35E 4-5	FD-200212-2	80N35E 9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled		01/24/20	01/23/20	02/12/20	02/12/20	02/12/20
Parameter	Units				Field Duplicate (1-1)	
Volatile Organic Compounds						
Vinyl chloride	MG/KG	0.12 U	0.24 U	0.0057 U	0.0056 U	3 U
Xylene (total)	MG/KG	0.25 U	0.48 U	0.011 U	0.011 U	5.9 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		80N 35E	80N 40E	90N 10E	90N 10E	90N 50E
Sample ID		80N35E 11-12	80N 40E SOIL	90N 10E SOIL	90N16E 6-6.5	90N 50E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		11.0-12.0	0.0-3.0	0.0-3.0	6.0-6.5	0.0-3.0
Date Sampled		02/12/20	01/23/20	01/24/20	02/13/20	01/24/20
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,1,2,2-Tetrachloroethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,1,2-Trichloro-1,2,2-trifluoroethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,1,2-Trichloroethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,1-Dichloroethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,1-Dichloroethene	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,2,4-Trichlorobenzene	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,2-Dibromo-3-chloropropane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,2-Dibromoethane (Ethylene dibromide)	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,2-Dichlorobenzene	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,2-Dichloroethane	MG/KG	100 UJ	0.0051 U	0.11 U	0.0055 U	0.23 U
1,2-Dichloroethene (cis)	MG/KG	100 U	0.0051 U	0.051 J	0.0055 U	0.85
1,2-Dichloroethene (trans)	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,2-Dichloropropane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,3-Dichlorobenzene	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,3-Dichloropropene (cis)	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,3-Dichloropropene (trans)	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
1,4-Dichlorobenzene	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
2-Hexanone	MG/KG	510 U	0.025 U	0.56 U	0.028 U	1.2 U
4-Methyl-2-pentanone	MG/KG	510 U	0.025 U	0.56 U	0.028 U	1.2 U
Acetone	MG/KG	510 U	0.025 U	0.56 U	0.028 U	1.2 U
Benzene	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Bromodichloromethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		80N 35E	80N 40E	90N 10E	90N 10E	90N 50E
Sample ID		80N35E 11-12	80N 40E SOIL	90N 10E SOIL	90N16E 6-6.5	90N 50E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		11.0-12.0	0.0-3.0	0.0-3.0	6.0-6.5	0.0-3.0
Date Sampled		02/12/20	01/23/20	01/24/20	02/13/20	01/24/20
Parameter	Units					
Volatile Organic Compounds						
Bromoform	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Bromomethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Carbon disulfide	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Carbon tetrachloride	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Chlorobenzene	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Chloroethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Chloroform	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Chloromethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Cyclohexane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Dibromochloromethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Dichlorodifluoromethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Ethylbenzene	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Isopropylbenzene (Cumene)	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Methyl acetate	MG/KG	510 U	0.025 U	0.56 U	0.028 U	1.2 U
Methyl ethyl ketone (2-Butanone)	MG/KG	510 U	0.025 U	0.56 U	0.028 U	1.2 U
Methyl tert-butyl ether	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Methylcyclohexane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Methylene chloride	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Styrene	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Tetrachloroethene	MG/KG	7,400	0.024	5.2	0.16	37 D
Toluene	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Trichloroethene	MG/KG	100 U	0.0051 U	0.12	0.0055 U	0.97
Trichlorofluoromethane	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		80N 35E	80N 40E	90N 10E	90N 10E	90N 50E
Sample ID		80N35E 11-12	80N 40E SOIL	90N 10E SOIL	90N16E 6-6.5	90N 50E SOIL
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		11.0-12.0	0.0-3.0	0.0-3.0	6.0-6.5	0.0-3.0
Date Sampled		02/12/20	01/23/20	01/24/20	02/13/20	01/24/20
Parameter	Units					
Volatile Organic Compounds						
Vinyl chloride	MG/KG	100 U	0.0051 U	0.11 U	0.0055 U	0.23 U
Xylene (total)	MG/KG	210 U	0.010 U	0.22 U	0.011 U	0.46 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		90N 50E	100N 20E	100N 35E	100N 40E	110N 20E
Sample ID		90N50E 5	100N 20E SOIL	100N35E 7-7.5	100N 40E SOIL	110N20E 10-10.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		5.0-5.0	0.0-3.0	7.0-7.5	0.0-3.0	10.0-10.5
Date Sampled		02/12/20	01/24/20	02/13/20	01/23/20	02/13/20
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,1,2,2-Tetrachloroethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,1,2-Trichloro-1,2,2-trifluoroethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,1,2-Trichloroethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,1-Dichloroethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,1-Dichloroethene	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,2,4-Trichlorobenzene	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,2-Dibromo-3-chloropropane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,2-Dibromoethane (Ethylene dibromide)	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,2-Dichlorobenzene	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,2-Dichloroethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,2-Dichloroethene (cis)	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.012
1,2-Dichloroethene (trans)	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,2-Dichloropropane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,3-Dichlorobenzene	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,3-Dichloropropene (cis)	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,3-Dichloropropene (trans)	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
1,4-Dichlorobenzene	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
2-Hexanone	MG/KG	0.03 U	0.56 U	0.028 U	0.025 U	0.03 U
4-Methyl-2-pentanone	MG/KG	0.03 U	0.56 U	0.028 U	0.025 U	0.03 U
Acetone	MG/KG	0.03 U	0.56 U	0.028 U	0.025 U	0.03 U
Benzene	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Bromodichloromethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		90N 50E	100N 20E	100N 35E	100N 40E	110N 20E
Sample ID		90N50E 5	100N 20E SOIL	100N35E 7-7.5	100N 40E SOIL	110N20E 10-10.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		5.0-5.0	0.0-3.0	7.0-7.5	0.0-3.0	10.0-10.5
Date Sampled		02/12/20	01/24/20	02/13/20	01/23/20	02/13/20
Parameter	**Units**					
Volatile Organic Compounds						
Bromoform	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Bromomethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Carbon disulfide	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Carbon tetrachloride	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Chlorobenzene	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Chloroethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Chloroform	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Chloromethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Cyclohexane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Dibromochloromethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Dichlorodifluoromethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Ethylbenzene	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Isopropylbenzene (Cumene)	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Methyl acetate	MG/KG	0.03 U	0.56 U	0.028 U	0.025 U	0.03 U
Methyl ethyl ketone (2-Butanone)	MG/KG	0.03 U	0.56 U	0.028 U	0.025 U	0.03 U
Methyl tert-butyl ether	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Methylcyclohexane	MG/KG	0.0059 U	0.056 J	0.0055 U	0.0051 U	0.0059 U
Methylene chloride	MG/KG	0.0032 J	0.11 U	0.0055 U	0.0051 U	0.0059 U
Styrene	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Tetrachloroethene	MG/KG	0.012	6.0	0.047	0.031	0.44
Toluene	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Trichloroethene	MG/KG	0.0059 U	0.047 J	0.0055 U	0.0051 U	0.0095
Trichlorofluoromethane	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U

Flags assigned during chemistry validation are shown.

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		90N 50E	100N 20E	100N 35E	100N 40E	110N 20E
Sample ID		90N50E 5	100N 20E SOIL	100N35E 7-7.5	100N 40E SOIL	110N20E 10-10.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		5.0-5.0	0.0-3.0	7.0-7.5	0.0-3.0	10.0-10.5
Date Sampled		02/12/20	01/24/20	02/13/20	01/23/20	02/13/20
Parameter	Units					
Volatile Organic Compounds						
Vinyl chloride	MG/KG	0.0059 U	0.11 U	0.0055 U	0.0051 U	0.0059 U
Xylene (total)	MG/KG	0.012 U	0.23 U	0.011 U	0.010 U	0.012 U

Flags assigned during chemistry validation are shown.

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[LOGDATE] > #1/1/2020# AND [LOCID] <> 'FIELDQC' AND [PRCCODE] = 'VOA

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		110N 30E	110N 50E	MW-13OB	MW-13I	MW-13S
Sample ID		110N 30E SOIL	110N 50E SOIL	MW-13OB 7.5-8.5	MW-13I 7-7.5	MW-13S 7.5-8.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	7.5-8.5	7.0-7.5	7.5-8.5
Date Sampled		01/24/20	01/24/20	04/15/20	04/20/20	04/20/20
Parameter	Units					
Volatile Organic Compounds						
1,1,1-Trichloroethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,1,2,2-Tetrachloroethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,1,2-Trichloro-1,2,2-trifluoroethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,1,2-Trichloroethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,1-Dichloroethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,1-Dichloroethene	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,2,4-Trichlorobenzene	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,2-Dibromo-3-chloropropane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,2-Dibromoethane (Ethylene dibromide)	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,2-Dichlorobenzene	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,2-Dichloroethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,2-Dichloroethene (cis)	MG/KG	0.11 U	0.046 J	0.11 U	0.47 U	0.12 U
1,2-Dichloroethene (trans)	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,2-Dichloropropane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,3-Dichlorobenzene	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,3-Dichloropropene (cis)	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,3-Dichloropropene (trans)	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
1,4-Dichlorobenzene	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
2-Hexanone	MG/KG	0.57 U	0.56 U	0.57 U	2.3 U	0.62 U
4-Methyl-2-pentanone	MG/KG	0.57 U	0.56 U	0.57 U	2.3 U	0.62 U
Acetone	MG/KG	0.57 U	0.56 U	0.57 U	2.3 U	0.62 U
Benzene	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Bromodichloromethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
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Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		110N 30E	110N 50E	MW-13OB	MW-13I	MW-13S
Sample ID		110N 30E SOIL	110N 50E SOIL	MW-13OB 7.5-8.5	MW-13I 7-7.5	MW-13S 7.5-8.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	7.5-8.5	7.0-7.5	7.5-8.5
Date Sampled		01/24/20	01/24/20	04/15/20	04/20/20	04/20/20
Parameter	**Units**					
Volatile Organic Compounds						
Bromoform	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Bromomethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Carbon disulfide	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Carbon tetrachloride	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Chlorobenzene	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Chloroethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Chloroform	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Chloromethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Cyclohexane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Dibromochloromethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Dichlorodifluoromethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Ethylbenzene	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Isopropylbenzene (Cumene)	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Methyl acetate	MG/KG	0.34 J	0.56 U	0.57 U	2.3 U	0.62 U
Methyl ethyl ketone (2-Butanone)	MG/KG	0.57 U	0.56 U	0.57 U	2.3 U	0.62 U
Methyl tert-butyl ether	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Methylcyclohexane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Methylene chloride	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Styrene	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Tetrachloroethene	MG/KG	9.7	3.9	0.48	31	0.89
Toluene	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Trichloroethene	MG/KG	0.13	0.093 J	0.11 U	0.46 J	0.12 U
Trichlorofluoromethane	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U

Flags assigned during chemistry validation are shown.

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Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		110N 30E	110N 50E	MW-13OB	MW-13I	MW-13S
Sample ID		110N 30E SOIL	110N 50E SOIL	MW-13OB 7.5-8.5	MW-13I 7-7.5	MW-13S 7.5-8.5
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	7.5-8.5	7.0-7.5	7.5-8.5
Date Sampled		01/24/20	01/24/20	04/15/20	04/20/20	04/20/20
Parameter	Units					
Volatile Organic Compounds						
Vinyl chloride	MG/KG	0.11 U	0.11 U	0.11 U	0.47 U	0.12 U
Xylene (total)	MG/KG	0.23 U	0.23 U	0.23 U	0.93 U	0.25 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

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[LOGDATE] > #1/1/2020# AND [LOCID] <> 'FIELDQC' AND [PRCCODE] = 'VOA

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		MW-14I	MW-14S	MW-14S
Sample ID		MW-14I 8-8.5	MW-14S 8.5-9.0	MW-14S 10-11
Matrix		Soil	Soil	Soil
Depth Interval (ft)		8.0-8.5	8.5-9.0	10.0-11.0
Date Sampled		04/16/20	04/16/20	04/16/20
Parameter	**Units**			
Volatile Organic Compounds				
1,1,1-Trichloroethane	MG/KG	0.13 U	58 U	2.3 U
1,1,2,2-Tetrachloroethane	MG/KG	0.13 U	58 U	2.3 U
1,1,2-Trichloro-1,2,2-trifluoroethane	MG/KG	0.13 U	58 U	2.3 U
1,1,2-Trichloroethane	MG/KG	0.13 U	58 U	2.3 U
1,1-Dichloroethane	MG/KG	0.13 U	58 U	2.3 U
1,1-Dichloroethene	MG/KG	0.13 U	58 U	2.3 U
1,2,4-Trichlorobenzene	MG/KG	0.13 U	58 U	2.3 U
1,2-Dibromo-3-chloropropane	MG/KG	0.13 U	58 U	2.3 U
1,2-Dibromoethane (Ethylene dibromide)	MG/KG	0.13 U	58 U	2.3 U
1,2-Dichlorobenzene	MG/KG	0.13 U	58 U	2.3 U
1,2-Dichloroethane	MG/KG	0.13 U	58 U	2.3 U
1,2-Dichloroethene (cis)	MG/KG	0.13 U	58 U	2.3 U
1,2-Dichloroethene (trans)	MG/KG	0.13 U	58 U	2.3 U
1,2-Dichloropropane	MG/KG	0.13 U	58 U	2.3 U
1,3-Dichlorobenzene	MG/KG	0.13 U	58 U	2.3 U
1,3-Dichloropropene (cis)	MG/KG	0.13 U	58 U	2.3 U
1,3-Dichloropropene (trans)	MG/KG	0.13 U	58 U	2.3 U
1,4-Dichlorobenzene	MG/KG	0.13 U	58 U	2.3 U
2-Hexanone	MG/KG	0.66 U	290 U	12 U
4-Methyl-2-pentanone	MG/KG	0.66 U	290 U	12 U
Acetone	MG/KG	0.66 U	290 U	12 U
Benzene	MG/KG	0.13 U	58 U	2.3 U
Bromodichloromethane	MG/KG	0.13 U	58 U	2.3 U

Flags assigned during chemistry validation are shown.

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Checked By PRF 6/25/20

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		MW-14I	MW-14S	MW-14S
Sample ID		MW-14I 8-8.5	MW-14S 8.5-9.0	MW-14S 10-11
Matrix		Soil	Soil	Soil
Depth Interval (ft)		8.0-8.5	8.5-9.0	10.0-11.0
Date Sampled		04/16/20	04/16/20	04/16/20
Parameter	**Units**			
Volatile Organic Compounds				
Bromoform	MG/KG	0.13 U	58 U	2.3 U
Bromomethane	MG/KG	0.13 U	58 U	2.3 U
Carbon disulfide	MG/KG	0.13 U	58 U	2.3 U
Carbon tetrachloride	MG/KG	0.13 U	58 U	2.3 U
Chlorobenzene	MG/KG	0.13 U	58 U	2.3 U
Chloroethane	MG/KG	0.13 U	58 U	2.3 U
Chloroform	MG/KG	0.13 U	58 U	2.3 U
Chloromethane	MG/KG	0.13 U	58 U	2.3 U
Cyclohexane	MG/KG	0.13 U	58 U	2.3 U
Dibromochloromethane	MG/KG	0.13 U	58 U	2.3 U
Dichlorodifluoromethane	MG/KG	0.13 U	58 U	2.3 U
Ethylbenzene	MG/KG	0.13 U	58 U	2.3 U
Isopropylbenzene (Cumene)	MG/KG	0.13 U	58 U	2.3 U
Methyl acetate	MG/KG	0.37 J	290 U	12 U
Methyl ethyl ketone (2-Butanone)	MG/KG	0.66 U	290 U	12 U
Methyl tert-butyl ether	MG/KG	0.13 U	58 U	2.3 U
Methylcyclohexane	MG/KG	0.13 U	58 U	2.3 U
Methylene chloride	MG/KG	0.13 U	58 U	2.3 U
Styrene	MG/KG	0.13 U	58 U	2.3 U
Tetrachloroethene	MG/KG	1.8	2,000	90
Toluene	MG/KG	0.13 U	58 U	2.3 U
Trichloroethene	MG/KG	0.13 U	58 U	2.3 U
Trichlorofluoromethane	MG/KG	0.13 U	58 U	2.3 U

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Made By: AMK 6/18/20
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Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		MW-14I	MW-14S	MW-14S
Sample ID		MW-14I 8-8.5	MW-14S 8.5-9.0	MW-14S 10-11
Matrix		Soil	Soil	Soil
Depth Interval (ft)		8.0-8.5	8.5-9.0	10.0-11.0
Date Sampled		04/16/20	04/16/20	04/16/20
Parameter	Units			
Volatile Organic Compounds				
Vinyl chloride	MG/KG	0.13 U	58 U	2.3 U
Xylene (total)	MG/KG	0.26 U	120 U	4.7 U

Flags assigned during chemistry validation are shown.

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		20N 10E	40N 30E	40N 40E	42N 20E	42N 20E
Sample ID		20N 10E SOIL	40N 30E SOIL	40N 40E	42N 20E 11.5-12.3	DUP-200212-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	14.0-16.0	11.5-12.3	11.5-12.3
Date Sampled		01/24/20	01/24/20	02/11/20	02/12/20	02/12/20
Parameter	Units					Field Duplicate (1-1)
Semivolatile Organic Compounds						
1,1-Biphenyl	MG/KG	0.60 J	NA	NA	NA	NA
1,4-Dioxane	MG/KG	2.1 U	NA	NA	NA	NA
2,2-oxybis(1-Chloropropane)	MG/KG	3.6 U	NA	NA	NA	NA
2,4,5-Trichlorophenol	MG/KG	3.6 U	NA	NA	NA	NA
2,4,6-Trichlorophenol	MG/KG	3.6 U	NA	NA	NA	NA
2,4-Dichlorophenol	MG/KG	3.6 U	NA	NA	NA	NA
2,4-Dimethylphenol	MG/KG	3.6 U	NA	NA	NA	NA
2,4-Dinitrophenol	MG/KG	35 U	NA	NA	NA	NA
2,4-Dinitrotoluene	MG/KG	3.6 U	NA	NA	NA	NA
2,6-Dinitrotoluene	MG/KG	3.6 U	NA	NA	NA	NA
2-Chloronaphthalene	MG/KG	3.6 U	NA	NA	NA	NA
2-Chlorophenol	MG/KG	6.9 U	NA	NA	NA	NA
2-Methylnaphthalene	MG/KG	2.0 J	NA	NA	NA	NA
2-Methylphenol (o-cresol)	MG/KG	3.6 U	NA	NA	NA	NA
2-Nitroaniline	MG/KG	6.9 U	NA	NA	NA	NA
2-Nitrophenol	MG/KG	3.6 U	NA	NA	NA	NA
3,3-Dichlorobenzidine	MG/KG	6.9 U	NA	NA	NA	NA
3-Nitroaniline	MG/KG	6.9 U	NA	NA	NA	NA
4,6-Dinitro-2-methylphenol	MG/KG	6.9 U	NA	NA	NA	NA
4-Bromophenyl-phenylether	MG/KG	3.6 U	NA	NA	NA	NA
4-Chloro-3-methylphenol	MG/KG	3.6 U	NA	NA	NA	NA
4-Chloroaniline	MG/KG	3.6 U	NA	NA	NA	NA
4-Chlorophenyl-phenylether	MG/KG	3.6 U	NA	NA	NA	NA

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		20N 10E	40N 30E	40N 40E	42N 20E	42N 20E
Sample ID		20N 10E SOIL	40N 30E SOIL	40N 40E	42N 20E 11.5-12.3	DUP-200212-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	14.0-16.0	11.5-12.3	11.5-12.3
Date Sampled		01/24/20	01/24/20	02/11/20	02/12/20	02/12/20
Parameter	Units					Field Duplicate (1-1)
Semivolatile Organic Compounds						
4-Methylphenol (p-cresol)	MG/KG	6.9 U	NA	NA	NA	NA
4-Nitroaniline	MG/KG	6.9 U	NA	NA	NA	NA
4-Nitrophenol	MG/KG	6.9 U	NA	NA	NA	NA
Acenaphthene	MG/KG	5.7	NA	NA	NA	NA
Acenaphthylene	MG/KG	1.1 J	NA	NA	NA	NA
Acetophenone	MG/KG	3.6 U	NA	NA	NA	NA
Anthracene	MG/KG	19	NA	NA	NA	NA
Atrazine	MG/KG	3.6 U	NA	NA	NA	NA
Benzaldehyde	MG/KG	3.6 U	NA	NA	NA	NA
Benzo(a)anthracene	MG/KG	39	NA	NA	NA	NA
Benzo(a)pyrene	MG/KG	33	NA	NA	NA	NA
Benzo(b)fluoranthene	MG/KG	37	NA	NA	NA	NA
Benzo(g,h,i)perylene	MG/KG	22	NA	NA	NA	NA
Benzo(k)fluoranthene	MG/KG	18	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	MG/KG	3.6 U	NA	NA	NA	NA
bis(2-Chloroethyl)ether	MG/KG	3.6 U	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	MG/KG	3.6 U	NA	NA	NA	NA
Butylbenzylphthalate	MG/KG	3.6 U	NA	NA	NA	NA
Caprolactam	MG/KG	3.6 U	NA	NA	NA	NA
Carbazole	MG/KG	10	NA	NA	NA	NA
Chrysene	MG/KG	37	NA	NA	NA	NA
Dibenz(a,h)anthracene	MG/KG	7.3	NA	NA	NA	NA
Dibenzofuran	MG/KG	4.2	NA	NA	NA	NA

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		20N 10E	40N 30E	40N 40E	42N 20E	42N 20E
Sample ID		20N 10E SOIL	40N 30E SOIL	40N 40E	42N 20E 11.5-12.3	DUP-200212-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	14.0-16.0	11.5-12.3	11.5-12.3
Date Sampled		01/24/20	01/24/20	02/11/20	02/12/20	02/12/20
Parameter	Units					Field Duplicate (1-1)
Semivolatile Organic Compounds						
Diethylphthalate	MG/KG	3.6 U	NA	NA	NA	NA
Dimethylphthalate	MG/KG	3.6 U	NA	NA	NA	NA
Di-n-butylphthalate	MG/KG	3.6 U	NA	NA	NA	NA
Di-n-octylphthalate	MG/KG	3.6 U	NA	NA	NA	NA
Fluoranthene	MG/KG	80	NA	NA	NA	NA
Fluorene	MG/KG	7.2	NA	NA	NA	NA
Hexachlorobenzene	MG/KG	3.6 U	NA	NA	NA	NA
Hexachlorobutadiene	MG/KG	3.6 U	NA	NA	NA	NA
Hexachlorocyclopentadiene	MG/KG	3.6 UJ	NA	NA	NA	NA
Hexachloroethane	MG/KG	3.6 U	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	MG/KG	21	NA	NA	NA	NA
Isophorone	MG/KG	3.6 U	NA	NA	NA	NA
Naphthalene	MG/KG	3.4 J	NA	NA	NA	NA
Nitrobenzene	MG/KG	3.6 U	NA	NA	NA	NA
N-Nitroso-di-n-propylamine	MG/KG	3.6 U	NA	NA	NA	NA
N-Nitrosodiphenylamine	MG/KG	3.6 U	NA	NA	NA	NA
Pentachlorophenol	MG/KG	6.9 U	NA	NA	NA	NA
Phenanthrene	MG/KG	74	NA	NA	NA	NA
Phenol	MG/KG	3.6 U	NA	NA	NA	NA
Pyrene	MG/KG	68	NA	NA	NA	NA
Pesticide Organic Compounds						
4,4'-DDD	MG/KG	0.035 U	NA	NA	NA	NA
4,4'-DDE	MG/KG	0.035 U	NA	NA	NA	NA

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		20N 10E	40N 30E	40N 40E	42N 20E	42N 20E
Sample ID		20N 10E SOIL	40N 30E SOIL	40N 40E	42N 20E 11.5-12.3	DUP-200212-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	14.0-16.0	11.5-12.3	11.5-12.3
Date Sampled		01/24/20	01/24/20	02/11/20	02/12/20	02/12/20
Parameter	Units					Field Duplicate (1-1)
Pesticide Organic Compounds						
4,4'-DDT	MG/KG	0.035 U	NA	NA	NA	NA
Aldrin	MG/KG	0.035 U	NA	NA	NA	NA
alpha-BHC	MG/KG	0.035 U	NA	NA	NA	NA
alpha-Chlordane	MG/KG	0.035 U	NA	NA	NA	NA
beta-BHC	MG/KG	0.035 U	NA	NA	NA	NA
delta-BHC	MG/KG	0.035 U	NA	NA	NA	NA
Dieldrin	MG/KG	0.035 U	NA	NA	NA	NA
Endosulfan I	MG/KG	0.035 U	NA	NA	NA	NA
Endosulfan II	MG/KG	0.035 U	NA	NA	NA	NA
Endosulfan sulfate	MG/KG	0.035 U	NA	NA	NA	NA
Endrin	MG/KG	0.011 J	NA	NA	NA	NA
Endrin aldehyde	MG/KG	0.12 J	NA	NA	NA	NA
Endrin ketone	MG/KG	0.035 U	NA	NA	NA	NA
gamma-BHC (Lindane)	MG/KG	0.035 U	NA	NA	NA	NA
gamma-Chlordane	MG/KG	0.035 U	NA	NA	NA	NA
Heptachlor	MG/KG	0.035 U	NA	NA	NA	NA
Heptachlor epoxide	MG/KG	0.035 U	NA	NA	NA	NA
Methoxychlor	MG/KG	0.035 U	NA	NA	NA	NA
Toxaphene	MG/KG	0.35 U	NA	NA	NA	NA
Herbicides						
2,4,5-T	MG/KG	0.017 U	NA	NA	NA	NA
2,4,5-TP (Silvex)	MG/KG	0.017 U	NA	NA	NA	NA
2,4-D	MG/KG	0.017 U	NA	NA	NA	NA

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		20N 10E	40N 30E	40N 40E	42N 20E	42N 20E
Sample ID		20N 10E SOIL	40N 30E SOIL	40N 40E	42N 20E 11.5-12.3	DUP-200212-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	14.0-16.0	11.5-12.3	11.5-12.3
Date Sampled		01/24/20	01/24/20	02/11/20	02/12/20	02/12/20
Parameter	Units					Field Duplicate (1-1)
Polychlorinated Biphenyls						
Aroclor 1016	MG/KG	0.24 U	NA	NA	NA	NA
Aroclor 1221	MG/KG	0.24 U	NA	NA	NA	NA
Aroclor 1232	MG/KG	0.24 U	NA	NA	NA	NA
Aroclor 1242	MG/KG	0.24 U	NA	NA	NA	NA
Aroclor 1248	MG/KG	0.24 U	NA	NA	NA	NA
Aroclor 1254	MG/KG	0.24 U	NA	NA	NA	NA
Aroclor 1260	MG/KG	0.24 U	NA	NA	NA	NA
Aroclor 1262	MG/KG	0.24 U	NA	NA	NA	NA
Aroclor 1268	MG/KG	0.24 U	NA	NA	NA	NA
Metals						
Aluminum	MG/KG	NA	8,320	NA	NA	NA
Antimony	MG/KG	NA	1.6 J	NA	NA	NA
Arsenic	MG/KG	NA	5.2	NA	NA	NA
Barium	MG/KG	NA	82.7	NA	NA	NA
Beryllium	MG/KG	NA	0.42	NA	NA	NA
Cadmium	MG/KG	NA	0.23	NA	NA	NA
Calcium	MG/KG	NA	64,700	NA	NA	NA
Chromium	MG/KG	NA	13.6	NA	NA	NA
Cobalt	MG/KG	NA	4.8	NA	NA	NA
Copper	MG/KG	NA	23.3	NA	NA	NA
Iron	MG/KG	NA	13,000	NA	NA	NA
Lead	MG/KG	NA	91.7	NA	NA	NA
Magnesium	MG/KG	NA	17,500	NA	NA	NA

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Checked By PRF 6/25/20

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		20N 10E	40N 30E	40N 40E	42N 20E	42N 20E
Sample ID		20N 10E SOIL	40N 30E SOIL	40N 40E	42N 20E 11.5-12.3	DUP-200212-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	14.0-16.0	11.5-12.3	11.5-12.3
Date Sampled		01/24/20	01/24/20	02/11/20	02/12/20	02/12/20
Parameter	Units					Field Duplicate (1-1)
Metals						
Manganese	MG/KG	NA	395	NA	NA	NA
Mercury	MG/KG	NA	0.15	NA	NA	NA
Nickel	MG/KG	NA	14.2	NA	NA	NA
Potassium	MG/KG	NA	1,910	NA	NA	NA
Selenium	MG/KG	NA	4.4 U	NA	NA	NA
Silver	MG/KG	NA	0.66 U	NA	NA	NA
Sodium	MG/KG	NA	283	NA	NA	NA
Thallium	MG/KG	NA	6.6 U	NA	NA	NA
Vanadium	MG/KG	NA	18.6	NA	NA	NA
Zinc	MG/KG	NA	72.6	NA	NA	NA
Miscellaneous Parameters						
Cyanide	MG/KG	0.97 U	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances						
Perfluorobutanesulfonic acid (PFBS)	UG/KG	NA	NA	0.026 J	0.24 U	0.23 U
Perfluorobutanoic acid (PFBA)	UG/KG	NA	NA	0.21 U	0.24 U	0.23 U
Perfluorodecane sulfonate (PFDS)	UG/KG	NA	NA	0.31 J	0.24 U	0.23 U
Perfluorodecanoic acid (PFDA)	UG/KG	NA	NA	0.16 J	0.24 U	0.23 U
Perfluorododecanoic acid (PFDoA)	UG/KG	NA	NA	0.21 U	0.24 U	0.23 U
Perfluoroheptanesulfonic acid (PFHpS)	UG/KG	NA	NA	0.21 U	0.24 U	0.23 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	NA	NA	0.075 J	0.24 U	0.23 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	NA	NA	0.35 J	0.24 U	0.23 U
Perfluorohexanoic acid (PFHxA)	UG/KG	NA	NA	0.21 U	0.24 U	0.23 U
Perfluorononanoic acid (PFNA)	UG/KG	NA	NA	0.070 J	0.24 U	0.23 U

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		20N 10E	40N 30E	40N 40E	42N 20E	42N 20E
Sample ID		20N 10E SOIL	40N 30E SOIL	40N 40E	42N 20E 11.5-12.3	DUP-200212-1
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	14.0-16.0	11.5-12.3	11.5-12.3
Date Sampled		01/24/20	01/24/20	02/11/20	02/12/20	02/12/20
Parameter	Units					Field Duplicate (1-1)
Per- and Polyfluoroalkyl Substances						
Perfluorooctane sulfonamide (PFOSA)	UG/KG	NA	NA	0.32 J	0.24 U	0.23 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	NA	NA	2.0 J	0.59 U	0.23 J
Perfluorooctanoic acid (PFOA)	UG/KG	NA	NA	0.60 J	0.24 U	0.23 U
Perfluoropentanoic acid (PFPeA)	UG/KG	NA	NA	0.21 U	0.24 U	0.23 U
Perfluorotetradecanoic acid (PFTeA)	UG/KG	NA	NA	0.21 U	0.24 U	0.23 U
Perfluorotridecanoic acid (PFTriA)	UG/KG	NA	NA	0.21 U	0.24 U	0.23 U
Perfluoroundecanoic acid (PFUnA)	UG/KG	NA	NA	0.21 U	0.24 U	0.23 U
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2)	UG/KG	NA	NA	2.1 U	2.4 U	2.3 U
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2)	UG/KG	NA	NA	2.1 U	2.4 U	2.3 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	UG/KG	NA	NA	0.86 J	2.4 U	2.3 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	UG/KG	NA	NA	3.1 J	2.4 U	2.3 U

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		60N 10E	60N 40E	80N 35E	80N 35E	80N 35E
Sample ID		60N 10E SOIL	60N 40E SOIL	80N35E 4-5	FD-200212-2	80N 35E 9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled		01/24/20	01/24/20	02/12/20	02/12/20	02/12/20
Parameter	Units				Field Duplicate (1-1)	
Semivolatile Organic Compounds						
1,1-Biphenyl	MG/KG	NA	0.19 U	38 U	38 U	NA
1,4-Dioxane	MG/KG	NA	0.11 U	22 U	22 U	NA
2,2-oxybis(1-Chloropropane)	MG/KG	NA	0.19 U	38 U	38 U	NA
2,4,5-Trichlorophenol	MG/KG	NA	0.19 U	38 U	38 U	NA
2,4,6-Trichlorophenol	MG/KG	NA	0.19 U	38 U	38 U	NA
2,4-Dichlorophenol	MG/KG	NA	0.19 U	38 U	38 U	NA
2,4-Dimethylphenol	MG/KG	NA	0.19 U	38 U	38 U	NA
2,4-Dinitrophenol	MG/KG	NA	1.8 U	370 U	370 U	NA
2,4-Dinitrotoluene	MG/KG	NA	0.19 U	38 U	38 U	NA
2,6-Dinitrotoluene	MG/KG	NA	0.19 U	38 U	38 U	NA
2-Chloronaphthalene	MG/KG	NA	0.19 U	38 U	38 U	NA
2-Chlorophenol	MG/KG	NA	0.36 U	74 U	73 U	NA
2-Methylnaphthalene	MG/KG	NA	0.19 U	38 U	38 U	NA
2-Methylphenol (o-cresol)	MG/KG	NA	0.19 U	38 U	38 U	NA
2-Nitroaniline	MG/KG	NA	0.36 U	74 U	73 U	NA
2-Nitrophenol	MG/KG	NA	0.19 U	38 U	38 U	NA
3,3-Dichlorobenzidine	MG/KG	NA	0.36 U	74 U	73 U	NA
3-Nitroaniline	MG/KG	NA	0.36 U	74 U	73 U	NA
4,6-Dinitro-2-methylphenol	MG/KG	NA	0.36 U	74 U	73 U	NA
4-Bromophenyl-phenylether	MG/KG	NA	0.19 U	38 U	38 U	NA
4-Chloro-3-methylphenol	MG/KG	NA	0.19 U	38 U	38 U	NA
4-Chloroaniline	MG/KG	NA	0.19 U	38 U	38 U	NA
4-Chlorophenyl-phenylether	MG/KG	NA	0.19 U	38 U	38 U	NA

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		60N 10E	60N 40E	80N 35E	80N 35E	80N 35E
Sample ID		60N 10E SOIL	60N 40E SOIL	80N35E 4-5	FD-200212-2	80N 35E 9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled		01/24/20	01/24/20	02/12/20	02/12/20	02/12/20
Parameter	Units				Field Duplicate (1-1)	
Semivolatile Organic Compounds						
4-Methylphenol (p-cresol)	MG/KG	NA	0.36 U	74 U	73 U	NA
4-Nitroaniline	MG/KG	NA	0.36 U	74 U	73 U	NA
4-Nitrophenol	MG/KG	NA	0.36 U	74 U	73 U	NA
Acenaphthene	MG/KG	NA	0.19 U	8.4 J	20 J	NA
Acenaphthylene	MG/KG	NA	0.19 U	13 J	17 J	NA
Acetophenone	MG/KG	NA	0.19 U	38 U	38 U	NA
Anthracene	MG/KG	NA	0.19 U	34 J	70 J	NA
Atrazine	MG/KG	NA	0.19 U	38 U	38 U	NA
Benzaldehyde	MG/KG	NA	0.19 U	38 U	38 U	NA
Benzo(a)anthracene	MG/KG	NA	0.19 U	140 J	220 J	NA
Benzo(a)pyrene	MG/KG	NA	0.19 U	140	190	NA
Benzo(b)fluoranthene	MG/KG	NA	0.11 J	160	240	NA
Benzo(g,h,i)perylene	MG/KG	NA	0.084 J	97	120	NA
Benzo(k)fluoranthene	MG/KG	NA	0.19 U	80	84	NA
bis(2-Chloroethoxy)methane	MG/KG	NA	0.19 U	38 U	38 U	NA
bis(2-Chloroethyl)ether	MG/KG	NA	0.19 U	38 U	38 U	NA
bis(2-Ethylhexyl)phthalate	MG/KG	NA	0.13 J	38 U	38 U	NA
Butylbenzylphthalate	MG/KG	NA	0.14 J	38 U	38 U	NA
Caprolactam	MG/KG	NA	0.19 U	38 U	38 U	NA
Carbazole	MG/KG	NA	0.19 U	12 J	19 J	NA
Chrysene	MG/KG	NA	0.19 U	160	210	NA
Dibenz(a,h)anthracene	MG/KG	NA	0.19 U	32 J	38	NA
Dibenzofuran	MG/KG	NA	0.19 U	38 U	14 J	NA

Flags assigned during chemistry validation are shown.

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		60N 10E	60N 40E	80N 35E	80N 35E	80N 35E
Sample ID		60N 10E SOIL	60N 40E SOIL	80N35E 4-5	FD-200212-2	80N 35E 9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled		01/24/20	01/24/20	02/12/20	02/12/20	02/12/20
Parameter	Units				Field Duplicate (1-1)	
Semivolatile Organic Compounds						
Diethylphthalate	MG/KG	NA	0.19 U	38 U	38 U	NA
Dimethylphthalate	MG/KG	NA	0.19 U	38 U	38 U	NA
Di-n-butylphthalate	MG/KG	NA	0.058 J	38 U	38 U	NA
Di-n-octylphthalate	MG/KG	NA	0.19 U	38 U	38 U	NA
Fluoranthene	MG/KG	NA	0.040 J	260	370	NA
Fluorene	MG/KG	NA	0.19 U	11 J	32 J	NA
Hexachlorobenzene	MG/KG	NA	0.19 U	38 U	38 U	NA
Hexachlorobutadiene	MG/KG	NA	0.19 U	38 U	38 U	NA
Hexachlorocyclopentadiene	MG/KG	NA	0.19 UJ	38 U	38 U	NA
Hexachloroethane	MG/KG	NA	0.19 U	38 U	38 U	NA
Indeno(1,2,3-cd)pyrene	MG/KG	NA	0.066 J	85	110	NA
Isophorone	MG/KG	NA	0.19 U	38 U	38 U	NA
Naphthalene	MG/KG	NA	0.19 U	38 U	7.7 J	NA
Nitrobenzene	MG/KG	NA	0.19 U	38 U	38 U	NA
N-Nitroso-di-n-propylamine	MG/KG	NA	0.19 U	38 U	38 U	NA
N-Nitrosodiphenylamine	MG/KG	NA	0.19 U	38 U	38 U	NA
Pentachlorophenol	MG/KG	NA	0.36 U	74 U	73 U	NA
Phenanthrene	MG/KG	NA	0.19 U	150 J	300 J	NA
Phenol	MG/KG	NA	0.19 U	38 U	38 U	NA
Pyrene	MG/KG	NA	0.039 J	260	390	NA
Pesticide Organic Compounds						
4,4'-DDD	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
4,4'-DDE	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		60N 10E	60N 40E	80N 35E	80N 35E	80N 35E
Sample ID		60N 10E SOIL	60N 40E SOIL	80N35E 4-5	FD-200212-2	80N 35E 9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled		01/24/20	01/24/20	02/12/20	02/12/20	02/12/20
Parameter	Units				Field Duplicate (1-1)	
Pesticide Organic Compounds						
4,4'-DDT	MG/KG	0.036 U	NA	0.036 J	0.069 J	NA
Aldrin	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
alpha-BHC	MG/KG	0.036 U	NA	0.0078 J	0.016 J	NA
alpha-Chlordane	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
beta-BHC	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
delta-BHC	MG/KG	0.0074 J	NA	0.038 U	0.075 U	NA
Dieldrin	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
Endosulfan I	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
Endosulfan II	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
Endosulfan sulfate	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
Endrin	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
Endrin aldehyde	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
Endrin ketone	MG/KG	0.036 U	NA	0.042 J	0.11 J	NA
gamma-BHC (Lindane)	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
gamma-Chlordane	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
Heptachlor	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
Heptachlor epoxide	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
Methoxychlor	MG/KG	0.036 U	NA	0.038 U	0.075 U	NA
Toxaphene	MG/KG	0.36 U	NA	0.38 U	0.75 U	NA
Herbicides						
2,4,5-T	MG/KG	0.018 U	NA	0.019 U	0.018 U	NA
2,4,5-TP (Silvex)	MG/KG	0.018 U	NA	0.019 U	0.018 U	NA
2,4-D	MG/KG	0.018 U	NA	0.019 U	0.018 U	NA

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		60N 10E	60N 40E	80N 35E	80N 35E	80N 35E
Sample ID		60N 10E SOIL	60N 40E SOIL	80N35E 4-5	FD-200212-2	80N 35E 9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled		01/24/20	01/24/20	02/12/20	02/12/20	02/12/20
Parameter	Units				Field Duplicate (1-1)	
Polychlorinated Biphenyls						
Aroclor 1016	MG/KG	0.24 U	NA	0.26 U	0.25 U	NA
Aroclor 1221	MG/KG	0.24 U	NA	0.26 U	0.25 U	NA
Aroclor 1232	MG/KG	0.24 U	NA	0.26 U	0.25 U	NA
Aroclor 1242	MG/KG	0.24 U	NA	0.26 U	0.25 U	NA
Aroclor 1248	MG/KG	0.24 U	NA	0.26 U	0.25 U	NA
Aroclor 1254	MG/KG	0.24 U	NA	0.26 U	0.25 U	NA
Aroclor 1260	MG/KG	0.24 U	NA	0.26 U	0.25 U	NA
Aroclor 1262	MG/KG	0.24 U	NA	0.26 U	0.25 U	NA
Aroclor 1268	MG/KG	0.24 U	NA	0.26 U	0.25 U	NA
Metals						
Aluminum	MG/KG	NA	5,590	8,150	7,190	NA
Antimony	MG/KG	NA	1.1 J	1.3 J	1.1 J	NA
Arsenic	MG/KG	NA	4.2	8.8	8.7	NA
Barium	MG/KG	NA	67.2 J	86.8	75.2	NA
Beryllium	MG/KG	NA	0.27	0.43	0.43	NA
Cadmium	MG/KG	NA	0.18 J	0.44	0.48	NA
Calcium	MG/KG	NA	37,600 J	20,300	20,900	NA
Chromium	MG/KG	NA	7.8	12.2	11.4	NA
Cobalt	MG/KG	NA	3.6	4	3.8	NA
Copper	MG/KG	NA	37.1 J	31.8	31	NA
Iron	MG/KG	NA	9,330 J	13,000	11,500	NA
Lead	MG/KG	NA	120 J	133	143	NA
Magnesium	MG/KG	NA	12,300	6,670	6,390	NA

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		60N 10E	60N 40E	80N 35E	80N 35E	80N 35E
Sample ID		60N 10E SOIL	60N 40E SOIL	80N35E 4-5	FD-200212-2	80N 35E 9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled		01/24/20	01/24/20	02/12/20	02/12/20	02/12/20
Parameter	Units				Field Duplicate (1-1)	
Metals						
Manganese	MG/KG	NA	350 J	324	265	NA
Mercury	MG/KG	NA	0.37	0.49	0.43	NA
Nickel	MG/KG	NA	10.5	11.1	9.7	NA
Potassium	MG/KG	NA	1,510	1,690	1,330	NA
Selenium	MG/KG	NA	4.2 U	4.2 U	0.68 J	NA
Silver	MG/KG	NA	0.23 J	0.63 U	0.21 J	NA
Sodium	MG/KG	NA	360 J	257	208	NA
Thallium	MG/KG	NA	6.3 U	0.58 J	0.87 J	NA
Vanadium	MG/KG	NA	11.6	17.3	15.6	NA
Zinc	MG/KG	NA	78.0 J	167	178	NA
Miscellaneous Parameters						
Cyanide	MG/KG	NA	1.1 UJ	1.1 U	1.1 U	NA
Per- and Polyfluoroalkyl Substances						
Perfluorobutanesulfonic acid (PFBS)	UG/KG	NA	NA	NA	NA	0.037 J
Perfluorobutanoic acid (PFBA)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluorodecane sulfonate (PFDS)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluorodecanoic acid (PFDA)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluorododecanoic acid (PFDoA)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluoroheptanesulfonic acid (PFHpS)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	NA	NA	NA	NA	0.084 J
Perfluorohexanoic acid (PFHxA)	UG/KG	NA	NA	NA	NA	0.059 J
Perfluorononanoic acid (PFNA)	UG/KG	NA	NA	NA	NA	0.22 U

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		60N 10E	60N 40E	80N 35E	80N 35E	80N 35E
Sample ID		60N 10E SOIL	60N 40E SOIL	80N35E 4-5	FD-200212-2	80N 35E 9
Matrix		Soil	Soil	Soil	Soil	Soil
Depth Interval (ft)		0.0-3.0	0.0-3.0	4.0-5.0	4.0-5.0	9.0-9.0
Date Sampled		01/24/20	01/24/20	02/12/20	02/12/20	02/12/20
Parameter	Units				Field Duplicate (1-1)	
Per- and Polyfluoroalkyl Substances						
Perfluorooctane sulfonamide (PFOSA)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	NA	NA	NA	NA	0.82
Perfluorooctanoic acid (PFOA)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluoropentanoic acid (PFPeA)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluorotetradecanoic acid (PFTeA)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluorotridecanoic acid (PFTriA)	UG/KG	NA	NA	NA	NA	0.22 U
Perfluoroundecanoic acid (PFUnA)	UG/KG	NA	NA	NA	NA	0.22 U
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2)	UG/KG	NA	NA	NA	NA	2.2 U
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2)	UG/KG	NA	NA	NA	NA	2.2 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	UG/KG	NA	NA	NA	NA	2.2 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	UG/KG	NA	NA	NA	NA	2.2 U

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		MW-13OB	MW-14S	MW-14S
Sample ID		MW-13OB 7.5-8.5	FD-20200416-1	MW-14S 10-11
Matrix		Soil	Soil	Soil
Depth Interval (ft)		7.5-8.5	10.0-11.0	10.0-11.0
Date Sampled		04/15/20	04/16/20	04/16/20
Parameter	Units		Field Duplicate (1-1)	
Semivolatile Organic Compounds				
1,1-Biphenyl	MG/KG	NA	NA	0.051 J
1,4-Dioxane	MG/KG	NA	NA	0.11 U
2,2-oxybis(1-Chloropropane)	MG/KG	NA	NA	0.19 U
2,4,5-Trichlorophenol	MG/KG	NA	NA	0.19 U
2,4,6-Trichlorophenol	MG/KG	NA	NA	0.19 U
2,4-Dichlorophenol	MG/KG	NA	NA	0.19 U
2,4-Dimethylphenol	MG/KG	NA	NA	0.19 U
2,4-Dinitrophenol	MG/KG	NA	NA	1.9 U
2,4-Dinitrotoluene	MG/KG	NA	NA	0.19 U
2,6-Dinitrotoluene	MG/KG	NA	NA	0.19 U
2-Chloronaphthalene	MG/KG	NA	NA	0.19 U
2-Chlorophenol	MG/KG	NA	NA	0.38 U
2-Methylnaphthalene	MG/KG	NA	NA	0.12 J
2-Methylphenol (o-cresol)	MG/KG	NA	NA	0.19 U
2-Nitroaniline	MG/KG	NA	NA	0.38 U
2-Nitrophenol	MG/KG	NA	NA	0.19 U
3,3-Dichlorobenzidine	MG/KG	NA	NA	0.38 U
3-Nitroaniline	MG/KG	NA	NA	0.38 U
4,6-Dinitro-2-methylphenol	MG/KG	NA	NA	0.38 U
4-Bromophenyl-phenylether	MG/KG	NA	NA	0.19 U
4-Chloro-3-methylphenol	MG/KG	NA	NA	0.19 U
4-Chloroaniline	MG/KG	NA	NA	0.19 U
4-Chlorophenyl-phenylether	MG/KG	NA	NA	0.19 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		MW-13OB	MW-14S	MW-14S
Sample ID		MW-13OB 7.5-8.5	FD-20200416-1	MW-14S 10-11
Matrix		Soil	Soil	Soil
Depth Interval (ft)		7.5-8.5	10.0-11.0	10.0-11.0
Date Sampled		04/15/20	04/16/20	04/16/20
Parameter	Units		Field Duplicate (1-1)	
Semivolatile Organic Compounds				
4-Methylphenol (p-cresol)	MG/KG	NA	NA	0.38 U
4-Nitroaniline	MG/KG	NA	NA	0.38 U
4-Nitrophenol	MG/KG	NA	NA	0.38 U
Acenaphthene	MG/KG	NA	NA	0.14 J
Acenaphthylene	MG/KG	NA	NA	0.065 J
Acetophenone	MG/KG	NA	NA	0.19 U
Anthracene	MG/KG	NA	NA	0.5
Atrazine	MG/KG	NA	NA	0.19 U
Benzaldehyde	MG/KG	NA	NA	0.19 U
Benzo(a)anthracene	MG/KG	NA	NA	1.3
Benzo(a)pyrene	MG/KG	NA	NA	0.89
Benzo(b)fluoranthene	MG/KG	NA	NA	1.1
Benzo(g,h,i)perylene	MG/KG	NA	NA	0.56
Benzo(k)fluoranthene	MG/KG	NA	NA	0.6
bis(2-Chloroethoxy)methane	MG/KG	NA	NA	0.19 U
bis(2-Chloroethyl)ether	MG/KG	NA	NA	0.19 U
bis(2-Ethylhexyl)phthalate	MG/KG	NA	NA	2.2
Butylbenzylphthalate	MG/KG	NA	NA	0.43
Caprolactam	MG/KG	NA	NA	0.19 U
Carbazole	MG/KG	NA	NA	0.19 U
Chrysene	MG/KG	NA	NA	1.2
Dibenz(a,h)anthracene	MG/KG	NA	NA	0.23
Dibenzofuran	MG/KG	NA	NA	0.19

Flags assigned during chemistry validation are shown.

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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		MW-13OB	MW-14S	MW-14S
Sample ID		MW-13OB 7.5-8.5	FD-20200416-1	MW-14S 10-11
Matrix		Soil	Soil	Soil
Depth Interval (ft)		7.5-8.5	10.0-11.0	10.0-11.0
Date Sampled		04/15/20	04/16/20	04/16/20
Parameter	Units		Field Duplicate (1-1)	
Semivolatile Organic Compounds				
Diethylphthalate	MG/KG	NA	NA	0.19 U
Dimethylphthalate	MG/KG	NA	NA	0.19 U
Di-n-butylphthalate	MG/KG	NA	NA	0.14 J
Di-n-octylphthalate	MG/KG	NA	NA	0.19 U
Fluoranthene	MG/KG	NA	NA	2.7
Fluorene	MG/KG	NA	NA	0.26
Hexachlorobenzene	MG/KG	NA	NA	0.19 U
Hexachlorobutadiene	MG/KG	NA	NA	0.19 U
Hexachlorocyclopentadiene	MG/KG	NA	NA	0.19 U
Hexachloroethane	MG/KG	NA	NA	0.19 U
Indeno(1,2,3-cd)pyrene	MG/KG	NA	NA	0.51
Isophorone	MG/KG	NA	NA	0.19 U
Naphthalene	MG/KG	NA	NA	0.19 U
Nitrobenzene	MG/KG	NA	NA	0.19 U
N-Nitroso-di-n-propylamine	MG/KG	NA	NA	0.19 U
N-Nitrosodiphenylamine	MG/KG	NA	NA	0.19 U
Pentachlorophenol	MG/KG	NA	NA	0.38 U
Phenanthrene	MG/KG	NA	NA	2.8
Phenol	MG/KG	NA	NA	0.19 U
Pyrene	MG/KG	NA	NA	2.3
Pesticide Organic Compounds				
4,4'-DDD	MG/KG	NA	NA	0.0094 U
4,4'-DDE	MG/KG	NA	NA	0.0094 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

Advanced Selection: amk-tem
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[LOGDATE] > #1/1/2020# AND [LOCID] <> 'FIELDQC' AND [PRCCODE] <> 'VOA

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		MW-13OB	MW-14S	MW-14S
Sample ID		MW-13OB 7.5-8.5	FD-20200416-1	MW-14S 10-11
Matrix		Soil	Soil	Soil
Depth Interval (ft)		7.5-8.5	10.0-11.0	10.0-11.0
Date Sampled		04/15/20	04/16/20	04/16/20
Parameter	Units		Field Duplicate (1-1)	
Pesticide Organic Compounds				
4,4'-DDT	MG/KG	NA	NA	0.0071 J
Aldrin	MG/KG	NA	NA	0.0094 U
alpha-BHC	MG/KG	NA	NA	0.0094 U
alpha-Chlordane	MG/KG	NA	NA	0.0094 U
beta-BHC	MG/KG	NA	NA	0.0094 U
delta-BHC	MG/KG	NA	NA	0.0094 U
Dieldrin	MG/KG	NA	NA	0.0094 U
Endosulfan I	MG/KG	NA	NA	0.0094 U
Endosulfan II	MG/KG	NA	NA	0.0094 U
Endosulfan sulfate	MG/KG	NA	NA	0.0094 U
Endrin	MG/KG	NA	NA	0.0094 U
Endrin aldehyde	MG/KG	NA	NA	0.027
Endrin ketone	MG/KG	NA	NA	0.013 JN
gamma-BHC (Lindane)	MG/KG	NA	NA	0.0094 U
gamma-Chlordane	MG/KG	NA	NA	0.0094 U
Heptachlor	MG/KG	NA	NA	0.0094 U
Heptachlor epoxide	MG/KG	NA	NA	0.0094 U
Methoxychlor	MG/KG	NA	NA	0.017 J
Toxaphene	MG/KG	NA	NA	0.094 U
Herbicides				
2,4,5-T	MG/KG	NA	NA	NA
2,4,5-TP (Silvex)	MG/KG	NA	NA	NA
2,4-D	MG/KG	NA	NA	NA

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		MW-13OB	MW-14S	MW-14S
Sample ID		MW-13OB 7.5-8.5	FD-20200416-1	MW-14S 10-11
Matrix		Soil	Soil	Soil
Depth Interval (ft)		7.5-8.5	10.0-11.0	10.0-11.0
Date Sampled		04/15/20	04/16/20	04/16/20
Parameter	Units		Field Duplicate (1-1)	
Polychlorinated Biphenyls				
Aroclor 1016	MG/KG	NA	NA	0.21 U
Aroclor 1221	MG/KG	NA	NA	0.21 U
Aroclor 1232	MG/KG	NA	NA	0.21 U
Aroclor 1242	MG/KG	NA	NA	0.21 U
Aroclor 1248	MG/KG	NA	NA	0.21 U
Aroclor 1254	MG/KG	NA	NA	0.21 U
Aroclor 1260	MG/KG	NA	NA	0.21 U
Aroclor 1262	MG/KG	NA	NA	0.21 U
Aroclor 1268	MG/KG	NA	NA	0.21 U
Metals				
Aluminum	MG/KG	NA	NA	3,140
Antimony	MG/KG	NA	NA	15.9 U
Arsenic	MG/KG	NA	NA	1.6 J
Barium	MG/KG	NA	NA	16.4
Beryllium	MG/KG	NA	NA	0.14 J
Cadmium	MG/KG	NA	NA	0.039 J
Calcium	MG/KG	NA	NA	30,800
Chromium	MG/KG	NA	NA	5.0
Cobalt	MG/KG	NA	NA	2.5
Copper	MG/KG	NA	NA	4.6
Iron	MG/KG	NA	NA	6,870
Lead	MG/KG	NA	NA	3.0
Magnesium	MG/KG	NA	NA	7,260

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By _____

Detection Limits shown are PQL

TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		MW-13OB	MW-14S	MW-14S
Sample ID		MW-13OB 7.5-8.5	FD-20200416-1	MW-14S 10-11
Matrix		Soil	Soil	Soil
Depth Interval (ft)		7.5-8.5	10.0-11.0	10.0-11.0
Date Sampled		04/15/20	04/16/20	04/16/20
Parameter	Units		Field Duplicate (1-1)	
Metals				
Manganese	MG/KG	NA	NA	295
Mercury	MG/KG	NA	NA	0.017 U
Nickel	MG/KG	NA	NA	5.2 J
Potassium	MG/KG	NA	NA	934
Selenium	MG/KG	NA	NA	4.2 U
Silver	MG/KG	NA	NA	0.64 U
Sodium	MG/KG	NA	NA	183
Thallium	MG/KG	NA	NA	6.4 U
Vanadium	MG/KG	NA	NA	9.8
Zinc	MG/KG	NA	NA	12.3
Miscellaneous Parameters				
Cyanide	MG/KG	NA	NA	1.1 U
Per- and Polyfluoroalkyl Substances				
Perfluorobutanesulfonic acid (PFBS)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluorobutanoic acid (PFBA)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluorodecane sulfonate (PFDS)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluorodecanoic acid (PFDA)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluorododecanoic acid (PFDoA)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluoroheptanesulfonic acid (PFHpS)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluoroheptanoic acid (PFHpA)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluorohexanesulfonic acid (PFHxS)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluorohexanoic acid (PFHxA)	UG/KG	0.051 J	0.28 U	0.25 U
Perfluorononanoic acid (PFNA)	UG/KG	0.24 U	0.28 U	0.25 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

Advanced Selection: amk-tem
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TABLE 2
VALIDATED SOIL SAMPLE ANALYTICAL RESULTS (NON-VOCS ONLY)
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		MW-13OB	MW-14S	MW-14S
Sample ID		MW-13OB 7.5-8.5	FD-20200416-1	MW-14S 10-11
Matrix		Soil	Soil	Soil
Depth Interval (ft)		7.5-8.5	10.0-11.0	10.0-11.0
Date Sampled		04/15/20	04/16/20	04/16/20
Parameter	Units		Field Duplicate (1-1)	
Per- and Polyfluoroalkyl Substances				
Perfluorooctane sulfonamide (PFOSA)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluorooctanesulfonic acid (PFOS)	UG/KG	0.59 U	0.70 U	0.64 U
Perfluorooctanoic acid (PFOA)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluoropentanoic acid (PFPeA)	UG/KG	0.24 U	0.28 U	0.14 J
Perfluorotetradecanoic acid (PFTeA)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluorotridecanoic acid (PFTriA)	UG/KG	0.24 U	0.28 U	0.25 U
Perfluoroundecanoic acid (PFUnA)	UG/KG	0.24 U	0.28 U	0.25 U
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2)	UG/KG	2.4 U	2.8 U	2.5 U
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2)	UG/KG	2.4 U	2.8 U	2.5 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	UG/KG	2.4 U	2.8 U	2.5 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	UG/KG	2.4 U	2.8 U	2.5 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

TABLE 3
VALIDATED FIELD QC SAMPLE ANALYTICAL RESULTS
ARTCO INDUSTRIAL LAUNDRIES SITE

Location ID		FIELDQC
Sample ID		EQUIPMENT RINSE BLANK
Matrix		Water Quality
Depth Interval (ft)		-
Date Sampled		04/23/20
Parameter	**Units**	Equipment Blank (1-1)
Per- and Polyfluoroalkyl Substances		
Perfluorobutanesulfonic acid (PFBS)	NG/L	1.7 U
Perfluorobutanoic acid (PFBA)	NG/L	11
Perfluorodecane sulfonate (PFDS)	NG/L	1.7 U
Perfluorodecanoic acid (PFDA)	NG/L	1.7 U
Perfluorododecanoic acid (PFDoA)	NG/L	1.7 U
Perfluoroheptanesulfonic acid (PFHpS)	NG/L	1.7 U
Perfluoroheptanoic acid (PFHpA)	NG/L	1.7 U
Perfluorohexanesulfonic acid (PFHxS)	NG/L	0.33 J
Perfluorohexanoic acid (PFHxA)	NG/L	1.7 U
Perfluorononanoic acid (PFNA)	NG/L	1.7 U
Perfluorooctane sulfonamide (PFOSA)	NG/L	0.42 J
Perfluorooctanesulfonic acid (PFOS)	NG/L	1.7 U
Perfluorooctanoic acid (PFOA)	NG/L	1.7 U
Perfluoropentanoic acid (PFPeA)	NG/L	1.7 U
Perfluorotetradecanoic acid (PFTeA)	NG/L	1.7 U
Perfluorotridecanoic acid (PFTriA)	NG/L	1.7 U
Perfluoroundecanoic acid (PFUnA)	NG/L	1.7 U
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2)	NG/L	4.5 J
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2)	NG/L	17 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NG/L	17 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	NG/L	17 U

Flags assigned during chemistry validation are shown.

Made By: AMK 6/18/20
Checked By PRF 6/25/20

Detection Limits shown are PQL

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ATTACHMENT A

VALIDATED FORM I'S

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 50E SOIL Lab Sample ID: 480-165607-1

Matrix: Solid Lab File ID: N1095.D

Analysis Method: 8260C Date Collected: 01/23/2020 13:55

Sample wt/vol: 5(g) Date Analyzed: 01/30/2020 14:22

Soil Aliquot Vol: 100 (uL) Dilution Factor: 100

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 20.0 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		14000	3800
79-34-5	1,1,2,2-Tetrachloroethane	ND		14000	2200
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		14000	6900
79-00-5	1,1,2-Trichloroethane	ND		14000	2900
75-34-3	1,1-Dichloroethane	ND		14000	4300
75-35-4	1,1-Dichloroethene	ND		14000	4800
120-82-1	1,2,4-Trichlorobenzene	ND		14000	5200
96-12-8	1,2-Dibromo-3-Chloropropane	ND		14000	6900
106-93-4	1,2-Dibromoethane	ND		14000	2400
95-50-1	1,2-Dichlorobenzene	ND		14000	3500
107-06-2	1,2-Dichloroethane	ND		14000	5600
78-87-5	1,2-Dichloropropane	ND		14000	2200
541-73-1	1,3-Dichlorobenzene	ND		14000	3700
106-46-7	1,4-Dichlorobenzene	ND		14000	1900
78-93-3	2-Butanone (MEK)	ND		69000	41000
591-78-6	2-Hexanone	ND		69000	28000
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		69000	4400
67-64-1	Acetone	ND		69000	57000
71-43-2	Benzene	ND		14000	2600
75-27-4	Bromodichloromethane	ND		14000	2800
75-25-2	Bromoform	ND		14000	6900
74-83-9	Bromomethane	ND		14000	3000
75-15-0	Carbon disulfide	ND		14000	6300
56-23-5	Carbon tetrachloride	ND		14000	3500
108-90-7	Chlorobenzene	ND		14000	1800
75-00-3	Chloroethane	ND		14000	2900
67-66-3	Chloroform	ND		14000	9400
74-87-3	Chloromethane	ND		14000	3300
156-59-2	cis-1,2-Dichloroethene	4900	J	14000	3800
10061-01-5	cis-1,3-Dichloropropene	ND		14000	3300
110-82-7	Cyclohexane	ND		14000	3100
124-48-1	Dibromochloromethane	ND		14000	6700
75-71-8	Dichlorodifluoromethane	ND		14000	6000
100-41-4	Ethylbenzene	ND		14000	4000
98-82-8	Isopropylbenzene	ND		14000	2100

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 50E SOIL Lab Sample ID: 480-165607-1

Matrix: Solid Lab File ID: N1095.D

Analysis Method: 8260C Date Collected: 01/23/2020 13:55

Sample wt/vol: 5(g) Date Analyzed: 01/30/2020 14:22

Soil Aliquot Vol: 100 (uL) Dilution Factor: 100

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 20.0 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		69000	6600
1634-04-4	Methyl tert-butyl ether	ND		14000	5200
108-87-2	Methylcyclohexane	ND		14000	6400
75-09-2	Methylene Chloride	ND		14000	2700
100-42-5	Styrene	ND		14000	3300
127-18-4	Tetrachloroethene	640000		14000	1800
108-88-3	Toluene	ND		14000	3700
156-60-5	trans-1,2-Dichloroethene	ND		14000	3200
10061-02-6	trans-1,3-Dichloropropene	ND		14000	1400
79-01-6	Trichloroethene	11000	J	14000	3800
75-69-4	Trichlorofluoromethane	ND		14000	6500
75-01-4	Vinyl chloride	ND		14000	4600
1330-20-7	Xylenes, Total	ND		28000	7600

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		53-146
460-00-4	4-Bromofluorobenzene (Surr)	100		49-148
1868-53-7	Dibromofluoromethane (Surr)	96		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 50E SOIL Lab Sample ID: 480-165607-1

Matrix: Solid Lab File ID: N1095.D

Analysis Method: 8260C Date Collected: 01/23/2020 13:55

Sample wt/vol: 5(g) Date Analyzed: 01/30/2020 14:22

Soil Aliquot Vol: 100 (uL) Dilution Factor: 100

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 20.0 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 20N 50E SOIL Lab Sample ID: 480-165607-2

Matrix: Solid Lab File ID: N1096.D

Analysis Method: 8260C Date Collected: 01/23/2020 14:17

Sample wt/vol: 5.02(g) Date Analyzed: 01/30/2020 14:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 20

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.7 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		2300	630
79-34-5	1,1,2,2-Tetrachloroethane	ND		2300	370
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2300	1100
79-00-5	1,1,2-Trichloroethane	ND		2300	480
75-34-3	1,1-Dichloroethane	ND		2300	700
75-35-4	1,1-Dichloroethene	ND		2300	790
120-82-1	1,2,4-Trichlorobenzene	ND		2300	860
96-12-8	1,2-Dibromo-3-Chloropropane	ND		2300	1100
106-93-4	1,2-Dibromoethane	ND		2300	400
95-50-1	1,2-Dichlorobenzene	ND		2300	580
107-06-2	1,2-Dichloroethane	ND		2300	930
78-87-5	1,2-Dichloropropane	ND		2300	370
541-73-1	1,3-Dichlorobenzene	ND		2300	610
106-46-7	1,4-Dichlorobenzene	ND		2300	320
78-93-3	2-Butanone (MEK)	ND		11000	6800
591-78-6	2-Hexanone	ND		11000	4700
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		11000	730
67-64-1	Acetone	ND		11000	9400
71-43-2	Benzene	ND		2300	430
75-27-4	Bromodichloromethane	ND		2300	460
75-25-2	Bromoform	ND		2300	1100
74-83-9	Bromomethane	ND		2300	500
75-15-0	Carbon disulfide	ND		2300	1000
56-23-5	Carbon tetrachloride	ND		2300	580
108-90-7	Chlorobenzene	ND		2300	300
75-00-3	Chloroethane	ND		2300	470
67-66-3	Chloroform	ND		2300	1600
74-87-3	Chloromethane	ND		2300	540
156-59-2	cis-1,2-Dichloroethene	ND		2300	630
10061-01-5	cis-1,3-Dichloropropene	ND		2300	540
110-82-7	Cyclohexane	ND		2300	510
124-48-1	Dibromochloromethane	ND		2300	1100
75-71-8	Dichlorodifluoromethane	ND		2300	990
100-41-4	Ethylbenzene	ND		2300	660
98-82-8	Isopropylbenzene	ND		2300	340

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 20N 50E SOIL Lab Sample ID: 480-165607-2

Matrix: Solid Lab File ID: N1096.D

Analysis Method: 8260C Date Collected: 01/23/2020 14:17

Sample wt/vol: 5.02(g) Date Analyzed: 01/30/2020 14:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 20

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.7 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		11000	1100
1634-04-4	Methyl tert-butyl ether	ND		2300	860
108-87-2	Methylcyclohexane	ND		2300	1100
75-09-2	Methylene Chloride	ND		2300	450
100-42-5	Styrene	ND		2300	550
127-18-4	Tetrachloroethene	94000		2300	310
108-88-3	Toluene	ND		2300	610
156-60-5	trans-1,2-Dichloroethene	ND		2300	540
10061-02-6	trans-1,3-Dichloropropene	ND		2300	220
79-01-6	Trichloroethene	2800		2300	630
75-69-4	Trichlorofluoromethane	ND		2300	1100
75-01-4	Vinyl chloride	ND		2300	760
1330-20-7	Xylenes, Total	ND		4600	1300

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	96		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	91		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 20N 50E SOIL Lab Sample ID: 480-165607-2

Matrix: Solid Lab File ID: N1096.D

Analysis Method: 8260C Date Collected: 01/23/2020 14:17

Sample wt/vol: 5.02(g) Date Analyzed: 01/30/2020 14:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 20

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.7 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 30N 50E SOIL (30N 40E) Lab Sample ID: 480-165607-3

Matrix: Solid Lab File ID: N1097.D

Analysis Method: 8260C Date Collected: 01/23/2020 14:43

Sample wt/vol: 5.17(g) Date Analyzed: 01/30/2020 15:10

Soil Aliquot Vol: 100 (uL) Dilution Factor: 50

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.2 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5600	1500
79-34-5	1,1,2,2-Tetrachloroethane	ND		5600	910
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5600	2800
79-00-5	1,1,2-Trichloroethane	ND		5600	1200
75-34-3	1,1-Dichloroethane	ND		5600	1700
75-35-4	1,1-Dichloroethene	ND		5600	1900
120-82-1	1,2,4-Trichlorobenzene	ND		5600	2100
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5600	2800
106-93-4	1,2-Dibromoethane	ND		5600	980
95-50-1	1,2-Dichlorobenzene	ND		5600	1400
107-06-2	1,2-Dichloroethane	ND		5600	2300
78-87-5	1,2-Dichloropropane	ND		5600	900
541-73-1	1,3-Dichlorobenzene	ND		5600	1500
106-46-7	1,4-Dichlorobenzene	ND		5600	780
78-93-3	2-Butanone (MEK)	ND		28000	17000
591-78-6	2-Hexanone	ND		28000	11000
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		28000	1800
67-64-1	Acetone	ND		28000	23000
71-43-2	Benzene	ND		5600	1100
75-27-4	Bromodichloromethane	ND		5600	1100
75-25-2	Bromoform	ND		5600	2800
74-83-9	Bromomethane	ND		5600	1200
75-15-0	Carbon disulfide	ND		5600	2500
56-23-5	Carbon tetrachloride	ND		5600	1400
108-90-7	Chlorobenzene	ND		5600	740
75-00-3	Chloroethane	ND		5600	1200
67-66-3	Chloroform	ND		5600	3800
74-87-3	Chloromethane	ND		5600	1300
156-59-2	cis-1,2-Dichloroethene	ND		5600	1500
10061-01-5	cis-1,3-Dichloropropene	ND		5600	1300
110-82-7	Cyclohexane	ND		5600	1200
124-48-1	Dibromochloromethane	ND		5600	2700
75-71-8	Dichlorodifluoromethane	ND		5600	2400
100-41-4	Ethylbenzene	ND		5600	1600
98-82-8	Isopropylbenzene	ND		5600	840

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 30N 50E SOIL (30N 40E) Lab Sample ID: 480-165607-3

Matrix: Solid Lab File ID: N1097.D

Analysis Method: 8260C Date Collected: 01/23/2020 14:43

Sample wt/vol: 5.17(g) Date Analyzed: 01/30/2020 15:10

Soil Aliquot Vol: 100 (uL) Dilution Factor: 50

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.2 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		28000	2700
1634-04-4	Methyl tert-butyl ether	ND		5600	2100
108-87-2	Methylcyclohexane	ND		5600	2600
75-09-2	Methylene Chloride	ND		5600	1100
100-42-5	Styrene	ND		5600	1300
127-18-4	Tetrachloroethene	180000		5600	750
108-88-3	Toluene	ND		5600	1500
156-60-5	trans-1,2-Dichloroethene	ND		5600	1300
10061-02-6	trans-1,3-Dichloropropene	ND		5600	550
79-01-6	Trichloroethene	5200	J	5600	1600
75-69-4	Trichlorofluoromethane	ND		5600	2600
75-01-4	Vinyl chloride	ND		5600	1900
1330-20-7	Xylenes, Total	ND		11000	3100

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		53-146
460-00-4	4-Bromofluorobenzene (Surr)	96		49-148
1868-53-7	Dibromofluoromethane (Surr)	93		60-140
2037-26-5	Toluene-d8 (Surr)	98		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 30N 50E SOIL (30N 40E) Lab Sample ID: 480-165607-3

Matrix: Solid Lab File ID: N1097.D

Analysis Method: 8260C Date Collected: 01/23/2020 14:43

Sample wt/vol: 5.17(g) Date Analyzed: 01/30/2020 15:10

Soil Aliquot Vol: 100 (uL) Dilution Factor: 50

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.2 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 10N 30E SOIL Lab Sample ID: 480-165607-4

Matrix: Solid Lab File ID: N1098.D

Analysis Method: 8260C Date Collected: 01/23/2020 14:55

Sample wt/vol: 5(g) Date Analyzed: 01/30/2020 15:34

Soil Aliquot Vol: 100 (uL) Dilution Factor: 200

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 13.2 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		25000	6800
79-34-5	1,1,2,2-Tetrachloroethane	ND		25000	4000
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		25000	12000
79-00-5	1,1,2-Trichloroethane	ND		25000	5200
75-34-3	1,1-Dichloroethane	ND		25000	7600
75-35-4	1,1-Dichloroethene	ND		25000	8500
120-82-1	1,2,4-Trichlorobenzene	ND		25000	9300
96-12-8	1,2-Dibromo-3-Chloropropane	ND		25000	12000
106-93-4	1,2-Dibromoethane	ND		25000	4300
95-50-1	1,2-Dichlorobenzene	ND		25000	6300
107-06-2	1,2-Dichloroethane	ND		25000	10000
78-87-5	1,2-Dichloropropane	ND		25000	4000
541-73-1	1,3-Dichlorobenzene	ND		25000	6600
106-46-7	1,4-Dichlorobenzene	ND		25000	3400
78-93-3	2-Butanone (MEK)	ND		120000	73000
591-78-6	2-Hexanone	ND		120000	50000
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		120000	7900
67-64-1	Acetone	ND		120000	100000
71-43-2	Benzene	ND		25000	4700
75-27-4	Bromodichloromethane	ND		25000	4900
75-25-2	Bromoform	ND		25000	12000
74-83-9	Bromomethane	ND		25000	5400
75-15-0	Carbon disulfide	ND		25000	11000
56-23-5	Carbon tetrachloride	ND		25000	6300
108-90-7	Chlorobenzene	ND		25000	3200
75-00-3	Chloroethane	ND		25000	5100
67-66-3	Chloroform	ND		25000	17000
74-87-3	Chloromethane	ND		25000	5800
156-59-2	cis-1,2-Dichloroethene	ND		25000	6800
10061-01-5	cis-1,3-Dichloropropene	ND		25000	5900
110-82-7	Cyclohexane	ND		25000	5500
124-48-1	Dibromochloromethane	ND		25000	12000
75-71-8	Dichlorodifluoromethane	ND		25000	11000
100-41-4	Ethylbenzene	ND		25000	7200
98-82-8	Isopropylbenzene	ND		25000	3700

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 10N 30E SOIL Lab Sample ID: 480-165607-4

Matrix: Solid Lab File ID: N1098.D

Analysis Method: 8260C Date Collected: 01/23/2020 14:55

Sample wt/vol: 5(g) Date Analyzed: 01/30/2020 15:34

Soil Aliquot Vol: 100 (uL) Dilution Factor: 200

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 13.2 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		120000	12000
1634-04-4	Methyl tert-butyl ether	ND		25000	9300
108-87-2	Methylcyclohexane	ND		25000	12000
75-09-2	Methylene Chloride	ND		25000	4900
100-42-5	Styrene	ND		25000	5900
127-18-4	Tetrachloroethene	820000		25000	3300
108-88-3	Toluene	ND		25000	6600
156-60-5	trans-1,2-Dichloroethene	ND		25000	5800
10061-02-6	trans-1,3-Dichloropropene	ND		25000	2400
79-01-6	Trichloroethene	ND		25000	6800
75-69-4	Trichlorofluoromethane	ND		25000	12000
75-01-4	Vinyl chloride	ND		25000	8200
1330-20-7	Xylenes, Total	ND		49000	14000

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	93		60-140
2037-26-5	Toluene-d8 (Surr)	101		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 10N 30E SOIL Lab Sample ID: 480-165607-4

Matrix: Solid Lab File ID: N1098.D

Analysis Method: 8260C Date Collected: 01/23/2020 14:55

Sample wt/vol: 5(g) Date Analyzed: 01/30/2020 15:34

Soil Aliquot Vol: 100 (uL) Dilution Factor: 200

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 13.2 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 40E SOIL Lab Sample ID: 480-165607-5

Matrix: Solid Lab File ID: N1099.D

Analysis Method: 8260C Date Collected: 01/23/2020 15:55

Sample wt/vol: 5.08(g) Date Analyzed: 01/30/2020 15:58

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 28.9 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		320	88
79-34-5	1,1,2,2-Tetrachloroethane	ND		320	52
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		320	160
79-00-5	1,1,2-Trichloroethane	ND		320	67
75-34-3	1,1-Dichloroethane	ND		320	98
75-35-4	1,1-Dichloroethene	ND		320	110
120-82-1	1,2,4-Trichlorobenzene	ND		320	120
96-12-8	1,2-Dibromo-3-Chloropropane	ND		320	160
106-93-4	1,2-Dibromoethane	ND		320	56
95-50-1	1,2-Dichlorobenzene	ND		320	81
107-06-2	1,2-Dichloroethane	ND		320	130
78-87-5	1,2-Dichloropropane	ND		320	51
541-73-1	1,3-Dichlorobenzene	ND		320	85
106-46-7	1,4-Dichlorobenzene	ND		320	44
78-93-3	2-Butanone (MEK)	ND		1600	940
591-78-6	2-Hexanone	ND		1600	650
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		1600	100
67-64-1	Acetone	ND		1600	1300
71-43-2	Benzene	ND		320	60
75-27-4	Bromodichloromethane	ND		320	64
75-25-2	Bromoform	ND		320	160
74-83-9	Bromomethane	ND		320	70
75-15-0	Carbon disulfide	ND		320	140
56-23-5	Carbon tetrachloride	ND		320	81
108-90-7	Chlorobenzene	ND		320	42
75-00-3	Chloroethane	ND		320	66
67-66-3	Chloroform	ND		320	220
74-87-3	Chloromethane	ND		320	76
156-59-2	cis-1,2-Dichloroethene	94	J	320	88
10061-01-5	cis-1,3-Dichloropropene	ND		320	76
110-82-7	Cyclohexane	ND		320	70
124-48-1	Dibromochloromethane	ND		320	150
75-71-8	Dichlorodifluoromethane	ND		320	140
100-41-4	Ethylbenzene	ND		320	92
98-82-8	Isopropylbenzene	ND		320	48

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 40E SOIL Lab Sample ID: 480-165607-5

Matrix: Solid Lab File ID: N1099.D

Analysis Method: 8260C Date Collected: 01/23/2020 15:55

Sample wt/vol: 5.08(g) Date Analyzed: 01/30/2020 15:58

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 28.9 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		1600	150
1634-04-4	Methyl tert-butyl ether	ND		320	120
108-87-2	Methylcyclohexane	ND		320	150
75-09-2	Methylene Chloride	ND		320	63
100-42-5	Styrene	ND		320	77
127-18-4	Tetrachloroethene	9600		320	43
108-88-3	Toluene	ND		320	85
156-60-5	trans-1,2-Dichloroethene	ND		320	75
10061-02-6	trans-1,3-Dichloropropene	ND		320	31
79-01-6	Trichloroethene	ND		320	88
75-69-4	Trichlorofluoromethane	ND		320	150
75-01-4	Vinyl chloride	ND		320	110
1330-20-7	Xylenes, Total	ND		640	180

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		53-146
460-00-4	4-Bromofluorobenzene (Surr)	96		49-148
1868-53-7	Dibromofluoromethane (Surr)	95		60-140
2037-26-5	Toluene-d8 (Surr)	100		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 40E SOIL Lab Sample ID: 480-165607-5

Matrix: Solid Lab File ID: N1099.D

Analysis Method: 8260C Date Collected: 01/23/2020 15:55

Sample wt/vol: 5.08(g) Date Analyzed: 01/30/2020 15:58

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 28.9 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 100N 40E SOIL Lab Sample ID: 480-165607-6

Matrix: Solid Lab File ID: F5344.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:08

Sample wt/vol: 5.09(g) Date Analyzed: 01/28/2020 12:29

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 3.7 Level: (low/med) Low

Analysis Batch No.: 515133 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.1	0.37
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.1	0.83
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.1	1.2
79-00-5	1,1,2-Trichloroethane	ND		5.1	0.66
75-34-3	1,1-Dichloroethane	ND		5.1	0.62
75-35-4	1,1-Dichloroethene	ND		5.1	0.62
120-82-1	1,2,4-Trichlorobenzene	ND		5.1	0.31
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.1	2.5
106-93-4	1,2-Dibromoethane	ND		5.1	0.65
95-50-1	1,2-Dichlorobenzene	ND		5.1	0.40
107-06-2	1,2-Dichloroethane	ND		5.1	0.26
78-87-5	1,2-Dichloropropane	ND		5.1	2.5
541-73-1	1,3-Dichlorobenzene	ND		5.1	0.26
106-46-7	1,4-Dichlorobenzene	ND		5.1	0.71
78-93-3	2-Butanone (MEK)	ND		25	1.9
591-78-6	2-Hexanone	ND		25	2.5
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		25	1.7
67-64-1	Acetone	ND		25	4.3
71-43-2	Benzene	ND		5.1	0.25
75-27-4	Bromodichloromethane	ND		5.1	0.68
75-25-2	Bromoform	ND		5.1	2.5
74-83-9	Bromomethane	ND		5.1	0.46
75-15-0	Carbon disulfide	ND		5.1	2.5
56-23-5	Carbon tetrachloride	ND		5.1	0.49
108-90-7	Chlorobenzene	ND		5.1	0.67
75-00-3	Chloroethane	ND		5.1	1.2
67-66-3	Chloroform	ND	U	5.1	0.32
74-87-3	Chloromethane	ND		5.1	0.31
156-59-2	cis-1,2-Dichloroethene	ND		5.1	0.65
10061-01-5	cis-1,3-Dichloropropene	ND		5.1	0.73
110-82-7	Cyclohexane	ND		5.1	0.71
124-48-1	Dibromochloromethane	ND		5.1	0.65
75-71-8	Dichlorodifluoromethane	ND		5.1	0.42
100-41-4	Ethylbenzene	ND		5.1	0.35
98-82-8	Isopropylbenzene	ND		5.1	0.77

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 100N 40E SOIL Lab Sample ID: 480-165607-6

Matrix: Solid Lab File ID: F5344.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:08

Sample wt/vol: 5.09(g) Date Analyzed: 01/28/2020 12:29

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 3.7 Level: (low/med) Low

Analysis Batch No.: 515133 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		25	3.1
1634-04-4	Methyl tert-butyl ether	ND		5.1	0.50
108-87-2	Methylcyclohexane	ND		5.1	0.78
75-09-2	Methylene Chloride	ND		5.1	2.3
100-42-5	Styrene	ND		5.1	0.25
127-18-4	Tetrachloroethene	31		5.1	0.68
108-88-3	Toluene	ND		5.1	0.39
156-60-5	trans-1,2-Dichloroethene	ND		5.1	0.53
10061-02-6	trans-1,3-Dichloropropene	ND		5.1	2.2
79-01-6	Trichloroethene	ND		5.1	1.1
75-69-4	Trichlorofluoromethane	ND		5.1	0.48
75-01-4	Vinyl chloride	ND		5.1	0.62
1330-20-7	Xylenes, Total	ND		10	0.86

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		64-126
460-00-4	4-Bromofluorobenzene (Surr)	99		72-126
1868-53-7	Dibromofluoromethane (Surr)	102		60-140
2037-26-5	Toluene-d8 (Surr)	97		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 100N 40E SOIL Lab Sample ID: 480-165607-6

Matrix: Solid Lab File ID: F5344.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:08

Sample wt/vol: 5.09(g) Date Analyzed: 01/28/2020 12:29

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 3.7 Level: (low/med) Low

Analysis Batch No.: 515133 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 80N 40E SOIL Lab Sample ID: 480-165607-7

Matrix: Solid Lab File ID: F5345.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:20

Sample wt/vol: 5.11(g) Date Analyzed: 01/28/2020 12:55

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 3.2 Level: (low/med) Low

Analysis Batch No.: 515133 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.1	0.37
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.1	0.82
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.1	1.2
79-00-5	1,1,2-Trichloroethane	ND		5.1	0.66
75-34-3	1,1-Dichloroethane	ND		5.1	0.62
75-35-4	1,1-Dichloroethene	ND		5.1	0.62
120-82-1	1,2,4-Trichlorobenzene	ND		5.1	0.31
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.1	2.5
106-93-4	1,2-Dibromoethane	ND		5.1	0.65
95-50-1	1,2-Dichlorobenzene	ND		5.1	0.40
107-06-2	1,2-Dichloroethane	ND		5.1	0.25
78-87-5	1,2-Dichloropropane	ND		5.1	2.5
541-73-1	1,3-Dichlorobenzene	ND		5.1	0.26
106-46-7	1,4-Dichlorobenzene	ND		5.1	0.71
78-93-3	2-Butanone (MEK)	ND		25	1.8
591-78-6	2-Hexanone	ND		25	2.5
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		25	1.7
67-64-1	Acetone	ND		25	4.3
71-43-2	Benzene	ND		5.1	0.25
75-27-4	Bromodichloromethane	ND		5.1	0.68
75-25-2	Bromoform	ND		5.1	2.5
74-83-9	Bromomethane	ND		5.1	0.45
75-15-0	Carbon disulfide	ND		5.1	2.5
56-23-5	Carbon tetrachloride	ND		5.1	0.49
108-90-7	Chlorobenzene	ND		5.1	0.67
75-00-3	Chloroethane	ND		5.1	1.1
67-66-3	Chloroform	ND	U	5.1	0.31
74-87-3	Chloromethane	ND		5.1	0.31
156-59-2	cis-1,2-Dichloroethene	ND		5.1	0.65
10061-01-5	cis-1,3-Dichloropropene	ND		5.1	0.73
110-82-7	Cyclohexane	ND		5.1	0.71
124-48-1	Dibromochloromethane	ND		5.1	0.65
75-71-8	Dichlorodifluoromethane	ND		5.1	0.42
100-41-4	Ethylbenzene	ND		5.1	0.35
98-82-8	Isopropylbenzene	ND		5.1	0.76

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 80N 40E SOIL Lab Sample ID: 480-165607-7

Matrix: Solid Lab File ID: F5345.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:20

Sample wt/vol: 5.11(g) Date Analyzed: 01/28/2020 12:55

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 3.2 Level: (low/med) Low

Analysis Batch No.: 515133 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		25	3.1
1634-04-4	Methyl tert-butyl ether	ND		5.1	0.50
108-87-2	Methylcyclohexane	ND		5.1	0.77
75-09-2	Methylene Chloride	ND		5.1	2.3
100-42-5	Styrene	ND		5.1	0.25
127-18-4	Tetrachloroethene	24		5.1	0.68
108-88-3	Toluene	ND		5.1	0.38
156-60-5	trans-1,2-Dichloroethene	ND		5.1	0.52
10061-02-6	trans-1,3-Dichloropropene	ND		5.1	2.2
79-01-6	Trichloroethene	ND		5.1	1.1
75-69-4	Trichlorofluoromethane	ND		5.1	0.48
75-01-4	Vinyl chloride	ND		5.1	0.62
1330-20-7	Xylenes, Total	ND		10	0.85

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	107		64-126
460-00-4	4-Bromofluorobenzene (Surr)	99		72-126
1868-53-7	Dibromofluoromethane (Surr)	104		60-140
2037-26-5	Toluene-d8 (Surr)	97		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 80N 40E SOIL Lab Sample ID: 480-165607-7

Matrix: Solid Lab File ID: F5345.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:20

Sample wt/vol: 5.11(g) Date Analyzed: 01/28/2020 12:55

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 3.2 Level: (low/med) Low

Analysis Batch No.: 515133 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 80N 30E SOIL Lab Sample ID: 480-165607-8

Matrix: Solid Lab File ID: N1036.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:45

Sample wt/vol: 5.03(g) Date Analyzed: 01/29/2020 12:28

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.4 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		240	67
79-34-5	1,1,2,2-Tetrachloroethane	ND		240	39
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		240	120
79-00-5	1,1,2-Trichloroethane	ND		240	51
75-34-3	1,1-Dichloroethane	ND		240	74
75-35-4	1,1-Dichloroethene	ND		240	83
120-82-1	1,2,4-Trichlorobenzene	ND		240	91
96-12-8	1,2-Dibromo-3-Chloropropane	ND		240	120
106-93-4	1,2-Dibromoethane	ND		240	42
95-50-1	1,2-Dichlorobenzene	ND		240	61
107-06-2	1,2-Dichloroethane	ND		240	99
78-87-5	1,2-Dichloropropane	ND		240	39
541-73-1	1,3-Dichlorobenzene	ND		240	64
106-46-7	1,4-Dichlorobenzene	ND		240	34
78-93-3	2-Butanone (MEK)	ND		1200	720
591-78-6	2-Hexanone	ND		1200	490
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		1200	77
67-64-1	Acetone	ND		1200	990
71-43-2	Benzene	ND		240	46
75-27-4	Bromodichloromethane	ND		240	48
75-25-2	Bromoform	ND		240	120
74-83-9	Bromomethane	ND		240	53
75-15-0	Carbon disulfide	ND		240	110
56-23-5	Carbon tetrachloride	ND		240	61
108-90-7	Chlorobenzene	ND		240	32
75-00-3	Chloroethane	ND		240	50
67-66-3	Chloroform	ND		240	170
74-87-3	Chloromethane	ND		240	57
156-59-2	cis-1,2-Dichloroethene	530		240	67
10061-01-5	cis-1,3-Dichloropropene	ND		240	58
110-82-7	Cyclohexane	ND		240	54
124-48-1	Dibromochloromethane	ND		240	120
75-71-8	Dichlorodifluoromethane	ND		240	110
100-41-4	Ethylbenzene	ND		240	70
98-82-8	Isopropylbenzene	ND		240	36

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 80N 30E SOIL Lab Sample ID: 480-165607-8

Matrix: Solid Lab File ID: N1036.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:45

Sample wt/vol: 5.03(g) Date Analyzed: 01/29/2020 12:28

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.4 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		1200	110
1634-04-4	Methyl tert-butyl ether	ND		240	91
108-87-2	Methylcyclohexane	ND		240	110
75-09-2	Methylene Chloride	ND		240	48
100-42-5	Styrene	ND		240	58
127-18-4	*Tetrachloroethene*	*38000*	*E*	*240*	*32*
108-88-3	Toluene	ND		240	65
156-60-5	trans-1,2-Dichloroethene	ND		240	57
10061-02-6	trans-1,3-Dichloropropene	ND		240	24
79-01-6	Trichloroethene	750		240	67
75-69-4	Trichlorofluoromethane	ND		240	110
75-01-4	Vinyl chloride	ND		240	81
1330-20-7	Xylenes, Total	ND		480	130

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		53-146
460-00-4	4-Bromofluorobenzene (Surr)	100		49-148
1868-53-7	Dibromofluoromethane (Surr)	97		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 80N 30E SOIL Lab Sample ID: 480-165607-8

Matrix: Solid Lab File ID: N1036.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:45

Sample wt/vol: 5.03(g) Date Analyzed: 01/29/2020 12:28

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.4 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 10 TIC Result Total: 25100

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Unknown	11.32	1500	T J	
17301-23-4	Undecane, 2,6-dimethyl-	12.23	3900	T J N	90%
	Unknown	12.59	2000	T J	
	Unknown	12.73	3200	T J	
	Unknown	13.40	1500	T J	
	Unknown	13.55	2700	T J	
	Unknown	13.73	3900	T J	
	Unknown	14.15	2200	T J	
	Unknown	14.38	1800	T J	
	Unknown	14.67	2400	T J	

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 80N 30E SOIL DL Lab Sample ID: 480-165607-8 DL

Matrix: Solid Lab File ID: N1088.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:45

Sample wt/vol: 5.03(g) Date Analyzed: 01/30/2020 11:34

Soil Aliquot Vol: 100 (uL) Dilution Factor: 8

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.4 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		960	270
79-34-5	1,1,2,2-Tetrachloroethane	ND		960	160
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		960	480
79-00-5	1,1,2-Trichloroethane	ND		960	200
75-34-3	1,1-Dichloroethane	ND		960	300
75-35-4	1,1-Dichloroethene	ND		960	330
120-82-1	1,2,4-Trichlorobenzene	ND		960	370
96-12-8	1,2-Dibromo-3-Chloropropane	ND		960	480
106-93-4	1,2-Dibromoethane	ND		960	170
95-50-1	1,2-Dichlorobenzene	ND		960	250
107-06-2	1,2-Dichloroethane	ND		960	390
78-87-5	1,2-Dichloropropane	ND		960	160
541-73-1	1,3-Dichlorobenzene	ND		960	260
106-46-7	1,4-Dichlorobenzene	ND		960	130
78-93-3	2-Butanone (MEK)	ND		4800	2900
591-78-6	2-Hexanone	ND		4800	2000
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		4800	310
67-64-1	Acetone	ND		4800	4000
71-43-2	Benzene	ND		960	180
75-27-4	Bromodichloromethane	ND		960	190
75-25-2	Bromoform	ND		960	480
74-83-9	Bromomethane	ND		960	210
75-15-0	Carbon disulfide	ND		960	440
56-23-5	Carbon tetrachloride	ND		960	250
108-90-7	Chlorobenzene	ND		960	130
75-00-3	Chloroethane	ND		960	200
67-66-3	Chloroform	ND		960	660
74-87-3	Chloromethane	ND		960	230
156-59-2	cis-1,2-Dichloroethene	610	J	960	270
10061-01-5	cis-1,3-Dichloropropene	ND		960	230
110-82-7	Cyclohexane	ND		960	210
124-48-1	Dibromochloromethane	ND		960	470
75-71-8	Dichlorodifluoromethane	ND		960	420
100-41-4	Ethylbenzene	ND		960	280
98-82-8	Isopropylbenzene	ND		960	140

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 80N 30E SOIL DL Lab Sample ID: 480-165607-8 DL

Matrix: Solid Lab File ID: N1088.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:45

Sample wt/vol: 5.03(g) Date Analyzed: 01/30/2020 11:34

Soil Aliquot Vol: 100 (uL) Dilution Factor: 8

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.4 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	*Methyl acetate*	*ND*		*4800*	*460*
1634-04-4	*Methyl tert-butyl ether*	*ND*		*960*	*360*
108-87-2	*Methylcyclohexane*	*ND*		*960*	*450*
75-09-2	*Methylene Chloride*	*ND*		*960*	*190*
100-42-5	*Styrene*	*ND*		*960*	*230*
127-18-4	Tetrachloroethene	48000	D	960	130
108-88-3	*Toluene*	*ND*		*960*	*260*
156-60-5	*trans-1,2-Dichloroethene*	*ND*		*960*	*230*
10061-02-6	*trans-1,3-Dichloropropene*	*ND*		*960*	*95*
79-01-6	*Trichloroethene*	*890*	*J*	*960*	*270*
75-69-4	*Trichlorofluoromethane*	*ND*		*960*	*450*
75-01-4	*Vinyl chloride*	*ND*		*960*	*320*
1330-20-7	*Xylenes, Total*	*ND*		*1900*	*530*

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	96		53-146
460-00-4	4-Bromofluorobenzene (Surr)	96		49-148
1868-53-7	Dibromofluoromethane (Surr)	95		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 80N 30E SOIL DL Lab Sample ID: 480-165607-8 DL

Matrix: Solid Lab File ID: N1088.D

Analysis Method: 8260C Date Collected: 01/23/2020 16:45

Sample wt/vol: 5.03(g) Date Analyzed: 01/30/2020 11:34

Soil Aliquot Vol: 100 (uL) Dilution Factor: 8

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.4 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 3 TIC Result Total: 13000

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Unknown	12.23	4300	T J	
	Unknown	12.73	5500	T J	
	Unknown	13.82	3200	T J	

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 60N 40E SOIL Lab Sample ID: 480-165607-9

Matrix: Solid Lab File ID: N1037.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:15

Sample wt/vol: 5.05(g) Date Analyzed: 01/29/2020 12:52

Soil Aliquot Vol: 100 (uL) Dilution Factor: 10

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.2 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		1100	320
79-34-5	1,1,2,2-Tetrachloroethane	ND		1100	190
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1100	570
79-00-5	1,1,2-Trichloroethane	ND		1100	240
75-34-3	1,1-Dichloroethane	ND		1100	350
75-35-4	1,1-Dichloroethene	ND		1100	390
120-82-1	1,2,4-Trichlorobenzene	ND		1100	430
96-12-8	1,2-Dibromo-3-Chloropropane	ND		1100	570
106-93-4	1,2-Dibromoethane	ND		1100	200
95-50-1	1,2-Dichlorobenzene	ND		1100	290
107-06-2	1,2-Dichloroethane	ND		1100	470
78-87-5	1,2-Dichloropropane	ND		1100	180
541-73-1	1,3-Dichlorobenzene	ND		1100	300
106-46-7	1,4-Dichlorobenzene	ND		1100	160
78-93-3	2-Butanone (MEK)	ND		5700	3400
591-78-6	2-Hexanone	ND		5700	2300
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5700	370
67-64-1	Acetone	ND		5700	4700
71-43-2	Benzene	ND		1100	220
75-27-4	Bromodichloromethane	ND		1100	230
75-25-2	Bromoform	ND		1100	570
74-83-9	Bromomethane	ND		1100	250
75-15-0	Carbon disulfide	ND		1100	520
56-23-5	Carbon tetrachloride	ND		1100	290
108-90-7	Chlorobenzene	ND		1100	150
75-00-3	Chloroethane	ND		1100	240
67-66-3	Chloroform	ND		1100	780
74-87-3	Chloromethane	ND		1100	270
156-59-2	cis-1,2-Dichloroethene	2100		1100	310
10061-01-5	cis-1,3-Dichloropropene	ND		1100	270
110-82-7	Cyclohexane	ND		1100	250
124-48-1	Dibromochloromethane	ND		1100	550
75-71-8	Dichlorodifluoromethane	ND		1100	500
100-41-4	Ethylbenzene	ND		1100	330
98-82-8	Isopropylbenzene	ND		1100	170

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 60N 40E SOIL Lab Sample ID: 480-165607-9

Matrix: Solid Lab File ID: N1037.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:15

Sample wt/vol: 5.05(g) Date Analyzed: 01/29/2020 12:52

Soil Aliquot Vol: 100 (uL) Dilution Factor: 10

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.2 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		5700	540
1634-04-4	Methyl tert-butyl ether	ND		1100	430
108-87-2	Methylcyclohexane	ND		1100	530
75-09-2	Methylene Chloride	ND		1100	230
100-42-5	Styrene	ND		1100	280
127-18-4	Tetrachloroethene	100000		1100	150
108-88-3	Toluene	ND		1100	310
156-60-5	trans-1,2-Dichloroethene	ND		1100	270
10061-02-6	trans-1,3-Dichloropropene	ND		1100	110
79-01-6	Trichloroethene	2000		1100	320
75-69-4	Trichlorofluoromethane	ND		1100	540
75-01-4	Vinyl chloride	ND		1100	380
1330-20-7	Xylenes, Total	ND		2300	630

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		53-146
460-00-4	4-Bromofluorobenzene (Surr)	97		49-148
1868-53-7	Dibromofluoromethane (Surr)	93		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 60N 40E SOIL Lab Sample ID: 480-165607-9

Matrix: Solid Lab File ID: N1037.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:15

Sample wt/vol: 5.05(g) Date Analyzed: 01/29/2020 12:52

Soil Aliquot Vol: 100 (uL) Dilution Factor: 10

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.2 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 0N 20E SOIL Lab Sample ID: 480-165607-10

Matrix: Solid Lab File ID: N1038.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:11

Sample wt/vol: 5.09(g) Date Analyzed: 01/29/2020 13:16

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.9 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		470	130
79-34-5	1,1,2,2-Tetrachloroethane	ND		470	77
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		470	240
79-00-5	1,1,2-Trichloroethane	ND		470	99
75-34-3	1,1-Dichloroethane	ND		470	150
75-35-4	1,1-Dichloroethene	ND		470	160
120-82-1	1,2,4-Trichlorobenzene	ND		470	180
96-12-8	1,2-Dibromo-3-Chloropropane	ND		470	240
106-93-4	1,2-Dibromoethane	ND		470	83
95-50-1	1,2-Dichlorobenzene	ND		470	120
107-06-2	1,2-Dichloroethane	ND		470	190
78-87-5	1,2-Dichloropropane	ND		470	77
541-73-1	1,3-Dichlorobenzene	ND		470	130
106-46-7	1,4-Dichlorobenzene	ND		470	66
78-93-3	2-Butanone (MEK)	ND		2400	1400
591-78-6	2-Hexanone	ND		2400	970
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		2400	150
67-64-1	Acetone	ND		2400	1900
71-43-2	Benzene	ND		470	90
75-27-4	Bromodichloromethane	ND		470	95
75-25-2	Bromoform	ND		470	240
74-83-9	Bromomethane	ND		470	100
75-15-0	Carbon disulfide	ND		470	220
56-23-5	Carbon tetrachloride	ND		470	120
108-90-7	Chlorobenzene	ND		470	62
75-00-3	Chloroethane	ND		470	98
67-66-3	Chloroform	ND		470	320
74-87-3	Chloromethane	ND		470	110
156-59-2	cis-1,2-Dichloroethene	ND		470	130
10061-01-5	cis-1,3-Dichloropropene	ND		470	110
110-82-7	Cyclohexane	ND		470	110
124-48-1	Dibromochloromethane	ND		470	230
75-71-8	Dichlorodifluoromethane	ND		470	210
100-41-4	Ethylbenzene	ND		470	140
98-82-8	Isopropylbenzene	ND		470	71

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 0N 20E SOIL Lab Sample ID: 480-165607-10

Matrix: Solid Lab File ID: N1038.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:11

Sample wt/vol: 5.09(g) Date Analyzed: 01/29/2020 13:16

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.9 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		2400	230
1634-04-4	Methyl tert-butyl ether	ND		470	180
108-87-2	Methylcyclohexane	ND		470	220
75-09-2	Methylene Chloride	ND		470	94
100-42-5	Styrene	ND		470	110
127-18-4	*Tetrachloroethene*	*48000*	*E*	*470*	*64*
108-88-3	Toluene	ND		470	130
156-60-5	trans-1,2-Dichloroethene	ND		470	110
10061-02-6	trans-1,3-Dichloropropene	ND		470	47
79-01-6	Trichloroethene	570		470	130
75-69-4	Trichlorofluoromethane	ND		470	220
75-01-4	Vinyl chloride	ND		470	160
1330-20-7	Xylenes, Total	ND		950	260

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	105		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	96		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 0N 20E SOIL Lab Sample ID: 480-165607-10

Matrix: Solid Lab File ID: N1038.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:11

Sample wt/vol: 5.09(g) Date Analyzed: 01/29/2020 13:16

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.9 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 0N 20E SOIL DL Lab Sample ID: 480-165607-10 DL

Matrix: Solid Lab File ID: N1089.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:11

Sample wt/vol: 5.09(g) Date Analyzed: 01/30/2020 11:58

Soil Aliquot Vol: 100 (uL) Dilution Factor: 10

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.9 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		1200	330
79-34-5	1,1,2,2-Tetrachloroethane	ND		1200	190
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1200	590
79-00-5	1,1,2-Trichloroethane	ND		1200	250
75-34-3	1,1-Dichloroethane	ND		1200	370
75-35-4	1,1-Dichloroethene	ND		1200	410
120-82-1	1,2,4-Trichlorobenzene	ND		1200	450
96-12-8	1,2-Dibromo-3-Chloropropane	ND		1200	590
106-93-4	1,2-Dibromoethane	ND		1200	210
95-50-1	1,2-Dichlorobenzene	ND		1200	300
107-06-2	1,2-Dichloroethane	ND		1200	480
78-87-5	1,2-Dichloropropane	ND		1200	190
541-73-1	1,3-Dichlorobenzene	ND		1200	320
106-46-7	1,4-Dichlorobenzene	ND		1200	170
78-93-3	2-Butanone (MEK)	ND		5900	3500
591-78-6	2-Hexanone	ND		5900	2400
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		5900	380
67-64-1	Acetone	ND		5900	4900
71-43-2	Benzene	ND		1200	220
75-27-4	Bromodichloromethane	ND		1200	240
75-25-2	Bromoform	ND		1200	590
74-83-9	Bromomethane	ND		1200	260
75-15-0	Carbon disulfide	ND		1200	540
56-23-5	Carbon tetrachloride	ND		1200	300
108-90-7	Chlorobenzene	ND		1200	160
75-00-3	Chloroethane	ND		1200	250
67-66-3	Chloroform	ND		1200	810
74-87-3	Chloromethane	ND		1200	280
156-59-2	cis-1,2-Dichloroethene	ND		1200	330
10061-01-5	cis-1,3-Dichloropropene	ND		1200	280
110-82-7	Cyclohexane	ND		1200	260
124-48-1	Dibromochloromethane	ND		1200	570
75-71-8	Dichlorodifluoromethane	ND		1200	520
100-41-4	Ethylbenzene	ND		1200	340
98-82-8	Isopropylbenzene	ND		1200	180

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 0N 20E SOIL DL Lab Sample ID: 480-165607-10 DL

Matrix: Solid Lab File ID: N1089.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:11

Sample wt/vol: 5.09(g) Date Analyzed: 01/30/2020 11:58

Soil Aliquot Vol: 100 (uL) Dilution Factor: 10

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.9 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	*Methyl acetate*	*ND*		*5900*	*560*
1634-04-4	*Methyl tert-butyl ether*	*ND*		*1200*	*450*
108-87-2	*Methylcyclohexane*	*ND*		*1200*	*550*
75-09-2	*Methylene Chloride*	*ND*		*1200*	*230*
100-42-5	*Styrene*	*ND*		*1200*	*290*
127-18-4	Tetrachloroethene	48000	D	1200	160
108-88-3	*Toluene*	*ND*		*1200*	*320*
156-60-5	*trans-1,2-Dichloroethene*	*ND*		*1200*	*280*
10061-02-6	*trans-1,3-Dichloropropene*	*ND*		*1200*	*120*
79-01-6	*Trichloroethene*	*570*	*J*	*1200*	*330*
75-69-4	*Trichlorofluoromethane*	*ND*		*1200*	*550*
75-01-4	*Vinyl chloride*	*ND*		*1200*	*400*
1330-20-7	*Xylenes, Total*	*ND*		*2400*	*660*

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		53-146
460-00-4	4-Bromofluorobenzene (Surr)	100		49-148
1868-53-7	Dibromofluoromethane (Surr)	96		60-140
2037-26-5	Toluene-d8 (Surr)	101		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 0N 20E SOIL DL Lab Sample ID: 480-165607-10 DL

Matrix: Solid Lab File ID: N1089.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:11

Sample wt/vol: 5.09(g) Date Analyzed: 01/30/2020 11:58

Soil Aliquot Vol: 100 (uL) Dilution Factor: 10

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.9 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 20N 10E SOIL Lab Sample ID: 480-165607-11

Matrix: Solid Lab File ID: F5346.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:45

Sample wt/vol: 5(g) Date Analyzed: 01/28/2020 13:20

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 4.9 Level: (low/med) Low

Analysis Batch No.: 515133 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.3	0.38
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.3	0.85
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.3	1.2
79-00-5	1,1,2-Trichloroethane	ND		5.3	0.68
75-34-3	1,1-Dichloroethane	ND		5.3	0.64
75-35-4	1,1-Dichloroethene	ND		5.3	0.64
120-82-1	1,2,4-Trichlorobenzene	ND		5.3	0.32
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.3	2.6
106-93-4	1,2-Dibromoethane	ND		5.3	0.68
95-50-1	1,2-Dichlorobenzene	ND		5.3	0.41
107-06-2	1,2-Dichloroethane	ND		5.3	0.26
78-87-5	1,2-Dichloropropane	ND		5.3	2.6
541-73-1	1,3-Dichlorobenzene	ND		5.3	0.27
106-46-7	1,4-Dichlorobenzene	ND		5.3	0.74
78-93-3	2-Butanone (MEK)	ND		26	1.9
591-78-6	2-Hexanone	ND		26	2.6
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		26	1.7
67-64-1	Acetone	ND		26	4.4
71-43-2	Benzene	ND		5.3	0.26
75-27-4	Bromodichloromethane	ND		5.3	0.70
75-25-2	Bromoform	ND		5.3	2.6
74-83-9	Bromomethane	ND		5.3	0.47
75-15-0	Carbon disulfide	ND		5.3	2.6
56-23-5	Carbon tetrachloride	ND		5.3	0.51
108-90-7	Chlorobenzene	ND		5.3	0.69
75-00-3	Chloroethane	ND		5.3	1.2
67-66-3	Chloroform	ND	U	5.3	0.33
74-87-3	Chloromethane	ND		5.3	0.32
156-59-2	cis-1,2-Dichloroethene	11		5.3	0.67
10061-01-5	cis-1,3-Dichloropropene	ND		5.3	0.76
110-82-7	Cyclohexane	ND		5.3	0.74
124-48-1	Dibromochloromethane	ND		5.3	0.67
75-71-8	Dichlorodifluoromethane	ND		5.3	0.43
100-41-4	Ethylbenzene	ND		5.3	0.36
98-82-8	Isopropylbenzene	ND		5.3	0.79

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 20N 10E SOIL Lab Sample ID: 480-165607-11

Matrix: Solid Lab File ID: F5346.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:45

Sample wt/vol: 5(g) Date Analyzed: 01/28/2020 13:20

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 4.9 Level: (low/med) Low

Analysis Batch No.: 515133 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		26	3.2
1634-04-4	Methyl tert-butyl ether	ND		5.3	0.52
108-87-2	Methylcyclohexane	ND		5.3	0.80
75-09-2	Methylene Chloride	ND		5.3	2.4
100-42-5	Styrene	ND		5.3	0.26
127-18-4	Tetrachloroethene	74		5.3	0.71
108-88-3	Toluene	ND		5.3	0.40
156-60-5	trans-1,2-Dichloroethene	1.1	J	5.3	0.54
10061-02-6	trans-1,3-Dichloropropene	ND		5.3	2.3
79-01-6	Trichloroethene	3.9	J	5.3	1.2
75-69-4	Trichlorofluoromethane	ND		5.3	0.50
75-01-4	Vinyl chloride	ND		5.3	0.64
1330-20-7	Xylenes, Total	ND		11	0.88

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		64-126
460-00-4	4-Bromofluorobenzene (Surr)	95		72-126
1868-53-7	Dibromofluoromethane (Surr)	105		60-140
2037-26-5	Toluene-d8 (Surr)	99		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 20N 10E SOIL Lab Sample ID: 480-165607-11

Matrix: Solid Lab File ID: F5346.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:45

Sample wt/vol: 5(g) Date Analyzed: 01/28/2020 13:20

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 4.9 Level: (low/med) Low

Analysis Batch No.: 515133 Units: ug/Kg

Number TICs Found: 3 TIC Result Total: 31.5

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
91-20-3	Naphthalene	12.70	17	T J N	94%
264-09-5	Benzocycloheptatriene	13.81	6.9	T J N	94%
91-57-6	Naphthalene, 2-methyl-	14.03	7.6	T J N	94%

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 90N 50E SOIL Lab Sample ID: 480-165607-13

Matrix: Solid Lab File ID: N1039.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:36

Sample wt/vol: 5.06(g) Date Analyzed: 01/29/2020 13:40

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		230	64
79-34-5	1,1,2,2-Tetrachloroethane	ND		230	37
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		230	120
79-00-5	1,1,2-Trichloroethane	ND		230	48
75-34-3	1,1-Dichloroethane	ND		230	71
75-35-4	1,1-Dichloroethene	ND		230	80
120-82-1	1,2,4-Trichlorobenzene	ND		230	87
96-12-8	1,2-Dibromo-3-Chloropropane	ND		230	120
106-93-4	1,2-Dibromoethane	ND		230	40
95-50-1	1,2-Dichlorobenzene	ND		230	59
107-06-2	1,2-Dichloroethane	ND		230	94
78-87-5	1,2-Dichloropropane	ND		230	37
541-73-1	1,3-Dichlorobenzene	ND		230	62
106-46-7	1,4-Dichlorobenzene	ND		230	32
78-93-3	2-Butanone (MEK)	ND		1200	690
591-78-6	2-Hexanone	ND		1200	470
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		1200	74
67-64-1	Acetone	ND		1200	950
71-43-2	Benzene	ND		230	44
75-27-4	Bromodichloromethane	ND		230	46
75-25-2	Bromoform	ND		230	120
74-83-9	Bromomethane	ND		230	51
75-15-0	Carbon disulfide	ND		230	110
56-23-5	Carbon tetrachloride	ND		230	59
108-90-7	Chlorobenzene	ND		230	30
75-00-3	Chloroethane	ND		230	48
67-66-3	Chloroform	ND		230	160
74-87-3	Chloromethane	ND		230	55
156-59-2	cis-1,2-Dichloroethene	850		230	64
10061-01-5	cis-1,3-Dichloropropene	ND		230	55
110-82-7	Cyclohexane	ND		230	51
124-48-1	Dibromochloromethane	ND		230	110
75-71-8	Dichlorodifluoromethane	ND		230	100
100-41-4	Ethylbenzene	ND		230	67
98-82-8	Isopropylbenzene	ND		230	35

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 90N 50E SOIL Lab Sample ID: 480-165607-13

Matrix: Solid Lab File ID: N1039.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:36

Sample wt/vol: 5.06(g) Date Analyzed: 01/29/2020 13:40

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		1200	110
1634-04-4	Methyl tert-butyl ether	ND		230	87
108-87-2	Methylcyclohexane	ND		230	110
75-09-2	Methylene Chloride	ND		230	46
100-42-5	Styrene	ND		230	56
127-18-4	*Tetrachloroethene*	*29000*	*E*	*230*	*31*
108-88-3	Toluene	ND		230	62
156-60-5	trans-1,2-Dichloroethene	ND		230	54
10061-02-6	trans-1,3-Dichloropropene	ND		230	23
79-01-6	Trichloroethene	970		230	64
75-69-4	Trichlorofluoromethane	ND		230	110
75-01-4	Vinyl chloride	ND		230	77
1330-20-7	Xylenes, Total	ND		460	130

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		53-146
460-00-4	4-Bromofluorobenzene (Surr)	96		49-148
1868-53-7	Dibromofluoromethane (Surr)	92		60-140
2037-26-5	Toluene-d8 (Surr)	98		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 90N 50E SOIL Lab Sample ID: 480-165607-13

Matrix: Solid Lab File ID: N1039.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:36

Sample wt/vol: 5.06(g) Date Analyzed: 01/29/2020 13:40

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 90N 50E SOIL DL Lab Sample ID: 480-165607-13 DL

Matrix: Solid Lab File ID: N1090.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:36

Sample wt/vol: 5.06(g) Date Analyzed: 01/30/2020 12:22

Soil Aliquot Vol: 100 (uL) Dilution Factor: 8

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.0 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		920	260
79-34-5	1,1,2,2-Tetrachloroethane	ND		920	150
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		920	460
79-00-5	1,1,2-Trichloroethane	ND		920	190
75-34-3	1,1-Dichloroethane	ND		920	290
75-35-4	1,1-Dichloroethene	ND		920	320
120-82-1	1,2,4-Trichlorobenzene	ND		920	350
96-12-8	1,2-Dibromo-3-Chloropropane	ND		920	460
106-93-4	1,2-Dibromoethane	ND		920	160
95-50-1	1,2-Dichlorobenzene	ND		920	240
107-06-2	1,2-Dichloroethane	ND		920	380
78-87-5	1,2-Dichloropropane	ND		920	150
541-73-1	1,3-Dichlorobenzene	ND		920	250
106-46-7	1,4-Dichlorobenzene	ND		920	130
78-93-3	2-Butanone (MEK)	ND		4600	2700
591-78-6	2-Hexanone	ND		4600	1900
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		4600	300
67-64-1	Acetone	ND		4600	3800
71-43-2	Benzene	ND		920	180
75-27-4	Bromodichloromethane	ND		920	180
75-25-2	Bromoform	ND		920	460
74-83-9	Bromomethane	ND		920	200
75-15-0	Carbon disulfide	ND		920	420
56-23-5	Carbon tetrachloride	ND		920	240
108-90-7	Chlorobenzene	ND		920	120
75-00-3	Chloroethane	ND		920	190
67-66-3	Chloroform	ND		920	630
74-87-3	Chloromethane	ND		920	220
156-59-2	cis-1,2-Dichloroethene	1600		920	250
10061-01-5	cis-1,3-Dichloropropene	ND		920	220
110-82-7	Cyclohexane	ND		920	200
124-48-1	Dibromochloromethane	ND		920	450
75-71-8	Dichlorodifluoromethane	ND		920	400
100-41-4	Ethylbenzene	ND		920	270
98-82-8	Isopropylbenzene	ND		920	140

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 90N 50E SOIL DL Lab Sample ID: 480-165607-13 DL

Matrix: Solid Lab File ID: N1090.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:36

Sample wt/vol: 5.06(g) Date Analyzed: 01/30/2020 12:22

Soil Aliquot Vol: 100 (uL) Dilution Factor: 8

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.0 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	*Methyl acetate*	*ND*		*4600*	*440*
1634-04-4	*Methyl tert-butyl ether*	*ND*		*920*	*350*
108-87-2	*Methylcyclohexane*	*ND*		*920*	*430*
75-09-2	*Methylene Chloride*	*ND*		*920*	*180*
100-42-5	*Styrene*	*ND*		*920*	*220*
127-18-4	Tetrachloroethene	37000	D	920	120
108-88-3	*Toluene*	*ND*		*920*	*250*
156-60-5	*trans-1,2-Dichloroethene*	*ND*		*920*	*220*
10061-02-6	*trans-1,3-Dichloropropene*	*ND*		*920*	*91*
79-01-6	*Trichloroethene*	*1600*		*920*	*260*
75-69-4	*Trichlorofluoromethane*	*ND*		*920*	*430*
75-01-4	*Vinyl chloride*	*ND*		*920*	*310*
1330-20-7	*Xylenes, Total*	*ND*		*1800*	*510*

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	95		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 90N 50E SOIL DL Lab Sample ID: 480-165607-13 DL

Matrix: Solid Lab File ID: N1090.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:36

Sample wt/vol: 5.06(g) Date Analyzed: 01/30/2020 12:22

Soil Aliquot Vol: 100 (uL) Dilution Factor: 8

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.0 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 20E D Lab Sample ID: 480-165607-14

Matrix: Solid Lab File ID: N1040.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:21

Sample wt/vol: 5(g) Date Analyzed: 01/29/2020 14:04

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.2 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		110	31
79-34-5	1,1,2,2-Tetrachloroethane	ND		110	18
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		110	57
79-00-5	1,1,2-Trichloroethane	ND		110	24
75-34-3	1,1-Dichloroethane	ND		110	35
75-35-4	1,1-Dichloroethene	ND		110	39
120-82-1	1,2,4-Trichlorobenzene	ND		110	43
96-12-8	1,2-Dibromo-3-Chloropropane	ND		110	57
106-93-4	1,2-Dibromoethane	ND		110	20
95-50-1	1,2-Dichlorobenzene	ND		110	29
107-06-2	1,2-Dichloroethane	ND		110	46
78-87-5	1,2-Dichloropropane	ND		110	18
541-73-1	1,3-Dichlorobenzene	ND		110	30
106-46-7	1,4-Dichlorobenzene	ND		110	16
78-93-3	2-Butanone (MEK)	ND		570	340
591-78-6	2-Hexanone	ND		570	230
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		570	36
67-64-1	Acetone	ND		570	470
71-43-2	Benzene	ND		110	22
75-27-4	Bromodichloromethane	ND		110	23
75-25-2	Bromoform	ND		110	57
74-83-9	Bromomethane	ND		110	25
75-15-0	Carbon disulfide	ND		110	52
56-23-5	Carbon tetrachloride	ND		110	29
108-90-7	Chlorobenzene	ND		110	15
75-00-3	Chloroethane	ND		110	24
67-66-3	Chloroform	ND		110	78
74-87-3	Chloromethane	ND		110	27
156-59-2	cis-1,2-Dichloroethene	1700		110	31
10061-01-5	cis-1,3-Dichloropropene	ND		110	27
110-82-7	Cyclohexane	ND		110	25
124-48-1	Dibromochloromethane	ND		110	55
75-71-8	Dichlorodifluoromethane	ND		110	49
100-41-4	Ethylbenzene	ND		110	33
98-82-8	Isopropylbenzene	ND		110	17

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 20E D Lab Sample ID: 480-165607-14

Matrix: Solid Lab File ID: N1040.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:21

Sample wt/vol: 5(g) Date Analyzed: 01/29/2020 14:04

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.2 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	600		570	54
1634-04-4	Methyl tert-butyl ether	ND		110	43
108-87-2	Methylcyclohexane	ND		110	53
75-09-2	Methylene Chloride	ND		110	22
100-42-5	Styrene	ND		110	27
127-18-4	*Tetrachloroethene*	*12000*	*E*	*110*	*15*
108-88-3	Toluene	ND		110	30
156-60-5	trans-1,2-Dichloroethene	280		110	27
10061-02-6	trans-1,3-Dichloropropene	ND		110	11
79-01-6	Trichloroethene	350		110	32
75-69-4	Trichlorofluoromethane	ND		110	53
75-01-4	Vinyl chloride	ND		110	38
1330-20-7	Xylenes, Total	ND		230	63

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	96		53-146
460-00-4	4-Bromofluorobenzene (Surr)	101		49-148
1868-53-7	Dibromofluoromethane (Surr)	87		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 20E D Lab Sample ID: 480-165607-14

Matrix: Solid Lab File ID: N1040.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:21

Sample wt/vol: 5(g) Date Analyzed: 01/29/2020 14:04

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.2 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 20E D DL Lab Sample ID: 480-165607-14 DL

Matrix: Solid Lab File ID: N1091.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:21

Sample wt/vol: 5(g) Date Analyzed: 01/30/2020 12:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.2 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		230	63
79-34-5	1,1,2,2-Tetrachloroethane	ND		230	37
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		230	110
79-00-5	1,1,2-Trichloroethane	ND		230	48
75-34-3	1,1-Dichloroethane	ND		230	70
75-35-4	1,1-Dichloroethene	ND		230	78
120-82-1	1,2,4-Trichlorobenzene	ND		230	86
96-12-8	1,2-Dibromo-3-Chloropropane	ND		230	110
106-93-4	1,2-Dibromoethane	ND		230	40
95-50-1	1,2-Dichlorobenzene	ND		230	58
107-06-2	1,2-Dichloroethane	ND		230	93
78-87-5	1,2-Dichloropropane	ND		230	37
541-73-1	1,3-Dichlorobenzene	ND		230	61
106-46-7	1,4-Dichlorobenzene	ND		230	32
78-93-3	2-Butanone (MEK)	ND		1100	670
591-78-6	2-Hexanone	ND		1100	460
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		1100	73
67-64-1	Acetone	ND		1100	930
71-43-2	Benzene	ND		230	43
75-27-4	Bromodichloromethane	ND		230	45
75-25-2	Bromoform	ND		230	110
74-83-9	Bromomethane	ND		230	50
75-15-0	Carbon disulfide	ND		230	100
56-23-5	Carbon tetrachloride	ND		230	58
108-90-7	Chlorobenzene	ND		230	30
75-00-3	Chloroethane	ND		230	47
67-66-3	Chloroform	ND		230	160
74-87-3	Chloromethane	ND		230	54
156-59-2	cis-1,2-Dichloroethene	2200		230	63
10061-01-5	cis-1,3-Dichloropropene	ND		230	54
110-82-7	Cyclohexane	ND		230	50
124-48-1	Dibromochloromethane	ND		230	110
75-71-8	Dichlorodifluoromethane	ND		230	99
100-41-4	Ethylbenzene	ND		230	66
98-82-8	Isopropylbenzene	ND		230	34

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 20E D DL Lab Sample ID: 480-165607-14 DL

Matrix: Solid Lab File ID: N1091.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:21

Sample wt/vol: 5(g) Date Analyzed: 01/30/2020 12:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.2 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	*Methyl acetate*	*880*	*J*	*1100*	*110*
1634-04-4	*Methyl tert-butyl ether*	*ND*		*230*	*86*
108-87-2	*Methylcyclohexane*	*ND*		*230*	*110*
75-09-2	*Methylene Chloride*	*ND*		*230*	*45*
100-42-5	*Styrene*	*ND*		*230*	*55*
127-18-4	Tetrachloroethene	15000	D	230	30
108-88-3	*Toluene*	*ND*		*230*	*61*
156-60-5	*trans-1,2-Dichloroethene*	*310*		*230*	*53*
10061-02-6	*trans-1,3-Dichloropropene*	*ND*		*230*	*22*
79-01-6	*Trichloroethene*	*470*		*230*	*63*
75-69-4	*Trichlorofluoromethane*	*ND*		*230*	*110*
75-01-4	*Vinyl chloride*	*ND*		*230*	*76*
1330-20-7	*Xylenes, Total*	*ND*		*450*	*130*

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	97		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	92		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 20E D DL Lab Sample ID: 480-165607-14 DL

Matrix: Solid Lab File ID: N1091.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:21

Sample wt/vol: 5(g) Date Analyzed: 01/30/2020 12:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.2 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 110N 50E SOIL Lab Sample ID: 480-165607-15

Matrix: Solid Lab File ID: N1041.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:44

Sample wt/vol: 5.07(g) Date Analyzed: 01/29/2020 14:28

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.6 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		110	31
79-34-5	1,1,2,2-Tetrachloroethane	ND		110	18
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		110	56
79-00-5	1,1,2-Trichloroethane	ND		110	24
75-34-3	1,1-Dichloroethane	ND		110	35
75-35-4	1,1-Dichloroethene	ND		110	39
120-82-1	1,2,4-Trichlorobenzene	ND		110	43
96-12-8	1,2-Dibromo-3-Chloropropane	ND		110	56
106-93-4	1,2-Dibromoethane	ND		110	20
95-50-1	1,2-Dichlorobenzene	ND		110	29
107-06-2	1,2-Dichloroethane	ND		110	46
78-87-5	1,2-Dichloropropane	ND		110	18
541-73-1	1,3-Dichlorobenzene	ND		110	30
106-46-7	1,4-Dichlorobenzene	ND		110	16
78-93-3	2-Butanone (MEK)	ND		560	330
591-78-6	2-Hexanone	ND		560	230
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		560	36
67-64-1	Acetone	ND		560	460
71-43-2	Benzene	ND		110	21
75-27-4	Bromodichloromethane	ND		110	23
75-25-2	Bromoform	ND		110	56
74-83-9	Bromomethane	ND		110	25
75-15-0	Carbon disulfide	ND		110	51
56-23-5	Carbon tetrachloride	ND		110	29
108-90-7	Chlorobenzene	ND		110	15
75-00-3	Chloroethane	ND		110	23
67-66-3	Chloroform	ND		110	77
74-87-3	Chloromethane	ND		110	27
156-59-2	cis-1,2-Dichloroethene	46	J	110	31
10061-01-5	cis-1,3-Dichloropropene	ND		110	27
110-82-7	Cyclohexane	ND		110	25
124-48-1	Dibromochloromethane	ND		110	54
75-71-8	Dichlorodifluoromethane	ND		110	49
100-41-4	Ethylbenzene	ND		110	33
98-82-8	Isopropylbenzene	ND		110	17

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 110N 50E SOIL Lab Sample ID: 480-165607-15

Matrix: Solid Lab File ID: N1041.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:44

Sample wt/vol: 5.07(g) Date Analyzed: 01/29/2020 14:28

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.6 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		560	54
1634-04-4	Methyl tert-butyl ether	ND		110	43
108-87-2	Methylcyclohexane	ND		110	53
75-09-2	Methylene Chloride	ND		110	22
100-42-5	Styrene	ND		110	27
127-18-4	Tetrachloroethene	3900		110	15
108-88-3	Toluene	ND		110	30
156-60-5	trans-1,2-Dichloroethene	ND		110	27
10061-02-6	trans-1,3-Dichloropropene	ND		110	11
79-01-6	Trichloroethene	93	J	110	31
75-69-4	Trichlorofluoromethane	ND		110	53
75-01-4	Vinyl chloride	ND		110	38
1330-20-7	Xylenes, Total	ND		230	62

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		53-146
460-00-4	4-Bromofluorobenzene (Surr)	96		49-148
1868-53-7	Dibromofluoromethane (Surr)	89		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 110N 50E SOIL Lab Sample ID: 480-165607-15

Matrix: Solid Lab File ID: N1041.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:44

Sample wt/vol: 5.07(g) Date Analyzed: 01/29/2020 14:28

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.6 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 60N 10E SOIL Lab Sample ID: 480-165607-16

Matrix: Solid Lab File ID: N1116.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:55

Sample wt/vol: 5.01(g) Date Analyzed: 01/31/2020 12:37

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.4 Level: (low/med) Medium

Analysis Batch No.: 515703 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		110	31
79-34-5	1,1,2,2-Tetrachloroethane	ND		110	18
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		110	57
79-00-5	1,1,2-Trichloroethane	ND		110	24
75-34-3	1,1-Dichloroethane	ND		110	35
75-35-4	1,1-Dichloroethene	ND		110	39
120-82-1	1,2,4-Trichlorobenzene	ND		110	43
96-12-8	1,2-Dibromo-3-Chloropropane	ND		110	57
106-93-4	1,2-Dibromoethane	ND		110	20
95-50-1	1,2-Dichlorobenzene	ND		110	29
107-06-2	1,2-Dichloroethane	ND		110	46
78-87-5	1,2-Dichloropropane	ND		110	18
541-73-1	1,3-Dichlorobenzene	ND		110	30
106-46-7	1,4-Dichlorobenzene	ND		110	16
78-93-3	2-Butanone (MEK)	ND		570	340
591-78-6	2-Hexanone	ND		570	230
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		570	36
67-64-1	Acetone	ND	UJ	570	470
71-43-2	Benzene	ND		110	22
75-27-4	Bromodichloromethane	ND		110	23
75-25-2	Bromoform	ND		110	57
74-83-9	Bromomethane	ND		110	25
75-15-0	Carbon disulfide	ND		110	52
56-23-5	Carbon tetrachloride	ND		110	29
108-90-7	Chlorobenzene	ND		110	15
75-00-3	Chloroethane	ND		110	24
67-66-3	Chloroform	ND		110	78
74-87-3	Chloromethane	ND		110	27
156-59-2	cis-1,2-Dichloroethene	430		110	31
10061-01-5	cis-1,3-Dichloropropene	ND		110	27
110-82-7	Cyclohexane	ND		110	25
124-48-1	Dibromochloromethane	ND		110	55
75-71-8	Dichlorodifluoromethane	ND		110	49
100-41-4	Ethylbenzene	ND		110	33
98-82-8	Isopropylbenzene	ND		110	17

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 60N 10E SOIL Lab Sample ID: 480-165607-16

Matrix: Solid Lab File ID: N1116.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:55

Sample wt/vol: 5.01(g) Date Analyzed: 01/31/2020 12:37

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.4 Level: (low/med) Medium

Analysis Batch No.: 515703 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	240	J	570	54
1634-04-4	Methyl tert-butyl ether	ND		110	43
108-87-2	Methylcyclohexane	ND		110	53
75-09-2	Methylene Chloride	ND	U	110	22
100-42-5	Styrene	ND		110	27
127-18-4	Tetrachloroethene	4300		110	15
108-88-3	Toluene	ND		110	30
156-60-5	trans-1,2-Dichloroethene	34	J	110	27
10061-02-6	trans-1,3-Dichloropropene	ND		110	11
79-01-6	Trichloroethene	78	J	110	32
75-69-4	Trichlorofluoromethane	ND		110	53
75-01-4	Vinyl chloride	ND		110	38
1330-20-7	Xylenes, Total	ND		230	63

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		53-146
460-00-4	4-Bromofluorobenzene (Surr)	96		49-148
1868-53-7	Dibromofluoromethane (Surr)	91		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 60N 10E SOIL Lab Sample ID: 480-165607-16

Matrix: Solid Lab File ID: N1116.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:55

Sample wt/vol: 5.01(g) Date Analyzed: 01/31/2020 12:37

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.4 Level: (low/med) Medium

Analysis Batch No.: 515703 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 100N 20E SOIL Lab Sample ID: 480-165607-18

Matrix: Solid Lab File ID: N1042.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:00

Sample wt/vol: 5.09(g) Date Analyzed: 01/29/2020 14:53

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		110	31
79-34-5	1,1,2,2-Tetrachloroethane	ND		110	18
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		110	56
79-00-5	1,1,2-Trichloroethane	ND		110	24
75-34-3	1,1-Dichloroethane	ND		110	35
75-35-4	1,1-Dichloroethene	ND		110	39
120-82-1	1,2,4-Trichlorobenzene	ND		110	43
96-12-8	1,2-Dibromo-3-Chloropropane	ND		110	56
106-93-4	1,2-Dibromoethane	ND		110	20
95-50-1	1,2-Dichlorobenzene	ND		110	29
107-06-2	1,2-Dichloroethane	ND		110	46
78-87-5	1,2-Dichloropropane	ND		110	18
541-73-1	1,3-Dichlorobenzene	ND		110	30
106-46-7	1,4-Dichlorobenzene	ND		110	16
78-93-3	2-Butanone (MEK)	ND		560	340
591-78-6	2-Hexanone	ND		560	230
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		560	36
67-64-1	Acetone	ND		560	460
71-43-2	Benzene	ND		110	21
75-27-4	Bromodichloromethane	ND		110	23
75-25-2	Bromoform	ND		110	56
74-83-9	Bromomethane	ND		110	25
75-15-0	Carbon disulfide	ND		110	51
56-23-5	Carbon tetrachloride	ND		110	29
108-90-7	Chlorobenzene	ND		110	15
75-00-3	Chloroethane	ND		110	23
67-66-3	Chloroform	ND		110	77
74-87-3	Chloromethane	ND		110	27
156-59-2	cis-1,2-Dichloroethene	ND		110	31
10061-01-5	cis-1,3-Dichloropropene	ND		110	27
110-82-7	Cyclohexane	ND		110	25
124-48-1	Dibromochloromethane	ND		110	55
75-71-8	Dichlorodifluoromethane	ND		110	49
100-41-4	Ethylbenzene	ND		110	33
98-82-8	Isopropylbenzene	ND		110	17

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 100N 20E SOIL Lab Sample ID: 480-165607-18

Matrix: Solid Lab File ID: N1042.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:00

Sample wt/vol: 5.09(g) Date Analyzed: 01/29/2020 14:53

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		560	54
1634-04-4	Methyl tert-butyl ether	ND		110	43
108-87-2	Methylcyclohexane	56	J	110	53
75-09-2	Methylene Chloride	ND		110	22
100-42-5	Styrene	ND		110	27
127-18-4	Tetrachloroethene	6000		110	15
108-88-3	Toluene	ND		110	30
156-60-5	trans-1,2-Dichloroethene	ND		110	27
10061-02-6	trans-1,3-Dichloropropene	ND		110	11
79-01-6	Trichloroethene	47	J	110	31
75-69-4	Trichlorofluoromethane	ND		110	53
75-01-4	Vinyl chloride	ND		110	38
1330-20-7	Xylenes, Total	ND		230	63

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	100		53-146
460-00-4	4-Bromofluorobenzene (Surr)	96		49-148
1868-53-7	Dibromofluoromethane (Surr)	91		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 100N 20E SOIL Lab Sample ID: 480-165607-18

Matrix: Solid Lab File ID: N1042.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:00

Sample wt/vol: 5.09(g) Date Analyzed: 01/29/2020 14:53

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 4 TIC Result Total: 3450

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
91-20-3	Naphthalene	12.76	2000	T J N	94%
90-12-0	Naphthalene, 1-methyl-	13.68	630	T J N	91%
91-57-6	Naphthalene, 2-methyl-	13.84	500	T J N	91%
569-41-5	Naphthalene, 1,8-dimethyl-	14.63	320	T J N	95%

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 20E SOIL Lab Sample ID: 480-165607-22

Matrix: Solid Lab File ID: N1043.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:19

Sample wt/vol: 5.07(g) Date Analyzed: 01/29/2020 15:17

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.4 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		240	65
79-34-5	1,1,2,2-Tetrachloroethane	ND		240	38
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		240	120
79-00-5	1,1,2-Trichloroethane	ND		240	49
75-34-3	1,1-Dichloroethane	ND		240	73
75-35-4	1,1-Dichloroethene	ND		240	81
120-82-1	1,2,4-Trichlorobenzene	ND		240	89
96-12-8	1,2-Dibromo-3-Chloropropane	ND		240	120
106-93-4	1,2-Dibromoethane	ND		240	41
95-50-1	1,2-Dichlorobenzene	ND		240	60
107-06-2	1,2-Dichloroethane	ND		240	96
78-87-5	1,2-Dichloropropane	ND		240	38
541-73-1	1,3-Dichlorobenzene	ND		240	63
106-46-7	1,4-Dichlorobenzene	ND		240	33
78-93-3	2-Butanone (MEK)	ND		1200	700
591-78-6	2-Hexanone	ND		1200	480
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		1200	75
67-64-1	Acetone	ND		1200	970
71-43-2	Benzene	ND		240	45
75-27-4	Bromodichloromethane	ND		240	47
75-25-2	Bromoform	ND		240	120
74-83-9	Bromomethane	ND		240	52
75-15-0	Carbon disulfide	ND		240	110
56-23-5	Carbon tetrachloride	ND		240	60
108-90-7	Chlorobenzene	ND		240	31
75-00-3	Chloroethane	ND		240	49
67-66-3	Chloroform	ND		240	160
74-87-3	Chloromethane	ND		240	56
156-59-2	cis-1,2-Dichloroethene	2800		240	65
10061-01-5	cis-1,3-Dichloropropene	ND		240	56
110-82-7	Cyclohexane	ND		240	52
124-48-1	Dibromochloromethane	ND		240	110
75-71-8	Dichlorodifluoromethane	ND		240	100
100-41-4	Ethylbenzene	ND		240	68
98-82-8	Isopropylbenzene	ND		240	35

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 20E SOIL Lab Sample ID: 480-165607-22

Matrix: Solid Lab File ID: N1043.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:19

Sample wt/vol: 5.07(g) Date Analyzed: 01/29/2020 15:17

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.4 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	910	J	1200	110
1634-04-4	Methyl tert-butyl ether	ND		240	89
108-87-2	Methylcyclohexane	ND		240	110
75-09-2	Methylene Chloride	ND		240	47
100-42-5	Styrene	ND		240	57
127-18-4	Tetrachloroethene	15000		240	32
108-88-3	Toluene	ND		240	63
156-60-5	trans-1,2-Dichloroethene	420		240	56
10061-02-6	trans-1,3-Dichloropropene	ND		240	23
79-01-6	Trichloroethene	520		240	65
75-69-4	Trichlorofluoromethane	ND		240	110
75-01-4	Vinyl chloride	ND		240	79
1330-20-7	Xylenes, Total	ND		470	130

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	97		53-146
460-00-4	4-Bromofluorobenzene (Surr)	98		49-148
1868-53-7	Dibromofluoromethane (Surr)	91		60-140
2037-26-5	Toluene-d8 (Surr)	105		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 20E SOIL Lab Sample ID: 480-165607-22

Matrix: Solid Lab File ID: N1043.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:19

Sample wt/vol: 5.07(g) Date Analyzed: 01/29/2020 15:17

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.4 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 30N 20E SOIL Lab Sample ID: 480-165607-23

Matrix: Solid Lab File ID: N1044.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:03

Sample wt/vol: 5.13(g) Date Analyzed: 01/29/2020 15:41

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.5 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		220	62
79-34-5	1,1,2,2-Tetrachloroethane	ND		220	36
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		220	110
79-00-5	1,1,2-Trichloroethane	ND		220	47
75-34-3	1,1-Dichloroethane	ND		220	69
75-35-4	1,1-Dichloroethene	ND		220	77
120-82-1	1,2,4-Trichlorobenzene	ND		220	84
96-12-8	1,2-Dibromo-3-Chloropropane	ND		220	110
106-93-4	1,2-Dibromoethane	ND		220	39
95-50-1	1,2-Dichlorobenzene	ND		220	57
107-06-2	1,2-Dichloroethane	ND		220	91
78-87-5	1,2-Dichloropropane	ND		220	36
541-73-1	1,3-Dichlorobenzene	ND		220	59
106-46-7	1,4-Dichlorobenzene	ND		220	31
78-93-3	2-Butanone (MEK)	ND		1100	660
591-78-6	2-Hexanone	ND		1100	460
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		1100	71
67-64-1	Acetone	ND		1100	910
71-43-2	Benzene	ND		220	42
75-27-4	Bromodichloromethane	ND		220	44
75-25-2	Bromoform	ND		220	110
74-83-9	Bromomethane	ND		220	49
75-15-0	Carbon disulfide	ND		220	100
56-23-5	Carbon tetrachloride	ND		220	57
108-90-7	Chlorobenzene	ND		220	29
75-00-3	Chloroethane	ND		220	46
67-66-3	Chloroform	ND		220	150
74-87-3	Chloromethane	ND		220	53
156-59-2	cis-1,2-Dichloroethene	250		220	61
10061-01-5	cis-1,3-Dichloropropene	ND		220	53
110-82-7	Cyclohexane	ND		220	49
124-48-1	Dibromochloromethane	ND		220	110
75-71-8	Dichlorodifluoromethane	ND		220	97
100-41-4	Ethylbenzene	ND		220	65
98-82-8	Isopropylbenzene	ND		220	33

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 30N 20E SOIL Lab Sample ID: 480-165607-23

Matrix: Solid Lab File ID: N1044.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:03

Sample wt/vol: 5.13(g) Date Analyzed: 01/29/2020 15:41

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.5 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		1100	110
1634-04-4	Methyl tert-butyl ether	ND		220	84
108-87-2	Methylcyclohexane	ND		220	100
75-09-2	Methylene Chloride	ND		220	44
100-42-5	Styrene	ND		220	54
127-18-4	Tetrachloroethene	14000		220	30
108-88-3	Toluene	ND		220	60
156-60-5	trans-1,2-Dichloroethene	100	J	220	53
10061-02-6	trans-1,3-Dichloropropene	ND		220	22
79-01-6	Trichloroethene	460		220	62
75-69-4	Trichlorofluoromethane	ND		220	100
75-01-4	Vinyl chloride	ND		220	75
1330-20-7	Xylenes, Total	ND		440	120

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		53-146
460-00-4	4-Bromofluorobenzene (Surr)	97		49-148
1868-53-7	Dibromofluoromethane (Surr)	93		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 30N 20E SOIL Lab Sample ID: 480-165607-23

Matrix: Solid Lab File ID: N1044.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:03

Sample wt/vol: 5.13(g) Date Analyzed: 01/29/2020 15:41

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.5 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 40E SOIL Lab Sample ID: 480-165607-24

Matrix: Solid Lab File ID: N1045.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:45

Sample wt/vol: 5.01(g) Date Analyzed: 01/29/2020 16:05

Soil Aliquot Vol: 100 (uL) Dilution Factor: 25

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.5 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		2900	810
79-34-5	1,1,2,2-Tetrachloroethane	ND		2900	480
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2900	1500
79-00-5	1,1,2-Trichloroethane	ND		2900	620
75-34-3	1,1-Dichloroethane	ND		2900	910
75-35-4	1,1-Dichloroethene	ND		2900	1000
120-82-1	1,2,4-Trichlorobenzene	ND		2900	1100
96-12-8	1,2-Dibromo-3-Chloropropane	ND		2900	1500
106-93-4	1,2-Dibromoethane	ND		2900	510
95-50-1	1,2-Dichlorobenzene	ND		2900	750
107-06-2	1,2-Dichloroethane	ND		2900	1200
78-87-5	1,2-Dichloropropane	ND		2900	480
541-73-1	1,3-Dichlorobenzene	ND		2900	780
106-46-7	1,4-Dichlorobenzene	ND		2900	410
78-93-3	2-Butanone (MEK)	ND		15000	8700
591-78-6	2-Hexanone	ND		15000	6000
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		15000	940
67-64-1	Acetone	ND		15000	12000
71-43-2	Benzene	ND		2900	560
75-27-4	Bromodichloromethane	ND		2900	590
75-25-2	Bromoform	ND		2900	1500
74-83-9	Bromomethane	ND		2900	650
75-15-0	Carbon disulfide	ND		2900	1300
56-23-5	Carbon tetrachloride	ND		2900	750
108-90-7	Chlorobenzene	ND		2900	390
75-00-3	Chloroethane	ND		2900	610
67-66-3	Chloroform	ND		2900	2000
74-87-3	Chloromethane	ND		2900	700
156-59-2	cis-1,2-Dichloroethene	1600	J	2900	810
10061-01-5	cis-1,3-Dichloropropene	ND		2900	700
110-82-7	Cyclohexane	ND		2900	650
124-48-1	Dibromochloromethane	ND		2900	1400
75-71-8	Dichlorodifluoromethane	ND		2900	1300
100-41-4	Ethylbenzene	ND		2900	850
98-82-8	Isopropylbenzene	ND		2900	440

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 40E SOIL Lab Sample ID: 480-165607-24

Matrix: Solid Lab File ID: N1045.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:45

Sample wt/vol: 5.01(g) Date Analyzed: 01/29/2020 16:05

Soil Aliquot Vol: 100 (uL) Dilution Factor: 25

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.5 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		15000	1400
1634-04-4	Methyl tert-butyl ether	ND		2900	1100
108-87-2	Methylcyclohexane	ND		2900	1400
75-09-2	Methylene Chloride	ND		2900	580
100-42-5	Styrene	ND		2900	710
127-18-4	*Tetrachloroethene*	*370000*	*E*	*2900*	*390*
108-88-3	Toluene	ND		2900	790
156-60-5	trans-1,2-Dichloroethene	ND		2900	690
10061-02-6	trans-1,3-Dichloropropene	ND		2900	290
79-01-6	Trichloroethene	4300		2900	820
75-69-4	Trichlorofluoromethane	ND		2900	1400
75-01-4	Vinyl chloride	ND		2900	980
1330-20-7	Xylenes, Total	ND		5900	1600

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		53-146
460-00-4	4-Bromofluorobenzene (Surr)	98		49-148
1868-53-7	Dibromofluoromethane (Surr)	96		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 40E SOIL Lab Sample ID: 480-165607-24

Matrix: Solid Lab File ID: N1045.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:45

Sample wt/vol: 5.01(g) Date Analyzed: 01/29/2020 16:05

Soil Aliquot Vol: 100 (uL) Dilution Factor: 25

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.5 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 40E SOIL DL Lab Sample ID: 480-165607-24 DL

Matrix: Solid Lab File ID: N1092.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:45

Sample wt/vol: 5.01(g) Date Analyzed: 01/30/2020 13:10

Soil Aliquot Vol: 100 (uL) Dilution Factor: 80

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.5 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		9400	2600
79-34-5	1,1,2,2-Tetrachloroethane	ND		9400	1500
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		9400	4700
79-00-5	1,1,2-Trichloroethane	ND		9400	2000
75-34-3	1,1-Dichloroethane	ND		9400	2900
75-35-4	1,1-Dichloroethene	ND		9400	3200
120-82-1	1,2,4-Trichlorobenzene	ND		9400	3600
96-12-8	1,2-Dibromo-3-Chloropropane	ND		9400	4700
106-93-4	1,2-Dibromoethane	ND		9400	1600
95-50-1	1,2-Dichlorobenzene	ND		9400	2400
107-06-2	1,2-Dichloroethane	ND		9400	3800
78-87-5	1,2-Dichloropropane	ND		9400	1500
541-73-1	1,3-Dichlorobenzene	ND		9400	2500
106-46-7	1,4-Dichlorobenzene	ND		9400	1300
78-93-3	2-Butanone (MEK)	ND		47000	28000
591-78-6	2-Hexanone	ND		47000	19000
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		47000	3000
67-64-1	Acetone	ND		47000	39000
71-43-2	Benzene	ND		9400	1800
75-27-4	Bromodichloromethane	ND		9400	1900
75-25-2	Bromoform	ND		9400	4700
74-83-9	Bromomethane	ND		9400	2100
75-15-0	Carbon disulfide	ND		9400	4300
56-23-5	Carbon tetrachloride	ND		9400	2400
108-90-7	Chlorobenzene	ND		9400	1200
75-00-3	Chloroethane	ND		9400	2000
67-66-3	Chloroform	ND		9400	6400
74-87-3	Chloromethane	ND		9400	2200
156-59-2	cis-1,2-Dichloroethene	ND		9400	2600
10061-01-5	cis-1,3-Dichloropropene	ND		9400	2200
110-82-7	Cyclohexane	ND		9400	2100
124-48-1	Dibromochloromethane	ND		9400	4500
75-71-8	Dichlorodifluoromethane	ND		9400	4100
100-41-4	Ethylbenzene	ND		9400	2700
98-82-8	Isopropylbenzene	ND		9400	1400

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 40E SOIL DL Lab Sample ID: 480-165607-24 DL

Matrix: Solid Lab File ID: N1092.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:45

Sample wt/vol: 5.01(g) Date Analyzed: 01/30/2020 13:10

Soil Aliquot Vol: 100 (uL) Dilution Factor: 80

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.5 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	*Methyl acetate*	*ND*		*47000*	*4500*
1634-04-4	*Methyl tert-butyl ether*	*ND*		*9400*	*3500*
108-87-2	*Methylcyclohexane*	*ND*		*9400*	*4400*
75-09-2	*Methylene Chloride*	*2200*	*J*	*9400*	*1900*
100-42-5	*Styrene*	*ND*		*9400*	*2300*
127-18-4	Tetrachloroethene	450000	D	9400	1300
108-88-3	*Toluene*	*ND*		*9400*	*2500*
156-60-5	*trans-1,2-Dichloroethene*	*ND*		*9400*	*2200*
10061-02-6	*trans-1,3-Dichloropropene*	*ND*		*9400*	*920*
79-01-6	*Trichloroethene*	*8300*	*J*	*9400*	*2600*
75-69-4	*Trichlorofluoromethane*	*ND*		*9400*	*4400*
75-01-4	*Vinyl chloride*	*ND*		*9400*	*3100*
1330-20-7	*Xylenes, Total*	*ND*		*19000*	*5200*

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		53-146
460-00-4	4-Bromofluorobenzene (Surr)	98		49-148
1868-53-7	Dibromofluoromethane (Surr)	94		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 40E SOIL DL Lab Sample ID: 480-165607-24 DL

Matrix: Solid Lab File ID: N1092.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:45

Sample wt/vol: 5.01(g) Date Analyzed: 01/30/2020 13:10

Soil Aliquot Vol: 100 (uL) Dilution Factor: 80

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.5 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 60N 50E SOIL Lab Sample ID: 480-165607-26

Matrix: Solid Lab File ID: N1046.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:00

Sample wt/vol: 5.1(g) Date Analyzed: 01/29/2020 16:29

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.7 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		110	32
79-34-5	1,1,2,2-Tetrachloroethane	ND		110	19
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		110	57
79-00-5	1,1,2-Trichloroethane	ND		110	24
75-34-3	1,1-Dichloroethane	ND		110	35
75-35-4	1,1-Dichloroethene	ND		110	39
120-82-1	1,2,4-Trichlorobenzene	ND		110	43
96-12-8	1,2-Dibromo-3-Chloropropane	ND		110	57
106-93-4	1,2-Dibromoethane	ND		110	20
95-50-1	1,2-Dichlorobenzene	ND		110	29
107-06-2	1,2-Dichloroethane	ND		110	47
78-87-5	1,2-Dichloropropane	ND		110	18
541-73-1	1,3-Dichlorobenzene	ND		110	30
106-46-7	1,4-Dichlorobenzene	ND		110	16
78-93-3	2-Butanone (MEK)	ND		570	340
591-78-6	2-Hexanone	ND		570	230
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		570	36
67-64-1	Acetone	ND		570	470
71-43-2	Benzene	ND		110	22
75-27-4	Bromodichloromethane	ND		110	23
75-25-2	Bromoform	ND		110	57
74-83-9	Bromomethane	ND		110	25
75-15-0	Carbon disulfide	ND		110	52
56-23-5	Carbon tetrachloride	ND		110	29
108-90-7	Chlorobenzene	ND		110	15
75-00-3	Chloroethane	ND		110	24
67-66-3	Chloroform	ND		110	78
74-87-3	Chloromethane	ND		110	27
156-59-2	cis-1,2-Dichloroethene	250		110	31
10061-01-5	cis-1,3-Dichloropropene	ND		110	27
110-82-7	Cyclohexane	ND		110	25
124-48-1	Dibromochloromethane	ND		110	55
75-71-8	Dichlorodifluoromethane	ND		110	50
100-41-4	Ethylbenzene	ND		110	33
98-82-8	Isopropylbenzene	ND		110	17

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 60N 50E SOIL Lab Sample ID: 480-165607-26

Matrix: Solid Lab File ID: N1046.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:00

Sample wt/vol: 5.1(g) Date Analyzed: 01/29/2020 16:29

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.7 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	180	J	570	54
1634-04-4	Methyl tert-butyl ether	ND		110	43
108-87-2	Methylcyclohexane	ND		110	53
75-09-2	Methylene Chloride	ND		110	23
100-42-5	Styrene	ND		110	27
127-18-4	Tetrachloroethene	5200		110	15
108-88-3	Toluene	ND		110	31
156-60-5	trans-1,2-Dichloroethene	ND		110	27
10061-02-6	trans-1,3-Dichloropropene	ND		110	11
79-01-6	Trichloroethene	210		110	32
75-69-4	Trichlorofluoromethane	ND		110	53
75-01-4	Vinyl chloride	ND		110	38
1330-20-7	Xylenes, Total	ND		230	63

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		53-146
460-00-4	4-Bromofluorobenzene (Surr)	96		49-148
1868-53-7	Dibromofluoromethane (Surr)	89		60-140
2037-26-5	Toluene-d8 (Surr)	104		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 60N 50E SOIL Lab Sample ID: 480-165607-26

Matrix: Solid Lab File ID: N1046.D

Analysis Method: 8260C Date Collected: 01/24/2020 13:00

Sample wt/vol: 5.1(g) Date Analyzed: 01/29/2020 16:29

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.7 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 10E Lab Sample ID: 480-165607-27

Matrix: Solid Lab File ID: N1047.D

Analysis Method: 8260C Date Collected: 01/24/2020 08:33

Sample wt/vol: 5.17(g) Date Analyzed: 01/29/2020 16:52

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 7.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		110	30
79-34-5	1,1,2,2-Tetrachloroethane	ND		110	17
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		110	54
79-00-5	1,1,2-Trichloroethane	ND		110	23
75-34-3	1,1-Dichloroethane	ND		110	33
75-35-4	1,1-Dichloroethene	ND		110	37
120-82-1	1,2,4-Trichlorobenzene	ND		110	41
96-12-8	1,2-Dibromo-3-Chloropropane	ND		110	54
106-93-4	1,2-Dibromoethane	ND		110	19
95-50-1	1,2-Dichlorobenzene	ND		110	27
107-06-2	1,2-Dichloroethane	ND		110	44
78-87-5	1,2-Dichloropropane	ND		110	17
541-73-1	1,3-Dichlorobenzene	ND		110	29
106-46-7	1,4-Dichlorobenzene	ND		110	15
78-93-3	2-Butanone (MEK)	ND		540	320
591-78-6	2-Hexanone	ND		540	220
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		540	34
67-64-1	Acetone	ND		540	440
71-43-2	Benzene	ND		110	20
75-27-4	Bromodichloromethane	ND		110	22
75-25-2	Bromoform	ND		110	54
74-83-9	Bromomethane	ND		110	24
75-15-0	Carbon disulfide	ND		110	49
56-23-5	Carbon tetrachloride	ND		110	27
108-90-7	Chlorobenzene	ND		110	14
75-00-3	Chloroethane	ND		110	22
67-66-3	Chloroform	ND		110	74
74-87-3	Chloromethane	ND		110	26
156-59-2	cis-1,2-Dichloroethene	34	J	110	30
10061-01-5	cis-1,3-Dichloropropene	ND		110	26
110-82-7	Cyclohexane	ND		110	24
124-48-1	Dibromochloromethane	ND		110	52
75-71-8	Dichlorodifluoromethane	ND		110	47
100-41-4	Ethylbenzene	ND		110	31
98-82-8	Isopropylbenzene	ND		110	16

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 10E Lab Sample ID: 480-165607-27

Matrix: Solid Lab File ID: N1047.D

Analysis Method: 8260C Date Collected: 01/24/2020 08:33

Sample wt/vol: 5.17(g) Date Analyzed: 01/29/2020 16:52

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 7.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		540	51
1634-04-4	Methyl tert-butyl ether	ND		110	41
108-87-2	Methylcyclohexane	ND		110	50
75-09-2	Methylene Chloride	ND		110	21
100-42-5	Styrene	ND		110	26
127-18-4	Tetrachloroethene	1900		110	14
108-88-3	Toluene	ND		110	29
156-60-5	trans-1,2-Dichloroethene	ND		110	25
10061-02-6	trans-1,3-Dichloropropene	ND		110	11
79-01-6	Trichloroethene	100	J	110	30
75-69-4	Trichlorofluoromethane	ND		110	50
75-01-4	Vinyl chloride	ND		110	36
1330-20-7	Xylenes, Total	ND		220	60

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	90		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 10E Lab Sample ID: 480-165607-27

Matrix: Solid Lab File ID: N1047.D

Analysis Method: 8260C Date Collected: 01/24/2020 08:33

Sample wt/vol: 5.17(g) Date Analyzed: 01/29/2020 16:52

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 7.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 90N 10E SOIL Lab Sample ID: 480-165607-28

Matrix: Solid Lab File ID: N1048.D

Analysis Method: 8260C Date Collected: 01/24/2020 08:46

Sample wt/vol: 5.17(g) Date Analyzed: 01/29/2020 17:16

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		110	31
79-34-5	1,1,2,2-Tetrachloroethane	ND		110	18
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		110	56
79-00-5	1,1,2-Trichloroethane	ND		110	23
75-34-3	1,1-Dichloroethane	ND		110	34
75-35-4	1,1-Dichloroethene	ND		110	38
120-82-1	1,2,4-Trichlorobenzene	ND		110	42
96-12-8	1,2-Dibromo-3-Chloropropane	ND		110	56
106-93-4	1,2-Dibromoethane	ND		110	19
95-50-1	1,2-Dichlorobenzene	ND		110	28
107-06-2	1,2-Dichloroethane	ND		110	45
78-87-5	1,2-Dichloropropane	ND		110	18
541-73-1	1,3-Dichlorobenzene	ND		110	30
106-46-7	1,4-Dichlorobenzene	ND		110	16
78-93-3	2-Butanone (MEK)	ND		560	330
591-78-6	2-Hexanone	ND		560	230
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		560	36
67-64-1	Acetone	ND		560	460
71-43-2	Benzene	ND		110	21
75-27-4	Bromodichloromethane	ND		110	22
75-25-2	Bromoform	ND		110	56
74-83-9	Bromomethane	ND		110	24
75-15-0	Carbon disulfide	ND		110	51
56-23-5	Carbon tetrachloride	ND		110	28
108-90-7	Chlorobenzene	ND		110	15
75-00-3	Chloroethane	ND		110	23
67-66-3	Chloroform	ND		110	76
74-87-3	Chloromethane	ND		110	26
156-59-2	cis-1,2-Dichloroethene	51	J	110	31
10061-01-5	cis-1,3-Dichloropropene	ND		110	27
110-82-7	Cyclohexane	ND		110	25
124-48-1	Dibromochloromethane	ND		110	54
75-71-8	Dichlorodifluoromethane	ND		110	48
100-41-4	Ethylbenzene	ND		110	32
98-82-8	Isopropylbenzene	ND		110	17

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 90N 10E SOIL Lab Sample ID: 480-165607-28

Matrix: Solid Lab File ID: N1048.D

Analysis Method: 8260C Date Collected: 01/24/2020 08:46

Sample wt/vol: 5.17(g) Date Analyzed: 01/29/2020 17:16

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		560	53
1634-04-4	Methyl tert-butyl ether	ND		110	42
108-87-2	Methylcyclohexane	ND		110	52
75-09-2	Methylene Chloride	ND		110	22
100-42-5	Styrene	ND		110	27
127-18-4	Tetrachloroethene	5200		110	15
108-88-3	Toluene	ND		110	30
156-60-5	trans-1,2-Dichloroethene	ND		110	26
10061-02-6	trans-1,3-Dichloropropene	ND		110	11
79-01-6	Trichloroethene	120		110	31
75-69-4	Trichlorofluoromethane	ND		110	52
75-01-4	Vinyl chloride	ND		110	37
1330-20-7	Xylenes, Total	ND		220	62

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	95		53-146
460-00-4	4-Bromofluorobenzene (Surr)	92		49-148
1868-53-7	Dibromofluoromethane (Surr)	91		60-140
2037-26-5	Toluene-d8 (Surr)	98		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 90N 10E SOIL Lab Sample ID: 480-165607-28

Matrix: Solid Lab File ID: N1048.D

Analysis Method: 8260C Date Collected: 01/24/2020 08:46

Sample wt/vol: 5.17(g) Date Analyzed: 01/29/2020 17:16

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 5 TIC Result Total: 3490

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
275-51-4	Azulene	12.76	1200	T J N	94%
264-09-5	Benzocycloheptatriene	13.68	710	T J N	91%
91-57-6	Naphthalene, 2-methyl-	13.84	580	T J N	90%
581-42-0	Naphthalene, 2,6-dimethyl-	14.49	330	T J N	95%
582-16-1	Naphthalene, 2,7-dimethyl-	14.63	670	T J N	97%

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 50N 50E SOIL Lab Sample ID: 480-165607-31

Matrix: Solid Lab File ID: N1049.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:12

Sample wt/vol: 5.06(g) Date Analyzed: 01/29/2020 17:41

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		480	130
79-34-5	1,1,2,2-Tetrachloroethane	ND		480	77
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		480	240
79-00-5	1,1,2-Trichloroethane	ND		480	100
75-34-3	1,1-Dichloroethane	ND		480	150
75-35-4	1,1-Dichloroethene	ND		480	160
120-82-1	1,2,4-Trichlorobenzene	ND		480	180
96-12-8	1,2-Dibromo-3-Chloropropane	ND		480	240
106-93-4	1,2-Dibromoethane	ND		480	83
95-50-1	1,2-Dichlorobenzene	ND		480	120
107-06-2	1,2-Dichloroethane	ND		480	190
78-87-5	1,2-Dichloropropane	ND		480	77
541-73-1	1,3-Dichlorobenzene	ND		480	130
106-46-7	1,4-Dichlorobenzene	ND		480	67
78-93-3	2-Butanone (MEK)	ND		2400	1400
591-78-6	2-Hexanone	ND		2400	980
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		2400	150
67-64-1	Acetone	ND		2400	2000
71-43-2	Benzene	ND		480	90
75-27-4	Bromodichloromethane	ND		480	95
75-25-2	Bromoform	ND		480	240
74-83-9	Bromomethane	ND		480	100
75-15-0	Carbon disulfide	ND		480	220
56-23-5	Carbon tetrachloride	ND		480	120
108-90-7	Chlorobenzene	ND		480	63
75-00-3	Chloroethane	ND		480	99
67-66-3	Chloroform	ND		480	330
74-87-3	Chloromethane	ND		480	110
156-59-2	cis-1,2-Dichloroethene	540		480	130
10061-01-5	cis-1,3-Dichloropropene	ND		480	110
110-82-7	Cyclohexane	ND		480	110
124-48-1	Dibromochloromethane	ND		480	230
75-71-8	Dichlorodifluoromethane	ND		480	210
100-41-4	Ethylbenzene	ND		480	140
98-82-8	Isopropylbenzene	ND		480	71

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 50N 50E SOIL Lab Sample ID: 480-165607-31

Matrix: Solid Lab File ID: N1049.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:12

Sample wt/vol: 5.06(g) Date Analyzed: 01/29/2020 17:41

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	640	J	2400	230
1634-04-4	Methyl tert-butyl ether	ND		480	180
108-87-2	Methylcyclohexane	ND		480	220
75-09-2	Methylene Chloride	ND		480	94
100-42-5	Styrene	ND		480	110
127-18-4	*Tetrachloroethene*	*64000*	*E*	*480*	*64*
108-88-3	Toluene	ND		480	130
156-60-5	trans-1,2-Dichloroethene	ND		480	110
10061-02-6	trans-1,3-Dichloropropene	ND		480	47
79-01-6	Trichloroethene	1200		480	130
75-69-4	Trichlorofluoromethane	ND		480	220
75-01-4	Vinyl chloride	ND		480	160
1330-20-7	Xylenes, Total	ND		950	260

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	97		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	88		60-140
2037-26-5	Toluene-d8 (Surr)	104		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 50N 50E SOIL Lab Sample ID: 480-165607-31

Matrix: Solid Lab File ID: N1049.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:12

Sample wt/vol: 5.06(g) Date Analyzed: 01/29/2020 17:41

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 50N 50E SOIL DL Lab Sample ID: 480-165607-31 DL

Matrix: Solid Lab File ID: N1093.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:12

Sample wt/vol: 5.06(g) Date Analyzed: 01/30/2020 13:34

Soil Aliquot Vol: 100 (uL) Dilution Factor: 10

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.0 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		1200	330
79-34-5	1,1,2,2-Tetrachloroethane	ND		1200	190
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1200	600
79-00-5	1,1,2-Trichloroethane	ND		1200	250
75-34-3	1,1-Dichloroethane	ND		1200	370
75-35-4	1,1-Dichloroethene	ND		1200	410
120-82-1	1,2,4-Trichlorobenzene	ND		1200	450
96-12-8	1,2-Dibromo-3-Chloropropane	ND		1200	600
106-93-4	1,2-Dibromoethane	ND		1200	210
95-50-1	1,2-Dichlorobenzene	ND		1200	300
107-06-2	1,2-Dichloroethane	ND		1200	490
78-87-5	1,2-Dichloropropane	ND		1200	190
541-73-1	1,3-Dichlorobenzene	ND		1200	320
106-46-7	1,4-Dichlorobenzene	ND		1200	170
78-93-3	2-Butanone (MEK)	ND		6000	3500
591-78-6	2-Hexanone	ND		6000	2400
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		6000	380
67-64-1	Acetone	ND		6000	4900
71-43-2	Benzene	ND		1200	230
75-27-4	Bromodichloromethane	ND		1200	240
75-25-2	Bromoform	ND		1200	600
74-83-9	Bromomethane	ND		1200	260
75-15-0	Carbon disulfide	ND		1200	540
56-23-5	Carbon tetrachloride	ND		1200	300
108-90-7	Chlorobenzene	ND		1200	160
75-00-3	Chloroethane	ND		1200	250
67-66-3	Chloroform	ND		1200	820
74-87-3	Chloromethane	ND		1200	280
156-59-2	cis-1,2-Dichloroethene	740	J	1200	330
10061-01-5	cis-1,3-Dichloropropene	ND		1200	280
110-82-7	Cyclohexane	ND		1200	260
124-48-1	Dibromochloromethane	ND		1200	580
75-71-8	Dichlorodifluoromethane	ND		1200	520
100-41-4	Ethylbenzene	ND		1200	350
98-82-8	Isopropylbenzene	ND		1200	180

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 50N 50E SOIL DL Lab Sample ID: 480-165607-31 DL

Matrix: Solid Lab File ID: N1093.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:12

Sample wt/vol: 5.06(g) Date Analyzed: 01/30/2020 13:34

Soil Aliquot Vol: 100 (uL) Dilution Factor: 10

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.0 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	*Methyl acetate*	*850*	*J*	*6000*	*570*
1634-04-4	*Methyl tert-butyl ether*	*ND*		*1200*	*450*
108-87-2	*Methylcyclohexane*	*ND*		*1200*	*560*
75-09-2	*Methylene Chloride*	*ND*		*1200*	*240*
100-42-5	*Styrene*	*ND*		*1200*	*290*
127-18-4	Tetrachloroethene	79000	D	1200	160
108-88-3	*Toluene*	*ND*		*1200*	*320*
156-60-5	*trans-1,2-Dichloroethene*	*ND*		*1200*	*280*
10061-02-6	*trans-1,3-Dichloropropene*	*ND*		*1200*	*120*
79-01-6	*Trichloroethene*	*1600*		*1200*	*330*
75-69-4	*Trichlorofluoromethane*	*ND*		*1200*	*560*
75-01-4	*Vinyl chloride*	*ND*		*1200*	*400*
1330-20-7	*Xylenes, Total*	*ND*		*2400*	*660*

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	101		53-146
460-00-4	4-Bromofluorobenzene (Surr)	97		49-148
1868-53-7	Dibromofluoromethane (Surr)	94		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 50N 50E SOIL DL Lab Sample ID: 480-165607-31 DL

Matrix: Solid Lab File ID: N1093.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:12

Sample wt/vol: 5.06(g) Date Analyzed: 01/30/2020 13:34

Soil Aliquot Vol: 100 (uL) Dilution Factor: 10

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.0 Level: (low/med) Medium

Analysis Batch No.: 515502 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 110N 30E SOIL Lab Sample ID: 480-165607-32

Matrix: Solid Lab File ID: N1050.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:30

Sample wt/vol: 5(g) Date Analyzed: 01/29/2020 18:05

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.9 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		110	32
79-34-5	1,1,2,2-Tetrachloroethane	ND		110	19
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		110	57
79-00-5	1,1,2-Trichloroethane	ND		110	24
75-34-3	1,1-Dichloroethane	ND		110	35
75-35-4	1,1-Dichloroethene	ND		110	40
120-82-1	1,2,4-Trichlorobenzene	ND		110	43
96-12-8	1,2-Dibromo-3-Chloropropane	ND		110	57
106-93-4	1,2-Dibromoethane	ND		110	20
95-50-1	1,2-Dichlorobenzene	ND		110	29
107-06-2	1,2-Dichloroethane	ND		110	47
78-87-5	1,2-Dichloropropane	ND		110	19
541-73-1	1,3-Dichlorobenzene	ND		110	31
106-46-7	1,4-Dichlorobenzene	ND		110	16
78-93-3	2-Butanone (MEK)	ND		570	340
591-78-6	2-Hexanone	ND		570	240
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		570	37
67-64-1	Acetone	ND		570	470
71-43-2	Benzene	ND		110	22
75-27-4	Bromodichloromethane	ND		110	23
75-25-2	Bromoform	ND		110	57
74-83-9	Bromomethane	ND		110	25
75-15-0	Carbon disulfide	ND		110	52
56-23-5	Carbon tetrachloride	ND		110	29
108-90-7	Chlorobenzene	ND		110	15
75-00-3	Chloroethane	ND		110	24
67-66-3	Chloroform	ND		110	79
74-87-3	Chloromethane	ND		110	27
156-59-2	cis-1,2-Dichloroethene	ND		110	32
10061-01-5	cis-1,3-Dichloropropene	ND		110	27
110-82-7	Cyclohexane	ND		110	25
124-48-1	Dibromochloromethane	ND		110	56
75-71-8	Dichlorodifluoromethane	ND		110	50
100-41-4	Ethylbenzene	ND		110	33
98-82-8	Isopropylbenzene	ND		110	17

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 110N 30E SOIL Lab Sample ID: 480-165607-32

Matrix: Solid Lab File ID: N1050.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:30

Sample wt/vol: 5(g) Date Analyzed: 01/29/2020 18:05

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.9 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	340	J	570	55
1634-04-4	Methyl tert-butyl ether	ND		110	43
108-87-2	Methylcyclohexane	ND		110	54
75-09-2	Methylene Chloride	ND		110	23
100-42-5	Styrene	ND		110	28
127-18-4	Tetrachloroethene	9700		110	15
108-88-3	Toluene	ND		110	31
156-60-5	trans-1,2-Dichloroethene	ND		110	27
10061-02-6	trans-1,3-Dichloropropene	ND		110	11
79-01-6	Trichloroethene	130		110	32
75-69-4	Trichlorofluoromethane	ND		110	54
75-01-4	Vinyl chloride	ND		110	38
1330-20-7	Xylenes, Total	ND		230	64

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	99		53-146
460-00-4	4-Bromofluorobenzene (Surr)	98		49-148
1868-53-7	Dibromofluoromethane (Surr)	85		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 110N 30E SOIL Lab Sample ID: 480-165607-32

Matrix: Solid Lab File ID: N1050.D

Analysis Method: 8260C Date Collected: 01/24/2020 12:30

Sample wt/vol: 5(g) Date Analyzed: 01/29/2020 18:05

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 8.9 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 30E SOIL Lab Sample ID: 480-165607-36

Matrix: Solid Lab File ID: N1052.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:50

Sample wt/vol: 5.04(g) Date Analyzed: 01/29/2020 18:54

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.1 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		230	63
79-34-5	1,1,2,2-Tetrachloroethane	ND		230	37
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		230	110
79-00-5	1,1,2-Trichloroethane	ND		230	48
75-34-3	1,1-Dichloroethane	ND		230	71
75-35-4	1,1-Dichloroethene	ND		230	79
120-82-1	1,2,4-Trichlorobenzene	ND		230	86
96-12-8	1,2-Dibromo-3-Chloropropane	ND		230	110
106-93-4	1,2-Dibromoethane	ND		230	40
95-50-1	1,2-Dichlorobenzene	ND		230	58
107-06-2	1,2-Dichloroethane	ND		230	93
78-87-5	1,2-Dichloropropane	ND		230	37
541-73-1	1,3-Dichlorobenzene	ND		230	61
106-46-7	1,4-Dichlorobenzene	ND		230	32
78-93-3	2-Butanone (MEK)	ND		1100	680
591-78-6	2-Hexanone	ND		1100	470
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		1100	73
67-64-1	Acetone	ND		1100	940
71-43-2	Benzene	ND		230	43
75-27-4	Bromodichloromethane	ND		230	46
75-25-2	Bromoform	ND		230	110
74-83-9	Bromomethane	ND		230	50
75-15-0	Carbon disulfide	ND		230	100
56-23-5	Carbon tetrachloride	ND		230	58
108-90-7	Chlorobenzene	ND		230	30
75-00-3	Chloroethane	ND		230	47
67-66-3	Chloroform	ND		230	160
74-87-3	Chloromethane	ND		230	54
156-59-2	cis-1,2-Dichloroethene	270		230	63
10061-01-5	cis-1,3-Dichloropropene	ND		230	55
110-82-7	Cyclohexane	ND		230	51
124-48-1	Dibromochloromethane	ND		230	110
75-71-8	Dichlorodifluoromethane	ND		230	100
100-41-4	Ethylbenzene	ND		230	66
98-82-8	Isopropylbenzene	ND		230	34

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 30E SOIL Lab Sample ID: 480-165607-36

Matrix: Solid Lab File ID: N1052.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:50

Sample wt/vol: 5.04(g) Date Analyzed: 01/29/2020 18:54

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.1 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	380	J	1100	110
1634-04-4	Methyl tert-butyl ether	ND		230	86
108-87-2	Methylcyclohexane	ND		230	110
75-09-2	Methylene Chloride	ND		230	45
100-42-5	Styrene	ND		230	55
127-18-4	Tetrachloroethene	21000		230	31
108-88-3	Toluene	ND		230	61
156-60-5	trans-1,2-Dichloroethene	ND		230	54
10061-02-6	trans-1,3-Dichloropropene	ND		230	22
79-01-6	Trichloroethene	610		230	63
75-69-4	Trichlorofluoromethane	ND		230	110
75-01-4	Vinyl chloride	ND		230	76
1330-20-7	Xylenes, Total	ND		460	130

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	97		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	89		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 40N 30E SOIL Lab Sample ID: 480-165607-36

Matrix: Solid Lab File ID: N1052.D

Analysis Method: 8260C Date Collected: 01/24/2020 09:50

Sample wt/vol: 5.04(g) Date Analyzed: 01/29/2020 18:54

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 9.1 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 1 TIC Result Total: 890

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
91-20-3	Naphthalene	12.77	890	T J N	97%

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 50E Lab Sample ID: 480-165607-37

Matrix: Solid Lab File ID: N1053.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:20

Sample wt/vol: 5.06(g) Date Analyzed: 01/29/2020 19:19

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 15.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		120	35
79-34-5	1,1,2,2-Tetrachloroethane	ND		120	20
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		120	62
79-00-5	1,1,2-Trichloroethane	ND		120	26
75-34-3	1,1-Dichloroethane	ND		120	39
75-35-4	1,1-Dichloroethene	ND		120	43
120-82-1	1,2,4-Trichlorobenzene	ND		120	47
96-12-8	1,2-Dibromo-3-Chloropropane	ND		120	62
106-93-4	1,2-Dibromoethane	ND		120	22
95-50-1	1,2-Dichlorobenzene	ND		120	32
107-06-2	1,2-Dichloroethane	ND		120	51
78-87-5	1,2-Dichloropropane	ND		120	20
541-73-1	1,3-Dichlorobenzene	ND		120	33
106-46-7	1,4-Dichlorobenzene	ND		120	17
78-93-3	2-Butanone (MEK)	ND		620	370
591-78-6	2-Hexanone	ND		620	260
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		620	40
67-64-1	Acetone	ND		620	510
71-43-2	Benzene	ND		120	24
75-27-4	Bromodichloromethane	ND		120	25
75-25-2	Bromoform	ND		120	62
74-83-9	Bromomethane	ND		120	27
75-15-0	Carbon disulfide	ND		120	57
56-23-5	Carbon tetrachloride	ND		120	32
108-90-7	Chlorobenzene	ND		120	16
75-00-3	Chloroethane	ND		120	26
67-66-3	Chloroform	ND		120	86
74-87-3	Chloromethane	ND		120	30
156-59-2	cis-1,2-Dichloroethene	120		120	34
10061-01-5	cis-1,3-Dichloropropene	ND		120	30
110-82-7	Cyclohexane	ND		120	28
124-48-1	Dibromochloromethane	ND		120	60
75-71-8	Dichlorodifluoromethane	ND		120	54
100-41-4	Ethylbenzene	ND		120	36
98-82-8	Isopropylbenzene	ND		120	19

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 50E Lab Sample ID: 480-165607-37

Matrix: Solid Lab File ID: N1053.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:20

Sample wt/vol: 5.06(g) Date Analyzed: 01/29/2020 19:19

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 15.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		620	59
1634-04-4	Methyl tert-butyl ether	ND		120	47
108-87-2	Methylcyclohexane	ND		120	58
75-09-2	Methylene Chloride	ND		120	25
100-42-5	Styrene	ND		120	30
127-18-4	Tetrachloroethene	8400		120	17
108-88-3	Toluene	ND		120	33
156-60-5	trans-1,2-Dichloroethene	ND		120	29
10061-02-6	trans-1,3-Dichloropropene	ND		120	12
79-01-6	Trichloroethene	140		120	35
75-69-4	Trichlorofluoromethane	ND		120	59
75-01-4	Vinyl chloride	ND		120	42
1330-20-7	Xylenes, Total	ND		250	69

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		53-146
460-00-4	4-Bromofluorobenzene (Surr)	95		49-148
1868-53-7	Dibromofluoromethane (Surr)	89		60-140
2037-26-5	Toluene-d8 (Surr)	101		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: 70N 50E Lab Sample ID: 480-165607-37

Matrix: Solid Lab File ID: N1053.D

Analysis Method: 8260C Date Collected: 01/24/2020 10:20

Sample wt/vol: 5.06(g) Date Analyzed: 01/29/2020 19:19

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 15.0 Level: (low/med) Medium

Analysis Batch No.: 515300 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo | Job No.: 480-165607-2

SDG No.:

Client Sample ID: 60N 40E SOIL | Lab Sample ID: 480-165607-9

Matrix: Solid | Lab File ID: V3143345.D

Analysis Method: 8270D | Date Collected: 01/24/2020 13:15

Extract. Method: 3550C | Date Extracted: 01/30/2020 15:53

Sample wt/vol: 30.07(g) | Date Analyzed: 01/31/2020 23:23

Con. Extract Vol.: 1(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: 9.2 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 515793 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
92-52-4	Biphenyl	ND		190	27
108-60-1	bis (2-chloroisopropyl) ether	ND		190	37
95-95-4	2,4,5-Trichlorophenol	ND		190	51
88-06-2	2,4,6-Trichlorophenol	ND		190	37
120-83-2	2,4-Dichlorophenol	ND		190	20
105-67-9	2,4-Dimethylphenol	ND		190	45
51-28-5	2,4-Dinitrophenol	ND		1800	860
121-14-2	2,4-Dinitrotoluene	ND		190	38
606-20-2	2,6-Dinitrotoluene	ND		190	22
91-58-7	2-Chloronaphthalene	ND		190	31
95-57-8	2-Chlorophenol	ND		360	34
95-48-7	2-Methylphenol	ND		190	22
91-57-6	2-Methylnaphthalene	ND		190	37
88-74-4	2-Nitroaniline	ND		360	27
88-75-5	2-Nitrophenol	ND		190	53
91-94-1	3,3'-Dichlorobenzidine	ND		360	220
99-09-2	3-Nitroaniline	ND		360	52
534-52-1	4,6-Dinitro-2-methylphenol	ND		360	190
101-55-3	4-Bromophenyl phenyl ether	ND		190	26
59-50-7	4-Chloro-3-methylphenol	ND		190	46
106-47-8	4-Chloroaniline	ND		190	46
7005-72-3	4-Chlorophenyl phenyl ether	ND		190	23
106-44-5	4-Methylphenol	ND		360	22
100-01-6	4-Nitroaniline	ND		360	98
100-02-7	4-Nitrophenol	ND		360	130
83-32-9	Acenaphthene	ND		190	27
208-96-8	Acenaphthylene	ND		190	24
98-86-2	Acetophenone	ND		190	25
120-12-7	Anthracene	ND		190	46
1912-24-9	Atrazine	ND		190	65
100-52-7	Benzaldehyde	ND		190	150
56-55-3	Benzo[a]anthracene	ND		190	19
50-32-8	Benzo[a]pyrene	ND		190	27
205-99-2	Benzo[b]fluoranthene	110	J	190	30

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo | Job No.: 480-165607-2

SDG No.:

Client Sample ID: 60N 40E SOIL | Lab Sample ID: 480-165607-9

Matrix: Solid | Lab File ID: V3143345.D

Analysis Method: 8270D | Date Collected: 01/24/2020 13:15

Extract. Method: 3550C | Date Extracted: 01/30/2020 15:53

Sample wt/vol: 30.07(g) | Date Analyzed: 01/31/2020 23:23

Con. Extract Vol.: 1(mL) | Dilution Factor: 1

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: 9.2 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 515793 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
191-24-2	Benzo[g,h,i]perylene	84	J	190	20
207-08-9	Benzo[k]fluoranthene	ND		190	24
111-91-1	Bis(2-chloroethoxy)methane	ND		190	40
111-44-4	Bis(2-chloroethyl)ether	ND		190	24
117-81-7	Bis(2-ethylhexyl) phthalate	130	J	190	64
85-68-7	Butyl benzyl phthalate	140	J	190	31
105-60-2	Caprolactam	ND		190	56
86-74-8	Carbazole	ND		190	22
218-01-9	Chrysene	ND		190	42
53-70-3	Dibenz(a,h)anthracene	ND		190	33
84-74-2	Di-n-butyl phthalate	58	J	190	32
117-84-0	Di-n-octyl phthalate	ND		190	22
132-64-9	Dibenzofuran	ND		190	22
84-66-2	Diethyl phthalate	ND		190	24
131-11-3	Dimethyl phthalate	ND		190	22
206-44-0	Fluoranthene	40	J	190	20
86-73-7	Fluorene	ND		190	22
118-74-1	Hexachlorobenzene	ND		190	25
87-68-3	Hexachlorobutadiene	ND		190	27
77-47-4	Hexachlorocyclopentadiene	ND	UJ	190	25
67-72-1	Hexachloroethane	ND		190	24
193-39-5	Indeno[1,2,3-cd]pyrene	66	J	190	23
78-59-1	Isophorone	ND		190	40
621-64-7	N-Nitrosodi-n-propylamine	ND		190	32
86-30-6	N-Nitrosodiphenylamine	ND		190	150
91-20-3	Naphthalene	ND		190	24
98-95-3	Nitrobenzene	ND		190	21
87-86-5	Pentachlorophenol	ND		360	190
85-01-8	Phenanthrene	ND		190	27
108-95-2	Phenol	ND		190	29
129-00-0	Pyrene	39	J	190	22
123-91-1	1,4-Dioxane	ND		110	60

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: 60N 40E SOIL Lab Sample ID: 480-165607-9

Matrix: Solid Lab File ID: V3143345.D

Analysis Method: 8270D Date Collected: 01/24/2020 13:15

Extract. Method: 3550C Date Extracted: 01/30/2020 15:53

Sample wt/vol: 30.07(g) Date Analyzed: 01/31/2020 23:23

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 9.2 GPC Cleanup:(Y/N) N

Analysis Batch No.: 515793 Units: ug/Kg

Number TICs Found: 4 TIC Result Total: 21450

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Unknown	1.83	1800	T J	
127-18-4	Tetrachloroethylene	2.57	19000	T J N	98%
	Unknown	3.14	450	T J	
79-34-5	Ethane, 1,1,2,2-tetrachloro-	4.34	200	T J N	96%

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo | Job No.: 480-165607-2

SDG No.:

Client Sample ID: 20N 10E SOIL | Lab Sample ID: 480-165607-11

Matrix: Solid | Lab File ID: V3143346.D

Analysis Method: 8270D | Date Collected: 01/24/2020 13:45

Extract. Method: 3550C | Date Extracted: 01/30/2020 15:53

Sample wt/vol: 30.11(g) | Date Analyzed: 01/31/2020 23:48

Con. Extract Vol.: 1(mL) | Dilution Factor: 20

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: 4.9 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 515793 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
92-52-4	Biphenyl	600	J	3600	520
108-60-1	bis (2-chloroisopropyl) ether	ND		3600	710
95-95-4	2,4,5-Trichlorophenol	ND		3600	960
88-06-2	2,4,6-Trichlorophenol	ND		3600	710
120-83-2	2,4-Dichlorophenol	ND		3600	380
105-67-9	2,4-Dimethylphenol	ND		3600	860
51-28-5	2,4-Dinitrophenol	ND		35000	16000
121-14-2	2,4-Dinitrotoluene	ND		3600	730
606-20-2	2,6-Dinitrotoluene	ND		3600	420
91-58-7	2-Chloronaphthalene	ND		3600	590
95-57-8	2-Chlorophenol	ND		6900	650
95-48-7	2-Methylphenol	ND		3600	420
91-57-6	2-Methylnaphthalene	2000	J	3600	710
88-74-4	2-Nitroaniline	ND		6900	520
88-75-5	2-Nitrophenol	ND		3600	1000
91-94-1	3,3'-Dichlorobenzidine	ND		6900	4200
99-09-2	3-Nitroaniline	ND		6900	990
534-52-1	4,6-Dinitro-2-methylphenol	ND		6900	3600
101-55-3	4-Bromophenyl phenyl ether	ND		3600	500
59-50-7	4-Chloro-3-methylphenol	ND		3600	880
106-47-8	4-Chloroaniline	ND		3600	880
7005-72-3	4-Chlorophenyl phenyl ether	ND		3600	440
106-44-5	4-Methylphenol	ND		6900	420
100-01-6	4-Nitroaniline	ND		6900	1900
100-02-7	4-Nitrophenol	ND		6900	2500
83-32-9	Acenaphthene	5700		3600	520
208-96-8	Acenaphthylene	1100	J	3600	460
98-86-2	Acetophenone	ND		3600	480
120-12-7	Anthracene	19000		3600	880
1912-24-9	Atrazine	ND		3600	1200
100-52-7	Benzaldehyde	ND		3600	2800
56-55-3	Benzo[a]anthracene	39000		3600	360
50-32-8	Benzo[a]pyrene	33000		3600	520
205-99-2	Benzo[b]fluoranthene	37000		3600	570

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo | Job No.: 480-165607-2

SDG No.:

Client Sample ID: 20N 10E SOIL | Lab Sample ID: 480-165607-11

Matrix: Solid | Lab File ID: V3143346.D

Analysis Method: 8270D | Date Collected: 01/24/2020 13:45

Extract. Method: 3550C | Date Extracted: 01/30/2020 15:53

Sample wt/vol: 30.11(g) | Date Analyzed: 01/31/2020 23:48

Con. Extract Vol.: 1(mL) | Dilution Factor: 20

Injection Volume: 1(uL) | Level: (low/med) Low

% Moisture: 4.9 | GPC Cleanup:(Y/N) N

Analysis Batch No.: 515793 | Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
191-24-2	Benzo[g,h,i]perylene	22000		3600	380
207-08-9	Benzo[k]fluoranthene	18000		3600	460
111-91-1	Bis(2-chloroethoxy)methane	ND		3600	750
111-44-4	Bis(2-chloroethyl)ether	ND		3600	460
117-81-7	Bis(2-ethylhexyl) phthalate	ND		3600	1200
85-68-7	Butyl benzyl phthalate	ND		3600	590
105-60-2	Caprolactam	ND		3600	1100
86-74-8	Carbazole	10000		3600	420
218-01-9	Chrysene	37000		3600	800
53-70-3	Dibenz(a,h)anthracene	7300		3600	630
84-74-2	Di-n-butyl phthalate	ND		3600	610
117-84-0	Di-n-octyl phthalate	ND		3600	420
132-64-9	Dibenzofuran	4200		3600	420
84-66-2	Diethyl phthalate	ND		3600	460
131-11-3	Dimethyl phthalate	ND		3600	420
206-44-0	Fluoranthene	80000		3600	380
86-73-7	Fluorene	7200		3600	420
118-74-1	Hexachlorobenzene	ND		3600	480
87-68-3	Hexachlorobutadiene	ND		3600	520
77-47-4	Hexachlorocyclopentadiene	ND	UJ	3600	480
67-72-1	Hexachloroethane	ND		3600	460
193-39-5	Indeno[1,2,3-cd]pyrene	21000		3600	440
78-59-1	Isophorone	ND		3600	750
621-64-7	N-Nitrosodi-n-propylamine	ND		3600	610
86-30-6	N-Nitrosodiphenylamine	ND		3600	2900
91-20-3	Naphthalene	3400	J	3600	460
98-95-3	Nitrobenzene	ND		3600	400
87-86-5	Pentachlorophenol	ND		6900	3600
85-01-8	Phenanthrene	74000		3600	520
108-95-2	Phenol	ND		3600	540
129-00-0	Pyrene	68000		3600	420
123-91-1	1,4-Dioxane	ND		2100	1200

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: 20N 10E SOIL Lab Sample ID: 480-165607-11

Matrix: Solid Lab File ID: V3143346.D

Analysis Method: 8270D Date Collected: 01/24/2020 13:45

Extract. Method: 3550C Date Extracted: 01/30/2020 15:53

Sample wt/vol: 30.11(g) Date Analyzed: 01/31/2020 23:48

Con. Extract Vol.: 1(mL) Dilution Factor: 20

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 4.9 GPC Cleanup:(Y/N) N

Analysis Batch No.: 515793 Units: ug/Kg

Number TICs Found: 19 TIC Result Total: 128200

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
132-65-0	Dibenzothiophene	10.61	4100	T J N	94%
832-69-9	Phenanthrene, 1-methyl-	11.22	8100	T J N	95%
613-12-7	Anthracene, 2-methyl-	11.24	11000	T J N	94%
949-41-7	1H-Cyclopropa[l]phenanthrene,1a,9b-dihydro-	11.29	3800	T J N	95%
	Unknown	11.32	15000	T J	
610-48-0	Anthracene, 1-methyl-	11.35	6800	T J N	93%
	Unknown	11.51	5100	T J	
84-65-1	9,10-Anthracenedione	11.53	4600	T J N	95%
3674-66-6	Phenanthrene, 2,5-dimethyl-	11.74	5100	T J N	93%
5737-13-3	Cyclopenta(def)phenanthrenone	11.81	4400	T J N	90%
243-17-4	11H-Benzo[b]fluorene	12.37	4300	T J N	94%
3697-24-3	Chrysene, 5-methyl-	13.45	3100	T J N	90%
	Unknown	13.72	4100	T J	
205-82-3	Benzo[j]fluoranthene	14.05	4600	T J N	91%
198-55-0	Perylene	14.18	19000	T J N	95%
213-46-7	1,2:7,8-Dibenzophenanthrene	15.24	4400	T J N	95%
191-26-4	Dibenzo[def,mno]chrysene	15.49	7400	T J N	90%
189-64-0	3,4:8,9-Dibenzopyrene	16.49	9300	T J N	97%
566-08-5	Androst-4-ene-3,17-dione, 15-hydroxy-, (15.alpha.)-	16.58	4000	T J N	95%

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: 60N 10E SOIL Lab Sample ID: 480-165607-16

Matrix: Solid Lab File ID: 5_29374.D

Analysis Method: 8081B Date Collected: 01/24/2020 13:55

Extraction Method: 3550C Date Extracted: 01/29/2020 14:38

Sample wt/vol: 30.25(g) Date Analyzed: 01/30/2020 14:46

Con. Extract Vol.: 10(mL) Dilution Factor: 20

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: 8.4 GPC Cleanup:(Y/N) N

Analysis Batch No.: 515525 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	ND		36	7.0
72-55-9	4,4'-DDE	ND		36	7.6
50-29-3	4,4'-DDT	ND	U	36	36
309-00-2	Aldrin	ND		36	8.9
319-84-6	alpha-BHC	ND		36	6.5
5103-71-9	cis-Chlordane	ND		36	18
319-85-7	beta-BHC	ND		36	6.5
319-86-8	delta-BHC	7.4	J	36	6.7
60-57-1	Dieldrin	ND		36	8.7
959-98-8	Endosulfan I	ND		36	6.9
33213-65-9	Endosulfan II	ND		36	6.5
1031-07-8	Endosulfan sulfate	ND		36	6.7
72-20-8	Endrin	ND		36	7.1
7421-93-4	Endrin aldehyde	ND		36	9.2
53494-70-5	Endrin ketone	ND		36	8.9
58-89-9	gamma-BHC (Lindane)	ND		36	6.6
5103-74-2	trans-Chlordane	ND		36	11
76-44-8	Heptachlor	ND		36	7.8
1024-57-3	Heptachlor epoxide	ND		36	9.3
72-43-5	Methoxychlor	ND	U	36	36
8001-35-2	Toxaphene	ND		360	210

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	380	X	45-120
877-09-8	Tetrachloro-m-xylene	144	X	30-124

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: 20N 10E SOIL Lab Sample ID: 480-165607-21

Matrix: Solid Lab File ID: 5_29375.D

Analysis Method: 8081B Date Collected: 01/24/2020 13:45

Extraction Method: 3550C Date Extracted: 01/29/2020 14:38

Sample wt/vol: 30.33(g) Date Analyzed: 01/30/2020 15:06

Con. Extract Vol.: 10(mL) Dilution Factor: 20

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: 5.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 515525 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	ND		35	6.8
72-55-9	4,4'-DDE	ND		35	7.3
50-29-3	4,4'-DDT	ND	U	35	35
309-00-2	Aldrin	ND		35	8.6
319-84-6	alpha-BHC	ND		35	6.3
5103-71-9	cis-Chlordane	ND		35	17
319-85-7	beta-BHC	ND		35	6.3
319-86-8	delta-BHC	ND		35	6.5
60-57-1	Dieldrin	ND		35	8.4
959-98-8	Endosulfan I	ND		35	6.7
33213-65-9	Endosulfan II	ND		35	6.3
1031-07-8	Endosulfan sulfate	ND		35	6.5
72-20-8	Endrin	11	J	35	6.9
7421-93-4	Endrin aldehyde	120	J	35	8.9
53494-70-5	Endrin ketone	ND		35	8.6
58-89-9	gamma-BHC (Lindane)	ND		35	6.4
5103-74-2	trans-Chlordane	ND		35	11
76-44-8	Heptachlor	ND		35	7.6
1024-57-3	Heptachlor epoxide	ND		35	9.0
72-43-5	Methoxychlor	ND	U	35	35
8001-35-2	Toxaphene	ND		350	200

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	342	X	45-120
877-09-8	Tetrachloro-m-xylene	234	X	30-124

FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: 60N 10E SOIL Lab Sample ID: 480-165607-16

Matrix: Solid Lab File ID: 7_65-111.D

Analysis Method: 8082A Date Collected: 01/24/2020 13:55

Extraction Method: 3550C Date Extracted: 01/30/2020 15:25

Sample wt/vol: 2.29(g) Date Analyzed: 02/03/2020 19:05

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: ZB-5 ID: 0.53(mm)

% Moisture: 8.4 GPC Cleanup:(Y/N) N

Analysis Batch No.: 515960 Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	ND		0.24	0.047
11104-28-2	PCB-1221	ND		0.24	0.047
11141-16-5	PCB-1232	ND		0.24	0.047
53469-21-9	PCB-1242	ND		0.24	0.047
12672-29-6	PCB-1248	ND		0.24	0.047
11097-69-1	PCB-1254	ND		0.24	0.11
11096-82-5	PCB-1260	ND		0.24	0.11
37324-23-5	PCB-1262	ND		0.24	0.11
11100-14-4	PCB-1268	ND		0.24	0.11

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	128		60-154
2051-24-3	DCB Decachlorobiphenyl	149		65-174

FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: 20N 10E SOIL Lab Sample ID: 480-165607-21

Matrix: Solid Lab File ID: 7_64-257.D

Analysis Method: 8082A Date Collected: 01/24/2020 13:45

Extraction Method: 3550C Date Extracted: 01/28/2020 14:55

Sample wt/vol: 2.24(g) Date Analyzed: 01/29/2020 16:55

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: ZB-5 ID: 0.53(mm)

% Moisture: 5.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 515413 Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	ND		0.24	0.046
11104-28-2	PCB-1221	ND		0.24	0.046
11141-16-5	PCB-1232	ND		0.24	0.046
53469-21-9	PCB-1242	ND		0.24	0.046
12672-29-6	PCB-1248	ND		0.24	0.046
11097-69-1	PCB-1254	ND		0.24	0.11
11096-82-5	PCB-1260	ND		0.24	0.11
37324-23-5	PCB-1262	ND		0.24	0.11
11100-14-4	PCB-1268	ND		0.24	0.11

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	91		60-154
2051-24-3	DCB Decachlorobiphenyl	84		65-174

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: 60N 10E SOIL Lab Sample ID: 480-165607-20

Matrix: Solid Lab File ID: 13_27-327.D

Analysis Method: 8151A Date Collected: 01/24/2020 13:55

Extraction Method: 8151A Date Extracted: 01/30/2020 15:21

Sample wt/vol: 30.28(g) Date Analyzed: 02/03/2020 21:22

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: 9.1 GPC Cleanup:(Y/N) N

Analysis Batch No.: 515916 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	ND		18	5.8
93-72-1	Silvex (2,4,5-TP)	ND		18	6.5
94-75-7	2,4-D	ND		18	11

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	64		28-129

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: 20N 10E SOIL Lab Sample ID: 480-165607-21

Matrix: Solid Lab File ID: 13_27-328.D

Analysis Method: 8151A Date Collected: 01/24/2020 13:45

Extraction Method: 8151A Date Extracted: 01/30/2020 15:21

Sample wt/vol: 30.35(g) Date Analyzed: 02/03/2020 21:52

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: 5.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 515916 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	ND		17	5.6
93-72-1	Silvex (2,4,5-TP)	ND		17	6.3
94-75-7	2,4-D	ND		17	11

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	78		28-129

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: 60N 40E SOIL
Lab Sample ID: 480-165607-12
Lab Name: Eurofins TestAmerica, Buffalo
Job No.: 480-165607-2
SDG ID.:
Matrix: Solid
Date Sampled: 01/24/2020 13:15
Reporting Basis: DRY
Date Received: 01/27/2020 11:45
% Solids: 89.9

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	5590	10.4	4.6	mg/Kg			1	6010C
7440-36-0	Antimony	1.1	15.7	0.42	mg/Kg	J		1	6010C
7440-38-2	Arsenic	4.2	2.1	0.42	mg/Kg			1	6010C
7440-39-3	Barium	67.2	0.52	0.11	mg/Kg		J	1	6010C
7440-41-7	Beryllium	0.27	0.21	0.029	mg/Kg			1	6010C
7440-43-9	Cadmium	0.18	0.21	0.031	mg/Kg	J		1	6010C
7440-70-2	Calcium	37600	52.2	3.4	mg/Kg		J	1	6010C
7440-47-3	Chromium	7.8	0.52	0.21	mg/Kg			1	6010C
7440-48-4	Cobalt	3.6	0.52	0.052	mg/Kg			1	6010C
7440-50-8	Copper	37.1	1.0	0.22	mg/Kg		J	1	6010C
7439-89-6	Iron	9330	10.4	3.7	mg/Kg		J	1	6010C
7439-92-1	Lead	120	1.0	0.25	mg/Kg		J	1	6010C
7439-95-4	Magnesium	12300	20.9	0.97	mg/Kg			1	6010C
7439-96-5	Manganese	350	0.21	0.033	mg/Kg		J	1	6010C
7440-02-0	Nickel	10.5	5.2	0.24	mg/Kg			1	6010C
7440-09-7	Potassium	1510	31.3	20.9	mg/Kg			1	6010C
7782-49-2	Selenium	ND	4.2	0.42	mg/Kg			1	6010C
7440-22-4	Silver	0.23	0.63	0.21	mg/Kg	J		1	6010C
7440-23-5	Sodium	360	146	13.6	mg/Kg		J	1	6010C
7440-28-0	Thallium	ND	6.3	0.31	mg/Kg			1	6010C
7440-62-2	Vanadium	11.6	0.52	0.11	mg/Kg			1	6010C
7440-66-6	Zinc	78.0	2.1	0.67	mg/Kg		J	1	6010C
7439-97-6	Mercury	0.37	0.023	0.0092	mg/Kg			1	7471B

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: 40N 30E SOIL
Lab Sample ID: 480-165607-36
Lab Name: Eurofins TestAmerica, Buffalo
Job No.: 480-165607-2
SDG ID.:
Matrix: Solid
Date Sampled: 01/24/2020 09:50
Reporting Basis: DRY
Date Received: 01/27/2020 11:45
% Solids: 90.9

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	8320	11.0	4.8	mg/Kg			1	6010C
7440-36-0	Antimony	1.6	16.5	0.44	mg/Kg	J		1	6010C
7440-38-2	Arsenic	5.2	2.2	0.44	mg/Kg			1	6010C
7440-39-3	Barium	82.7	0.55	0.12	mg/Kg			1	6010C
7440-41-7	Beryllium	0.42	0.22	0.031	mg/Kg			1	6010C
7440-43-9	Cadmium	0.23	0.22	0.033	mg/Kg			1	6010C
7440-70-2	Calcium	64700	55.0	3.6	mg/Kg			1	6010C
7440-47-3	Chromium	13.6	0.55	0.22	mg/Kg			1	6010C
7440-48-4	Cobalt	4.8	0.55	0.055	mg/Kg			1	6010C
7440-50-8	Copper	23.3	1.1	0.23	mg/Kg			1	6010C
7439-89-6	Iron	13000	11.0	3.8	mg/Kg			1	6010C
7439-92-1	Lead	91.7	1.1	0.26	mg/Kg			1	6010C
7439-95-4	Magnesium	17500	22.0	1.0	mg/Kg			1	6010C
7439-96-5	Manganese	395	0.22	0.035	mg/Kg			1	6010C
7440-02-0	Nickel	14.2	5.5	0.25	mg/Kg			1	6010C
7440-09-7	Potassium	1910	33.0	22.0	mg/Kg			1	6010C
7782-49-2	Selenium	ND	4.4	0.44	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.66	0.22	mg/Kg			1	6010C
7440-23-5	Sodium	283	154	14.3	mg/Kg			1	6010C
7440-28-0	Thallium	ND	6.6	0.33	mg/Kg			1	6010C
7440-62-2	Vanadium	18.6	0.55	0.12	mg/Kg			1	6010C
7440-66-6	Zinc	72.6	2.2	0.70	mg/Kg			1	6010C
7439-97-6	Mercury	0.15	0.019	0.0078	mg/Kg			1	7471B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 60N 40E SOIL
Lab Sample ID: 480-165607-9
Lab Name: Eurofins TestAmerica, Buffalo
Job No.: 480-165607-2
SDG ID.:
Matrix: Solid
Date Sampled: 01/24/2020 13:15
Reporting Basis: DRY
Date Received: 01/27/2020 11:45
% Solids: 90.8

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
57-12-5	Cyanide, Total	ND	1.1	0.51	mg/Kg		UJ	1	9012B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 20N 10E SOIL
Lab Sample ID: 480-165607-11
Lab Name: Eurofins TestAmerica, Buffalo
Job No.: 480-165607-2
SDG ID.:
Matrix: Solid
Date Sampled: 01/24/2020 13:45
Reporting Basis: DRY
Date Received: 01/27/2020 11:45
% Solids: 95.1

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
57-12-5	Cyanide, Total	ND	0.97	0.47	mg/Kg			1	9012B

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-166397-1

SDG No.:

Client Sample ID: 40W 40E 14-16 Lab Sample ID: 480-166397-1

Matrix: Solid Lab File ID: 2020.02.22_LLB_025.d

Analysis Method: 537 (modified) Date Collected: 02/11/2020 11:45

Extraction Method: SHAKE Date Extracted: 02/19/2020 04:09

Sample wt/vol: 5.35(g) Date Analyzed: 02/24/2020 06:52

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 11.4 GPC Cleanup:(Y/N) N

Analysis Batch No.: 359346 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	ND		0.21	0.030
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		0.21	0.081
307-24-4	Perfluorohexanoic acid (PFHxA)	ND		0.21	0.044
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.075	J	0.21	0.031
335-67-1	Perfluorooctanoic acid (PFOA)	0.60	J	0.21	0.091
375-95-1	Perfluorononanoic acid (PFNA)	0.070	J	0.21	0.038
335-76-2	Perfluorodecanoic acid (PFDA)	0.16	J	0.21	0.023
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		0.21	0.038
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		0.21	0.071
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		0.21	0.054
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		0.21	0.057
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.026	J	0.21	0.026
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.35	J	0.21	0.033
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		0.21	0.037
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	J	0.53	0.21
335-77-3	Perfluorodecanesulfonic acid (PFDS)	0.31	J	0.21	0.041
754-91-6	Perfluorooctanesulfonamide (FOSA)	0.32	J	0.21	0.086
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	3.1	J	2.1	0.41
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.86	J	2.1	0.39
27619-97-2	6:2 FTS	ND		2.1	0.16
39108-34-4	8:2 FTS	ND		2.1	0.26

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-166397-1

SDG No.:

Client Sample ID: 42N 20E 11.5-12.3 Lab Sample ID: 480-166397-2

Matrix: Solid Lab File ID: 2020.02.22_LLB_026.d

Analysis Method: 537 (modified) Date Collected: 02/11/2020 11:00

Extraction Method: SHAKE Date Extracted: 02/19/2020 04:09

Sample wt/vol: 5.37(g) Date Analyzed: 02/24/2020 07:02

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 21.0 GPC Cleanup:(Y/N) N

Analysis Batch No.: 359346 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	ND	U	0.24	0.033
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		0.24	0.091
307-24-4	Perfluorohexanoic acid (PFHxA)	ND		0.24	0.049
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		0.24	0.034
335-67-1	Perfluorooctanoic acid (PFOA)	ND		0.24	0.10
375-95-1	Perfluorononanoic acid (PFNA)	ND		0.24	0.042
335-76-2	Perfluorodecanoic acid (PFDA)	ND		0.24	0.026
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.042
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		0.24	0.079
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.060
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.064
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.029
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND		0.24	0.037
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		0.24	0.041
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND		0.59	0.24
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		0.24	0.046
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND		0.24	0.097
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.46
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.44
27619-97-2	6:2 FTS	ND		2.4	0.18
39108-34-4	8:2 FTS	ND		2.4	0.29

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-166397-1

SDG No.:

Client Sample ID: DUP-200212-1 Lab Sample ID: 480-166397-3

Matrix: Solid Lab File ID: 2020.02.22_LLB_027.d

Analysis Method: 537 (modified) Date Collected: 02/12/2020 11:05

Extraction Method: SHAKE Date Extracted: 02/19/2020 04:11

Sample wt/vol: 5.47(g) Date Analyzed: 02/24/2020 07:12

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 19.0 GPC Cleanup:(Y/N) N

Analysis Batch No.: 359346 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	ND	U	0.23	0.032
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		0.23	0.087
307-24-4	Perfluorohexanoic acid (PFHxA)	ND		0.23	0.047
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		0.23	0.033
335-67-1	Perfluorooctanoic acid (PFOA)	ND		0.23	0.097
375-95-1	Perfluorononanoic acid (PFNA)	ND		0.23	0.041
335-76-2	Perfluorodecanoic acid (PFDA)	ND		0.23	0.025
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		0.23	0.041
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		0.23	0.076
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		0.23	0.058
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		0.23	0.061
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		0.23	0.028
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND		0.23	0.035
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		0.23	0.040
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.23	J	0.56	0.23
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		0.23	0.044
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND		0.23	0.093
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.3	0.44
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.3	0.42
27619-97-2	6:2 FTS	ND		2.3	0.17
39108-34-4	8:2 FTS	ND		2.3	0.28

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-166397-1

SDG No.:

Client Sample ID: 50W 35E 9 Lab Sample ID: 480-166397-4

Matrix: Solid Lab File ID: 2020.02.22_LLB_028.d

Analysis Method: 537 (modified) Date Collected: 02/12/2020 14:50

Extraction Method: SHAKE Date Extracted: 02/19/2020 04:11

Sample wt/vol: 5.27(g) Date Analyzed: 02/24/2020 07:22

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 15.2 GPC Cleanup:(Y/N) N

Analysis Batch No.: 359346 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	ND	U	0.22	0.031
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		0.22	0.086
307-24-4	Perfluorohexanoic acid (PFHxA)	0.059	J	0.22	0.047
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		0.22	0.032
335-67-1	Perfluorooctanoic acid (PFOA)	ND		0.22	0.096
375-95-1	Perfluorononanoic acid (PFNA)	ND		0.22	0.040
335-76-2	Perfluorodecanoic acid (PFDA)	ND		0.22	0.025
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		0.22	0.040
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		0.22	0.075
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		0.22	0.057
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		0.22	0.060
375-73-5	Perfluorobutanesulfonic acid (PFBS)	0.037	J	0.22	0.028
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.084	J	0.22	0.035
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		0.22	0.039
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.82		0.56	0.22
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		0.22	0.044
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND		0.22	0.092
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.2	0.44
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.2	0.41
27619-97-2	6:2 FTS	ND		2.2	0.17
39108-34-4	8:2 FTS	ND		2.2	0.28

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 40N40E 13 Lab Sample ID: 480-166399-1

Matrix: Solid Lab File ID: F5738.D

Analysis Method: 8260C Date Collected: 02/11/2020 12:10

Sample wt/vol: 5.09(g) Date Analyzed: 02/17/2020 15:32

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 7.6 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.3	0.39
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.3	0.86
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.3	1.2
79-00-5	1,1,2-Trichloroethane	ND		5.3	0.69
75-34-3	1,1-Dichloroethane	ND		5.3	0.65
75-35-4	1,1-Dichloroethene	ND		5.3	0.65
120-82-1	1,2,4-Trichlorobenzene	ND		5.3	0.32
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.3	2.7
106-93-4	1,2-Dibromoethane	ND		5.3	0.68
95-50-1	1,2-Dichlorobenzene	ND		5.3	0.42
107-06-2	1,2-Dichloroethane	ND		5.3	0.27
78-87-5	1,2-Dichloropropane	ND		5.3	2.7
541-73-1	1,3-Dichlorobenzene	ND		5.3	0.27
106-46-7	1,4-Dichlorobenzene	ND		5.3	0.74
78-93-3	2-Butanone (MEK)	ND		27	1.9
591-78-6	2-Hexanone	ND		27	2.7
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		27	1.7
67-64-1	Acetone	8.5	J	27	4.5
71-43-2	Benzene	ND		5.3	0.26
75-27-4	Bromodichloromethane	ND		5.3	0.71
75-25-2	Bromoform	ND		5.3	2.7
74-83-9	Bromomethane	ND		5.3	0.48
75-15-0	Carbon disulfide	ND		5.3	2.7
56-23-5	Carbon tetrachloride	ND		5.3	0.51
108-90-7	Chlorobenzene	ND		5.3	0.70
75-00-3	Chloroethane	ND		5.3	1.2
67-66-3	Chloroform	ND		5.3	0.33
74-87-3	Chloromethane	ND		5.3	0.32
156-59-2	cis-1,2-Dichloroethene	ND		5.3	0.68
10061-01-5	cis-1,3-Dichloropropene	ND		5.3	0.77
110-82-7	Cyclohexane	ND		5.3	0.74
124-48-1	Dibromochloromethane	ND		5.3	0.68
75-71-8	Dichlorodifluoromethane	ND		5.3	0.44
100-41-4	Ethylbenzene	ND		5.3	0.37
98-82-8	Isopropylbenzene	ND		5.3	0.80

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 40N40E 13 Lab Sample ID: 480-166399-1

Matrix: Solid Lab File ID: F5738.D

Analysis Method: 8260C Date Collected: 02/11/2020 12:10

Sample wt/vol: 5.09(g) Date Analyzed: 02/17/2020 15:32

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 7.6 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		27	3.2
1634-04-4	Methyl tert-butyl ether	ND		5.3	0.52
108-87-2	Methylcyclohexane	ND		5.3	0.81
75-09-2	Methylene Chloride	ND		5.3	2.4
100-42-5	Styrene	ND		5.3	0.27
127-18-4	Tetrachloroethene	160		5.3	0.71
108-88-3	Toluene	ND		5.3	0.40
156-60-5	trans-1,2-Dichloroethene	ND		5.3	0.55
10061-02-6	trans-1,3-Dichloropropene	ND		5.3	2.3
79-01-6	Trichloroethene	ND		5.3	1.2
75-69-4	Trichlorofluoromethane	ND		5.3	0.50
75-01-4	Vinyl chloride	ND		5.3	0.65
1330-20-7	Xylenes, Total	ND		11	0.89

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	106		64-126
460-00-4	4-Bromofluorobenzene (Surr)	94		72-126
1868-53-7	Dibromofluoromethane (Surr)	105		60-140
2037-26-5	Toluene-d8 (Surr)	96		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 40N40E 13 Lab Sample ID: 480-166399-1

Matrix: Solid Lab File ID: F5738.D

Analysis Method: 8260C Date Collected: 02/11/2020 12:10

Sample wt/vol: 5.09(g) Date Analyzed: 02/17/2020 15:32

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 7.6 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 10N36E 7 Lab Sample ID: 480-166399-2

Matrix: Solid Lab File ID: F5739.D

Analysis Method: 8260C Date Collected: 02/11/2020 13:30

Sample wt/vol: 5.01(g) Date Analyzed: 02/17/2020 15:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 17.8 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		6.1	0.44
79-34-5	1,1,2,2-Tetrachloroethane	ND		6.1	0.98
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		6.1	1.4
79-00-5	1,1,2-Trichloroethane	ND		6.1	0.79
75-34-3	1,1-Dichloroethane	ND		6.1	0.74
75-35-4	1,1-Dichloroethene	ND		6.1	0.74
120-82-1	1,2,4-Trichlorobenzene	ND		6.1	0.37
96-12-8	1,2-Dibromo-3-Chloropropane	ND		6.1	3.0
106-93-4	1,2-Dibromoethane	ND		6.1	0.78
95-50-1	1,2-Dichlorobenzene	ND		6.1	0.47
107-06-2	1,2-Dichloroethane	ND		6.1	0.30
78-87-5	1,2-Dichloropropane	ND		6.1	3.0
541-73-1	1,3-Dichlorobenzene	ND		6.1	0.31
106-46-7	1,4-Dichlorobenzene	ND		6.1	0.85
78-93-3	2-Butanone (MEK)	ND		30	2.2
591-78-6	2-Hexanone	ND		30	3.0
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		30	2.0
67-64-1	Acetone	6.4	J	30	5.1
71-43-2	Benzene	ND		6.1	0.30
75-27-4	Bromodichloromethane	ND		6.1	0.81
75-25-2	Bromoform	ND		6.1	3.0
74-83-9	Bromomethane	ND		6.1	0.55
75-15-0	Carbon disulfide	ND		6.1	3.0
56-23-5	Carbon tetrachloride	ND		6.1	0.59
108-90-7	Chlorobenzene	ND		6.1	0.80
75-00-3	Chloroethane	ND		6.1	1.4
67-66-3	Chloroform	ND		6.1	0.38
74-87-3	Chloromethane	ND		6.1	0.37
156-59-2	cis-1,2-Dichloroethene	ND		6.1	0.78
10061-01-5	cis-1,3-Dichloropropene	ND		6.1	0.87
110-82-7	Cyclohexane	ND		6.1	0.85
124-48-1	Dibromochloromethane	ND		6.1	0.78
75-71-8	Dichlorodifluoromethane	ND		6.1	0.50
100-41-4	Ethylbenzene	ND		6.1	0.42
98-82-8	Isopropylbenzene	ND		6.1	0.92

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 10N36E 7 Lab Sample ID: 480-166399-2

Matrix: Solid Lab File ID: F5739.D

Analysis Method: 8260C Date Collected: 02/11/2020 13:30

Sample wt/vol: 5.01(g) Date Analyzed: 02/17/2020 15:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 17.8 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		30	3.7
1634-04-4	Methyl tert-butyl ether	ND		6.1	0.60
108-87-2	Methylcyclohexane	ND		6.1	0.92
75-09-2	Methylene Chloride	ND		6.1	2.8
100-42-5	Styrene	ND		6.1	0.30
127-18-4	Tetrachloroethene	63		6.1	0.81
108-88-3	Toluene	ND		6.1	0.46
156-60-5	trans-1,2-Dichloroethene	ND		6.1	0.63
10061-02-6	trans-1,3-Dichloropropene	ND		6.1	2.7
79-01-6	Trichloroethene	ND		6.1	1.3
75-69-4	Trichlorofluoromethane	ND		6.1	0.57
75-01-4	Vinyl chloride	ND		6.1	0.74
1330-20-7	Xylenes, Total	ND		12	1.0

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		64-126
460-00-4	4-Bromofluorobenzene (Surr)	93		72-126
1868-53-7	Dibromofluoromethane (Surr)	104		60-140
2037-26-5	Toluene-d8 (Surr)	99		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 10N36E 7 Lab Sample ID: 480-166399-2

Matrix: Solid Lab File ID: F5739.D

Analysis Method: 8260C Date Collected: 02/11/2020 13:30

Sample wt/vol: 5.01(g) Date Analyzed: 02/17/2020 15:58

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 17.8 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 40N50E 12 Lab Sample ID: 480-166399-3

Matrix: Solid Lab File ID: F5740.D

Analysis Method: 8260C Date Collected: 02/11/2020 15:00

Sample wt/vol: 5.05(g) Date Analyzed: 02/17/2020 16:23

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 14.7 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.8	0.42
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.8	0.94
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.8	1.3
79-00-5	1,1,2-Trichloroethane	ND		5.8	0.75
75-34-3	1,1-Dichloroethane	ND		5.8	0.71
75-35-4	1,1-Dichloroethene	ND		5.8	0.71
120-82-1	1,2,4-Trichlorobenzene	ND		5.8	0.35
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.8	2.9
106-93-4	1,2-Dibromoethane	ND		5.8	0.75
95-50-1	1,2-Dichlorobenzene	ND		5.8	0.45
107-06-2	1,2-Dichloroethane	ND		5.8	0.29
78-87-5	1,2-Dichloropropane	ND		5.8	2.9
541-73-1	1,3-Dichlorobenzene	ND		5.8	0.30
106-46-7	1,4-Dichlorobenzene	ND		5.8	0.81
78-93-3	2-Butanone (MEK)	ND		29	2.1
591-78-6	2-Hexanone	ND		29	2.9
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		29	1.9
67-64-1	Acetone	ND		29	4.9
71-43-2	Benzene	ND		5.8	0.28
75-27-4	Bromodichloromethane	ND		5.8	0.78
75-25-2	Bromoform	ND		5.8	2.9
74-83-9	Bromomethane	ND		5.8	0.52
75-15-0	Carbon disulfide	ND		5.8	2.9
56-23-5	Carbon tetrachloride	ND		5.8	0.56
108-90-7	Chlorobenzene	ND		5.8	0.77
75-00-3	Chloroethane	ND		5.8	1.3
67-66-3	Chloroform	ND		5.8	0.36
74-87-3	Chloromethane	ND		5.8	0.35
156-59-2	cis-1,2-Dichloroethene	ND		5.8	0.74
10061-01-5	cis-1,3-Dichloropropene	ND		5.8	0.84
110-82-7	Cyclohexane	ND		5.8	0.81
124-48-1	Dibromochloromethane	ND		5.8	0.74
75-71-8	Dichlorodifluoromethane	ND		5.8	0.48
100-41-4	Ethylbenzene	ND		5.8	0.40
98-82-8	Isopropylbenzene	ND		5.8	0.88

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 40N50E 12 Lab Sample ID: 480-166399-3

Matrix: Solid Lab File ID: F5740.D

Analysis Method: 8260C Date Collected: 02/11/2020 15:00

Sample wt/vol: 5.05(g) Date Analyzed: 02/17/2020 16:23

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 14.7 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		29	3.5
1634-04-4	Methyl tert-butyl ether	ND		5.8	0.57
108-87-2	Methylcyclohexane	ND		5.8	0.88
75-09-2	Methylene Chloride	ND		5.8	2.7
100-42-5	Styrene	ND		5.8	0.29
127-18-4	Tetrachloroethene	200		5.8	0.78
108-88-3	Toluene	ND		5.8	0.44
156-60-5	trans-1,2-Dichloroethene	ND		5.8	0.60
10061-02-6	trans-1,3-Dichloropropene	ND		5.8	2.6
79-01-6	Trichloroethene	1.8	J	5.8	1.3
75-69-4	Trichlorofluoromethane	ND		5.8	0.55
75-01-4	Vinyl chloride	ND		5.8	0.71
1330-20-7	Xylenes, Total	ND		12	0.98

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	105		64-126
460-00-4	4-Bromofluorobenzene (Surr)	94		72-126
1868-53-7	Dibromofluoromethane (Surr)	104		60-140
2037-26-5	Toluene-d8 (Surr)	98		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 40N50E 12 Lab Sample ID: 480-166399-3

Matrix: Solid Lab File ID: F5740.D

Analysis Method: 8260C Date Collected: 02/11/2020 15:00

Sample wt/vol: 5.05(g) Date Analyzed: 02/17/2020 16:23

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 14.7 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 90N50E 5 Lab Sample ID: 480-166399-4

Matrix: Solid Lab File ID: F5759.D

Analysis Method: 8260C Date Collected: 02/12/2020 08:40

Sample wt/vol: 5.08(g) Date Analyzed: 02/18/2020 01:14

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 17.2 Level: (low/med) Low

Analysis Batch No.: 517962 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.9	0.43
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.9	0.96
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.9	1.4
79-00-5	1,1,2-Trichloroethane	ND		5.9	0.77
75-34-3	1,1-Dichloroethane	ND		5.9	0.73
75-35-4	1,1-Dichloroethene	ND		5.9	0.73
120-82-1	1,2,4-Trichlorobenzene	ND		5.9	0.36
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.9	3.0
106-93-4	1,2-Dibromoethane	ND		5.9	0.76
95-50-1	1,2-Dichlorobenzene	ND		5.9	0.47
107-06-2	1,2-Dichloroethane	ND		5.9	0.30
78-87-5	1,2-Dichloropropane	ND		5.9	3.0
541-73-1	1,3-Dichlorobenzene	ND		5.9	0.31
106-46-7	1,4-Dichlorobenzene	ND		5.9	0.83
78-93-3	2-Butanone (MEK)	ND		30	2.2
591-78-6	2-Hexanone	ND		30	3.0
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		30	2.0
67-64-1	Acetone	ND		30	5.0
71-43-2	Benzene	ND		5.9	0.29
75-27-4	Bromodichloromethane	ND		5.9	0.80
75-25-2	Bromoform	ND		5.9	3.0
74-83-9	Bromomethane	ND		5.9	0.54
75-15-0	Carbon disulfide	ND		5.9	3.0
56-23-5	Carbon tetrachloride	ND		5.9	0.58
108-90-7	Chlorobenzene	ND		5.9	0.79
75-00-3	Chloroethane	ND		5.9	1.3
67-66-3	Chloroform	ND		5.9	0.37
74-87-3	Chloromethane	ND		5.9	0.36
156-59-2	cis-1,2-Dichloroethene	ND		5.9	0.76
10061-01-5	cis-1,3-Dichloropropene	ND		5.9	0.86
110-82-7	Cyclohexane	ND		5.9	0.83
124-48-1	Dibromochloromethane	ND		5.9	0.76
75-71-8	Dichlorodifluoromethane	ND		5.9	0.49
100-41-4	Ethylbenzene	ND		5.9	0.41
98-82-8	Isopropylbenzene	ND		5.9	0.90

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 90N50E 5 Lab Sample ID: 480-166399-4

Matrix: Solid Lab File ID: F5759.D

Analysis Method: 8260C Date Collected: 02/12/2020 08:40

Sample wt/vol: 5.08(g) Date Analyzed: 02/18/2020 01:14

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 17.2 Level: (low/med) Low

Analysis Batch No.: 517962 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		30	3.6
1634-04-4	Methyl tert-butyl ether	ND		5.9	0.58
108-87-2	Methylcyclohexane	ND		5.9	0.90
75-09-2	Methylene Chloride	3.2	J	5.9	2.7
100-42-5	Styrene	ND		5.9	0.30
127-18-4	Tetrachloroethene	12		5.9	0.80
108-88-3	Toluene	ND		5.9	0.45
156-60-5	trans-1,2-Dichloroethene	ND		5.9	0.61
10061-02-6	trans-1,3-Dichloropropene	ND		5.9	2.6
79-01-6	Trichloroethene	ND		5.9	1.3
75-69-4	Trichlorofluoromethane	ND		5.9	0.56
75-01-4	Vinyl chloride	ND		5.9	0.73
1330-20-7	Xylenes, Total	ND		12	1.0

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	106		64-126
460-00-4	4-Bromofluorobenzene (Surr)	94		72-126
1868-53-7	Dibromofluoromethane (Surr)	107		60-140
2037-26-5	Toluene-d8 (Surr)	98		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 90N50E 5 Lab Sample ID: 480-166399-4

Matrix: Solid Lab File ID: F5759.D

Analysis Method: 8260C Date Collected: 02/12/2020 08:40

Sample wt/vol: 5.08(g) Date Analyzed: 02/18/2020 01:14

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 17.2 Level: (low/med) Low

Analysis Batch No.: 517962 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 25N50E 8.5 Lab Sample ID: 480-166399-5

Matrix: Solid Lab File ID: F5742.D

Analysis Method: 8260C Date Collected: 02/12/2020 09:25

Sample wt/vol: 5.04(g) Date Analyzed: 02/17/2020 17:14

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 25.2 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		6.6	0.48
79-34-5	1,1,2,2-Tetrachloroethane	ND		6.6	1.1
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		6.6	1.5
79-00-5	1,1,2-Trichloroethane	ND		6.6	0.86
75-34-3	1,1-Dichloroethane	ND		6.6	0.81
75-35-4	1,1-Dichloroethene	ND		6.6	0.81
120-82-1	1,2,4-Trichlorobenzene	ND		6.6	0.40
96-12-8	1,2-Dibromo-3-Chloropropane	ND		6.6	3.3
106-93-4	1,2-Dibromoethane	ND		6.6	0.85
95-50-1	1,2-Dichlorobenzene	ND		6.6	0.52
107-06-2	1,2-Dichloroethane	ND		6.6	0.33
78-87-5	1,2-Dichloropropane	ND		6.6	3.3
541-73-1	1,3-Dichlorobenzene	ND		6.6	0.34
106-46-7	1,4-Dichlorobenzene	ND		6.6	0.93
78-93-3	2-Butanone (MEK)	ND		33	2.4
591-78-6	2-Hexanone	ND		33	3.3
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		33	2.2
67-64-1	Acetone	ND		33	5.6
71-43-2	Benzene	ND		6.6	0.32
75-27-4	Bromodichloromethane	ND		6.6	0.89
75-25-2	Bromoform	ND		6.6	3.3
74-83-9	Bromomethane	ND		6.6	0.60
75-15-0	Carbon disulfide	ND		6.6	3.3
56-23-5	Carbon tetrachloride	ND		6.6	0.64
108-90-7	Chlorobenzene	ND		6.6	0.87
75-00-3	Chloroethane	ND		6.6	1.5
67-66-3	Chloroform	0.51	J	6.6	0.41
74-87-3	Chloromethane	ND		6.6	0.40
156-59-2	cis-1,2-Dichloroethene	14		6.6	0.85
10061-01-5	cis-1,3-Dichloropropene	ND		6.6	0.95
110-82-7	Cyclohexane	ND		6.6	0.93
124-48-1	Dibromochloromethane	ND		6.6	0.85
75-71-8	Dichlorodifluoromethane	ND		6.6	0.55
100-41-4	Ethylbenzene	ND		6.6	0.46
98-82-8	Isopropylbenzene	ND		6.6	1.0

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 25N50E 8.5 Lab Sample ID: 480-166399-5

Matrix: Solid Lab File ID: F5742.D

Analysis Method: 8260C Date Collected: 02/12/2020 09:25

Sample wt/vol: 5.04(g) Date Analyzed: 02/17/2020 17:14

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 25.2 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		33	4.0
1634-04-4	Methyl tert-butyl ether	ND		6.6	0.65
108-87-2	Methylcyclohexane	ND		6.6	1.0
75-09-2	Methylene Chloride	ND		6.6	3.0
100-42-5	Styrene	ND		6.6	0.33
127-18-4	Tetrachloroethene	560	E	6.6	0.89
108-88-3	Toluene	ND		6.6	0.50
156-60-5	trans-1,2-Dichloroethene	ND		6.6	0.68
10061-02-6	trans-1,3-Dichloropropene	ND		6.6	2.9
79-01-6	Trichloroethene	21		6.6	1.5
75-69-4	Trichlorofluoromethane	ND		6.6	0.63
75-01-4	Vinyl chloride	ND		6.6	0.81
1330-20-7	Xylenes, Total	ND		13	1.1

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	108		64-126
460-00-4	4-Bromofluorobenzene (Surr)	93		72-126
1868-53-7	Dibromofluoromethane (Surr)	108		60-140
2037-26-5	Toluene-d8 (Surr)	97		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 25N50E 8.5 Lab Sample ID: 480-166399-5

Matrix: Solid Lab File ID: F5742.D

Analysis Method: 8260C Date Collected: 02/12/2020 09:25

Sample wt/vol: 5.04(g) Date Analyzed: 02/17/2020 17:14

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 25.2 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 25N50E 8.5 DL Lab Sample ID: 480-166399-5 DL

Matrix: Solid Lab File ID: S4484.D

Analysis Method: 8260C Date Collected: 02/12/2020 09:25

Sample wt/vol: 5.04(g) Date Analyzed: 02/20/2020 11:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 25.2 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		150	41
79-34-5	1,1,2,2-Tetrachloroethane	ND		150	24
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		150	75
79-00-5	1,1,2-Trichloroethane	ND		150	31
75-34-3	1,1-Dichloroethane	ND		150	46
75-35-4	1,1-Dichloroethene	ND		150	52
120-82-1	1,2,4-Trichlorobenzene	ND		150	57
96-12-8	1,2-Dibromo-3-Chloropropane	ND		150	75
106-93-4	1,2-Dibromoethane	ND		150	26
95-50-1	1,2-Dichlorobenzene	ND		150	38
107-06-2	1,2-Dichloroethane	ND		150	61
78-87-5	1,2-Dichloropropane	ND		150	24
541-73-1	1,3-Dichlorobenzene	ND		150	40
106-46-7	1,4-Dichlorobenzene	ND		150	21
78-93-3	2-Butanone (MEK)	ND		750	440
591-78-6	2-Hexanone	ND		750	310
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		750	48
67-64-1	Acetone	ND		750	610
71-43-2	Benzene	ND		150	28
75-27-4	Bromodichloromethane	ND		150	30
75-25-2	Bromoform	ND		150	75
74-83-9	Bromomethane	ND		150	33
75-15-0	Carbon disulfide	ND		150	68
56-23-5	Carbon tetrachloride	ND		150	38
108-90-7	Chlorobenzene	ND		150	20
75-00-3	Chloroethane	ND		150	31
67-66-3	Chloroform	ND		150	100
74-87-3	Chloromethane	ND		150	36
156-59-2	cis-1,2-Dichloroethene	ND		150	41
10061-01-5	cis-1,3-Dichloropropene	ND		150	36
110-82-7	Cyclohexane	ND		150	33
124-48-1	Dibromochloromethane	ND		150	72
75-71-8	Dichlorodifluoromethane	ND		150	65
100-41-4	Ethylbenzene	ND		150	43
98-82-8	Isopropylbenzene	ND		150	22

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 25N50E 8.5 DL Lab Sample ID: 480-166399-5 DL

Matrix: Solid Lab File ID: S4484.D

Analysis Method: 8260C Date Collected: 02/12/2020 09:25

Sample wt/vol: 5.04(g) Date Analyzed: 02/20/2020 11:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 25.2 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		750	71
1634-04-4	Methyl tert-butyl ether	ND		150	56
108-87-2	Methylcyclohexane	ND		150	70
75-09-2	Methylene Chloride	ND		150	30
100-42-5	Styrene	ND		150	36
127-18-4	Tetrachloroethene	1200		150	20
108-88-3	Toluene	ND		150	40
156-60-5	trans-1,2-Dichloroethene	ND		150	35
10061-02-6	trans-1,3-Dichloropropene	ND		150	15
79-01-6	Trichloroethene	ND		150	42
75-69-4	Trichlorofluoromethane	ND		150	70
75-01-4	Vinyl chloride	ND		150	50
1330-20-7	Xylenes, Total	ND		300	83

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		53-146
460-00-4	4-Bromofluorobenzene (Surr)	100		49-148
1868-53-7	Dibromofluoromethane (Surr)	98		60-140
2037-26-5	Toluene-d8 (Surr)	101		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 25N50E 8.5 DL Lab Sample ID: 480-166399-5 DL

Matrix: Solid Lab File ID: S4484.D

Analysis Method: 8260C Date Collected: 02/12/2020 09:25

Sample wt/vol: 5.04(g) Date Analyzed: 02/20/2020 11:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 25.2 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 42N20E 11.5-12.3 Lab Sample ID: 480-166399-6

Matrix: Solid Lab File ID: F5760.D

Analysis Method: 8260C Date Collected: 02/12/2020 11:00

Sample wt/vol: 5.02(g) Date Analyzed: 02/18/2020 01:40

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 15.5 Level: (low/med) Low

Analysis Batch No.: 517962 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.9	0.43
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.9	0.96
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.9	1.3
79-00-5	1,1,2-Trichloroethane	ND		5.9	0.77
75-34-3	1,1-Dichloroethane	ND		5.9	0.72
75-35-4	1,1-Dichloroethene	ND		5.9	0.72
120-82-1	1,2,4-Trichlorobenzene	ND		5.9	0.36
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.9	2.9
106-93-4	1,2-Dibromoethane	ND		5.9	0.76
95-50-1	1,2-Dichlorobenzene	ND		5.9	0.46
107-06-2	1,2-Dichloroethane	ND		5.9	0.30
78-87-5	1,2-Dichloropropane	ND		5.9	2.9
541-73-1	1,3-Dichlorobenzene	ND		5.9	0.30
106-46-7	1,4-Dichlorobenzene	ND		5.9	0.83
78-93-3	2-Butanone (MEK)	ND		29	2.2
591-78-6	2-Hexanone	ND		29	2.9
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		29	1.9
67-64-1	Acetone	ND		29	5.0
71-43-2	Benzene	ND		5.9	0.29
75-27-4	Bromodichloromethane	ND		5.9	0.79
75-25-2	Bromoform	ND		5.9	2.9
74-83-9	Bromomethane	ND		5.9	0.53
75-15-0	Carbon disulfide	ND		5.9	2.9
56-23-5	Carbon tetrachloride	ND		5.9	0.57
108-90-7	Chlorobenzene	ND		5.9	0.78
75-00-3	Chloroethane	ND		5.9	1.3
67-66-3	Chloroform	ND		5.9	0.36
74-87-3	Chloromethane	ND		5.9	0.36
156-59-2	cis-1,2-Dichloroethene	ND		5.9	0.75
10061-01-5	cis-1,3-Dichloropropene	ND		5.9	0.85
110-82-7	Cyclohexane	ND		5.9	0.83
124-48-1	Dibromochloromethane	ND		5.9	0.75
75-71-8	Dichlorodifluoromethane	ND		5.9	0.49
100-41-4	Ethylbenzene	ND		5.9	0.41
98-82-8	Isopropylbenzene	ND		5.9	0.89

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 42N20E 11.5-12.3 Lab Sample ID: 480-166399-6

Matrix: Solid Lab File ID: F5760.D

Analysis Method: 8260C Date Collected: 02/12/2020 11:00

Sample wt/vol: 5.02(g) Date Analyzed: 02/18/2020 01:40

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 15.5 Level: (low/med) Low

Analysis Batch No.: 517962 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		29	3.6
1634-04-4	Methyl tert-butyl ether	ND		5.9	0.58
108-87-2	Methylcyclohexane	ND		5.9	0.90
75-09-2	Methylene Chloride	ND		5.9	2.7
100-42-5	Styrene	ND		5.9	0.29
127-18-4	Tetrachloroethene	77		5.9	0.79
108-88-3	Toluene	ND		5.9	0.45
156-60-5	trans-1,2-Dichloroethene	ND		5.9	0.61
10061-02-6	trans-1,3-Dichloropropene	ND		5.9	2.6
79-01-6	Trichloroethene	ND		5.9	1.3
75-69-4	Trichlorofluoromethane	ND		5.9	0.56
75-01-4	Vinyl chloride	ND		5.9	0.72
1330-20-7	Xylenes, Total	ND		12	0.99

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	104		64-126
460-00-4	4-Bromofluorobenzene (Surr)	94		72-126
1868-53-7	Dibromofluoromethane (Surr)	104		60-140
2037-26-5	Toluene-d8 (Surr)	98		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 42N20E 11.5-12.3 Lab Sample ID: 480-166399-6

Matrix: Solid Lab File ID: F5760.D

Analysis Method: 8260C Date Collected: 02/12/2020 11:00

Sample wt/vol: 5.02(g) Date Analyzed: 02/18/2020 01:40

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 15.5 Level: (low/med) Low

Analysis Batch No.: 517962 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 70N20E 12-12.5 Lab Sample ID: 480-166399-7

Matrix: Solid Lab File ID: F5744.D

Analysis Method: 8260C Date Collected: 02/12/2020 13:15

Sample wt/vol: 5(g) Date Analyzed: 02/17/2020 18:05

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 10.9 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.6	0.41
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.6	0.91
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.6	1.3
79-00-5	1,1,2-Trichloroethane	ND		5.6	0.73
75-34-3	1,1-Dichloroethane	ND		5.6	0.68
75-35-4	1,1-Dichloroethene	ND		5.6	0.69
120-82-1	1,2,4-Trichlorobenzene	ND		5.6	0.34
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.6	2.8
106-93-4	1,2-Dibromoethane	ND		5.6	0.72
95-50-1	1,2-Dichlorobenzene	ND		5.6	0.44
107-06-2	1,2-Dichloroethane	ND		5.6	0.28
78-87-5	1,2-Dichloropropane	ND		5.6	2.8
541-73-1	1,3-Dichlorobenzene	ND		5.6	0.29
106-46-7	1,4-Dichlorobenzene	ND		5.6	0.79
78-93-3	2-Butanone (MEK)	ND		28	2.1
591-78-6	2-Hexanone	ND		28	2.8
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		28	1.8
67-64-1	Acetone	ND		28	4.7
71-43-2	Benzene	ND		5.6	0.28
75-27-4	Bromodichloromethane	ND		5.6	0.75
75-25-2	Bromoform	ND		5.6	2.8
74-83-9	Bromomethane	ND		5.6	0.51
75-15-0	Carbon disulfide	ND		5.6	2.8
56-23-5	Carbon tetrachloride	ND		5.6	0.54
108-90-7	Chlorobenzene	ND		5.6	0.74
75-00-3	Chloroethane	ND		5.6	1.3
67-66-3	Chloroform	ND		5.6	0.35
74-87-3	Chloromethane	ND		5.6	0.34
156-59-2	cis-1,2-Dichloroethene	1.4	J	5.6	0.72
10061-01-5	cis-1,3-Dichloropropene	ND		5.6	0.81
110-82-7	Cyclohexane	ND		5.6	0.79
124-48-1	Dibromochloromethane	ND		5.6	0.72
75-71-8	Dichlorodifluoromethane	ND		5.6	0.46
100-41-4	Ethylbenzene	ND		5.6	0.39
98-82-8	Isopropylbenzene	ND		5.6	0.85

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 70N20E 12-12.5 Lab Sample ID: 480-166399-7

Matrix: Solid Lab File ID: F5744.D

Analysis Method: 8260C Date Collected: 02/12/2020 13:15

Sample wt/vol: 5(g) Date Analyzed: 02/17/2020 18:05

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 10.9 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		28	3.4
1634-04-4	Methyl tert-butyl ether	ND		5.6	0.55
108-87-2	Methylcyclohexane	ND		5.6	0.85
75-09-2	Methylene Chloride	ND		5.6	2.6
100-42-5	Styrene	ND		5.6	0.28
127-18-4	Tetrachloroethene	630	E	5.6	0.75
108-88-3	Toluene	ND		5.6	0.42
156-60-5	trans-1,2-Dichloroethene	ND		5.6	0.58
10061-02-6	trans-1,3-Dichloropropene	ND		5.6	2.5
79-01-6	Trichloroethene	9.0		5.6	1.2
75-69-4	Trichlorofluoromethane	ND		5.6	0.53
75-01-4	Vinyl chloride	ND		5.6	0.68
1330-20-7	Xylenes, Total	ND		11	0.94

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	106		64-126
460-00-4	4-Bromofluorobenzene (Surr)	95		72-126
1868-53-7	Dibromofluoromethane (Surr)	106		60-140
2037-26-5	Toluene-d8 (Surr)	97		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 70N20E 12-12.5 Lab Sample ID: 480-166399-7

Matrix: Solid Lab File ID: F5744.D

Analysis Method: 8260C Date Collected: 02/12/2020 13:15

Sample wt/vol: 5(g) Date Analyzed: 02/17/2020 18:05

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 10.9 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 70N20E 12-12.5 DL Lab Sample ID: 480-166399-7 DL

Matrix: Solid Lab File ID: S4485.D

Analysis Method: 8260C Date Collected: 02/12/2020 13:15

Sample wt/vol: 5(g) Date Analyzed: 02/20/2020 12:09

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.9 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		120	33
79-34-5	1,1,2,2-Tetrachloroethane	ND		120	19
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		120	59
79-00-5	1,1,2-Trichloroethane	ND		120	25
75-34-3	1,1-Dichloroethane	ND		120	37
75-35-4	1,1-Dichloroethene	ND		120	41
120-82-1	1,2,4-Trichlorobenzene	ND		120	45
96-12-8	1,2-Dibromo-3-Chloropropane	ND		120	59
106-93-4	1,2-Dibromoethane	ND		120	21
95-50-1	1,2-Dichlorobenzene	ND		120	30
107-06-2	1,2-Dichloroethane	ND		120	48
78-87-5	1,2-Dichloropropane	ND		120	19
541-73-1	1,3-Dichlorobenzene	ND		120	32
106-46-7	1,4-Dichlorobenzene	ND		120	17
78-93-3	2-Butanone (MEK)	ND		590	350
591-78-6	2-Hexanone	ND		590	240
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		590	38
67-64-1	Acetone	ND		590	490
71-43-2	Benzene	ND		120	22
75-27-4	Bromodichloromethane	ND		120	24
75-25-2	Bromoform	ND		120	59
74-83-9	Bromomethane	ND		120	26
75-15-0	Carbon disulfide	ND		120	54
56-23-5	Carbon tetrachloride	ND		120	30
108-90-7	Chlorobenzene	ND		120	16
75-00-3	Chloroethane	ND		120	25
67-66-3	Chloroform	ND		120	81
74-87-3	Chloromethane	ND		120	28
156-59-2	cis-1,2-Dichloroethene	ND		120	33
10061-01-5	cis-1,3-Dichloropropene	ND		120	28
110-82-7	Cyclohexane	ND		120	26
124-48-1	Dibromochloromethane	ND		120	57
75-71-8	Dichlorodifluoromethane	ND		120	52
100-41-4	Ethylbenzene	ND		120	34
98-82-8	Isopropylbenzene	ND		120	18

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 70N20E 12-12.5 DL Lab Sample ID: 480-166399-7 DL

Matrix: Solid Lab File ID: S4485.D

Analysis Method: 8260C Date Collected: 02/12/2020 13:15

Sample wt/vol: 5(g) Date Analyzed: 02/20/2020 12:09

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.9 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		590	56
1634-04-4	Methyl tert-butyl ether	ND		120	45
108-87-2	Methylcyclohexane	ND		120	55
75-09-2	Methylene Chloride	ND		120	23
100-42-5	Styrene	ND		120	29
127-18-4	Tetrachloroethene	1400		120	16
108-88-3	Toluene	ND		120	32
156-60-5	trans-1,2-Dichloroethene	ND		120	28
10061-02-6	trans-1,3-Dichloropropene	ND		120	12
79-01-6	Trichloroethene	ND		120	33
75-69-4	Trichlorofluoromethane	ND		120	56
75-01-4	Vinyl chloride	ND		120	40
1330-20-7	Xylenes, Total	ND		240	66

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		53-146
460-00-4	4-Bromofluorobenzene (Surr)	100		49-148
1868-53-7	Dibromofluoromethane (Surr)	93		60-140
2037-26-5	Toluene-d8 (Surr)	101		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 70N20E 12-12.5 DL Lab Sample ID: 480-166399-7 DL

Matrix: Solid Lab File ID: S4485.D

Analysis Method: 8260C Date Collected: 02/12/2020 13:15

Sample wt/vol: 5(g) Date Analyzed: 02/20/2020 12:09

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.9 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 Lab Sample ID: 480-166399-8

Matrix: Solid Lab File ID: F5745.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:16

Sample wt/vol: 5.02(g) Date Analyzed: 02/17/2020 18:31

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 12.4 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.7	0.41
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.7	0.92
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.7	1.3
79-00-5	1,1,2-Trichloroethane	ND		5.7	0.74
75-34-3	1,1-Dichloroethane	ND		5.7	0.69
75-35-4	1,1-Dichloroethene	ND		5.7	0.70
120-82-1	1,2,4-Trichlorobenzene	ND		5.7	0.35
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.7	2.8
106-93-4	1,2-Dibromoethane	ND		5.7	0.73
95-50-1	1,2-Dichlorobenzene	ND		5.7	0.44
107-06-2	1,2-Dichloroethane	ND		5.7	0.29
78-87-5	1,2-Dichloropropane	ND		5.7	2.8
541-73-1	1,3-Dichlorobenzene	ND		5.7	0.29
106-46-7	1,4-Dichlorobenzene	ND		5.7	0.80
78-93-3	2-Butanone (MEK)	ND		28	2.1
591-78-6	2-Hexanone	ND		28	2.8
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		28	1.9
67-64-1	Acetone	6.8	J	28	4.8
71-43-2	Benzene	ND		5.7	0.28
75-27-4	Bromodichloromethane	ND		5.7	0.76
75-25-2	Bromoform	ND		5.7	2.8
74-83-9	Bromomethane	ND		5.7	0.51
75-15-0	Carbon disulfide	ND		5.7	2.8
56-23-5	Carbon tetrachloride	ND		5.7	0.55
108-90-7	Chlorobenzene	ND		5.7	0.75
75-00-3	Chloroethane	ND		5.7	1.3
67-66-3	Chloroform	0.97	J	5.7	0.35
74-87-3	Chloromethane	ND		5.7	0.34
156-59-2	cis-1,2-Dichloroethene	14		5.7	0.73
10061-01-5	cis-1,3-Dichloropropene	ND		5.7	0.82
110-82-7	Cyclohexane	ND		5.7	0.80
124-48-1	Dibromochloromethane	ND		5.7	0.73
75-71-8	Dichlorodifluoromethane	ND		5.7	0.47
100-41-4	Ethylbenzene	ND		5.7	0.39
98-82-8	Isopropylbenzene	ND		5.7	0.86

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 Lab Sample ID: 480-166399-8

Matrix: Solid Lab File ID: F5745.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:16

Sample wt/vol: 5.02(g) Date Analyzed: 02/17/2020 18:31

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 12.4 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		28	3.4
1634-04-4	Methyl tert-butyl ether	ND		5.7	0.56
108-87-2	Methylcyclohexane	ND		5.7	0.86
75-09-2	Methylene Chloride	ND		5.7	2.6
100-42-5	Styrene	ND		5.7	0.28
127-18-4	Tetrachloroethene	2900	E	5.7	0.76
108-88-3	Toluene	ND		5.7	0.43
156-60-5	trans-1,2-Dichloroethene	ND		5.7	0.59
10061-02-6	trans-1,3-Dichloropropene	ND		5.7	2.5
79-01-6	Trichloroethene	21		5.7	1.3
75-69-4	Trichlorofluoromethane	ND		5.7	0.54
75-01-4	Vinyl chloride	ND		5.7	0.69
1330-20-7	Xylenes, Total	ND		11	0.95

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	108		64-126
460-00-4	4-Bromofluorobenzene (Surr)	93		72-126
1868-53-7	Dibromofluoromethane (Surr)	107		60-140
2037-26-5	Toluene-d8 (Surr)	94		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 Lab Sample ID: 480-166399-8

Matrix: Solid Lab File ID: F5745.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:16

Sample wt/vol: 5.02(g) Date Analyzed: 02/17/2020 18:31

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 12.4 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

Number TICs Found: 1 TIC Result Total: 6

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
91-20-3	Naphthalene	12.70	6.0	T J N	91%

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 DL Lab Sample ID: 480-166399-8 DL

Matrix: Solid Lab File ID: S4486.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:16

Sample wt/vol: 5.07(g) Date Analyzed: 02/20/2020 12:32

Soil Aliquot Vol: 100 (uL) Dilution Factor: 40

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.4 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		4800	1300
79-34-5	1,1,2,2-Tetrachloroethane	ND		4800	780
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		4800	2400
79-00-5	1,1,2-Trichloroethane	ND		4800	1000
75-34-3	1,1-Dichloroethane	ND		4800	1500
75-35-4	1,1-Dichloroethene	ND		4800	1700
120-82-1	1,2,4-Trichlorobenzene	ND		4800	1800
96-12-8	1,2-Dibromo-3-Chloropropane	ND		4800	2400
106-93-4	1,2-Dibromoethane	ND		4800	840
95-50-1	1,2-Dichlorobenzene	ND		4800	1200
107-06-2	1,2-Dichloroethane	ND		4800	2000
78-87-5	1,2-Dichloropropane	ND		4800	770
541-73-1	1,3-Dichlorobenzene	ND		4800	1300
106-46-7	1,4-Dichlorobenzene	ND		4800	670
78-93-3	2-Butanone (MEK)	ND		24000	14000
591-78-6	2-Hexanone	ND		24000	9800
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		24000	1500
67-64-1	Acetone	ND		24000	20000
71-43-2	Benzene	ND		4800	910
75-27-4	Bromodichloromethane	ND		4800	960
75-25-2	Bromoform	ND		4800	2400
74-83-9	Bromomethane	ND		4800	1100
75-15-0	Carbon disulfide	ND		4800	2200
56-23-5	Carbon tetrachloride	ND		4800	1200
108-90-7	Chlorobenzene	ND		4800	630
75-00-3	Chloroethane	ND		4800	1000
67-66-3	Chloroform	ND		4800	3300
74-87-3	Chloromethane	ND		4800	1100
156-59-2	cis-1,2-Dichloroethene	ND		4800	1300
10061-01-5	cis-1,3-Dichloropropene	ND		4800	1100
110-82-7	Cyclohexane	ND		4800	1100
124-48-1	Dibromochloromethane	ND		4800	2300
75-71-8	Dichlorodifluoromethane	ND		4800	2100
100-41-4	Ethylbenzene	ND		4800	1400
98-82-8	Isopropylbenzene	ND		4800	720

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 DL Lab Sample ID: 480-166399-8 DL

Matrix: Solid Lab File ID: S4486.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:16

Sample wt/vol: 5.07(g) Date Analyzed: 02/20/2020 12:32

Soil Aliquot Vol: 100 (uL) Dilution Factor: 40

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.4 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		24000	2300
1634-04-4	Methyl tert-butyl ether	ND		4800	1800
108-87-2	Methylcyclohexane	ND		4800	2200
75-09-2	Methylene Chloride	ND		4800	950
100-42-5	Styrene	ND		4800	1200
127-18-4	Tetrachloroethene	200000		4800	640
108-88-3	Toluene	ND		4800	1300
156-60-5	trans-1,2-Dichloroethene	ND		4800	1100
10061-02-6	trans-1,3-Dichloropropene	ND		4800	470
79-01-6	Trichloroethene	ND		4800	1300
75-69-4	Trichlorofluoromethane	ND		4800	2200
75-01-4	Vinyl chloride	ND		4800	1600
1330-20-7	Xylenes, Total	ND		9600	2700

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	102		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	102		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 DL Lab Sample ID: 480-166399-8 DL

Matrix: Solid Lab File ID: S4486.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:16

Sample wt/vol: 5.07(g) Date Analyzed: 02/20/2020 12:32

Soil Aliquot Vol: 100 (uL) Dilution Factor: 40

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.4 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 9 Lab Sample ID: 480-166399-9

Matrix: Solid Lab File ID: N1828.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:50

Sample wt/vol: 5.02(g) Date Analyzed: 02/19/2020 10:52

Soil Aliquot Vol: 100 (uL) Dilution Factor: 25

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.0 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		3000	820
79-34-5	1,1,2,2-Tetrachloroethane	ND		3000	480
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		3000	1500
79-00-5	1,1,2-Trichloroethane	ND		3000	620
75-34-3	1,1-Dichloroethane	ND		3000	910
75-35-4	1,1-Dichloroethene	ND		3000	1000
120-82-1	1,2,4-Trichlorobenzene	ND		3000	1100
96-12-8	1,2-Dibromo-3-Chloropropane	ND		3000	1500
106-93-4	1,2-Dibromoethane	ND		3000	520
95-50-1	1,2-Dichlorobenzene	ND		3000	750
107-06-2	1,2-Dichloroethane	ND	UJ	3000	1200
78-87-5	1,2-Dichloropropane	ND		3000	480
541-73-1	1,3-Dichlorobenzene	ND		3000	790
106-46-7	1,4-Dichlorobenzene	ND		3000	410
78-93-3	2-Butanone (MEK)	ND		15000	8800
591-78-6	2-Hexanone	ND		15000	6000
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		15000	940
67-64-1	Acetone	ND		15000	12000
71-43-2	Benzene	ND		3000	560
75-27-4	Bromodichloromethane	ND		3000	590
75-25-2	Bromoform	ND		3000	1500
74-83-9	Bromomethane	ND		3000	650
75-15-0	Carbon disulfide	ND		3000	1300
56-23-5	Carbon tetrachloride	ND		3000	750
108-90-7	Chlorobenzene	ND		3000	390
75-00-3	Chloroethane	ND		3000	610
67-66-3	Chloroform	ND		3000	2000
74-87-3	Chloromethane	ND		3000	700
156-59-2	cis-1,2-Dichloroethene	ND		3000	810
10061-01-5	cis-1,3-Dichloropropene	ND		3000	710
110-82-7	Cyclohexane	ND		3000	660
124-48-1	Dibromochloromethane	ND		3000	1400
75-71-8	Dichlorodifluoromethane	ND		3000	1300
100-41-4	Ethylbenzene	ND		3000	860
98-82-8	Isopropylbenzene	ND		3000	440

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 9 Lab Sample ID: 480-166399-9

Matrix: Solid Lab File ID: N1828.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:50

Sample wt/vol: 5.02(g) Date Analyzed: 02/19/2020 10:52

Soil Aliquot Vol: 100 (uL) Dilution Factor: 25

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.0 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		15000	1400
1634-04-4	Methyl tert-butyl ether	ND		3000	1100
108-87-2	Methylcyclohexane	ND		3000	1400
75-09-2	Methylene Chloride	ND		3000	580
100-42-5	Styrene	ND		3000	710
127-18-4	Tetrachloroethene	170000		3000	400
108-88-3	Toluene	ND		3000	790
156-60-5	trans-1,2-Dichloroethene	ND		3000	700
10061-02-6	trans-1,3-Dichloropropene	ND		3000	290
79-01-6	Trichloroethene	ND		3000	820
75-69-4	Trichlorofluoromethane	ND		3000	1400
75-01-4	Vinyl chloride	ND		3000	990
1330-20-7	Xylenes, Total	ND		5900	1600

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	89		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	90		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 9 Lab Sample ID: 480-166399-9

Matrix: Solid Lab File ID: N1828.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:50

Sample wt/vol: 5.02(g) Date Analyzed: 02/19/2020 10:52

Soil Aliquot Vol: 100 (uL) Dilution Factor: 25

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.0 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Matrix: Solid Lab File ID: F5746.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:20

Sample wt/vol: 5.07(g) Date Analyzed: 02/17/2020 18:56

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 11.6 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.6	0.40
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.6	0.90
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.6	1.3
79-00-5	1,1,2-Trichloroethane	ND		5.6	0.72
75-34-3	1,1-Dichloroethane	ND		5.6	0.68
75-35-4	1,1-Dichloroethene	ND		5.6	0.68
120-82-1	1,2,4-Trichlorobenzene	ND		5.6	0.34
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.6	2.8
106-93-4	1,2-Dibromoethane	ND		5.6	0.72
95-50-1	1,2-Dichlorobenzene	ND		5.6	0.44
107-06-2	1,2-Dichloroethane	ND		5.6	0.28
78-87-5	1,2-Dichloropropane	ND		5.6	2.8
541-73-1	1,3-Dichlorobenzene	ND		5.6	0.29
106-46-7	1,4-Dichlorobenzene	ND		5.6	0.78
78-93-3	2-Butanone (MEK)	ND		28	2.0
591-78-6	2-Hexanone	ND		28	2.8
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		28	1.8
67-64-1	Acetone	ND		28	4.7
71-43-2	Benzene	ND		5.6	0.27
75-27-4	Bromodichloromethane	ND		5.6	0.75
75-25-2	Bromoform	ND		5.6	2.8
74-83-9	Bromomethane	ND		5.6	0.50
75-15-0	Carbon disulfide	ND		5.6	2.8
56-23-5	Carbon tetrachloride	ND		5.6	0.54
108-90-7	Chlorobenzene	ND		5.6	0.74
75-00-3	Chloroethane	ND		5.6	1.3
67-66-3	Chloroform	1.1	J	5.6	0.34
74-87-3	Chloromethane	ND		5.6	0.34
156-59-2	cis-1,2-Dichloroethene	15		5.6	0.71
10061-01-5	cis-1,3-Dichloropropene	ND		5.6	0.80
110-82-7	Cyclohexane	ND		5.6	0.78
124-48-1	Dibromochloromethane	ND		5.6	0.71
75-71-8	Dichlorodifluoromethane	ND		5.6	0.46
100-41-4	Ethylbenzene	ND		5.6	0.38
98-82-8	Isopropylbenzene	ND		5.6	0.84

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Matrix: Solid Lab File ID: F5746.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:20

Sample wt/vol: 5.07(g) Date Analyzed: 02/17/2020 18:56

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 11.6 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		28	3.4
1634-04-4	Methyl tert-butyl ether	ND		5.6	0.55
108-87-2	Methylcyclohexane	ND		5.6	0.85
75-09-2	Methylene Chloride	ND		5.6	2.6
100-42-5	Styrene	ND		5.6	0.28
127-18-4	Tetrachloroethene	2600	E	5.6	0.75
108-88-3	Toluene	ND		5.6	0.42
156-60-5	trans-1,2-Dichloroethene	ND		5.6	0.58
10061-02-6	trans-1,3-Dichloropropene	ND		5.6	2.5
79-01-6	Trichloroethene	21		5.6	1.2
75-69-4	Trichlorofluoromethane	ND		5.6	0.53
75-01-4	Vinyl chloride	ND		5.6	0.68
1330-20-7	Xylenes, Total	ND		11	0.94

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	108		64-126
460-00-4	4-Bromofluorobenzene (Surr)	94		72-126
1868-53-7	Dibromofluoromethane (Surr)	107		60-140
2037-26-5	Toluene-d8 (Surr)	96		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1
SDG No.:
Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10
Matrix: Solid Lab File ID: F5746.D
Analysis Method: 8260C Date Collected: 02/12/2020 14:20
Sample wt/vol: 5.07(g) Date Analyzed: 02/17/2020 18:56
Soil Aliquot Vol: Dilution Factor: 1
Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)
% Moisture: 11.6 Level: (low/med) Low
Analysis Batch No.: 517782 Units: ug/Kg
Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 DL Lab Sample ID: 480-166399-10 DL

Matrix: Solid Lab File ID: S4487.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:20

Sample wt/vol: 5.16(g) Date Analyzed: 02/20/2020 12:55

Soil Aliquot Vol: 100 (uL) Dilution Factor: 40

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.6 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		4600	1300
79-34-5	1,1,2,2-Tetrachloroethane	ND		4600	750
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		4600	2300
79-00-5	1,1,2-Trichloroethane	ND		4600	980
75-34-3	1,1-Dichloroethane	ND		4600	1400
75-35-4	1,1-Dichloroethene	ND		4600	1600
120-82-1	1,2,4-Trichlorobenzene	ND		4600	1800
96-12-8	1,2-Dibromo-3-Chloropropane	ND		4600	2300
106-93-4	1,2-Dibromoethane	ND		4600	810
95-50-1	1,2-Dichlorobenzene	ND		4600	1200
107-06-2	1,2-Dichloroethane	ND		4600	1900
78-87-5	1,2-Dichloropropane	ND		4600	750
541-73-1	1,3-Dichlorobenzene	ND		4600	1200
106-46-7	1,4-Dichlorobenzene	ND		4600	650
78-93-3	2-Butanone (MEK)	ND		23000	14000
591-78-6	2-Hexanone	ND		23000	9500
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		23000	1500
67-64-1	Acetone	ND		23000	19000
71-43-2	Benzene	ND		4600	880
75-27-4	Bromodichloromethane	ND		4600	930
75-25-2	Bromoform	ND		4600	2300
74-83-9	Bromomethane	ND		4600	1000
75-15-0	Carbon disulfide	ND		4600	2100
56-23-5	Carbon tetrachloride	ND		4600	1200
108-90-7	Chlorobenzene	ND		4600	610
75-00-3	Chloroethane	ND		4600	970
67-66-3	Chloroform	ND		4600	3200
74-87-3	Chloromethane	ND		4600	1100
156-59-2	cis-1,2-Dichloroethene	ND		4600	1300
10061-01-5	cis-1,3-Dichloropropene	ND		4600	1100
110-82-7	Cyclohexane	ND		4600	1000
124-48-1	Dibromochloromethane	ND		4600	2200
75-71-8	Dichlorodifluoromethane	ND		4600	2000
100-41-4	Ethylbenzene	ND		4600	1400
98-82-8	Isopropylbenzene	ND		4600	700

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 DL Lab Sample ID: 480-166399-10 DL

Matrix: Solid Lab File ID: S4487.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:20

Sample wt/vol: 5.16(g) Date Analyzed: 02/20/2020 12:55

Soil Aliquot Vol: 100 (uL) Dilution Factor: 40

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.6 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		23000	2200
1634-04-4	Methyl tert-butyl ether	ND		4600	1800
108-87-2	Methylcyclohexane	ND		4600	2200
75-09-2	Methylene Chloride	ND		4600	920
100-42-5	Styrene	ND		4600	1100
127-18-4	Tetrachloroethene	190000		4600	620
108-88-3	Toluene	ND		4600	1200
156-60-5	trans-1,2-Dichloroethene	ND		4600	1100
10061-02-6	trans-1,3-Dichloropropene	ND		4600	460
79-01-6	Trichloroethene	ND		4600	1300
75-69-4	Trichlorofluoromethane	ND		4600	2200
75-01-4	Vinyl chloride	ND		4600	1600
1330-20-7	Xylenes, Total	ND		9300	2600

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	98		53-146
460-00-4	4-Bromofluorobenzene (Surr)	99		49-148
1868-53-7	Dibromofluoromethane (Surr)	99		60-140
2037-26-5	Toluene-d8 (Surr)	99		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 DL Lab Sample ID: 480-166399-10 DL

Matrix: Solid Lab File ID: S4487.D

Analysis Method: 8260C Date Collected: 02/12/2020 14:20

Sample wt/vol: 5.16(g) Date Analyzed: 02/20/2020 12:55

Soil Aliquot Vol: 100 (uL) Dilution Factor: 40

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.6 Level: (low/med) Medium

Analysis Batch No.: 518335 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 11-12 Lab Sample ID: 480-166399-11

Matrix: Solid Lab File ID: N1829.D

Analysis Method: 8260C Date Collected: 02/12/2020 15:00

Sample wt/vol: 5.06(g) Date Analyzed: 02/19/2020 11:16

Soil Aliquot Vol: 100 (uL) Dilution Factor: 800

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 16.6 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		100000	28000
79-34-5	1,1,2,2-Tetrachloroethane	ND		100000	17000
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		100000	51000
79-00-5	1,1,2-Trichloroethane	ND		100000	22000
75-34-3	1,1-Dichloroethane	ND		100000	32000
75-35-4	1,1-Dichloroethene	ND		100000	36000
120-82-1	1,2,4-Trichlorobenzene	ND		100000	39000
96-12-8	1,2-Dibromo-3-Chloropropane	ND		100000	51000
106-93-4	1,2-Dibromoethane	ND		100000	18000
95-50-1	1,2-Dichlorobenzene	ND		100000	26000
107-06-2	1,2-Dichloroethane	ND	UJ	100000	42000
78-87-5	1,2-Dichloropropane	ND		100000	17000
541-73-1	1,3-Dichlorobenzene	ND		100000	27000
106-46-7	1,4-Dichlorobenzene	ND		100000	14000
78-93-3	2-Butanone (MEK)	ND		510000	300000
591-78-6	2-Hexanone	ND		510000	210000
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		510000	33000
67-64-1	Acetone	ND		510000	420000
71-43-2	Benzene	ND		100000	20000
75-27-4	Bromodichloromethane	ND		100000	21000
75-25-2	Bromoform	ND		100000	51000
74-83-9	Bromomethane	ND		100000	23000
75-15-0	Carbon disulfide	ND		100000	47000
56-23-5	Carbon tetrachloride	ND		100000	26000
108-90-7	Chlorobenzene	ND		100000	14000
75-00-3	Chloroethane	ND		100000	21000
67-66-3	Chloroform	ND		100000	70000
74-87-3	Chloromethane	ND		100000	24000
156-59-2	cis-1,2-Dichloroethene	ND		100000	28000
10061-01-5	cis-1,3-Dichloropropene	ND		100000	25000
110-82-7	Cyclohexane	ND		100000	23000
124-48-1	Dibromochloromethane	ND		100000	50000
75-71-8	Dichlorodifluoromethane	ND		100000	45000
100-41-4	Ethylbenzene	ND		100000	30000
98-82-8	Isopropylbenzene	ND		100000	15000

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 11-12 Lab Sample ID: 480-166399-11

Matrix: Solid Lab File ID: N1829.D

Analysis Method: 8260C Date Collected: 02/12/2020 15:00

Sample wt/vol: 5.06(g) Date Analyzed: 02/19/2020 11:16

Soil Aliquot Vol: 100 (uL) Dilution Factor: 800

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 16.6 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		510000	49000
1634-04-4	Methyl tert-butyl ether	ND		100000	39000
108-87-2	Methylcyclohexane	ND		100000	48000
75-09-2	Methylene Chloride	ND		100000	20000
100-42-5	Styrene	ND		100000	25000
127-18-4	Tetrachloroethene	7400000		100000	14000
108-88-3	Toluene	ND		100000	28000
156-60-5	trans-1,2-Dichloroethene	ND		100000	24000
10061-02-6	trans-1,3-Dichloropropene	ND		100000	10000
79-01-6	Trichloroethene	ND		100000	29000
75-69-4	Trichlorofluoromethane	ND		100000	48000
75-01-4	Vinyl chloride	ND		100000	34000
1330-20-7	Xylenes, Total	ND		210000	57000

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	89		53-146
460-00-4	4-Bromofluorobenzene (Surr)	98		49-148
1868-53-7	Dibromofluoromethane (Surr)	92		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 11-12 Lab Sample ID: 480-166399-11

Matrix: Solid Lab File ID: N1829.D

Analysis Method: 8260C Date Collected: 02/12/2020 15:00

Sample wt/vol: 5.06(g) Date Analyzed: 02/19/2020 11:16

Soil Aliquot Vol: 100 (uL) Dilution Factor: 800

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 16.6 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 60N40E 8.5-9 Lab Sample ID: 480-166399-12

Matrix: Solid Lab File ID: N1830.D

Analysis Method: 8260C Date Collected: 02/13/2020 08:35

Sample wt/vol: 5(g) Date Analyzed: 02/19/2020 11:39

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 19.5 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		550	150
79-34-5	1,1,2,2-Tetrachloroethane	ND		550	89
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		550	270
79-00-5	1,1,2-Trichloroethane	ND		550	110
75-34-3	1,1-Dichloroethane	ND		550	170
75-35-4	1,1-Dichloroethene	ND		550	190
120-82-1	1,2,4-Trichlorobenzene	ND		550	210
96-12-8	1,2-Dibromo-3-Chloropropane	ND		550	270
106-93-4	1,2-Dibromoethane	ND		550	95
95-50-1	1,2-Dichlorobenzene	ND		550	140
107-06-2	1,2-Dichloroethane	ND	UJ	550	220
78-87-5	1,2-Dichloropropane	ND		550	88
541-73-1	1,3-Dichlorobenzene	ND		550	150
106-46-7	1,4-Dichlorobenzene	ND		550	76
78-93-3	2-Butanone (MEK)	ND		2700	1600
591-78-6	2-Hexanone	ND		2700	1100
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		2700	170
67-64-1	Acetone	ND		2700	2200
71-43-2	Benzene	ND		550	100
75-27-4	Bromodichloromethane	ND		550	110
75-25-2	Bromoform	ND		550	270
74-83-9	Bromomethane	ND		550	120
75-15-0	Carbon disulfide	ND		550	250
56-23-5	Carbon tetrachloride	ND		550	140
108-90-7	Chlorobenzene	ND		550	72
75-00-3	Chloroethane	ND		550	110
67-66-3	Chloroform	ND		550	370
74-87-3	Chloromethane	ND		550	130
156-59-2	cis-1,2-Dichloroethene	ND		550	150
10061-01-5	cis-1,3-Dichloropropene	ND		550	130
110-82-7	Cyclohexane	ND		550	120
124-48-1	Dibromochloromethane	ND		550	260
75-71-8	Dichlorodifluoromethane	ND		550	240
100-41-4	Ethylbenzene	ND		550	160
98-82-8	Isopropylbenzene	ND		550	82

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 60N40E 8.5-9 Lab Sample ID: 480-166399-12

Matrix: Solid Lab File ID: N1830.D

Analysis Method: 8260C Date Collected: 02/13/2020 08:35

Sample wt/vol: 5(g) Date Analyzed: 02/19/2020 11:39

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 19.5 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		2700	260
1634-04-4	Methyl tert-butyl ether	ND		550	210
108-87-2	Methylcyclohexane	ND		550	260
75-09-2	Methylene Chloride	ND		550	110
100-42-5	Styrene	ND		550	130
127-18-4	Tetrachloroethene	11000		550	73
108-88-3	Toluene	ND		550	150
156-60-5	trans-1,2-Dichloroethene	ND		550	130
10061-02-6	trans-1,3-Dichloropropene	ND		550	54
79-01-6	Trichloroethene	ND		550	150
75-69-4	Trichlorofluoromethane	ND		550	260
75-01-4	Vinyl chloride	ND		550	180
1330-20-7	Xylenes, Total	ND		1100	300

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	91		53-146
460-00-4	4-Bromofluorobenzene (Surr)	96		49-148
1868-53-7	Dibromofluoromethane (Surr)	92		60-140
2037-26-5	Toluene-d8 (Surr)	103		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 60N40E 8.5-9 Lab Sample ID: 480-166399-12

Matrix: Solid Lab File ID: N1830.D

Analysis Method: 8260C Date Collected: 02/13/2020 08:35

Sample wt/vol: 5(g) Date Analyzed: 02/19/2020 11:39

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 19.5 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 60N40E 10-11 Lab Sample ID: 480-166399-13

Matrix: Solid Lab File ID: N1831.D

Analysis Method: 8260C Date Collected: 02/13/2020 08:37

Sample wt/vol: 5.04(g) Date Analyzed: 02/19/2020 12:03

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 15.7 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		250	70
79-34-5	1,1,2,2-Tetrachloroethane	ND		250	41
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		250	130
79-00-5	1,1,2-Trichloroethane	ND		250	53
75-34-3	1,1-Dichloroethane	ND		250	78
75-35-4	1,1-Dichloroethene	ND		250	88
120-82-1	1,2,4-Trichlorobenzene	ND		250	96
96-12-8	1,2-Dibromo-3-Chloropropane	ND		250	130
106-93-4	1,2-Dibromoethane	ND		250	44
95-50-1	1,2-Dichlorobenzene	ND		250	65
107-06-2	1,2-Dichloroethane	ND	UJ	250	100
78-87-5	1,2-Dichloropropane	ND		250	41
541-73-1	1,3-Dichlorobenzene	ND		250	68
106-46-7	1,4-Dichlorobenzene	ND		250	36
78-93-3	2-Butanone (MEK)	ND		1300	750
591-78-6	2-Hexanone	ND		1300	520
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		1300	81
67-64-1	Acetone	ND		1300	1000
71-43-2	Benzene	ND		250	48
75-27-4	Bromodichloromethane	ND		250	51
75-25-2	Bromoform	ND		250	130
74-83-9	Bromomethane	ND		250	56
75-15-0	Carbon disulfide	ND		250	120
56-23-5	Carbon tetrachloride	ND		250	65
108-90-7	Chlorobenzene	ND		250	34
75-00-3	Chloroethane	ND		250	53
67-66-3	Chloroform	ND		250	170
74-87-3	Chloromethane	ND		250	60
156-59-2	cis-1,2-Dichloroethene	160	J	250	70
10061-01-5	cis-1,3-Dichloropropene	ND		250	61
110-82-7	Cyclohexane	ND		250	56
124-48-1	Dibromochloromethane	ND		250	120
75-71-8	Dichlorodifluoromethane	ND		250	110
100-41-4	Ethylbenzene	ND		250	74
98-82-8	Isopropylbenzene	980		250	38

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 60N40E 10-11 Lab Sample ID: 480-166399-13

Matrix: Solid Lab File ID: N1831.D

Analysis Method: 8260C Date Collected: 02/13/2020 08:37

Sample wt/vol: 5.04(g) Date Analyzed: 02/19/2020 12:03

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 15.7 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		1300	120
1634-04-4	Methyl tert-butyl ether	ND		250	96
108-87-2	Methylcyclohexane	ND		250	120
75-09-2	Methylene Chloride	ND		250	50
100-42-5	Styrene	ND		250	61
127-18-4	Tetrachloroethene	24000		250	34
108-88-3	Toluene	ND		250	68
156-60-5	trans-1,2-Dichloroethene	ND		250	60
10061-02-6	trans-1,3-Dichloropropene	ND		250	25
79-01-6	Trichloroethene	1100		250	71
75-69-4	Trichlorofluoromethane	ND		250	120
75-01-4	Vinyl chloride	ND		250	85
1330-20-7	Xylenes, Total	ND		510	140

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	87		53-146
460-00-4	4-Bromofluorobenzene (Surr)	100		49-148
1868-53-7	Dibromofluoromethane (Surr)	89		60-140
2037-26-5	Toluene-d8 (Surr)	104		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 60N40E 10-11 Lab Sample ID: 480-166399-13

Matrix: Solid Lab File ID: N1831.D

Analysis Method: 8260C Date Collected: 02/13/2020 08:37

Sample wt/vol: 5.04(g) Date Analyzed: 02/19/2020 12:03

Soil Aliquot Vol: 100 (uL) Dilution Factor: 2

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 15.7 Level: (low/med) Medium

Analysis Batch No.: 518170 Units: ug/Kg

Number TICs Found: 10 TIC Result Total: 38600

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
103-65-1	Benzene, propyl-	9.85	1900	T J N	91%
124-18-5	Decane	9.99	6300	T J N	90%
526-73-8	Benzene, 1,2,3-trimethyl-	10.40	10000	T J N	97%
135-98-8	Benzene, (1-methylpropyl)-	10.56	1700	T J N	91%
	Unknown	11.01	4400	T J	
	Unknown	11.06	2700	T J	
1120-21-4	Undecane	11.14	3700	T J N	95%
934-74-7	Benzene, 1-ethyl-3,5-dimethyl-	11.32	2900	T J N	93%
874-41-9	Benzene, 1-ethyl-2,4-dimethyl-	11.42	3200	T J N	95%
95-93-2	Benzene, 1,2,4,5-tetramethyl-	12.19	1800	T J N	91%

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 100N35E 7-7.5 Lab Sample ID: 480-166399-14

Matrix: Solid Lab File ID: F5786.D

Analysis Method: 8260C Date Collected: 02/13/2020 09:47

Sample wt/vol: 5.04(g) Date Analyzed: 02/18/2020 13:41

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 10.5 Level: (low/med) Low

Analysis Batch No.: 517985 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.5	0.40
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.5	0.90
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.5	1.3
79-00-5	1,1,2-Trichloroethane	ND		5.5	0.72
75-34-3	1,1-Dichloroethane	ND		5.5	0.68
75-35-4	1,1-Dichloroethene	ND		5.5	0.68
120-82-1	1,2,4-Trichlorobenzene	ND		5.5	0.34
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.5	2.8
106-93-4	1,2-Dibromoethane	ND		5.5	0.71
95-50-1	1,2-Dichlorobenzene	ND		5.5	0.43
107-06-2	1,2-Dichloroethane	ND		5.5	0.28
78-87-5	1,2-Dichloropropane	ND		5.5	2.8
541-73-1	1,3-Dichlorobenzene	ND		5.5	0.28
106-46-7	1,4-Dichlorobenzene	ND		5.5	0.78
78-93-3	2-Butanone (MEK)	ND		28	2.0
591-78-6	2-Hexanone	ND		28	2.8
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		28	1.8
67-64-1	Acetone	ND		28	4.7
71-43-2	Benzene	ND		5.5	0.27
75-27-4	Bromodichloromethane	ND		5.5	0.74
75-25-2	Bromoform	ND		5.5	2.8
74-83-9	Bromomethane	ND		5.5	0.50
75-15-0	Carbon disulfide	ND		5.5	2.8
56-23-5	Carbon tetrachloride	ND		5.5	0.54
108-90-7	Chlorobenzene	ND		5.5	0.73
75-00-3	Chloroethane	ND		5.5	1.3
67-66-3	Chloroform	ND		5.5	0.34
74-87-3	Chloromethane	ND		5.5	0.33
156-59-2	cis-1,2-Dichloroethene	ND		5.5	0.71
10061-01-5	cis-1,3-Dichloropropene	ND		5.5	0.80
110-82-7	Cyclohexane	ND		5.5	0.78
124-48-1	Dibromochloromethane	ND		5.5	0.71
75-71-8	Dichlorodifluoromethane	ND		5.5	0.46
100-41-4	Ethylbenzene	ND		5.5	0.38
98-82-8	Isopropylbenzene	ND		5.5	0.84

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 100N35E 7-7.5 Lab Sample ID: 480-166399-14

Matrix: Solid Lab File ID: F5786.D

Analysis Method: 8260C Date Collected: 02/13/2020 09:47

Sample wt/vol: 5.04(g) Date Analyzed: 02/18/2020 13:41

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 10.5 Level: (low/med) Low

Analysis Batch No.: 517985 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		28	3.3
1634-04-4	Methyl tert-butyl ether	ND		5.5	0.54
108-87-2	Methylcyclohexane	ND		5.5	0.84
75-09-2	Methylene Chloride	ND		5.5	2.6
100-42-5	Styrene	ND		5.5	0.28
127-18-4	Tetrachloroethene	47		5.5	0.74
108-88-3	Toluene	ND		5.5	0.42
156-60-5	trans-1,2-Dichloroethene	ND		5.5	0.57
10061-02-6	trans-1,3-Dichloropropene	ND		5.5	2.4
79-01-6	Trichloroethene	ND		5.5	1.2
75-69-4	Trichlorofluoromethane	ND		5.5	0.52
75-01-4	Vinyl chloride	ND		5.5	0.68
1330-20-7	Xylenes, Total	ND		11	0.93

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		64-126
460-00-4	4-Bromofluorobenzene (Surr)	95		72-126
1868-53-7	Dibromofluoromethane (Surr)	103		60-140
2037-26-5	Toluene-d8 (Surr)	98		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 100N35E 7-7.5 Lab Sample ID: 480-166399-14

Matrix: Solid Lab File ID: F5786.D

Analysis Method: 8260C Date Collected: 02/13/2020 09:47

Sample wt/vol: 5.04(g) Date Analyzed: 02/18/2020 13:41

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 10.5 Level: (low/med) Low

Analysis Batch No.: 517985 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 110N20E 10-10.5 Lab Sample ID: 480-166399-15

Matrix: Solid Lab File ID: F5748.D

Analysis Method: 8260C Date Collected: 02/13/2020 12:07

Sample wt/vol: 5.07(g) Date Analyzed: 02/17/2020 19:47

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 16.9 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.9	0.43
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.9	0.96
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.9	1.4
79-00-5	1,1,2-Trichloroethane	ND		5.9	0.77
75-34-3	1,1-Dichloroethane	ND		5.9	0.72
75-35-4	1,1-Dichloroethene	ND		5.9	0.73
120-82-1	1,2,4-Trichlorobenzene	ND		5.9	0.36
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.9	3.0
106-93-4	1,2-Dibromoethane	ND		5.9	0.76
95-50-1	1,2-Dichlorobenzene	ND		5.9	0.46
107-06-2	1,2-Dichloroethane	ND		5.9	0.30
78-87-5	1,2-Dichloropropane	ND		5.9	3.0
541-73-1	1,3-Dichlorobenzene	ND		5.9	0.31
106-46-7	1,4-Dichlorobenzene	ND		5.9	0.83
78-93-3	2-Butanone (MEK)	ND		30	2.2
591-78-6	2-Hexanone	ND		30	3.0
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		30	1.9
67-64-1	Acetone	ND		30	5.0
71-43-2	Benzene	ND		5.9	0.29
75-27-4	Bromodichloromethane	ND		5.9	0.80
75-25-2	Bromoform	ND		5.9	3.0
74-83-9	Bromomethane	ND		5.9	0.53
75-15-0	Carbon disulfide	ND		5.9	3.0
56-23-5	Carbon tetrachloride	ND		5.9	0.57
108-90-7	Chlorobenzene	ND		5.9	0.78
75-00-3	Chloroethane	ND		5.9	1.3
67-66-3	Chloroform	ND		5.9	0.37
74-87-3	Chloromethane	ND		5.9	0.36
156-59-2	cis-1,2-Dichloroethene	12		5.9	0.76
10061-01-5	cis-1,3-Dichloropropene	ND		5.9	0.85
110-82-7	Cyclohexane	ND		5.9	0.83
124-48-1	Dibromochloromethane	ND		5.9	0.76
75-71-8	Dichlorodifluoromethane	ND		5.9	0.49
100-41-4	Ethylbenzene	ND		5.9	0.41
98-82-8	Isopropylbenzene	ND		5.9	0.90

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 110N20E 10-10.5 Lab Sample ID: 480-166399-15

Matrix: Solid Lab File ID: F5748.D

Analysis Method: 8260C Date Collected: 02/13/2020 12:07

Sample wt/vol: 5.07(g) Date Analyzed: 02/17/2020 19:47

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 16.9 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		30	3.6
1634-04-4	Methyl tert-butyl ether	ND		5.9	0.58
108-87-2	Methylcyclohexane	ND		5.9	0.90
75-09-2	Methylene Chloride	ND		5.9	2.7
100-42-5	Styrene	ND		5.9	0.30
127-18-4	*Tetrachloroethene*	*330*	*E*	*5.9*	*0.80*
108-88-3	Toluene	ND		5.9	0.45
156-60-5	trans-1,2-Dichloroethene	ND		5.9	0.61
10061-02-6	trans-1,3-Dichloropropene	ND		5.9	2.6
79-01-6	Trichloroethene	9.5		5.9	1.3
75-69-4	Trichlorofluoromethane	ND		5.9	0.56
75-01-4	Vinyl chloride	ND		5.9	0.72
1330-20-7	Xylenes, Total	ND		12	1.0

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	105		64-126
460-00-4	4-Bromofluorobenzene (Surr)	93		72-126
1868-53-7	Dibromofluoromethane (Surr)	106		60-140
2037-26-5	Toluene-d8 (Surr)	97		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 110N20E 10-10.5 Lab Sample ID: 480-166399-15

Matrix: Solid Lab File ID: F5748.D

Analysis Method: 8260C Date Collected: 02/13/2020 12:07

Sample wt/vol: 5.07(g) Date Analyzed: 02/17/2020 19:47

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 16.9 Level: (low/med) Low

Analysis Batch No.: 517782 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 110N20E 10-10.5 DL Lab Sample ID: 480-166399-15 DL

Matrix: Solid Lab File ID: F5758.D

Analysis Method: 8260C Date Collected: 02/13/2020 12:07

Sample wt/vol: 1.2(g) Date Analyzed: 02/18/2020 00:49

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 16.9 Level: (low/med) Low

Analysis Batch No.: 517962 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		25	1.8
79-34-5	1,1,2,2-Tetrachloroethane	ND		25	4.1
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		25	5.7
79-00-5	1,1,2-Trichloroethane	ND		25	3.3
75-34-3	1,1-Dichloroethane	ND		25	3.1
75-35-4	1,1-Dichloroethene	ND		25	3.1
120-82-1	1,2,4-Trichlorobenzene	ND		25	1.5
96-12-8	1,2-Dibromo-3-Chloropropane	ND		25	13
106-93-4	1,2-Dibromoethane	ND		25	3.2
95-50-1	1,2-Dichlorobenzene	ND		25	2.0
107-06-2	1,2-Dichloroethane	ND		25	1.3
78-87-5	1,2-Dichloropropane	ND		25	13
541-73-1	1,3-Dichlorobenzene	ND		25	1.3
106-46-7	1,4-Dichlorobenzene	ND		25	3.5
78-93-3	2-Butanone (MEK)	ND		130	9.2
591-78-6	2-Hexanone	ND		130	13
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		130	8.2
67-64-1	Acetone	ND		130	21
71-43-2	Benzene	ND		25	1.2
75-27-4	Bromodichloromethane	ND		25	3.4
75-25-2	Bromoform	ND		25	13
74-83-9	Bromomethane	ND		25	2.3
75-15-0	Carbon disulfide	ND		25	13
56-23-5	Carbon tetrachloride	ND		25	2.4
108-90-7	Chlorobenzene	ND		25	3.3
75-00-3	Chloroethane	ND		25	5.7
67-66-3	Chloroform	ND		25	1.5
74-87-3	Chloromethane	ND		25	1.5
156-59-2	cis-1,2-Dichloroethene	14	J	25	3.2
10061-01-5	cis-1,3-Dichloropropene	ND		25	3.6
110-82-7	Cyclohexane	ND		25	3.5
124-48-1	Dibromochloromethane	ND		25	3.2
75-71-8	Dichlorodifluoromethane	ND		25	2.1
100-41-4	Ethylbenzene	ND		25	1.7
98-82-8	Isopropylbenzene	ND		25	3.8

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 110N20E 10-10.5 DL Lab Sample ID: 480-166399-15 DL

Matrix: Solid Lab File ID: F5758.D

Analysis Method: 8260C Date Collected: 02/13/2020 12:07

Sample wt/vol: 1.2(g) Date Analyzed: 02/18/2020 00:49

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 16.9 Level: (low/med) Low

Analysis Batch No.: 517962 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	*Methyl acetate*	*ND*		*130*	*15*
1634-04-4	*Methyl tert-butyl ether*	*ND*		*25*	*2.5*
108-87-2	*Methylcyclohexane*	*ND*		*25*	*3.8*
75-09-2	*Methylene Chloride*	*ND*		*25*	*12*
100-42-5	*Styrene*	*ND*		*25*	*1.3*
127-18-4	Tetrachloroethene	440		25	3.4
108-88-3	*Toluene*	*ND*		*25*	*1.9*
156-60-5	*trans-1,2-Dichloroethene*	*ND*		*25*	*2.6*
10061-02-6	*trans-1,3-Dichloropropene*	*ND*		*25*	*11*
79-01-6	*Trichloroethene*	*11*	*J*	*25*	*5.5*
75-69-4	*Trichlorofluoromethane*	*ND*		*25*	*2.4*
75-01-4	*Vinyl chloride*	*ND*		*25*	*3.1*
1330-20-7	*Xylenes, Total*	*ND*		*50*	*4.2*

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	103		64-126
460-00-4	4-Bromofluorobenzene (Surr)	94		72-126
1868-53-7	Dibromofluoromethane (Surr)	105		60-140
2037-26-5	Toluene-d8 (Surr)	98		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 110N20E 10-10.5 DL Lab Sample ID: 480-166399-15 DL

Matrix: Solid Lab File ID: F5758.D

Analysis Method: 8260C Date Collected: 02/13/2020 12:07

Sample wt/vol: 1.2(g) Date Analyzed: 02/18/2020 00:49

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 16.9 Level: (low/med) Low

Analysis Batch No.: 517962 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.: (90N 10E)

Client Sample ID: 90N16E 6-6.5 Lab Sample ID: 480-166399-16

Matrix: Solid Lab File ID: F5787.D

Analysis Method: 8260C Date Collected: 02/13/2020 12:20

Sample wt/vol: 5.07(g) Date Analyzed: 02/18/2020 14:07

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 10.7 Level: (low/med) Low

Analysis Batch No.: 517985 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.5	0.40
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.5	0.90
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.5	1.3
79-00-5	1,1,2-Trichloroethane	ND		5.5	0.72
75-34-3	1,1-Dichloroethane	ND		5.5	0.67
75-35-4	1,1-Dichloroethene	ND		5.5	0.68
120-82-1	1,2,4-Trichlorobenzene	ND		5.5	0.34
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.5	2.8
106-93-4	1,2-Dibromoethane	ND		5.5	0.71
95-50-1	1,2-Dichlorobenzene	ND		5.5	0.43
107-06-2	1,2-Dichloroethane	ND		5.5	0.28
78-87-5	1,2-Dichloropropane	ND		5.5	2.8
541-73-1	1,3-Dichlorobenzene	ND		5.5	0.28
106-46-7	1,4-Dichlorobenzene	ND		5.5	0.77
78-93-3	2-Butanone (MEK)	ND		28	2.0
591-78-6	2-Hexanone	ND		28	2.8
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		28	1.8
67-64-1	Acetone	ND		28	4.6
71-43-2	Benzene	ND		5.5	0.27
75-27-4	Bromodichloromethane	ND		5.5	0.74
75-25-2	Bromoform	ND		5.5	2.8
74-83-9	Bromomethane	ND		5.5	0.50
75-15-0	Carbon disulfide	ND		5.5	2.8
56-23-5	Carbon tetrachloride	ND		5.5	0.53
108-90-7	Chlorobenzene	ND		5.5	0.73
75-00-3	Chloroethane	ND		5.5	1.2
67-66-3	Chloroform	ND		5.5	0.34
74-87-3	Chloromethane	ND		5.5	0.33
156-59-2	cis-1,2-Dichloroethene	ND		5.5	0.71
10061-01-5	cis-1,3-Dichloropropene	ND		5.5	0.80
110-82-7	Cyclohexane	ND		5.5	0.77
124-48-1	Dibromochloromethane	ND		5.5	0.71
75-71-8	Dichlorodifluoromethane	ND		5.5	0.46
100-41-4	Ethylbenzene	ND		5.5	0.38

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.: (90N 10E)

Client Sample ID: 90N16E 6-6.5 Lab Sample ID: 480-166399-16

Matrix: Solid Lab File ID: F5787.D

Analysis Method: 8260C Date Collected: 02/13/2020 12:20

Sample wt/vol: 5.07(g) Date Analyzed: 02/18/2020 14:07

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 10.7 Level: (low/med) Low

Analysis Batch No.: 517985 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
98-82-8	Isopropylbenzene	ND		5.5	0.83
79-20-9	Methyl acetate	ND		28	3.3
1634-04-4	Methyl tert-butyl ether	ND		5.5	0.54
108-87-2	Methylcyclohexane	ND		5.5	0.84
75-09-2	Methylene Chloride	ND		5.5	2.5
100-42-5	Styrene	ND		5.5	0.28
127-18-4	Tetrachloroethene	160		5.5	0.74
108-88-3	Toluene	ND		5.5	0.42
156-60-5	trans-1,2-Dichloroethene	ND		5.5	0.57
10061-02-6	trans-1,3-Dichloropropene	ND		5.5	2.4
79-01-6	Trichloroethene	ND		5.5	1.2
75-69-4	Trichlorofluoromethane	ND		5.5	0.52
75-01-4	Vinyl chloride	ND		5.5	0.67
1330-20-7	Xylenes, Total	ND		11	0.93

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	105		64-126
460-00-4	4-Bromofluorobenzene (Surr)	96		72-126
1868-53-7	Dibromofluoromethane (Surr)	104		60-140
2037-26-5	Toluene-d8 (Surr)	98		71-125

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.: (90N 10E)

Client Sample ID: 90N16E 6-6.5 Lab Sample ID: 480-166399-16

Matrix: Solid Lab File ID: F5787.D

Analysis Method: 8260C Date Collected: 02/13/2020 12:20

Sample wt/vol: 5.07(g) Date Analyzed: 02/18/2020 14:07

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: 10.7 Level: (low/med) Low

Analysis Batch No.: 517985 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 Lab Sample ID: 480-166399-8

Matrix: Solid Lab File ID: X21466239.D

Analysis Method: 8270D Date Collected: 02/12/2020 14:16

Extract. Method: 3550C Date Extracted: 02/18/2020 14:40

Sample wt/vol: 30.53(g) Date Analyzed: 02/20/2020 17:43

Con. Extract Vol.: 10(mL) Dilution Factor: 20

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 12.4 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518402 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	ND		22000	12000
95-95-4	2,4,5-Trichlorophenol	ND		38000	10000
88-06-2	2,4,6-Trichlorophenol	ND		38000	7600
120-83-2	2,4-Dichlorophenol	ND		38000	4000
105-67-9	2,4-Dimethylphenol	ND		38000	9200
51-28-5	2,4-Dinitrophenol	ND		370000	180000
121-14-2	2,4-Dinitrotoluene	ND		38000	7800
606-20-2	2,6-Dinitrotoluene	ND		38000	4500
91-58-7	2-Chloronaphthalene	ND		38000	6300
95-57-8	2-Chlorophenol	ND		74000	7000
91-57-6	2-Methylnaphthalene	ND		38000	7600
95-48-7	2-Methylphenol	ND		38000	4500
88-74-4	2-Nitroaniline	ND		74000	5600
88-75-5	2-Nitrophenol	ND		38000	11000
91-94-1	3,3'-Dichlorobenzidine	ND		74000	45000
99-09-2	3-Nitroaniline	ND		74000	11000
534-52-1	4,6-Dinitro-2-methylphenol	ND		74000	38000
101-55-3	4-Bromophenyl phenyl ether	ND		38000	5400
59-50-7	4-Chloro-3-methylphenol	ND		38000	9400
106-47-8	4-Chloroaniline	ND		38000	9400
7005-72-3	4-Chlorophenyl phenyl ether	ND		38000	4700
106-44-5	4-Methylphenol	ND		74000	4500
100-01-6	4-Nitroaniline	ND		74000	20000
100-02-7	4-Nitrophenol	ND		74000	27000
83-32-9	Acenaphthene	8400	J	38000	5600
208-96-8	Acenaphthylene	13000	J	38000	4900
98-86-2	Acetophenone	ND		38000	5200
120-12-7	Anthracene	34000	J	38000	9400
1912-24-9	Atrazine	ND		38000	13000
100-52-7	Benzaldehyde	ND		38000	30000
56-55-3	Benzo[a]anthracene	140000	J	38000	3800
50-32-8	Benzo[a]pyrene	140000		38000	5600
205-99-2	Benzo[b]fluoranthene	160000		38000	6100
191-24-2	Benzo[g,h,i]perylene	97000		38000	4000

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 Lab Sample ID: 480-166399-8

Matrix: Solid Lab File ID: X21466239.D

Analysis Method: 8270D Date Collected: 02/12/2020 14:16

Extract. Method: 3550C Date Extracted: 02/18/2020 14:40

Sample wt/vol: 30.53(g) Date Analyzed: 02/20/2020 17:43

Con. Extract Vol.: 10(mL) Dilution Factor: 20

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 12.4 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518402 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
207-08-9	Benzo[k]fluoranthene	80000		38000	4900
92-52-4	Biphenyl	ND		38000	5600
108-60-1	bis (2-chloroisopropyl) ether	ND		38000	7600
111-91-1	Bis(2-chloroethoxy)methane	ND		38000	8100
111-44-4	Bis(2-chloroethyl)ether	ND		38000	4900
117-81-7	Bis(2-ethylhexyl) phthalate	ND		38000	13000
85-68-7	Butyl benzyl phthalate	ND		38000	6300
105-60-2	Caprolactam	ND		38000	11000
86-74-8	Carbazole	12000	J	38000	4500
218-01-9	Chrysene	160000		38000	8500
53-70-3	Dibenz(a,h)anthracene	32000	J	38000	6700
132-64-9	Dibenzofuran	ND		38000	4500
84-66-2	Diethyl phthalate	ND		38000	4900
131-11-3	Dimethyl phthalate	ND		38000	4500
84-74-2	Di-n-butyl phthalate	ND		38000	6500
117-84-0	Di-n-octyl phthalate	ND		38000	4500
206-44-0	Fluoranthene	260000		38000	4000
86-73-7	Fluorene	11000	J	38000	4500
118-74-1	Hexachlorobenzene	ND		38000	5200
87-68-3	Hexachlorobutadiene	ND		38000	5600
77-47-4	Hexachlorocyclopentadiene	ND		38000	5200
67-72-1	Hexachloroethane	ND		38000	4900
193-39-5	Indeno[1,2,3-cd]pyrene	85000		38000	4700
78-59-1	Isophorone	ND		38000	8100
91-20-3	Naphthalene	ND		38000	4900
98-95-3	Nitrobenzene	ND		38000	4300
621-64-7	N-Nitrosodi-n-propylamine	ND		38000	6500
86-30-6	N-Nitrosodiphenylamine	ND		38000	31000
87-86-5	Pentachlorophenol	ND		74000	38000
85-01-8	Phenanthrene	150000	J	38000	5600
108-95-2	Phenol	ND		38000	5800
129-00-0	Pyrene	260000		38000	4500

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 Lab Sample ID: 480-166399-8

Matrix: Solid Lab File ID: X21466239.D

Analysis Method: 8270D Date Collected: 02/12/2020 14:16

Extract. Method: 3550C Date Extracted: 02/18/2020 14:40

Sample wt/vol: 30.53(g) Date Analyzed: 02/20/2020 17:43

Con. Extract Vol.: 10(mL) Dilution Factor: 20

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 12.4 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518402 Units: ug/Kg

Number TICs Found: 12 TIC Result Total: 632000

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Unknown	1.66	39000	T J	
127-18-4	Tetrachloroethylene	2.41	130000	T J N	96%
	Unknown	4.92	59000	T J	
	Unknown	11.21	55000	T J	
2381-21-7	Pyrene, 1-methyl-	12.27	38000	T J N	93%
	Unknown	12.85	31000	T J	
	Unknown	13.96	30000	T J	
192-97-2	Benzo[e]pyrene	14.09	85000	T J N	96%
213-46-7	1,2:7,8-Dibenzophenanthrene	14.89	56000	T J N	86%
226-88-0	Benzo[a]naphthacene	15.07	36000	T J N	89%
189-64-0	3,4:8,9-Dibenzopyrene	16.29	42000	T J N	93%
191-30-0	1,2:3,4-Dibenzopyrene	16.38	31000	T J N	86%

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Matrix: Solid Lab File ID: X21466240.D

Analysis Method: 8270D Date Collected: 02/12/2020 14:20

Extract. Method: 3550C Date Extracted: 02/18/2020 14:40

Sample wt/vol: 30.73(g) Date Analyzed: 02/20/2020 18:07

Con. Extract Vol.: 10(mL) Dilution Factor: 20

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 11.6 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518402 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	ND		22000	12000
95-95-4	2,4,5-Trichlorophenol	ND		38000	10000
88-06-2	2,4,6-Trichlorophenol	ND		38000	7500
120-83-2	2,4-Dichlorophenol	ND		38000	4000
105-67-9	2,4-Dimethylphenol	ND		38000	9100
51-28-5	2,4-Dinitrophenol	ND		370000	170000
121-14-2	2,4-Dinitrotoluene	ND		38000	7700
606-20-2	2,6-Dinitrotoluene	ND		38000	4400
91-58-7	2-Chloronaphthalene	ND		38000	6200
95-57-8	2-Chlorophenol	ND		73000	6800
91-57-6	2-Methylnaphthalene	ND		38000	7500
95-48-7	2-Methylphenol	ND		38000	4400
88-74-4	2-Nitroaniline	ND		73000	5500
88-75-5	2-Nitrophenol	ND		38000	11000
91-94-1	3,3'-Dichlorobenzidine	ND		73000	44000
99-09-2	3-Nitroaniline	ND		73000	10000
534-52-1	4,6-Dinitro-2-methylphenol	ND		73000	38000
101-55-3	4-Bromophenyl phenyl ether	ND		38000	5300
59-50-7	4-Chloro-3-methylphenol	ND		38000	9300
106-47-8	4-Chloroaniline	ND		38000	9300
7005-72-3	4-Chlorophenyl phenyl ether	ND		38000	4600
106-44-5	4-Methylphenol	ND		73000	4400
100-01-6	4-Nitroaniline	ND		73000	20000
100-02-7	4-Nitrophenol	ND		73000	26000
83-32-9	Acenaphthene	20000	J	38000	5500
208-96-8	Acenaphthylene	17000	J	38000	4900
98-86-2	Acetophenone	ND		38000	5100
120-12-7	Anthracene	70000	J	38000	9300
1912-24-9	Atrazine	ND		38000	13000
100-52-7	Benzaldehyde	ND		38000	30000
56-55-3	Benzo[a]anthracene	220000	J	38000	3800
50-32-8	Benzo[a]pyrene	190000		38000	5500
205-99-2	Benzo[b]fluoranthene	240000		38000	6000
191-24-2	Benzo[g,h,i]perylene	120000		38000	4000

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Matrix: Solid Lab File ID: X21466240.D

Analysis Method: 8270D Date Collected: 02/12/2020 14:20

Extract. Method: 3550C Date Extracted: 02/18/2020 14:40

Sample wt/vol: 30.73(g) Date Analyzed: 02/20/2020 18:07

Con. Extract Vol.: 10(mL) Dilution Factor: 20

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 11.6 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518402 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
207-08-9	Benzo[k]fluoranthene	84000		38000	4900
92-52-4	Biphenyl	ND		38000	5500
108-60-1	bis (2-chloroisopropyl) ether	ND		38000	7500
111-91-1	Bis(2-chloroethoxy)methane	ND		38000	7900
111-44-4	Bis(2-chloroethyl)ether	ND		38000	4900
117-81-7	Bis(2-ethylhexyl) phthalate	ND		38000	13000
85-68-7	Butyl benzyl phthalate	ND		38000	6200
105-60-2	Caprolactam	ND		38000	11000
86-74-8	Carbazole	19000	J	38000	4400
218-01-9	Chrysene	210000		38000	8400
53-70-3	Dibenz(a,h)anthracene	38000		38000	6600
132-64-9	Dibenzofuran	14000	J	38000	4400
84-66-2	Diethyl phthalate	ND		38000	4900
131-11-3	Dimethyl phthalate	ND		38000	4400
84-74-2	Di-n-butyl phthalate	ND		38000	6400
117-84-0	Di-n-octyl phthalate	ND		38000	4400
206-44-0	Fluoranthene	370000		38000	4000
86-73-7	Fluorene	32000	J	38000	4400
118-74-1	Hexachlorobenzene	ND		38000	5100
87-68-3	Hexachlorobutadiene	ND		38000	5500
77-47-4	Hexachlorocyclopentadiene	ND		38000	5100
67-72-1	Hexachloroethane	ND		38000	4900
193-39-5	Indeno[1,2,3-cd]pyrene	110000		38000	4600
78-59-1	Isophorone	ND		38000	7900
91-20-3	Naphthalene	7700	J	38000	4900
98-95-3	Nitrobenzene	ND		38000	4200
621-64-7	N-Nitrosodi-n-propylamine	ND		38000	6400
86-30-6	N-Nitrosodiphenylamine	ND		38000	30000
87-86-5	Pentachlorophenol	ND		73000	38000
85-01-8	Phenanthrene	300000	J	38000	5500
108-95-2	Phenol	ND		38000	5700
129-00-0	Pyrene	390000		38000	4400

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Matrix: Solid Lab File ID: X21466240.D

Analysis Method: 8270D Date Collected: 02/12/2020 14:20

Extract. Method: 3550C Date Extracted: 02/18/2020 14:40

Sample wt/vol: 30.73(g) Date Analyzed: 02/20/2020 18:07

Con. Extract Vol.: 10(mL) Dilution Factor: 20

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 11.6 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518402 Units: ug/Kg

Number TICs Found: 19 TIC Result Total: 1.198e+006

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
127-18-4	Tetrachloroethylene	2.38	220000	T J N	98%
832-69-9	Phenanthrene, 1-methyl-	11.12	59000	T J N	94%
613-12-7	Anthracene, 2-methyl-	11.14	69000	T J N	93%
	Unknown	11.22	140000	T J	
	Unknown	11.40	56000	T J	
3674-66-6	Phenanthrene, 2,5-dimethyl-	11.64	51000	T J N	95%
	Unknown	11.70	45000	T J	
243-17-4	11H-Benzo[b]fluorene	12.27	41000	T J N	97%
	Unknown	12.82	33000	T J	
198-55-0	Perylene	13.95	37000	T J N	89%
192-97-2	Benzo[e]pyrene	14.08	110000	T J N	95%
	Unknown	14.35	40000	T J	
	Unknown	14.80	41000	T J	
	Unknown	14.88	63000	T J	
213-46-7	1,2:7,8-Dibenzophenanthrene	15.07	41000	T J N	93%
191-26-4	Dibenzo[def,mno]chrysene	15.33	31000	T J N	91%
192-65-4	1,2:4,5-Dibenzopyrene	16.29	53000	T J N	93%
191-30-0	1,2:3,4-Dibenzopyrene	16.37	35000	T J N	96%
	Unknown	16.42	33000	T J	

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 Lab Sample ID: 480-166399-8

Matrix: Solid Lab File ID: 25_31-099.D

Analysis Method: 8081B Date Collected: 02/12/2020 14:16

Extraction Method: 3550C Date Extracted: 02/19/2020 15:12

Sample wt/vol: 30.40(g) Date Analyzed: 02/20/2020 13:53

Con. Extract Vol.: 10(mL) Dilution Factor: 20

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: 12.4 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518337 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	ND		38	7.3
72-55-9	4,4'-DDE	ND		38	7.9
50-29-3	4,4'-DDT	36	J	38	8.8
309-00-2	Aldrin	ND		38	9.2
319-84-6	alpha-BHC	7.8	J	38	6.8
5103-71-9	cis-Chlordane	ND		38	19
319-85-7	beta-BHC	ND		38	6.8
319-86-8	delta-BHC	ND	U	38	38
60-57-1	Dieldrin	ND		38	9.0
959-98-8	Endosulfan I	ND		38	7.2
33213-65-9	Endosulfan II	ND		38	6.8
1031-07-8	Endosulfan sulfate	ND		38	7.0
72-20-8	Endrin	ND		38	7.4
7421-93-4	Endrin aldehyde	ND	U	38	38
53494-70-5	Endrin ketone	42	J	38	9.2
58-89-9	gamma-BHC (Lindane)	ND		38	6.9
5103-74-2	trans-Chlordane	ND		38	12
76-44-8	Heptachlor	ND		38	8.1
1024-57-3	Heptachlor epoxide	ND		38	9.7
72-43-5	Methoxychlor	ND		38	7.7
8001-35-2	Toxaphene	ND		380	220

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	461	X	45-120
877-09-8	Tetrachloro-m-xylene	137	X	30-124

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Matrix: Solid Lab File ID: 25_31-100.D

Analysis Method: 8081B Date Collected: 02/12/2020 14:20

Extraction Method: 3550C Date Extracted: 02/19/2020 15:12

Sample wt/vol: 15.04(g) Date Analyzed: 02/20/2020 14:12

Con. Extract Vol.: 10(mL) Dilution Factor: 20

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: 11.6 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518337 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	ND		75	15
72-55-9	4,4'-DDE	ND		75	16
50-29-3	4,4'-DDT	69	J	75	18
309-00-2	Aldrin	ND		75	18
319-84-6	alpha-BHC	16	J	75	14
5103-71-9	cis-Chlordane	ND		75	37
319-85-7	beta-BHC	ND		75	14
319-86-8	delta-BHC	ND		75	14
60-57-1	Dieldrin	ND		75	18
959-98-8	Endosulfan I	ND		75	14
33213-65-9	Endosulfan II	ND		75	14
1031-07-8	Endosulfan sulfate	ND		75	14
72-20-8	Endrin	ND		75	15
7421-93-4	Endrin aldehyde	ND	U	75	75
53494-70-5	Endrin ketone	110	J	75	18
58-89-9	gamma-BHC (Lindane)	ND	U	75	75
5103-74-2	trans-Chlordane	ND		75	24
76-44-8	Heptachlor	ND		75	16
1024-57-3	Heptachlor epoxide	ND		75	19
72-43-5	Methoxychlor	ND		75	15
8001-35-2	Toxaphene	ND		750	440

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	694	X	45-120
877-09-8	Tetrachloro-m-xylene	138	X	30-124

FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 Lab Sample ID: 480-166399-8

Matrix: Solid Lab File ID: 7_66-271.D

Analysis Method: 8082A Date Collected: 02/12/2020 14:16

Extraction Method: 3550C Date Extracted: 02/18/2020 15:29

Sample wt/vol: 2.21(g) Date Analyzed: 02/19/2020 15:37

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: ZB-5 ID: 0.53(mm)

% Moisture: 12.4 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518259 Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	ND		0.26	0.050
11104-28-2	PCB-1221	ND		0.26	0.050
11141-16-5	PCB-1232	ND		0.26	0.050
53469-21-9	PCB-1242	ND		0.26	0.050
12672-29-6	PCB-1248	ND		0.26	0.050
11097-69-1	PCB-1254	ND		0.26	0.12
11096-82-5	PCB-1260	ND		0.26	0.12
37324-23-5	PCB-1262	ND		0.26	0.12
11100-14-4	PCB-1268	ND		0.26	0.12

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	80		60-154
2051-24-3	DCB Decachlorobiphenyl	78		65-174

FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Matrix: Solid Lab File ID: 7_66-272.D

Analysis Method: 8082A Date Collected: 02/12/2020 14:20

Extraction Method: 3550C Date Extracted: 02/18/2020 15:29

Sample wt/vol: 2.30(g) Date Analyzed: 02/19/2020 15:49

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: ZB-5 ID: 0.53(mm)

% Moisture: 11.6 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518259 Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	ND		0.25	0.048
11104-28-2	PCB-1221	ND		0.25	0.048
11141-16-5	PCB-1232	ND		0.25	0.048
53469-21-9	PCB-1242	ND		0.25	0.048
12672-29-6	PCB-1248	ND		0.25	0.048
11097-69-1	PCB-1254	ND		0.25	0.12
11096-82-5	PCB-1260	ND		0.25	0.12
37324-23-5	PCB-1262	ND		0.25	0.12
11100-14-4	PCB-1268	ND		0.25	0.12

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	63		60-154
2051-24-3	DCB Decachlorobiphenyl	67		65-174

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 Lab Sample ID: 480-166399-8

Matrix: Solid Lab File ID: 13_28-241.D

Analysis Method: 8151A Date Collected: 02/12/2020 14:16

Extraction Method: 8151A Date Extracted: 02/18/2020 14:47

Sample wt/vol: 30.50(g) Date Analyzed: 02/21/2020 20:28

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: 12.4 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518492 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	ND		19	6.0
93-72-1	Silvex (2,4,5-TP)	ND		19	6.7
94-75-7	2,4-D	ND		19	12

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	65		28-129

FORM I
HERBICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Matrix: Solid Lab File ID: 13_28-242.D

Analysis Method: 8151A Date Collected: 02/12/2020 14:20

Extraction Method: 8151A Date Extracted: 02/18/2020 14:47

Sample wt/vol: 30.66(g) Date Analyzed: 02/21/2020 20:58

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: 11.6 GPC Cleanup:(Y/N) N

Analysis Batch No.: 518492 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
93-76-5	2,4,5-T	ND		18	5.9
93-72-1	Silvex (2,4,5-TP)	ND		18	6.6
94-75-7	2,4-D	ND		18	12

CAS NO.	SURROGATE	%REC	Q	LIMITS
19719-28-9	2,4-Dichlorophenylacetic acid	74		28-129

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: 80N35E 4-5 | Lab Sample ID: 480-166399-8

Lab Name: Eurofins TestAmerica, Buffalo | Job No.: 480-166399-1

SDG ID.:

Matrix: Solid | Date Sampled: 02/12/2020 14:16

Reporting Basis: DRY | Date Received: 02/14/2020 08:00

% Solids: 87.6

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	8150	10.6	4.7	mg/Kg			1	6010C
7440-36-0	Antimony	1.3	15.9	0.42	mg/Kg	J		1	6010C
7440-38-2	Arsenic	8.8	2.1	0.42	mg/Kg			1	6010C
7440-39-3	Barium	86.8	0.53	0.12	mg/Kg			1	6010C
7440-41-7	Beryllium	0.43	0.21	0.030	mg/Kg			1	6010C
7440-43-9	Cadmium	0.44	0.21	0.032	mg/Kg			1	6010C
7440-70-2	Calcium	20300	52.9	3.5	mg/Kg			1	6010C
7440-47-3	Chromium	12.2	0.53	0.21	mg/Kg			1	6010C
7440-48-4	Cobalt	4.0	0.53	0.053	mg/Kg			1	6010C
7440-50-8	Copper	31.8	1.1	0.22	mg/Kg			1	6010C
7439-89-6	Iron	13000	10.6	3.7	mg/Kg			1	6010C
7439-92-1	Lead	133	1.1	0.25	mg/Kg			1	6010C
7439-95-4	Magnesium	6670	21.2	0.98	mg/Kg			1	6010C
7439-96-5	Manganese	324	0.21	0.034	mg/Kg			1	6010C
7440-02-0	Nickel	11.1	5.3	0.24	mg/Kg			1	6010C
7440-09-7	Potassium	1690	31.7	21.2	mg/Kg			1	6010C
7782-49-2	Selenium	ND	4.2	0.42	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.63	0.21	mg/Kg			1	6010C
7440-23-5	Sodium	257	148	13.8	mg/Kg			1	6010C
7440-28-0	Thallium	0.58	6.3	0.32	mg/Kg	J		1	6010C
7440-62-2	Vanadium	17.3	0.53	0.12	mg/Kg			1	6010C
7440-66-6	Zinc	167	2.1	0.68	mg/Kg			1	6010C
7439-97-6	Mercury	0.49	0.022	0.0087	mg/Kg			1	7471B

FD of 80N 35E 4-5

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG ID.:

Matrix: Solid Date Sampled: 02/12/2020 14:20

Reporting Basis: DRY Date Received: 02/14/2020 08:00

% Solids: 88.4

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	7190	10.7	4.7	mg/Kg			1	6010C
7440-36-0	Antimony	1.1	16.0	0.43	mg/Kg	J		1	6010C
7440-38-2	Arsenic	8.7	2.1	0.43	mg/Kg			1	6010C
7440-39-3	Barium	75.2	0.53	0.12	mg/Kg			1	6010C
7440-41-7	Beryllium	0.43	0.21	0.030	mg/Kg			1	6010C
7440-43-9	Cadmium	0.48	0.21	0.032	mg/Kg			1	6010C
7440-70-2	Calcium	20900	53.4	3.5	mg/Kg			1	6010C
7440-47-3	Chromium	11.4	0.53	0.21	mg/Kg			1	6010C
7440-48-4	Cobalt	3.8	0.53	0.053	mg/Kg			1	6010C
7440-50-8	Copper	31.0	1.1	0.22	mg/Kg			1	6010C
7439-89-6	Iron	11500	10.7	3.7	mg/Kg			1	6010C
7439-92-1	Lead	143	1.1	0.26	mg/Kg			1	6010C
7439-95-4	Magnesium	6390	21.3	0.99	mg/Kg			1	6010C
7439-96-5	Manganese	265	0.21	0.034	mg/Kg			1	6010C
7440-02-0	Nickel	9.7	5.3	0.25	mg/Kg			1	6010C
7440-09-7	Potassium	1330	32.0	21.3	mg/Kg			1	6010C
7782-49-2	Selenium	0.68	4.3	0.43	mg/Kg	J		1	6010C
7440-22-4	Silver	0.21	0.64	0.21	mg/Kg	J		1	6010C
7440-23-5	Sodium	208	149	13.9	mg/Kg			1	6010C
7440-28-0	Thallium	0.87	6.4	0.32	mg/Kg	J		1	6010C
7440-62-2	Vanadium	15.6	0.53	0.12	mg/Kg			1	6010C
7440-66-6	Zinc	178	2.1	0.68	mg/Kg			1	6010C
7439-97-6	Mercury	0.43	0.021	0.0086	mg/Kg			1	7471B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: 80N35E 4-5
Lab Sample ID: 480-166399-8
Lab Name: Eurofins TestAmerica, Buffalo
Job No.: 480-166399-1
SDG ID.:
Matrix: Solid
Date Sampled: 02/12/2020 14:16
Reporting Basis: DRY
Date Received: 02/14/2020 08:00
% Solids: 87.6

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
57-12-5	Cyanide, Total	ND	1.1	0.53	mg/Kg			1	9012B

FD of 80N 35E 4-5

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG ID.:

Matrix: Solid Date Sampled: 02/12/2020 14:20

Reporting Basis: DRY Date Received: 02/14/2020 08:00

% Solids: 88.4

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
57-12-5	Cyanide, Total	ND	1.1	0.53	mg/Kg			1	9012B

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-169159-1

SDG No.:

Client Sample ID: MW-14S 10-11 Lab Sample ID: 480-169159-1

Matrix: Solid Lab File ID: 2020.05.02_A9_PFC_B_019.d

Analysis Method: 537 (modified) Date Collected: 04/16/2020 11:25

Extraction Method: SHAKE Date Extracted: 04/29/2020 18:36

Sample wt/vol: 5.04(g) Date Analyzed: 05/03/2020 22:09

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 22.0 GPC Cleanup:(Y/N) N

Analysis Batch No.: 376161 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	ND	U	0.25	0.036
2706-90-3	Perfluoropentanoic acid (PFPeA)	0.14	J	0.25	0.098
307-24-4	Perfluorohexanoic acid (PFHxA)	ND		0.25	0.053
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		0.25	0.037
335-67-1	Perfluorooctanoic acid (PFOA)	ND		0.25	0.11
375-95-1	Perfluorononanoic acid (PFNA)	ND		0.25	0.046
335-76-2	Perfluorodecanoic acid (PFDA)	ND		0.25	0.028
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		0.25	0.046
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		0.25	0.085
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		0.25	0.065
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		0.25	0.069
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		0.25	0.032
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND	U	0.25	0.039
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		0.25	0.045
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND		0.64	0.25
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		0.25	0.050
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND		0.25	0.10
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.5	0.50
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.5	0.47
27619-97-2	6:2 FTS	ND		2.5	0.19
39108-34-4	8:2 FTS	ND		2.5	0.32

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-169159-1

SDG No.:

Client Sample ID: MW-13OB 7.5-8.5 Lab Sample ID: 480-169159-2

Matrix: Solid Lab File ID: 2020.05.02_A9_PFC_B_022.d

Analysis Method: 537 (modified) Date Collected: 04/15/2020 12:29

Extraction Method: SHAKE Date Extracted: 04/29/2020 18:36

Sample wt/vol: 5.35(g) Date Analyzed: 05/03/2020 22:37

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 21.0 GPC Cleanup:(Y/N) N

Analysis Batch No.: 376161 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	ND	U	0.24	0.033
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		0.24	0.091
307-24-4	Perfluorohexanoic acid (PFHxA)	0.051	J	0.24	0.050
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		0.24	0.034
335-67-1	Perfluorooctanoic acid (PFOA)	ND		0.24	0.10
375-95-1	Perfluorononanoic acid (PFNA)	ND		0.24	0.043
335-76-2	Perfluorodecanoic acid (PFDA)	ND		0.24	0.026
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		0.24	0.043
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		0.24	0.079
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.060
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.064
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.030
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND		0.24	0.037
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		0.24	0.041
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND	U	0.59	0.24
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		0.24	0.046
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND		0.24	0.097
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.46
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.44
27619-97-2	6:2 FTS	ND		2.4	0.18
39108-34-4	8:2 FTS	ND		2.4	0.30

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-169159-1

SDG No.:

Client Sample ID: FD-20200416-1 Lab Sample ID: 480-169159-3

Matrix: Solid Lab File ID: 2020.05.02_A9_PFC_B_023.d

Analysis Method: 537 (modified) Date Collected: 04/16/2020 12:00

Extraction Method: SHAKE Date Extracted: 04/29/2020 18:36

Sample wt/vol: 5.28(g) Date Analyzed: 05/03/2020 22:46

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: 32.1 GPC Cleanup:(Y/N) N

Analysis Batch No.: 376161 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	ND	U	0.28	0.039
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		0.28	0.11
307-24-4	Perfluorohexanoic acid (PFHxA)	ND		0.28	0.059
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		0.28	0.040
335-67-1	Perfluorooctanoic acid (PFOA)	ND		0.28	0.12
375-95-1	Perfluorononanoic acid (PFNA)	ND		0.28	0.050
335-76-2	Perfluorodecanoic acid (PFDA)	ND		0.28	0.031
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		0.28	0.050
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		0.28	0.094
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		0.28	0.071
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		0.28	0.075
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		0.28	0.035
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND		0.28	0.043
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		0.28	0.049
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND		0.70	0.28
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		0.28	0.054
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND		0.28	0.11
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.8	0.54
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.8	0.52
27619-97-2	6:2 FTS	ND		2.8	0.21
39108-34-4	8:2 FTS	ND		2.8	0.35

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-169159-1

SDG No.:

Client Sample ID: EQUIPMENT RINSE BLANK Lab Sample ID: 480-169159-4

Matrix: Water Lab File ID: 2020.04.30_A9_PFC_BC_035.d

Analysis Method: 537 (modified) Date Collected: 04/23/2020 15:00

Extraction Method: 3535 Date Extracted: 04/30/2020 04:19

Sample wt/vol: 287.3(mL) Date Analyzed: 05/01/2020 00:05

Con. Extract Vol.: 10.0(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 375780 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	11		1.7	0.30
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		1.7	0.43
307-24-4	Perfluorohexanoic acid (PFHxA)	ND		1.7	0.50
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		1.7	0.22
335-67-1	Perfluorooctanoic acid (PFOA)	ND		1.7	0.74
375-95-1	Perfluorononanoic acid (PFNA)	ND		1.7	0.23
335-76-2	Perfluorodecanoic acid (PFDA)	ND		1.7	0.27
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.96
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		1.7	0.48
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.25
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		1.7	0.17
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.33	J	1.7	0.15
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.7	0.17
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND		1.7	0.47
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.28
754-91-6	Perfluorooctanesulfonamide (FOSA)	0.42	J	1.7	0.30
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		17	2.7
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		17	1.7
27619-97-2	6:2 FTS	4.5	J	17	1.7
39108-34-4	8:2 FTS	ND		17	1.7

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-13OB 7.5-8.5 Lab Sample ID: 480-169160-1

Matrix: Solid Lab File ID: S6733.D

Analysis Method: 8260C Date Collected: 04/15/2020 12:29

Sample wt/vol: 5.14(g) Date Analyzed: 04/29/2020 15:14

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.1 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		110	32
79-34-5	1,1,2,2-Tetrachloroethane	ND		110	18
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		110	57
79-00-5	1,1,2-Trichloroethane	ND		110	24
75-34-3	1,1-Dichloroethane	ND		110	35
75-35-4	1,1-Dichloroethene	ND		110	39
120-82-1	1,2,4-Trichlorobenzene	ND		110	43
96-12-8	1,2-Dibromo-3-Chloropropane	ND		110	57
106-93-4	1,2-Dibromoethane	ND		110	20
95-50-1	1,2-Dichlorobenzene	ND		110	29
107-06-2	1,2-Dichloroethane	ND		110	47
78-87-5	1,2-Dichloropropane	ND		110	18
541-73-1	1,3-Dichlorobenzene	ND		110	30
106-46-7	1,4-Dichlorobenzene	ND		110	16
78-93-3	2-Butanone (MEK)	ND		570	340
591-78-6	2-Hexanone	ND		570	230
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		570	36
67-64-1	Acetone	ND		570	470
71-43-2	Benzene	ND		110	22
75-27-4	Bromodichloromethane	ND		110	23
75-25-2	Bromoform	ND		110	57
74-83-9	Bromomethane	ND		110	25
75-15-0	Carbon disulfide	ND		110	52
56-23-5	Carbon tetrachloride	ND		110	29
108-90-7	Chlorobenzene	ND		110	15
75-00-3	Chloroethane	ND		110	24
67-66-3	Chloroform	ND		110	78
74-87-3	Chloromethane	ND		110	27
156-59-2	cis-1,2-Dichloroethene	ND		110	31
10061-01-5	cis-1,3-Dichloropropene	ND		110	27
110-82-7	Cyclohexane	ND		110	25
124-48-1	Dibromochloromethane	ND		110	55
75-71-8	Dichlorodifluoromethane	ND		110	50
100-41-4	Ethylbenzene	ND		110	33
98-82-8	Isopropylbenzene	ND		110	17

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-13OB 7.5-8.5 Lab Sample ID: 480-169160-1

Matrix: Solid Lab File ID: S6733.D

Analysis Method: 8260C Date Collected: 04/15/2020 12:29

Sample wt/vol: 5.14(g) Date Analyzed: 04/29/2020 15:14

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.1 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		570	54
1634-04-4	Methyl tert-butyl ether	ND		110	43
108-87-2	Methylcyclohexane	ND		110	53
75-09-2	Methylene Chloride	ND	U	110	110
100-42-5	Styrene	ND		110	27
127-18-4	Tetrachloroethene	480		110	15
108-88-3	Toluene	ND		110	31
156-60-5	trans-1,2-Dichloroethene	ND		110	27
10061-02-6	trans-1,3-Dichloropropene	ND		110	11
79-01-6	Trichloroethene	ND		110	32
75-69-4	Trichlorofluoromethane	ND		110	53
75-01-4	Vinyl chloride	ND		110	38
1330-20-7	Xylenes, Total	ND		230	63

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	90		53-146
460-00-4	4-Bromofluorobenzene (Surr)	101		49-148
1868-53-7	Dibromofluoromethane (Surr)	95		60-140
2037-26-5	Toluene-d8 (Surr)	99		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-13OB 7.5-8.5 Lab Sample ID: 480-169160-1

Matrix: Solid Lab File ID: S6733.D

Analysis Method: 8260C Date Collected: 04/15/2020 12:29

Sample wt/vol: 5.14(g) Date Analyzed: 04/29/2020 15:14

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.1 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

Number TICs Found: 3 TIC Result Total: 1450

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Unknown	1.83	320	T J	
1120-21-4	Undecane	11.11	590	T J N	93%
112-40-3	Dodecane	12.07	540	T J N	90%

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 8.5-9.0 Lab Sample ID: 480-169160-2

Matrix: Solid Lab File ID: S6734.D

Analysis Method: 8260C Date Collected: 04/16/2020 11:16

Sample wt/vol: 5.08(g) Date Analyzed: 04/29/2020 15:37

Soil Aliquot Vol: 100 (uL) Dilution Factor: 500

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.9 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		58000	16000
79-34-5	1,1,2,2-Tetrachloroethane	ND		58000	9500
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		58000	29000
79-00-5	1,1,2-Trichloroethane	ND		58000	12000
75-34-3	1,1-Dichloroethane	ND		58000	18000
75-35-4	1,1-Dichloroethene	ND		58000	20000
120-82-1	1,2,4-Trichlorobenzene	ND		58000	22000
96-12-8	1,2-Dibromo-3-Chloropropane	ND		58000	29000
106-93-4	1,2-Dibromoethane	ND		58000	10000
95-50-1	1,2-Dichlorobenzene	ND		58000	15000
107-06-2	1,2-Dichloroethane	ND		58000	24000
78-87-5	1,2-Dichloropropane	ND		58000	9500
541-73-1	1,3-Dichlorobenzene	ND		58000	16000
106-46-7	1,4-Dichlorobenzene	ND		58000	8200
78-93-3	2-Butanone (MEK)	ND		290000	170000
591-78-6	2-Hexanone	ND		290000	120000
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		290000	19000
67-64-1	Acetone	ND		290000	240000
71-43-2	Benzene	ND		58000	11000
75-27-4	Bromodichloromethane	ND		58000	12000
75-25-2	Bromoform	ND		58000	29000
74-83-9	Bromomethane	ND		58000	13000
75-15-0	Carbon disulfide	ND		58000	27000
56-23-5	Carbon tetrachloride	ND		58000	15000
108-90-7	Chlorobenzene	ND		58000	7700
75-00-3	Chloroethane	ND		58000	12000
67-66-3	Chloroform	ND		58000	40000
74-87-3	Chloromethane	ND		58000	14000
156-59-2	cis-1,2-Dichloroethene	ND		58000	16000
10061-01-5	cis-1,3-Dichloropropene	ND		58000	14000
110-82-7	Cyclohexane	ND		58000	13000
124-48-1	Dibromochloromethane	ND		58000	28000
75-71-8	Dichlorodifluoromethane	ND		58000	25000
100-41-4	Ethylbenzene	ND		58000	17000
98-82-8	Isopropylbenzene	ND		58000	8800

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 8.5-9.0 Lab Sample ID: 480-169160-2

Matrix: Solid Lab File ID: S6734.D

Analysis Method: 8260C Date Collected: 04/16/2020 11:16

Sample wt/vol: 5.08(g) Date Analyzed: 04/29/2020 15:37

Soil Aliquot Vol: 100 (uL) Dilution Factor: 500

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.9 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		290000	28000
1634-04-4	Methyl tert-butyl ether	ND		58000	22000
108-87-2	Methylcyclohexane	ND		58000	27000
75-09-2	Methylene Chloride	ND		58000	12000
100-42-5	Styrene	ND		58000	14000
127-18-4	Tetrachloroethene	2000000		58000	7800
108-88-3	Toluene	ND		58000	16000
156-60-5	trans-1,2-Dichloroethene	ND		58000	14000
10061-02-6	trans-1,3-Dichloropropene	ND		58000	5700
79-01-6	Trichloroethene	ND		58000	16000
75-69-4	Trichlorofluoromethane	ND		58000	27000
75-01-4	Vinyl chloride	ND		58000	20000
1330-20-7	Xylenes, Total	ND		120000	32000

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	91		53-146
460-00-4	4-Bromofluorobenzene (Surr)	105		49-148
1868-53-7	Dibromofluoromethane (Surr)	94		60-140
2037-26-5	Toluene-d8 (Surr)	101		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 8.5-9.0 Lab Sample ID: 480-169160-2

Matrix: Solid Lab File ID: S6734.D

Analysis Method: 8260C Date Collected: 04/16/2020 11:16

Sample wt/vol: 5.08(g) Date Analyzed: 04/29/2020 15:37

Soil Aliquot Vol: 100 (uL) Dilution Factor: 500

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 10.9 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 10-11 Lab Sample ID: 480-169160-3

Matrix: Solid Lab File ID: S6735.D

Analysis Method: 8260C Date Collected: 04/16/2020 11:25

Sample wt/vol: 5.19(g) Date Analyzed: 04/29/2020 16:00

Soil Aliquot Vol: 100 (uL) Dilution Factor: 20

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.5 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		2300	650
79-34-5	1,1,2,2-Tetrachloroethane	ND		2300	380
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2300	1200
79-00-5	1,1,2-Trichloroethane	ND		2300	490
75-34-3	1,1-Dichloroethane	ND		2300	720
75-35-4	1,1-Dichloroethene	ND		2300	810
120-82-1	1,2,4-Trichlorobenzene	ND		2300	890
96-12-8	1,2-Dibromo-3-Chloropropane	ND		2300	1200
106-93-4	1,2-Dibromoethane	ND		2300	410
95-50-1	1,2-Dichlorobenzene	ND		2300	600
107-06-2	1,2-Dichloroethane	ND		2300	960
78-87-5	1,2-Dichloropropane	ND		2300	380
541-73-1	1,3-Dichlorobenzene	ND		2300	630
106-46-7	1,4-Dichlorobenzene	ND		2300	330
78-93-3	2-Butanone (MEK)	ND		12000	7000
591-78-6	2-Hexanone	ND		12000	4800
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		12000	750
67-64-1	Acetone	ND		12000	9600
71-43-2	Benzene	ND		2300	450
75-27-4	Bromodichloromethane	ND		2300	470
75-25-2	Bromoform	ND		2300	1200
74-83-9	Bromomethane	ND		2300	520
75-15-0	Carbon disulfide	ND		2300	1100
56-23-5	Carbon tetrachloride	ND		2300	600
108-90-7	Chlorobenzene	ND		2300	310
75-00-3	Chloroethane	ND		2300	490
67-66-3	Chloroform	ND		2300	1600
74-87-3	Chloromethane	ND		2300	560
156-59-2	cis-1,2-Dichloroethene	ND		2300	650
10061-01-5	cis-1,3-Dichloropropene	ND		2300	560
110-82-7	Cyclohexane	ND		2300	520
124-48-1	Dibromochloromethane	ND		2300	1100
75-71-8	Dichlorodifluoromethane	ND		2300	1000
100-41-4	Ethylbenzene	ND		2300	680
98-82-8	Isopropylbenzene	ND		2300	350

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 10-11 Lab Sample ID: 480-169160-3

Matrix: Solid Lab File ID: S6735.D

Analysis Method: 8260C Date Collected: 04/16/2020 11:25

Sample wt/vol: 5.19(g) Date Analyzed: 04/29/2020 16:00

Soil Aliquot Vol: 100 (uL) Dilution Factor: 20

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.5 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		12000	1100
1634-04-4	Methyl tert-butyl ether	ND		2300	890
108-87-2	Methylcyclohexane	ND		2300	1100
75-09-2	Methylene Chloride	ND		2300	460
100-42-5	Styrene	ND		2300	570
127-18-4	Tetrachloroethene	90000		2300	320
108-88-3	Toluene	ND		2300	630
156-60-5	trans-1,2-Dichloroethene	ND		2300	550
10061-02-6	trans-1,3-Dichloropropene	ND		2300	230
79-01-6	Trichloroethene	ND		2300	650
75-69-4	Trichlorofluoromethane	ND		2300	1100
75-01-4	Vinyl chloride	ND		2300	790
1330-20-7	Xylenes, Total	ND		4700	1300

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	86		53-146
460-00-4	4-Bromofluorobenzene (Surr)	105		49-148
1868-53-7	Dibromofluoromethane (Surr)	92		60-140
2037-26-5	Toluene-d8 (Surr)	101		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 10-11 Lab Sample ID: 480-169160-3

Matrix: Solid Lab File ID: S6735.D

Analysis Method: 8260C Date Collected: 04/16/2020 11:25

Sample wt/vol: 5.19(g) Date Analyzed: 04/29/2020 16:00

Soil Aliquot Vol: 100 (uL) Dilution Factor: 20

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 12.5 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

Number TICs Found: 1 TIC Result Total: 6000

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Unknown	14.11	6000	T J	

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14I 8-8.5 Lab Sample ID: 480-169160-4

Matrix: Solid Lab File ID: S6736.D

Analysis Method: 8260C Date Collected: 04/16/2020 13:20

Sample wt/vol: 5(g) Date Analyzed: 04/29/2020 16:23

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 17.2 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		130	36
79-34-5	1,1,2,2-Tetrachloroethane	ND		130	21
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		130	66
79-00-5	1,1,2-Trichloroethane	ND		130	28
75-34-3	1,1-Dichloroethane	ND		130	41
75-35-4	1,1-Dichloroethene	ND		130	45
120-82-1	1,2,4-Trichlorobenzene	ND		130	50
96-12-8	1,2-Dibromo-3-Chloropropane	ND		130	66
106-93-4	1,2-Dibromoethane	ND		130	23
95-50-1	1,2-Dichlorobenzene	ND		130	33
107-06-2	1,2-Dichloroethane	ND		130	54
78-87-5	1,2-Dichloropropane	ND		130	21
541-73-1	1,3-Dichlorobenzene	ND		130	35
106-46-7	1,4-Dichlorobenzene	ND		130	18
78-93-3	2-Butanone (MEK)	ND		660	390
591-78-6	2-Hexanone	ND		660	270
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		660	42
67-64-1	Acetone	ND		660	540
71-43-2	Benzene	ND		130	25
75-27-4	Bromodichloromethane	ND		130	26
75-25-2	Bromoform	ND		130	66
74-83-9	Bromomethane	ND		130	29
75-15-0	Carbon disulfide	ND		130	60
56-23-5	Carbon tetrachloride	ND		130	33
108-90-7	Chlorobenzene	ND		130	17
75-00-3	Chloroethane	ND		130	27
67-66-3	Chloroform	ND		130	90
74-87-3	Chloromethane	ND		130	31
156-59-2	cis-1,2-Dichloroethene	ND		130	36
10061-01-5	cis-1,3-Dichloropropene	ND		130	31
110-82-7	Cyclohexane	ND		130	29
124-48-1	Dibromochloromethane	ND		130	63
75-71-8	Dichlorodifluoromethane	ND		130	57
100-41-4	Ethylbenzene	ND		130	38
98-82-8	Isopropylbenzene	ND		130	20

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14I 8-8.5 Lab Sample ID: 480-169160-4

Matrix: Solid Lab File ID: S6736.D

Analysis Method: 8260C Date Collected: 04/16/2020 13:20

Sample wt/vol: 5(g) Date Analyzed: 04/29/2020 16:23

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 17.2 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	370	J	660	62
1634-04-4	Methyl tert-butyl ether	ND		130	50
108-87-2	Methylcyclohexane	ND		130	61
75-09-2	Methylene Chloride	ND	U	130	130
100-42-5	Styrene	ND		130	32
127-18-4	Tetrachloroethene	1800		130	18
108-88-3	Toluene	ND		130	35
156-60-5	trans-1,2-Dichloroethene	ND		130	31
10061-02-6	trans-1,3-Dichloropropene	ND		130	13
79-01-6	Trichloroethene	ND		130	36
75-69-4	Trichlorofluoromethane	ND		130	62
75-01-4	Vinyl chloride	ND		130	44
1330-20-7	Xylenes, Total	ND		260	73

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	92		53-146
460-00-4	4-Bromofluorobenzene (Surr)	102		49-148
1868-53-7	Dibromofluoromethane (Surr)	93		60-140
2037-26-5	Toluene-d8 (Surr)	99		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14I 8-8.5 Lab Sample ID: 480-169160-4

Matrix: Solid Lab File ID: S6736.D

Analysis Method: 8260C Date Collected: 04/16/2020 13:20

Sample wt/vol: 5(g) Date Analyzed: 04/29/2020 16:23

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 17.2 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

Number TICs Found: 7 TIC Result Total: 3020

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
1120-21-4	Undecane	11.11	470	T J N	90%
112-40-3	Dodecane	12.07	490	T J N	94%
	Unknown	12.58	360	T J	
629-50-5	Tridecane	12.91	430	T J N	97%
	Unknown	13.50	410	T J	
629-59-4	Tetradecane	13.66	360	T J N	95%
	Unknown	14.10	500	T J	

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-13I 7-7.5 Lab Sample ID: 480-169160-5

Matrix: Solid Lab File ID: S6737.D

Analysis Method: 8260C Date Collected: 04/20/2020 08:57

Sample wt/vol: 5.15(g) Date Analyzed: 04/29/2020 16:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.8 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		470	130
79-34-5	1,1,2,2-Tetrachloroethane	ND		470	76
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		470	230
79-00-5	1,1,2-Trichloroethane	ND		470	98
75-34-3	1,1-Dichloroethane	ND		470	140
75-35-4	1,1-Dichloroethene	ND		470	160
120-82-1	1,2,4-Trichlorobenzene	ND		470	180
96-12-8	1,2-Dibromo-3-Chloropropane	ND		470	230
106-93-4	1,2-Dibromoethane	ND		470	82
95-50-1	1,2-Dichlorobenzene	ND		470	120
107-06-2	1,2-Dichloroethane	ND		470	190
78-87-5	1,2-Dichloropropane	ND		470	76
541-73-1	1,3-Dichlorobenzene	ND		470	120
106-46-7	1,4-Dichlorobenzene	ND		470	65
78-93-3	2-Butanone (MEK)	ND		2300	1400
591-78-6	2-Hexanone	ND		2300	960
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		2300	150
67-64-1	Acetone	ND		2300	1900
71-43-2	Benzene	ND		470	89
75-27-4	Bromodichloromethane	ND		470	93
75-25-2	Bromoform	ND		470	230
74-83-9	Bromomethane	ND		470	100
75-15-0	Carbon disulfide	ND		470	210
56-23-5	Carbon tetrachloride	ND		470	120
108-90-7	Chlorobenzene	ND		470	62
75-00-3	Chloroethane	ND		470	97
67-66-3	Chloroform	ND		470	320
74-87-3	Chloromethane	ND		470	110
156-59-2	cis-1,2-Dichloroethene	ND		470	130
10061-01-5	cis-1,3-Dichloropropene	ND		470	110
110-82-7	Cyclohexane	ND		470	100
124-48-1	Dibromochloromethane	ND		470	230
75-71-8	Dichlorodifluoromethane	ND		470	200
100-41-4	Ethylbenzene	ND		470	140
98-82-8	Isopropylbenzene	ND		470	70

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-13I 7-7.5 Lab Sample ID: 480-169160-5

Matrix: Solid Lab File ID: S6737.D

Analysis Method: 8260C Date Collected: 04/20/2020 08:57

Sample wt/vol: 5.15(g) Date Analyzed: 04/29/2020 16:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.8 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		2300	220
1634-04-4	Methyl tert-butyl ether	ND		470	180
108-87-2	Methylcyclohexane	ND		470	220
75-09-2	Methylene Chloride	ND	U	470	470
100-42-5	Styrene	ND		470	110
127-18-4	Tetrachloroethene	31000		470	63
108-88-3	Toluene	ND		470	130
156-60-5	trans-1,2-Dichloroethene	ND		470	110
10061-02-6	trans-1,3-Dichloropropene	ND		470	46
79-01-6	Trichloroethene	460	J	470	130
75-69-4	Trichlorofluoromethane	ND		470	220
75-01-4	Vinyl chloride	ND		470	160
1330-20-7	Xylenes, Total	ND		930	260

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	92		53-146
460-00-4	4-Bromofluorobenzene (Surr)	104		49-148
1868-53-7	Dibromofluoromethane (Surr)	97		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-13I 7-7.5 Lab Sample ID: 480-169160-5

Matrix: Solid Lab File ID: S6737.D

Analysis Method: 8260C Date Collected: 04/20/2020 08:57

Sample wt/vol: 5.15(g) Date Analyzed: 04/29/2020 16:46

Soil Aliquot Vol: 100 (uL) Dilution Factor: 4

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 11.8 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

Number TICs Found: 0 TIC Result Total: 0

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Tentatively Identified Compound		None		

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-13S 7.5-8.5 Lab Sample ID: 480-169160-6

Matrix: Solid Lab File ID: S6738.D

Analysis Method: 8260C Date Collected: 04/20/2020 13:45

Sample wt/vol: 5.01(g) Date Analyzed: 04/29/2020 17:09

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 13.4 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		120	34
79-34-5	1,1,2,2-Tetrachloroethane	ND		120	20
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		120	62
79-00-5	1,1,2-Trichloroethane	ND		120	26
75-34-3	1,1-Dichloroethane	ND		120	38
75-35-4	1,1-Dichloroethene	ND		120	43
120-82-1	1,2,4-Trichlorobenzene	ND		120	47
96-12-8	1,2-Dibromo-3-Chloropropane	ND		120	62
106-93-4	1,2-Dibromoethane	ND		120	22
95-50-1	1,2-Dichlorobenzene	ND		120	31
107-06-2	1,2-Dichloroethane	ND		120	50
78-87-5	1,2-Dichloropropane	ND		120	20
541-73-1	1,3-Dichlorobenzene	ND		120	33
106-46-7	1,4-Dichlorobenzene	ND		120	17
78-93-3	2-Butanone (MEK)	ND		620	370
591-78-6	2-Hexanone	ND		620	250
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		620	39
67-64-1	Acetone	ND		620	510
71-43-2	Benzene	ND		120	23
75-27-4	Bromodichloromethane	ND		120	25
75-25-2	Bromoform	ND		120	62
74-83-9	Bromomethane	ND		120	27
75-15-0	Carbon disulfide	ND		120	56
56-23-5	Carbon tetrachloride	ND		120	31
108-90-7	Chlorobenzene	ND		120	16
75-00-3	Chloroethane	ND		120	26
67-66-3	Chloroform	ND		120	84
74-87-3	Chloromethane	ND		120	29
156-59-2	cis-1,2-Dichloroethene	ND		120	34
10061-01-5	cis-1,3-Dichloropropene	ND		120	29
110-82-7	Cyclohexane	ND		120	27
124-48-1	Dibromochloromethane	ND		120	60
75-71-8	Dichlorodifluoromethane	ND		120	54
100-41-4	Ethylbenzene	ND		120	36
98-82-8	Isopropylbenzene	ND		120	18

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-13S 7.5-8.5 Lab Sample ID: 480-169160-6

Matrix: Solid Lab File ID: S6738.D

Analysis Method: 8260C Date Collected: 04/20/2020 13:45

Sample wt/vol: 5.01(g) Date Analyzed: 04/29/2020 17:09

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 13.4 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		620	59
1634-04-4	Methyl tert-butyl ether	ND		120	46
108-87-2	Methylcyclohexane	ND		120	58
75-09-2	Methylene Chloride	ND		120	24
100-42-5	Styrene	ND		120	30
127-18-4	Tetrachloroethene	890		120	17
108-88-3	Toluene	ND		120	33
156-60-5	trans-1,2-Dichloroethene	ND		120	29
10061-02-6	trans-1,3-Dichloropropene	ND		120	12
79-01-6	Trichloroethene	ND		120	34
75-69-4	Trichlorofluoromethane	ND		120	58
75-01-4	Vinyl chloride	ND		120	41
1330-20-7	Xylenes, Total	ND		250	68

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	89		53-146
460-00-4	4-Bromofluorobenzene (Surr)	101		49-148
1868-53-7	Dibromofluoromethane (Surr)	89		60-140
2037-26-5	Toluene-d8 (Surr)	99		50-149

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-13S 7.5-8.5 Lab Sample ID: 480-169160-6

Matrix: Solid Lab File ID: S6738.D

Analysis Method: 8260C Date Collected: 04/20/2020 13:45

Sample wt/vol: 5.01(g) Date Analyzed: 04/29/2020 17:09

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: 13.4 Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

Number TICs Found: 5 TIC Result Total: 2240

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Unknown	1.84	390	T J	
	Unknown	11.17	510	T J	
112-40-3	Dodecane	12.07	700	T J N	97%
	Unknown	12.58	320	T J	
	Unknown	12.98	320	T J	

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 10-11 Lab Sample ID: 480-169160-3

Matrix: Solid Lab File ID: U33156607.D

Analysis Method: 8270D Date Collected: 04/16/2020 11:25

Extract. Method: 3550C Date Extracted: 04/30/2020 07:33

Sample wt/vol: 30.03(g) Date Analyzed: 05/01/2020 04:08

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 12.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 529092 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
95-95-4	2,4,5-Trichlorophenol	ND		190	53
88-06-2	2,4,6-Trichlorophenol	ND		190	39
120-83-2	2,4-Dichlorophenol	ND		190	21
105-67-9	2,4-Dimethylphenol	ND		190	47
51-28-5	2,4-Dinitrophenol	ND		1900	900
121-14-2	2,4-Dinitrotoluene	ND		190	40
606-20-2	2,6-Dinitrotoluene	ND		190	23
91-58-7	2-Chloronaphthalene	ND		190	32
95-57-8	2-Chlorophenol	ND		380	35
91-57-6	2-Methylnaphthalene	120	J	190	39
95-48-7	2-Methylphenol	ND		190	23
88-74-4	2-Nitroaniline	ND		380	29
88-75-5	2-Nitrophenol	ND		190	55
91-94-1	3,3'-Dichlorobenzidine	ND		380	230
99-09-2	3-Nitroaniline	ND		380	54
534-52-1	4,6-Dinitro-2-methylphenol	ND		380	190
101-55-3	4-Bromophenyl phenyl ether	ND		190	27
123-91-1	1,4-Dioxane	ND		110	63
59-50-7	4-Chloro-3-methylphenol	ND		190	48
106-47-8	4-Chloroaniline	ND		190	48
7005-72-3	4-Chlorophenyl phenyl ether	ND		190	24
106-44-5	4-Methylphenol	ND		380	23
100-01-6	4-Nitroaniline	ND		380	100
100-02-7	4-Nitrophenol	ND		380	140
83-32-9	Acenaphthene	140	J	190	29
208-96-8	Acenaphthylene	65	J	190	25
98-86-2	Acetophenone	ND		190	26
120-12-7	Anthracene	500		190	48
1912-24-9	Atrazine	ND		190	67
100-52-7	Benzaldehyde	ND		190	150
56-55-3	Benzo[a]anthracene	1300		190	19
50-32-8	Benzo[a]pyrene	890		190	29
205-99-2	Benzo[b]fluoranthene	1100		190	31
191-24-2	Benzo[g,h,i]perylene	560		190	21

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 10-11 Lab Sample ID: 480-169160-3

Matrix: Solid Lab File ID: U33156607.D

Analysis Method: 8270D Date Collected: 04/16/2020 11:25

Extract. Method: 3550C Date Extracted: 04/30/2020 07:33

Sample wt/vol: 30.03(g) Date Analyzed: 05/01/2020 04:08

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 12.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 529092 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
207-08-9	Benzo[k]fluoranthene	600		190	25
92-52-4	Biphenyl	51	J	190	29
108-60-1	bis (2-chloroisopropyl) ether	ND		190	39
111-91-1	Bis(2-chloroethoxy)methane	ND		190	41
111-44-4	Bis(2-chloroethyl)ether	ND		190	25
117-81-7	Bis(2-ethylhexyl) phthalate	2200		190	66
85-68-7	Butyl benzyl phthalate	430		190	32
105-60-2	Caprolactam	ND		190	58
86-74-8	Carbazole	ND		190	23
218-01-9	Chrysene	1200		190	43
53-70-3	Dibenz(a,h)anthracene	230		190	34
132-64-9	Dibenzofuran	190		190	23
84-66-2	Diethyl phthalate	ND		190	25
131-11-3	Dimethyl phthalate	ND		190	23
84-74-2	Di-n-butyl phthalate	140	J	190	33
117-84-0	Di-n-octyl phthalate	ND		190	23
206-44-0	Fluoranthene	2700		190	21
86-73-7	Fluorene	260		190	23
118-74-1	Hexachlorobenzene	ND		190	26
87-68-3	Hexachlorobutadiene	ND		190	29
77-47-4	Hexachlorocyclopentadiene	ND		190	26
67-72-1	Hexachloroethane	ND		190	25
193-39-5	Indeno[1,2,3-cd]pyrene	510		190	24
78-59-1	Isophorone	ND		190	41
91-20-3	Naphthalene	ND		190	25
98-95-3	Nitrobenzene	ND		190	22
621-64-7	N-Nitrosodi-n-propylamine	ND		190	33
86-30-6	N-Nitrosodiphenylamine	ND		190	160
87-86-5	Pentachlorophenol	ND		380	190
85-01-8	Phenanthrene	2800		190	29
108-95-2	Phenol	ND		190	30
129-00-0	Pyrene	2300		190	23

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 10-11 Lab Sample ID: 480-169160-3

Matrix: Solid Lab File ID: U33156607.D

Analysis Method: 8270D Date Collected: 04/16/2020 11:25

Extract. Method: 3550C Date Extracted: 04/30/2020 07:33

Sample wt/vol: 30.03(g) Date Analyzed: 05/01/2020 04:08

Con. Extract Vol.: 1(mL) Dilution Factor: 1

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: 12.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 529092 Units: ug/Kg

Number TICs Found: 19 TIC Result Total: 19910

CAS NO.	COMPOUND NAME	RT	RESULT	Q	MATCH QUALITY
	Unknown	2.00	1200	T J	
127-18-4	Tetrachloroethylene	2.89	2300	T J N	98%
112-40-3	Dodecane	7.26	550	T J N	96%
17301-23-4	Undecane, 2,6-dimethyl-	7.36	570	T J N	97%
	Unknown	7.78	1200	T J	
629-50-5	Tridecane	7.99	1100	T J N	96%
	Unknown	8.50	760	T J	
629-59-4	Tetradecane	8.65	800	T J N	95%
1120-21-4	Undecane	9.03	920	T J N	90%
629-78-7	Heptadecane	10.38	1200	T J N	93%
1921-70-6	Pentadecane, 2,6,10,14-tetramethyl-	10.39	1700	T J N	96%
593-45-3	Octadecane	10.84	1200	T J N	97%
638-36-8	Hexadecane, 2,6,10,14-tetramethyl-	10.87	760	T J N	94%
544-76-3	Hexadecane	11.26	1200	T J N	96%
949-41-7	1H-Cyclopropa[l]phenanthrene,1a,9b-dihydro-	11.40	670	T J N	91%
610-48-0	Anthracene, 1-methyl-	11.43	790	T J N	93%
112-95-8	Eicosane	11.64	1100	T J N	98%
629-94-7	Heneicosane	11.99	1100	T J N	96%
192-97-2	Benzo[e]pyrene	14.38	790	T J N	91%

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 10-11 Lab Sample ID: 480-169160-3

Matrix: Solid Lab File ID: 5_32373.D

Analysis Method: 8081B Date Collected: 04/16/2020 11:25

Extraction Method: 3550C Date Extracted: 04/29/2020 15:23

Sample wt/vol: 30.33(g) Date Analyzed: 04/30/2020 12:03

Con. Extract Vol.: 10(mL) Dilution Factor: 5

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: 12.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 528870 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	ND		9.4	1.8
72-55-9	4,4'-DDE	ND		9.4	2.0
50-29-3	4,4'-DDT	7.1	J	9.4	2.2
309-00-2	Aldrin	ND		9.4	2.3
319-84-6	alpha-BHC	ND		9.4	1.7
5103-71-9	cis-Chlordane	ND		9.4	4.7
319-85-7	beta-BHC	ND		9.4	1.7
319-86-8	delta-BHC	ND		9.4	1.8
60-57-1	Dieldrin	ND		9.4	2.3
959-98-8	Endosulfan I	ND		9.4	1.8
33213-65-9	Endosulfan II	ND		9.4	1.7
1031-07-8	Endosulfan sulfate	ND		9.4	1.8
72-20-8	Endrin	ND		9.4	1.9
7421-93-4	Endrin aldehyde	27		9.4	2.4
53494-70-5	Endrin ketone	13	JN	9.4	2.3
58-89-9	gamma-BHC (Lindane)	ND		9.4	1.7
5103-74-2	trans-Chlordane	ND		9.4	3.0
76-44-8	Heptachlor	ND		9.4	2.0
1024-57-3	Heptachlor epoxide	ND		9.4	2.4
72-43-5	Methoxychlor	17	J	9.4	1.9
8001-35-2	Toxaphene	ND		94	55

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	73		45-120
877-09-8	Tetrachloro-m-xylene	93		30-124

FORM I
PCBS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 10-11 Lab Sample ID: 480-169160-3

Matrix: Solid Lab File ID: 7_67-265.D

Analysis Method: 8082A Date Collected: 04/16/2020 11:25

Extraction Method: 3550C Date Extracted: 04/29/2020 15:58

Sample wt/vol: 2.74(g) Date Analyzed: 04/30/2020 17:49

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: ZB-35 ID: 0.53(mm)

% Moisture: 12.5 GPC Cleanup:(Y/N) N

Analysis Batch No.: 528997 Units: mg/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
12674-11-2	PCB-1016	ND		0.21	0.041
11104-28-2	PCB-1221	ND		0.21	0.041
11141-16-5	PCB-1232	ND		0.21	0.041
53469-21-9	PCB-1242	ND		0.21	0.041
12672-29-6	PCB-1248	ND		0.21	0.041
11097-69-1	PCB-1254	ND		0.21	0.098
11096-82-5	PCB-1260	ND		0.21	0.098
37324-23-5	PCB-1262	ND		0.21	0.098
11100-14-4	PCB-1268	ND		0.21	0.098

CAS NO.	SURROGATE	%REC	Q	LIMITS
877-09-8	Tetrachloro-m-xylene	131		60-154
2051-24-3	DCB Decachlorobiphenyl	118		65-174

1A-IN
INORGANIC ANALYSIS DATA SHEET
METALS

Client Sample ID: MW-14S 10-11 | Lab Sample ID: 480-169160-3

Lab Name: Eurofins TestAmerica, Buffalo | Job No.: 480-169160-1

SDG ID.:

Matrix: Solid | Date Sampled: 04/16/2020 11:25

Reporting Basis: DRY | Date Received: 04/24/2020 08:10

% Solids: 87.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
7429-90-5	Aluminum	3140	10.6	4.7	mg/Kg			1	6010C
7440-36-0	Antimony	ND	15.9	0.42	mg/Kg			1	6010C
7440-38-2	Arsenic	1.6	2.1	0.42	mg/Kg	J		1	6010C
7440-39-3	Barium	16.4	0.53	0.12	mg/Kg		^	1	6010C
7440-41-7	Beryllium	0.14	0.21	0.030	mg/Kg	J		1	6010C
7440-43-9	Cadmium	0.039	0.21	0.032	mg/Kg	J		1	6010C
7440-70-2	Calcium	30800	53.1	3.5	mg/Kg			1	6010C
7440-47-3	Chromium	5.0	0.53	0.21	mg/Kg			1	6010C
7440-48-4	Cobalt	2.5	0.53	0.053	mg/Kg			1	6010C
7440-50-8	Copper	4.6	1.1	0.22	mg/Kg			1	6010C
7439-89-6	Iron	6870	10.6	3.7	mg/Kg			1	6010C
7439-92-1	Lead	3.0	1.1	0.25	mg/Kg			1	6010C
7439-95-4	Magnesium	7260	21.2	0.98	mg/Kg			1	6010C
7439-96-5	Manganese	295	0.21	0.034	mg/Kg			1	6010C
7440-02-0	Nickel	5.2	5.3	0.24	mg/Kg	J		1	6010C
7440-09-7	Potassium	934	31.9	21.2	mg/Kg			1	6010C
7782-49-2	Selenium	ND	4.2	0.42	mg/Kg			1	6010C
7440-22-4	Silver	ND	0.64	0.21	mg/Kg			1	6010C
7440-23-5	Sodium	183	149	13.8	mg/Kg			1	6010C
7440-28-0	Thallium	ND	6.4	0.32	mg/Kg			1	6010C
7440-62-2	Vanadium	9.8	0.53	0.12	mg/Kg			1	6010C
7440-66-6	Zinc	12.3	2.1	0.68	mg/Kg			1	6010C
7439-97-6	Mercury	ND	0.017	0.0068	mg/Kg			1	7471B

1B-IN
INORGANIC ANALYSIS DATA SHEET
GENERAL CHEMISTRY

Client Sample ID: MW-14S 10-11 | Lab Sample ID: 480-169160-3

Lab Name: Eurofins TestAmerica, Buffalo | Job No.: 480-169160-1

SDG ID.:

Matrix: Solid | Date Sampled: 04/16/2020 11:25

Reporting Basis: DRY | Date Received: 04/24/2020 08:10

% Solids: 87.5

CAS No.	Analyte	Result	RL	MDL	Units	C	Q	DIL	Method
57-12-5	Cyanide, Total	ND	1.1	0.53	mg/Kg			1	9012B

ATTACHMENT B

SUPPORT DOCUMENTATION

Chain of Custody Record

eurofins Environment Testing TestAmerica

...-2298
...e: 716-691-2600 Fax: 716-691-7991

Client Information	Sampler: Sean P Connolly	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-140736-31604.2
Client Contact: George Kisluk	Phone: (716) 923-1321	E-Mail: orlette.johnson@testamericainc.com		Page: Page ~~2 of 2~~ 1 of 1
Company: AECOM				Job #:

Address: 257 West Genesee Street Suite 400	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Buffalo	TAT Requested (days): 5 Day TAT		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: NY, 14202-2657			
Phone:	PO #: Callout ID: 137811		Other:
Email: george.kisluk@aecom.com	WO #:		
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA - (MOD) PFAS, Standard List (21 Analytes)	PFC_IDA - PFAS, Standard List (21 Analytes)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N		
40N 40R @ 14'-16'	2/11/20	1145	G	~~Solid~~ Solid	N	N	X			
42N 20R @ 11.5-12.3	2/11/20	1100	G	~~Solid~~ Solid	N	N	X			
DUP-200212-1	2/12/20	1105	G	~~Water~~ Solid	N	N	X			
80N 35E @ 9'	2/12/20	1750	G	~~Water~~ Solid	N	N	X			
				~~Water~~						
				~~Water~~						
				~~Water~~						
				~~Water~~						

480-166397 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time: 2/14/20 @ 0900	Company: Aecom	Received by:	Date/Time: 2/14/20 0900	Company: TAS
	Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
	Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.2 #1 ICE

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-54422.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: orlette.johnson@testamericainc.com	State of Origin: New York	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - New York		Job #: 480-166397-1
Address: 880 Riverside Parkway,	Due Date Requested: 2/20/2020			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Solid, Oil/Waste, BT=Tissue, Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IOA/Shake_Bath_14D (MOD) PFAS, Standard List (21 Analytes)	Moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
40W 40E @ 14"-16" (480-166397-1)	2/11/20	11:45 Eastern		Solid			X	X	1	
42N 20E @ 11.5-12.3 (480-166397-2)	2/11/20	11:00 Eastern		Solid			X	X	1	
DUP-200212-1 (480-166397-3)	2/12/20	11:05 Eastern		Solid			X	X	1	
50W 35E @9' (480-166397-4)	2/12/20	14:50 Eastern		Solid			X	X	1	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
	2-17-20 17:00	ETAB		18 Feb 20 0920	ETA WSac
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company

Custody Seals Intact: ☐ Yes ☒ No	Custody Seal No.: 992833	Cooler Temperature(s) °C and Other Remarks: 3.6°C / 4.2°C

Ver: 01/16/2019

02/25/2020

Job Narrative
480-166397-1

Comments
No additional comments.

Receipt
The samples were received on 2/14/2020 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2° C.

LCMS
Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for M2-6:2 FTS and M2-8:2 FTS in the following samples: 40W 40E 14-16 (480-166397-1), (460-203116-C-1-A), (460-203116-C-1-B MS) and (460-203116-C-1-C MSD). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method SHAKE: The following samples: 40W 40E 14-16 (480-166397-1) and 50W 35E 9 (480-166397-4) were observed to be yellow after extraction and final volume.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-166397-1

SDG No.:

Lab File ID: 2020.02.22_LLB_007.d Lab Sample ID: MB 320-358405/1-A

Matrix: Solid Date Extracted: 02/19/2020 04:09

Instrument ID: A9 Date Analyzed: 02/24/2020 03:52

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-358405/2-A	2020.02.22_LLB_008.d	02/24/2020 04:02
40W 40E 14-16	480-166397-1	2020.02.22_LLB_025.d	02/24/2020 06:52
42N 20E 11.5-12.3	480-166397-2	2020.02.22_LLB_026.d	02/24/2020 07:02
DUP-200212-1	480-166397-3	2020.02.22_LLB_027.d	02/24/2020 07:12
50W 35E 9	480-166397-4	2020.02.22_LLB_028.d	02/24/2020 07:22

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-166397-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-358405/1-A

Matrix: Solid Lab File ID: 2020.02.22_LLB_007.d

Analysis Method: 537 (modified) Date Collected:

Extraction Method: SHAKE Date Extracted: 02/19/2020 04:09

Sample wt/vol: 5.00(g) Date Analyzed: 02/24/2020 03:52

Con. Extract Vol.: 10.00(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 359346 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	0.108	J	0.20	0.028
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		0.20	0.077
307-24-4	Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029
335-67-1	Perfluorooctanoic acid (PFOA)	ND		0.20	0.086
375-95-1	Perfluorononanoic acid (PFNA)	ND		0.20	0.036
335-76-2	Perfluorodecanoic acid (PFDA)	ND		0.20	0.022
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		0.20	0.035
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		0.20	0.039
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND		0.20	0.082
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37
27619-97-2	6:2 FTS	ND		2.0	0.15
39108-34-4	8:2 FTS	ND		2.0	0.25

FORM II
LCMS SURROGATE RECOVERY

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-166397-1

SDG No.:

Matrix: Solid Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFBA #	PFPeA #	PFBS #	PFHxA #	PFHpA #	PFHxS #	M262FTS #	PFOA #
40W 40E 14-16	480-166397-1	97	85	100	105	100	101	213 *	94
42N 20E 11.5-12.3	480-166397-2	92	79	91	93	103	99	109	98
DUP-200212-1	480-166397-3	96	86	97	104	102	106	104	95
50W 35E 9	480-166397-4	91	79	86	94	97	97	95	92
	MB 320-358405/1-A	100	93	102	97	104	104	93	99
	LCS 320-358405/2-A	100	94	104	100	102	103	103	103

	QC LIMITS
PFBA = 13C4 PFBA	25-150
PFPeA = 13C5 PFPeA	25-150
PFBS = 13C3 PFBS	25-150
PFHxA = 13C2 PFHxA	25-150
PFHxS = 18O2 PFHxS	25-150
PFHpA = 13C4 PFHpA	25-150
M262FTS = M2-6:2 FTS	25-150
PFOA = 13C4 PFOA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

FORM II
LCMS SURROGATE RECOVERY

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-166397-1

SDG No.:

Matrix: Solid Level: Low

GC Column (1): Acquity ID: 2.1 (mm)

Client Sample ID	Lab Sample ID	PFOS #	PFNA #	PFOSA #	M282FTS #	PFDA #	d3NMFOS #	PFUnA #	d5NEFOS #
40W 40E 14-16	480-166397-1	103	101	84	216 *	94	97	104	99
42N 20E 11.5-12.3	480-166397-2	102	101	99	126	101	107	110	116
DUP-200212-1	480-166397-3	107	104	101	105	105	96	114	98
50W 35E 9	480-166397-4	96	104	98	119	108	79	108	79
	MB 320-358405/1-A	98	101	99	100	104	108	110	109
	LCS 320-358405/2-A	104	107	99	105	108	107	112	116

	QC LIMITS
PFOS = 13C4 PFOS	25-150
PFNA = 13C5 PFNA	25-150
PFOSA = 13C8 FOSA	25-150
M282FTS = M2-8:2 FTS	25-150
PFDA = 13C2 PFDA	25-150
d3NMFOS = d3-NMeFOSAA	25-150
PFUnA = 13C2 PFUnA	25-150
d5NEFOS = d5-NEtFOSAA	25-150

Column to be used to flag recovery values

FORM II 537 (modified)

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins Environment Testing Northamerica

Client Information	Sampler: S. Connelly / M. Gutmann	Lab PM: Johnson, Oriette S	Carrier Tracking No(s):	COC No: 480-140735-31603.2
Client Contact: George Kisluk	Phone: (716) 923-1321	E-Mail: oriette.johnson@testamericainc.com		Page: ~~Page 2 of 5~~ 1 of 4
Company: AECOM		Analysis Requested		Job #:
Address: 257 West Genesee Street Suite 400	Due Date Requested:			Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
City: Buffalo	TAT Requested (days): 5 Day TAT			
State, Zip: NY, 14202-2657	PO #: Callout ID: 137811			
Phone:	WO #:			Other:
Email: george.kisluk@aecom.com	Project #: 48021570			
Project Name: 331-337 W. Main St Rochester #828102	SSOW#:			
Site:				

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, Oil/waste, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (MOD) TCL list OLM04.2 + TICs	9012B - Cyanide	6010C, 7471B	6010B, 8082A, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	N	X	
40N 50E Soil	1/23/20	1355	G	Solid	N	N	X					
20N 50E Soil	1/23/20	1417	G	Solid	N	N	X					
30N 50E Soil	1/23/20	1443	G	Solid	N	N	X					
10N 30E Soil	1/23/20	1455	G	Solid	N	N	X					
70N 40E Soil	1/23/20	1555	G	Solid	N	N	X					
100N 40E Soil	1/23/20	1608	G	Solid	N	N	X					
80N 40E Soil	1/23/20	1620	G	Solid	N	N	X					
80N 30E Soil	1/23/20	1645	G	Solid	N	N	X					
60N 40E Soil	1/24/20	1315	G	Solid	N	N	X					
0N 20E Soil	1/24/20	1211	G	Solid	N	N	X					
20N 10E Soil	1/24/20	1375	G	Solid	N	N	X					

480-165607 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Sam P. Connelly	1/27/20 1145	Aecom	[signature]	01/27/20 1145	TTA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks: 3.6 #1 ICE

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins Environment Testing TestAmerica

Mike Gutmann, Sam

Client Information	Sampler: ~~Eric~~ S Connolly	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-140735-31603.3
Client Contact: George Kisluk	Phone: (716) 923-1321	E-Mail: orlette.johnson@testamericainc.com		Page: Page ~~2~~ 2 of 4
Company: AECOM				Job #:
Address: 257 West Genesee Street Suite 400	Due Date Requested:			
City: Buffalo	TAT Requested (days): 5 Days			
State, Zip: NY, 14202-2657				
Phone:	PO #: Callout ID: 137811			
Email: george.kisluk@aecom.com	WO #:			
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Wastewater, Sludge, Drinking Water, Air, Tissue, etc.)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (MOD) TCL list OLM04.2 + TICs	9012B - Cyanide	6010C, 7471B	8081B, 8082A, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	N		
60N 40E MS/MSD	1/24/20	1315	G	Solid	N	Y			X			limited volume
90N 50E Soil	1/24/20	1036	G	Solid	N	N	X					
70N 20E D	1/24/20	0921	G	Solid	N	N	X					
110N 50E Soil	1/24/20	1044	G	Solid	N	N	X					
60N 10E Soil	1/24/20	1355	G	Solid	N	N		X				
110N 50E Soil D	1/24/20	1050	G	Solid	N	N		X				
100N 20E Soil	1/24/20	0900	G	Solid	N	N	X					
90N 50E Soil MS/MSD	1/24/20	1036	G	Solid	N	Y	X					limited volume
110N 50E Soil	1/24/20	1045	G	Solid	N	N		X				
60N 10E Soil MS/MSD	1/24/20	1355	G	Solid	N	Y		X				limited volume
20N 10E Soil MS/MSD	1/24/20	1345	G	Solid	N	Y				X		limited volume

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Sam P. Connolly	1/27/20 @ 1145	Aecom	[signature]	01/27/20 1145	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins Environment Testing TestAmerica

Client Information	Sampler: Sam Cassidy, Mike Gutman	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-140735-31603.4
Client Contact: George Kisluk	Phone: (716) 923-1321	E-Mail: orlette.johnson@testamericainc.com		Page: Page 3 of 4
Company: AECOM				Job #:

Address: 257 West Genesee Street Suite 400	Due Date Requested:	Analysis Requested
City: Buffalo	TAT Requested (days): 5 Days TAT	
State, Zip: NY, 14202-2657		
Phone:	PO #: Callout ID: 137611	
Email: george.kisluk@aecom.com	WO #:	
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570	
Site:	SSOW#:	

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Wastewater, Sludge, Groundwater, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (MOD) TCL list OLM04.2 + TICs	9012B - Cyanide	6010C, 7471B	8081B, 8082A, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N		
70N 20E Soil	1/24/20	0919	G	Solid	N	N	X					
30N 20E Soil	1/24/20	1203	G	Solid	N	N	X					
40N 40E Soil	1/24/20	0945	G	Solid	N	N	X					
20N 10E Soil	1/24/20	1345	G	Solid	N	N				X		limited volume
60N 50E Soil D	1/24/20	1305	G	Solid	N	N			X			
90N 50E Soil MSD	1/24/20	1036	G	Solid	N	Y	X					
60N 50E Soil	1/24/20	1300	G	Solid	N	N	X					
40N 10E	1/24/20	0833	G	Solid	N	N	X					
90N 10E Soil	1/24/20	0846	G	Solid	N	N	X					
110N 30E Soil D	1/24/20	1235	G	Solid	N	N				X		limited volume
60N 50E Soil	1/24/20	1300	G	Solid	N	N			X			

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Sam P. Cassidy	1/27/20 @ 1145	Sam	[signature]	01/27/20 1145	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins Environment Testing TestAmerica

Client Information	Sampler: M. Gutmann, S. Comolly	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-140735-31603.5
Client Contact: George Kisluk	Phone: (716) 923-1321	E-Mail: orlette.johnson@testamericainc.com		Page: Page 5 of 5
Company: AECOM				Job #:

Address: 257 West Genesee Street Suite 400	Due Date Requested:
City: Buffalo	TAT Requested (days): 5 Day TAT
State, Zip: NY, 14202-2657	
Phone:	PO #: Callout ID: 137811
Email: george.kisluk@aecom.com	WO #:
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570
Site:	SSOW#:

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify), Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (WOD) TCL list OLM04.2 + TICs	9012B - Cyanide	6010C, 7471B	8081B, 8082A, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N		
50N 50E Soil	1/24/20	1012	G	Solid	N	N	X					
110N 30E Soil	1/24/20	1230	G	Solid	N	N				X		limited volume
110N 30E Soil	1/24/20	1230	G	Solid	N	N	X					
60N 40E Soil	1/24/20	1315	G	Solid	N	N			X			
40N 40E Soil	1/24/20	0945	G	Solid	N	N	X	X	X	X		limited volume
40N 30E Soil	1/24/20	0950	G	Solid	N	N	X	X	X	X		limited volume
				Solid								
				Solid								
				Solid								
				Solid								
				Solid								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Sam P. Comolly	1/27/20 @ 1145	Aecom		01/27/20 1145	TA
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

02/06/2020

Job Narrative
480-165607-1

Comments
No additional comments.

Receipt
The samples were received on 1/27/2020 11:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.0° C.

Receipt Exceptions
Sample received that was not listed on coc. Information listed on sample container label was used for sample login.
70N 50E (480-165607-37)

Information listed on COC versus sample containers had inconsistencies. As a result QC assignment and sample assignment was a result of info listed on COC and containers versus COC only.

Revised samples to match client email as per client request

Several tests were added and cancelled per client direction

GC/MS VOA
Method 8260C: The following samples were analyzed using medium level soil analysis and diluted to bring the concentration of target analytes within the calibration range: 80N 30E SOIL (480-165607-8), 60N 40E SOIL (480-165607-9), 0N 20E SOIL (480-165607-10), 90N 50E SOIL (480-165607-13), 70N 20E SOIL (480-165607-22), 30N 20E SOIL (480-165607-23), 40N 40E SOIL (480-165607-24), 50N 50E SOIL (480-165607-31) and 40N 30E SOIL (480-165607-36). Elevated reporting limits (RLs) are provided.

Method 8260C: The following samples were analyzed using medium level soil analysis and diluted to bring the concentration of target analytes within the calibration range: 40N 50E SOIL (480-165607-1), 20N 50E SOIL (480-165607-2), 30N 50E SOIL (480-165607-3), 10N 30E SOIL (480-165607-4), 70N 40E SOIL (480-165607-5), 80N 30E SOIL (480-165607-8), 0N 20E SOIL (480-165607-10), 90N 50E SOIL (480-165607-13), 90N 50E SOIL (480-165607-13[MS]), 90N 50E SOIL (480-165607-13[MSD]), 70N 20E D (480-165607-14), 40N 40E SOIL (480-165607-24) and 50N 50E SOIL (480-165607-31). Elevated reporting limits (RLs) are provided.

Method 8260C: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 480-515194 and analytical batch 480-515133 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. The following samples are impacted: (480-165607-A-11-C MS) and (480-165607-A-11-D MSD).

Method 8260C: The following samples were analyzed using medium level soil analysis to bring the concentration of target analytes within the calibration range: 70N 20E D (480-165607-14), 110N 50E SOIL (480-165607-15), 100N 20E SOIL (480-165607-18), 60N 50E SOIL (480-165607-26), 40N 10E (480-165607-27), 90N 10E SOIL (480-165607-28), 110N 30E SOIL (480-165607-32) and 70N 50E (480-165607-37). Elevated reporting limits (RLs) are provided.

Method 8260C: The following samples were analyzed using medium level soil analysis to bring the concentration of target analytes within the calibration range: 60N 10E SOIL (480-165607-16), 60N 10E SOIL (480-165607-16[MS]) and 60N 10E SOIL (480-165607-16[MSD]). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Lab File ID: F5343.D Lab Sample ID: MB 480-515194/2-A

Matrix: Solid Heated Purge:(Y/N) Y

Instrument ID: HP5973F Date Analyzed: 01/28/2020 11:50

GC Column: ZB-624 (30) VOA ID: 0.25(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 480-515194/1-A	F5341.D	01/28/2020 10:45
100N 40E SOIL	480-165607-6	F5344.D	01/28/2020 12:29
80N 40E SOIL	480-165607-7	F5345.D	01/28/2020 12:55
20N 10E SOIL	480-165607-11	F5346.D	01/28/2020 13:20
20N 10E SOIL MS	480-165607-11 MS	F5347.D	01/28/2020 13:46
20N 10E SOIL MSD	480-165607-11 MSD	F5348.D	01/28/2020 14:11

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 480-515194/2-A

Matrix: Solid Lab File ID: F5343.D

Analysis Method: 8260C Date Collected:

Sample wt/vol: 5(g) Date Analyzed: 01/28/2020 11:50

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: ZB-624 (30) VOA ID: 0.25(mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 515133 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
71-55-6	1,1,1-Trichloroethane	ND		5.0	0.36
79-34-5	1,1,2,2-Tetrachloroethane	ND		5.0	0.81
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.0	1.1
79-00-5	1,1,2-Trichloroethane	ND		5.0	0.65
75-34-3	1,1-Dichloroethane	ND		5.0	0.61
75-35-4	1,1-Dichloroethene	ND		5.0	0.61
120-82-1	1,2,4-Trichlorobenzene	ND		5.0	0.30
96-12-8	1,2-Dibromo-3-Chloropropane	ND		5.0	2.5
106-93-4	1,2-Dibromoethane	ND		5.0	0.64
95-50-1	1,2-Dichlorobenzene	ND		5.0	0.39
107-06-2	1,2-Dichloroethane	ND		5.0	0.25
78-87-5	1,2-Dichloropropane	ND		5.0	2.5
541-73-1	1,3-Dichlorobenzene	ND		5.0	0.26
106-46-7	1,4-Dichlorobenzene	ND		5.0	0.70
78-93-3	2-Butanone (MEK)	ND		25	1.8
591-78-6	2-Hexanone	ND		25	2.5
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		25	1.6
67-64-1	Acetone	ND		25	4.2
71-43-2	Benzene	ND		5.0	0.25
75-27-4	Bromodichloromethane	ND		5.0	0.67
75-25-2	Bromoform	ND		5.0	2.5
74-83-9	Bromomethane	ND		5.0	0.45
75-15-0	Carbon disulfide	ND		5.0	2.5
56-23-5	Carbon tetrachloride	ND		5.0	0.48
108-90-7	Chlorobenzene	ND		5.0	0.66
75-00-3	Chloroethane	ND		5.0	1.1
67-66-3	Chloroform	0.326	J	5.0	0.31
74-87-3	Chloromethane	ND		5.0	0.30
156-59-2	cis-1,2-Dichloroethene	ND		5.0	0.64
10061-01-5	cis-1,3-Dichloropropene	ND		5.0	0.72
110-82-7	Cyclohexane	ND		5.0	0.70
124-48-1	Dibromochloromethane	ND		5.0	0.64
75-71-8	Dichlorodifluoromethane	ND		5.0	0.41
100-41-4	Ethylbenzene	ND		5.0	0.35
98-82-8	Isopropylbenzene	ND		5.0	0.75

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Lab File ID: N1115.D Lab Sample ID: MB 480-515589/2-A

Matrix: Solid Heated Purge:(Y/N) N

Instrument ID: HP5973N Date Analyzed: 01/31/2020 11:44

GC Column: ZB-624 (20) ID: 0.18(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
60N 10E SOIL	480-165607-16	N1116.D	01/31/2020 12:37
60N 10E SOIL MS	480-165607-16 MS	N1117.D	01/31/2020 13:02
60N 10E SOIL MSD	480-165607-16 MSD	N1118.D	01/31/2020 13:26

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 480-515589/2-A

Matrix: Solid Lab File ID: N1115.D

Analysis Method: 8260C Date Collected:

Sample wt/vol: 5(g) Date Analyzed: 01/31/2020 11:44

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: Level: (low/med) Medium

Analysis Batch No.: 515703 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		500	48
1634-04-4	Methyl tert-butyl ether	ND		100	38
108-87-2	Methylcyclohexane	ND		100	47
75-09-2	Methylene Chloride	68.7	J	100	20
100-42-5	Styrene	ND		100	24
127-18-4	Tetrachloroethene	ND		100	13
108-88-3	Toluene	ND		100	27
156-60-5	trans-1,2-Dichloroethene	ND		100	24
10061-02-6	trans-1,3-Dichloropropene	ND		100	9.8
79-01-6	Trichloroethene	ND		100	28
75-69-4	Trichlorofluoromethane	ND		100	47
75-01-4	Vinyl chloride	ND		100	34
1330-20-7	Xylenes, Total	ND		200	55

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	96		53-146
460-00-4	4-Bromofluorobenzene (Surr)	98		49-148
1868-53-7	Dibromofluoromethane (Surr)	91		60-140
2037-26-5	Toluene-d8 (Surr)	106		50-149

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Lab File ID: N1108.D BFB Injection Date: 01/31/2020

Instrument ID: HP5973N BFB Injection Time: 08:40

Analysis Batch No.: 515703

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	26.4	
75	30.0 - 60.0 % of mass 95	48.0	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.3	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	50.0 - 120.00 % of mass 95	93.8	
175	5.0 - 9.0 % of mass 174	7.3	(7.8) 1
176	95.0 - 101.0 % of mass 174	91.8	(97.9) 1
177	5.0 - 9.0 % of mass 176	5.4	(5.9) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 480-515703/3	N1109.D	01/31/2020	09:06
	LCS 480-515589/1-A	N1112.D	01/31/2020	10:33
	MB 480-515589/2-A	N1115.D	01/31/2020	11:44
60N 10E SOIL	480-165607-16	N1116.D	01/31/2020	12:37
60N 10E SOIL MS	480-165607-16 MS	N1117.D	01/31/2020	13:02
60N 10E SOIL MSD	480-165607-16 MSD	N1118.D	01/31/2020	13:26

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-1

SDG No.:

Lab Sample ID: CCVIS 480-515703/3 Calibration Date: 01/31/2020 09:06

Instrument ID: HP5973N Calib Start Date: 01/20/2020 17:59

GC Column: ZB-624 (20) ID: 0.18(mm) Calib End Date: 01/20/2020 20:49

Lab File ID: N1109.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	1.330	1.379	0.1000	25.9	25.0	3.7	50.0
Chloromethane	Ave	2.272	2.112	0.1000	23.2	25.0	-7.1	20.0
Butadiene	Ave	2.164	1.987		22.9	25.0	-8.2	20.0
Vinyl chloride	Ave	1.729	1.667	0.1000	24.1	25.0	-3.6	20.0
Bromomethane	Ave	1.056	0.9726	0.1000	23.0	25.0	-7.9	50.0
Chloroethane	Ave	1.128	1.069	0.1000	23.7	25.0	-5.2	50.0
Dichlorofluoromethane	Ave	2.507	2.400		23.9	25.0	-4.2	20.0
Trichlorofluoromethane	Ave	2.178	2.150	0.1000	24.7	25.0	-1.3	20.0
Ethyl ether	Ave	1.561	1.606		25.7	25.0	2.9	20.0
Acrolein	Ave	0.4288	0.4627		135	125	7.9	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	1.179	1.245	0.1000	26.4	25.0	5.7	20.0
1,1-Dichloroethene	Ave	1.190	1.158	0.1000	24.3	25.0	-2.7	20.0
Acetone	Ave	0.6547	0.7979	0.1000	152	125	21.9	50.0
Iodomethane	Ave	2.373	2.194		23.1	25.0	-7.5	20.0
Carbon disulfide	Ave	4.145	3.865	0.1000	23.3	25.0	-6.7	20.0
Allyl chloride	Ave	3.349	3.386		25.3	25.0	1.1	20.0
Methyl acetate	Ave	1.761	1.870	0.1000	53.1	50.0	6.2	50.0
Methylene Chloride	Lin1		1.384	0.1000	24.5	25.0	-2.1	20.0
2-Methyl-2-propanol	Ave	0.1625	0.2024		311	250	24.6	50.0
Methyl tert-butyl ether	Ave	3.933	3.813	0.1000	24.2	25.0	-3.0	20.0
trans-1,2-Dichloroethene	Ave	1.425	1.373	0.1000	24.1	25.0	-3.6	20.0
Acrylonitrile	Ave	0.8163	0.9257		283	250	13.4	20.0
Hexane	Ave	2.467	2.902		29.4	25.0	17.6	20.0
1,1-Dichloroethane	Ave	2.987	2.831	0.2000	23.7	25.0	-5.2	20.0
Vinyl acetate	Ave	4.677	5.166		55.2	50.0	10.5	20.0
2,2-Dichloropropane	Ave	1.517	1.433		23.6	25.0	-5.5	20.0
cis-1,2-Dichloroethene	Ave	1.475	1.479	0.1000	25.1	25.0	0.3	20.0
2-Butanone (MEK)	Ave	1.049	1.210	0.1000	144	125	15.3	20.0
Chlorobromomethane	Ave	0.7846	0.7672		24.4	25.0	-2.2	20.0
Tetrahydrofuran	Ave	0.7047	0.7821		55.5	50.0	11.0	20.0
Chloroform	Ave	2.527	2.491	0.2000	24.6	25.0	-1.4	20.0
1,1,1-Trichloroethane	Ave	2.137	2.183	0.1000	25.5	25.0	2.2	20.0
Cyclohexane	Ave	2.996	3.286	0.1000	27.4	25.0	9.7	20.0
Carbon tetrachloride	Ave	1.821	1.918	0.1000	26.3	25.0	5.3	20.0
1,1-Dichloropropene	Ave	1.805	1.899		26.3	25.0	5.2	20.0
Benzene	Ave	5.319	5.364	0.5000	25.2	25.0	0.8	20.0
Isobutyl alcohol	Ave	0.0774	0.1007		813	625	30.1	50.0
1,2-Dichloroethane	Ave	2.560	2.552	0.1000	24.9	25.0	-0.3	20.0
n-Heptane	Ave	2.678	3.322		31.0	25.0	24.1*	20.0
Trichloroethene	Ave	1.409	1.421	0.2000	25.2	25.0	0.9	20.0

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins Environment Testing Northamerica

Client Information	Sampler: S. Connelly / M. Gutmann	Lab PM: Johnson, Oriette S	Carrier Tracking No(s):	COC No: 480-140735-31603.2
Client Contact: George Kisluk	Phone: (716) 923-1321	E-Mail: oriette.johnson@testamericainc.com		Page: ~~Page 2 of 5~~ 1 of 4
Company: AECOM				Job #:
Address: 257 West Genesee Street Suite 400	Due Date Requested:			
City: Buffalo	TAT Requested (days): 5 Day TAT			
State, Zip: NY, 14202-2657				
Phone:	PO #: Callout ID: 137611			
Email: george.kisluk@aecom.com	WO #:			
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, Oil/waste, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (MOD) TCL list OLM04.2 + TICs	9012B - Cyanide	6010C, 7471B	6010B, 8082A, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
Preservation Code:					X	X	N	N	N	N	X	
40N 50E Soil	1/23/20	1355	G	Solid	N	N	X					
20N 50E Soil	1/23/20	1417	G	Solid	N	N	X					
30N 50E Soil	1/23/20	1443	G	Solid	N	N	X					
10N 30E Soil	1/23/20	1455	G	Solid	N	N	X					
70N 40E Soil	1/23/20	1555	G	Solid	N	N	X					
100N 40E Soil	1/23/20	1608	G	Solid	N	N	X					
80N 40E Soil	1/23/20	1620	G	Solid	N	N	X					
80N 30E Soil	1/23/20	1645	G	Solid	N	N	X					
60N 40E Soil	1/24/20	1315	G	Solid	N	N	X					
0N 20E Soil	1/24/20	1211	G	Solid	N	N	X					
20N 10E Soil	1/24/20	1375	G	Solid	N	N	X					

480-165607 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Sam P. Connelly	1/27/20 1145	Aecom	[signature]	01/27/20 1145	TTP
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks: 3.6 #1 ICE

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins Environment Testing TestAmerica

Mike Gutmann, Sam

Client Information	Sampler: ~~Eric~~ S Connolly	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-140735-31603.3
Client Contact: George Kisluk	Phone: (716) 423-1321	E-Mail: orlette.johnson@testamericainc.com		Page: Page ~~2~~ 2 of 4
Company: AECOM				Job #:
Address: 257 West Genesee Street Suite 400	Due Date Requested:			
City: Buffalo	TAT Requested (days): 5 Days			
State, Zip: NY, 14202-2657				
Phone:	PO #: Callout ID: 137811			
Email: george.kisluk@aecom.com	WO #:			
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Wastewater, Sludge, Drinking Water, Air, Tissue, Soil)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (MOD) TCL list OLM04.2 + TICs	9012B - Cyanide	6010C, 7471B	8081B, 8082A, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	N		
60N 40E MS/MSD	1/24/20	1315	G	Solid	N	Y			X			limited volume
90N 50E Soil	1/24/20	1036	G	Solid	N	N	X					
70N 20E D	1/24/20	0921	G	Solid	N	N	X					
110N 50E Soil	1/24/20	1044	G	Solid	N	N	X					
60N 10E Soil	1/24/20	1355	G	Solid	N	N		X				
110N 50E Soil D	1/24/20	1050	G	Solid	N	N		X				
100N 20E Soil	1/24/20	0900	G	Solid	N	N	X					
90N 50E Soil MS/MSD	1/24/20	1036	G	Solid	N	Y	X					limited volume
110N 50E Soil	1/24/20	1045	G	Solid	N	N		X				
60N 10E Soil MS/MSD	1/24/20	1355	G	Solid	N	Y		X				limited volume
20N 10E Soil MS/MSD	1/24/20	1345	G	Solid	N	Y				X		limited volume

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Sam P. Connolly	1/27/20 @ 1145	Aecom	[signature]	01/27/20 1145	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins Environment Testing TestAmerica

Client Information	Sampler: Sean Cassidy Mike Gibson	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-140735-31603.4
Client Contact: George Kisluk	Phone: (716) 923-1321	E-Mail: orlette.johnson@testamericainc.com		Page: Page 3 of 4
Company: AECOM				Job #:
Address: 257 West Genesee Street Suite 400	Due Date Requested:	Analysis Requested		Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
City: Buffalo	TAT Requested (days): 5 Days TAT			
State, Zip: NY, 14202-2657				
Phone:	PO #: Callout ID: 137611			Other:
Email: george.kisluk@aecom.com	WO #:			
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Wastewater, Sludge, Groundwater, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (MOD) TCL list OLM04.2 + TICs	9012B - Cyanide	6010C, 7471B	8081B, 8082A, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	N	X	
70N 20E Soil	1/24/20	0919	G	Solid	N	N	X					
30N 20E Soil	1/24/20	1203	G	Solid	N	N	X					
40N 40E Soil	1/24/20	0945	G	Solid	N	N	X					
20N 10E Soil	1/24/20	1345	G	Solid	N	N				X		limited volume
60N 50E Soil D	1/24/20	1305	G	Solid	N	N			X			
90N 50E Soil MSD	1/24/20	1030	G	Solid	N	Y	X					
60N 50E Soil	1/24/20	1300	G	Solid	N	N	X					
40N 10E	1/24/20	0833	G	Solid	N	N	X					
90N 10E Soil	1/24/20	0846	G	Solid	N	N	X					
110N 30E Soil D	1/24/20	1235	G	Solid	N	N				X		limited volume
60N 50E Soil	1/24/20	1300	G	Solid	N	N			X			

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Sean P. Cassidy	1/27/20 @ 1145	Sean	[signature]	01/27/20 1145	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins Environment Testing TestAmerica

Client Information	Sampler: M. Gutmann, S. Comolly	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-140735-31603.5
Client Contact: George Kisluk	Phone: (716) 923-1321	E-Mail: orlette.johnson@testamericainc.com		Page: Page 5 of 5
Company: AECOM				Job #:

Address: 257 West Genesee Street Suite 400	Due Date Requested:
City: Buffalo	TAT Requested (days): 5 Day TAT
State, Zip: NY, 14202-2657	
Phone:	PO #: Callout ID: 137811
Email: george.kisluk@aecom.com	WO #:
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570
Site:	SSOW#:

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify), Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Wastewater, Sludge, Drinking Water, Tissue, Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (WOD) TCL list OLM04.2 + TICs	9012B - Cyanide	6010C, 7471B	8081B, 8082A, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N		
50N 50E Soil	1/24/20	1012	G	Solid	N	N	X					
110N 30E Soil	1/24/20	1230	G	Solid	N	N				X		limited volume
110N 30E Soil	1/24/20	1230	G	Solid	N	N	X					
60N 40E Soil	1/24/20	1315	G	Solid	N	N			X			
40N 40E Soil	1/24/20	0945	G	Solid	N	N	X	X	X	X		limited volume
40N 30E Soil	1/24/20	0950	G	Solid	N	N	X	X	X	X		limited volume
				Solid								
				Solid								
				Solid								
				Solid								
				Solid								

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Sam P. Comolly	1/27/20 @ 1145	Aecom			
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Job Narrative
480-165607-2

Comments
No additional comments.

Receipt
The samples were received on 1/27/2020 11:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.0° C.

Receipt Exceptions
Sample received that was not listed on coc. Information listed on sample container label was used for sample login. 70N 50E (480-165607-37)

Information listed on sample coc versus sample containers and info listed on containers had inconsistencies as a result qc assignment and sample assignment was a result of info listed on coc and containers versus coc only.

40N 50E SOIL (480-165607-1), 20N 50E SOIL (480-165607-2), 30N 50E SOIL (480-165607-3), 10N 30E SOIL (480-165607-4), 70N 40E SOIL (480-165607-5), 100N 40E SOIL (480-165607-6), 80N 40E SOIL (480-165607-7), 80N 30E SOIL (480-165607-8), 60N 40E SOIL (480-165607-9), 60N 40E SOIL (480-165607-9[MS]), 60N 40E SOIL (480-165607-9[MSD]), 0N 20E SOIL (480-165607-10), 20N 10E SOIL (480-165607-11), 20N 10E SOIL (480-165607-11[MS]), 20N 10E SOIL (480-165607-11[MSD]), 60N 40E SOIL (480-165607-12), 60N 40E SOIL (480-165607-12[MS]), 60N 40E SOIL (480-165607-12[MSD]), 90N 50E SOIL (480-165607-13), 90N 50E SOIL (480-165607-13[MS]), 90N 50E SOIL (480-165607-13[MSD]), 70N 20E D (480-165607-14), 110N 50E SOIL (480-165607-15), 60N 10E SOIL (480-165607-16), 60N 10E SOIL (480-165607-16[MS]), 60N 10E SOIL (480-165607-16[MSD]), 110N 50E SOIL D (480-165607-17), 100N 20E SOIL (480-165607-18), 110N 50E SOIL (480-165607-19), 60N 10E SOIL (480-165607-20), 60N 10E SOIL (480-165607-20[MS]), 60N 10E SOIL (480-165607-20[MSD]), 20N 10E SOIL (480-165607-21), 20N 10E SOIL (480-165607-21[MS]), 20N 10E SOIL (480-165607-21[MSD]), 70N 20E SOIL (480-165607-22), 30N 20E SOIL (480-165607-23), 40N 40E SOIL (480-165607-24), 60N 50E SOIL D (480-165607-25), 60N 50E SOIL (480-165607-26), 40N 10E (480-165607-27), 90N 10E SOIL (480-165607-28), 110N 30E SOIL D (480-165607-29), 60N 50E SOIL (480-165607-30), 50N 50E SOIL (480-165607-31), 110N 30E SOIL (480-165607-32), 110N 30E SOIL (480-165607-33), 60N 40E SOIL (480-165607-34), 40N 40E SOIL (480-165607-35), 40N 30E SOIL (480-165607-36) and 70N 50E (480-165607-37)

GC/MS Semi VOA
Method 8270D: The following sample was diluted due to color, appearance and viscosity: 20N 10E SOIL (480-165607-11). Elevated reporting limits (RL) are provided.

Method 8270D: The following sample required a dilution due to color, appearance and viscosity: 20N 10E SOIL (480-165607-11). Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method 8270D: The continuing calibration verification (CCV) associated with batch 480-515793 recovered above the upper control limit for bis (2-chloroisopropyl) ether. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: 60N 40E SOIL (480-165607-9) and 20N 10E SOIL (480-165607-11).

Method 8270D: The continuing calibration verification (CCV) associated with batch 480-515793 recovered outside acceptance criteria, low biased, for 2,4-Dinitrophenol and Hexachlorocyclopentadiene. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method 8270D: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 480-515626 and analytical batch 480-515793 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 8270D: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 480-515626 and analytical batch 480-515793 was the method detection limit (MDL) for 2,4-Dinitrophenol; therefore, percent recoveries and RPD were not calculated. The associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method 8081B: The following samples were diluted due to the nature of the sample matrix: 60N 10E SOIL (480-165607-16) and 20N 10E SOIL (480-165607-21). As such, surrogate recoveries are below the calibration range, estimated and not representative. Elevated reporting limits (RLs) are provided.

Method 8081B: The following samples were diluted due to the nature of the sample matrix: 60N 10E SOIL (480-165607-16[MS]) and 60N 10E SOIL (480-165607-16[MSD]). As such, spike and surrogate recoveries are below the calibration range, estimated and not representative. Elevated reporting limits (RLs) are provided.

Method 8082A: The continuing calibration verification (CCV) associated with batch 480-515413 recovered above the upper control limit for Aroclor 1262. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been

reported. The following sample is impacted: 20N 10E SOIL (480-165607-21).

Method 8082A: The following sample is associated with a continuing calibration verification (CCV 480-515960/31) that had recoveries for the surrogate Decachlorobiphenyl and Tetrachloro-m-xylene that were above acceptance limits: 60N 10E SOIL (480-165607-16). Sample surrogate recoveries are within acceptance limits; therefore, the data has been reported.

Method 8082A: The continuing calibration verification (CCV) associated with batch 480-515960 recovered above the upper control limit for PCB-1016 and PCB-1260. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following sample is impacted: 60N 10E SOIL (480-165607-16).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6010C: The Low Level Continuing Calibration Verification, (CCVL 480-515733/21) associated with batch 480-515733, contained Total Iron above the upper quality control limit. The associated samples were either ND for the affected analyte or contained this analyte at a concentration greater than 10X the value found in the CCVL; therefore, re-analysis of samples 60N 40E SOIL (480-165607-12), (LCSSRM 480-515391/2-A), (MB 480-515391/1-A), (480-165607-A-12-E PDS) and (480-165607-A-12-E SD ^5) was not performed.

Method 6010C: The Low Level Continuing Calibration Verification, (CCVL 480-515733/31) associated with batch 480-515733, contained Total Iron above the upper quality control limit. The associated samples were either ND for the affected analyte or contained this analyte at a concentration greater than 10X the value found in the CCVL; therefore, re-analysis of samples 60N 40E SOIL (480-165607-12), 60N 40E SOIL (480-165607-12[MS]), 60N 40E SOIL (480-165607-12[MSD]), 40N 30E SOIL (480-165607-36), (LCSSRM 480-515391/2-A), (MB 480-515391/1-A), (480-165607-A-12-E PDS) and (480-165607-A-12-E SD ^5) was not performed.

Method 6010C: The Low Level Continuing Calibration Verification, (CCVL 480-515733/39) associated with batch 480-515733, contained Total Iron above the upper quality control limit. The associated samples were either ND for the affected analyte or contained this analyte at a concentration greater than 10X the value found in the CCVL; therefore, re-analysis of samples 60N 40E SOIL (480-165607-12[MS]), 60N 40E SOIL (480-165607-12[MSD]) and 40N 30E SOIL (480-165607-36) was not performed.

Method 6010C: The Serial Dilution (480-165607-A-12-E SD ^5) in batch 480-515391 , exhibited results outside the quality control limits for Total Barium, Calcium, Chromium, Copper, Potassium, Sodium, Lead, Vanadium, and Zinc. However, the Post Digestion Spike was compliant so no corrective action was necessary.

Method 6010C: The recovery of Post Spike, (480-165607-A-12-E PDS) and (480-165607-A-12-E SD ^5), in batch 480-515391 exhibited results outside the quality control limits for Total Aluminum, Iron, Magnesium, and Manganese. However, the Serial Dilution of this sample was compliant. Therefore, no corrective action was necessary.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3550C: The following samples required a Florisil clean-up, via EPA Method 3620C, to reduce matrix interferences: 60N 10E SOIL (480-165607-16), 60N 10E SOIL (480-165607-16[MS]), 60N 10E SOIL (480-165607-16[MSD]) and 20N 10E SOIL (480-165607-21).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

FORM V
GC/MS SEMI VOA INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Lab File ID: V3143327.D DFTPP Injection Date: 01/31/2020

Instrument ID: HP5973V DFTPP Injection Time: 15:49

Analysis Batch No.: 515793

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	10-80% of Base Peak	36.1	
68	Less than 2% of mass 69	0.6	(1.7) 1
69	Mass 69 Relative abundance	32.2	
70	Less than 2% of mass 69	0.4	(1.1) 1
127	10-80% of Base Peak	46.2	
197	Less than 2% of mass 198	0.0	
198	Base peak	100.0	
199	5-9% of mass 198	8.0	
275	10-60% of Base Peak	31.9	
365	Greater than 1% of mass 198	4.9	
441	present but less than 24% of mass 442	12.8	(13.6) 2
442	Greater than 50% of mass 198	93.9	
443	15-24% of mass 442	17.4	(18.5) 2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 480-515793/3	V3143328.D	01/31/2020	16:19
	MB 480-515626/1-A	V3143338.D	01/31/2020	20:28
	LCS 480-515626/2-A	V3143339.D	01/31/2020	20:53
60N 40E SOIL MS	480-165607-9 MS	V3143343.D	01/31/2020	22:33
60N 40E SOIL MSD	480-165607-9 MSD	V3143344.D	01/31/2020	22:58
60N 40E SOIL	480-165607-9	V3143345.D	01/31/2020	23:23
20N 10E SOIL	480-165607-11	V3143346.D	01/31/2020	23:48

FORM VII
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Lab Sample ID: CCVIS 480-515793/3 Calibration Date: 01/31/2020 16:19

Instrument ID: HP5973V Calib Start Date: 01/13/2020 16:49

GC Column: RXI-5Sil MS ID: 0.25(mm) Calib End Date: 01/13/2020 19:20

Lab File ID: V3143328.D Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
1,4-Dioxane	Ave	0.5706	0.5871	0.0100	51400	50000	2.9	20.0
N-Nitrosodimethylamine	Ave	0.7077	0.8490	0.0100	60000	50000	20.0	50.0
Pyridine	Ave	0.7807	1.043	0.0100	134000	100000	33.6	50.0
Benzaldehyde	Ave	1.045	0.9628	0.0100	46100	50000	-7.9	50.0
Aniline	Ave	1.871	2.018	0.0100	53900	50000	7.8	20.0
Phenol	Ave	1.606	1.675	0.8000	52200	50000	4.3	20.0
Bis(2-chloroethyl)ether	Ave	1.167	1.227	0.7000	52600	50000	5.2	20.0
2-Chlorophenol	Ave	1.207	1.321	0.8000	54700	50000	9.4	20.0
n-Decane	Ave	1.334	1.584	0.0100	59300	50000	18.7	20.0
1,3-Dichlorobenzene	Ave	1.441	1.580	0.0100	54800	50000	9.7	20.0
1,4-Dichlorobenzene	Ave	1.482	1.597	0.0100	53900	50000	7.8	20.0
Benzyl alcohol	Ave	0.7760	0.8159	0.0100	52600	50000	5.1	20.0
1,2-Dichlorobenzene	Ave	1.377	1.484	0.0100	53900	50000	7.8	20.0
Indene	Ave	0.5354	0.5759	0.0100	161000	150000	7.6	20.0
bis (2-chloroisopropyl) ether	Ave	1.548	1.928	0.0100	62300	50000	24.5*	20.0
2-Methylphenol	Ave	1.075	1.137	0.7000	52900	50000	5.8	20.0
Acetophenone	Ave	1.640	1.719	0.0100	52400	50000	4.8	20.0
N-Nitrosodi-n-propylamine	Ave	0.8876	0.9172	0.5000	51700	50000	3.3	20.0
4-Methylphenol	Ave	1.080	1.141	0.6000	52900	50000	5.7	20.0
Hexachloroethane	Ave	0.5361	0.5878	0.3000	54800	50000	9.6	20.0
Nitrobenzene	Ave	0.4368	0.4157	0.2000	47600	50000	-4.8	20.0
Isophorone	Ave	0.7266	0.6915	0.4000	47600	50000	-4.8	20.0
2-Nitrophenol	Ave	0.1919	0.1911	0.1000	49800	50000	-0.4	20.0
2,4-Dimethylphenol	Ave	0.3846	0.3726	0.2000	48400	50000	-3.1	20.0
Bis(2-chloroethoxy)methane	Ave	0.3991	0.3881	0.3000	48600	50000	-2.7	20.0
2,4-Dichlorophenol	Ave	0.3426	0.3232	0.2000	47200	50000	-5.7	20.0
Benzoic acid	Lin1		0.1707	0.0100	138000	150000	-7.9	50.0
1,2,4-Trichlorobenzene	Ave	0.4162	0.3837	0.0100	46100	50000	-7.8	20.0
Naphthalene	Ave	1.021	1.046	0.7000	51200	50000	2.5	20.0
4-Chloroaniline	Ave	0.4212	0.4315	0.0100	51200	50000	2.4	20.0
2,6-Dichlorophenol	Ave	0.3480	0.3254	0.0100	46800	50000	-6.5	20.0
Hexachlorobutadiene	Ave	0.2963	0.2602	0.0100	43900	50000	-12.2	20.0
Caprolactam	Lin2		0.0925	0.0100	48100	50000	-3.9	50.0
4-Chloro-3-methylphenol	Lin2		0.2906	0.2000	46800	50000	-6.3	20.0
2-Methylnaphthalene	Ave	0.7191	0.7260	0.4000	50500	50000	1.0	20.0
1-Methylnaphthalene	Ave	0.6699	0.6705	0.0100	50000	50000	0.0	20.0
Hexachlorocyclopentadiene	Lin1		0.3718	0.0500	38000	50000	-24.0*	20.0
1,2,4,5-Tetrachlorobenzene	Ave	0.7979	0.7153	0.0100	44800	50000	-10.4	20.0
2,4,6-Trichlorophenol	Ave	0.4613	0.4176	0.2000	45300	50000	-9.5	20.0
2,4,5-Trichlorophenol	Ave	0.4819	0.4305	0.2000	44700	50000	-10.7	20.0

FORM IV
PESTICIDES METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Lab Sample ID: MB 480-515449/1-A

Matrix: Solid Date Extracted: 01/29/2020 14:38

Lab File ID:(1) 5_29370.D Lab File ID:(2) 5_29370.D

Date Analyzed:(1) 01/30/2020 13:28 Date Analyzed:(2) 01/30/2020 13:28

Instrument ID:(1) HP6890-5 Instrument ID:(2) HP6890-5

GC Column:(1) RTX-CLPI ID: 0.53(mm) GC Column:(2) RTX-CLPII ID: 0.53(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 480-515449/2-A	01/30/2020 13:48	01/30/2020 13:48
60N 10E SOIL MS	480-165607-16 MS	01/30/2020 14:07	01/30/2020 14:07
60N 10E SOIL MSD	480-165607-16 MSD	01/30/2020 14:27	01/30/2020 14:27
60N 10E SOIL	480-165607-16	01/30/2020 14:46	01/30/2020 14:46
20N 10E SOIL	480-165607-21	01/30/2020 15:06	01/30/2020 15:06

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: Lab Sample ID: MB 480-515449/1-A

Matrix: Solid Lab File ID: 5_29370.D

Analysis Method: 8081B Date Collected:

Extraction Method: 3550C Date Extracted: 01/29/2020 14:38

Sample wt/vol: 30.22(g) Date Analyzed: 01/30/2020 13:28

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 515525 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	ND		1.7	0.32
72-55-9	4,4'-DDE	ND		1.7	0.35
50-29-3	4,4'-DDT	0.852	J	1.7	0.39
309-00-2	Aldrin	ND		1.7	0.41
319-84-6	alpha-BHC	ND		1.7	0.30
5103-71-9	cis-Chlordane	ND		1.7	0.82
319-85-7	beta-BHC	ND		1.7	0.30
319-86-8	delta-BHC	ND		1.7	0.31
60-57-1	Dieldrin	ND		1.7	0.40
959-98-8	Endosulfan I	ND		1.7	0.32
33213-65-9	Endosulfan II	ND		1.7	0.30
1031-07-8	Endosulfan sulfate	ND		1.7	0.31
72-20-8	Endrin	ND		1.7	0.33
7421-93-4	Endrin aldehyde	0.786	J	1.7	0.42
53494-70-5	Endrin ketone	ND		1.7	0.41
58-89-9	gamma-BHC (Lindane)	0.454	J	1.7	0.30
5103-74-2	trans-Chlordane	ND		1.7	0.53
76-44-8	Heptachlor	ND		1.7	0.36
1024-57-3	Heptachlor epoxide	ND		1.7	0.43
72-43-5	Methoxychlor	ND		1.7	0.34
8001-35-2	Toxaphene	ND		17	9.6

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	117		45-120
877-09-8	Tetrachloro-m-xylene	92		30-124

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: 60N 10E SOIL Lab Sample ID: 480-165607-16

Instrument ID (1): HP6890-5 Instrument ID (2): HP6890-5

Date Analyzed (1): 01/30/2020 14:46 Date Analyzed (2): 01/30/2020 14:46

GC Column (1): RTX-CLPI ID: 0.53(mm) GC Column (2): RTX-CLPII ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
delta-BHC	1		3.24	3.23	3.29	7.4		7.1
	2		3.94	3.94	4.00	8.0		
4,4'-DDT	1		5.52	5.50	5.56	23		17.9
	2		6.46	6.41	6.47	19		
Methoxychlor	1		6.01	6.00	6.06	15		123.2
	2		7.11	7.10	7.16	64		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Client Sample ID: 20N 10E SOIL Lab Sample ID: 480-165607-21

Instrument ID (1): HP6890-5 Instrument ID (2): HP6890-5

Date Analyzed (1): 01/30/2020 15:06 Date Analyzed (2): 01/30/2020 15:06

GC Column (1): RTX-CLPI ID: 0.53(mm) GC Column (2): RTX-CLPII ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
Endrin	1		5.18	5.13	5.19	11		31.8
	2		6.01	5.98	6.04	15		
4,4'-DDT	1		5.52	5.50	5.56	24		24.3
	2		6.46	6.41	6.47	31		
Endrin aldehyde	1		5.79	5.78	5.84	120		35.5
	2		6.57	6.54	6.60	170		
Methoxychlor	1		6.01	6.00	6.06	15		173.3
	2		7.11	7.10	7.16	200		

5A-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
METALS

Client ID: 60N 40E SOIL MSD
Lab ID: 480-165607-12 MSD
Lab Name: Eurofins TestAmerica, Buffalo
Job No.: 480-165607-2
SDG No.:
Matrix: Solid
Concentration Units: mg/Kg
% Solids: 89.9

Analyte	(SDR)	C	Spike Added (SA)	%R	Control Limit %R	RPD	RPD Limit	Q	Method
Aluminum	12610		2030	345	75-125	2	20	F1	6010C
Antimony	33.79		40.7	80	75-125	1	20		6010C
Arsenic	41.37		40.7	91	75-125	1	20		6010C
Barium	135.7		40.7	169	75-125	4	20	F1	6010C
Beryllium	36.61		40.7	89	75-125	2	20		6010C
Cadmium	37.37		40.7	91	75-125	1	20		6010C
Calcium	49580		2030	589	75-125	9	20	4	6010C
Chromium	46.01		40.7	94	75-125	2	20		6010C
Cobalt	43.92		40.7	99	75-125	4	20		6010C
Copper	63.94		40.7	66	75-125	4	20	F1	6010C
Iron	11170		2030	90	75-125	21	20	^ 4 F2	6010C
Lead	122.2		40.7	6	75-125	2	20	F1	6010C
Magnesium	18200		2030	289	75-125	1	20	4	6010C
Manganese	397.0		40.7	116	75-125	14	20	4	6010C
Nickel	51.53		40.7	101	75-125	3	20		6010C
Potassium	6609		2030	251	75-125	3	20	F1	6010C
Selenium	37.00		40.7	91	75-125	2	20		6010C
Silver	10.01		10.2	96	75-125	1	20		6010C
Sodium	4066		2040	182	75-125	1	20	F1	6010C
Thallium	40.72		40.7	100	75-125	0	20		6010C
Vanadium	52.59		40.7	101	75-125	3	20		6010C
Zinc	99.76		40.7	53	75-125	0	20	F1	6010C
Mercury	0.710		0.346	99	80-120	2	20		7471B

SDR = Sample Duplicate Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VD - IN

5B-IN
POST DIGESTION SPIKE SAMPLE RECOVERY
METALS

Client ID: 60N 40E SOIL PDS
Lab ID: 480-165607-12 PDS
Lab Name: Eurofins TestAmerica, Buffalo
Job No.: 480-165607-2
SDG No.:
Matrix: Solid
Concentration Units: mg/Kg

Analyte	SSR	C	Sample Result (SR)	C	Spike Added (SA)	%R	Control Limit %R	Q	Method
Aluminum	7227		5590		2090	79	80-120	W	6010C
Antimony	43.91		1.1	J	41.8	103	80-120		6010C
Arsenic	43.99		4.2		41.8	95	80-120		6010C
Barium	102.7		67.2		41.8	85	80-120		6010C
Beryllium	40.13		0.27		41.8	95	80-120		6010C
Cadmium	39.99		0.18	J	41.8	95	80-120		6010C
Calcium	37950		37600		2090	NC	80-120		6010C
Chromium	46.23		7.8		41.8	92	80-120		6010C
Cobalt	45.61		3.6		41.8	101	80-120		6010C
Copper	74.87		37.1		41.8	90	80-120		6010C
Iron	10840		9330		2090	72	80-120	W ^	6010C
Lead	157.5		120		41.8	90	80-120		6010C
Magnesium	13810		12300		2090	70	80-120	W	6010C
Manganese	373.6		350		41.8	57	80-120	W	6010C
Nickel	52.70		10.5		41.8	101	80-120		6010C
Potassium	3480		1510		2090	94	80-120		6010C
Selenium	38.62		ND		41.8	92	80-120		6010C
Silver	10.25		0.23	J	10.4	96	80-120		6010C
Sodium	2282		360		2090	92	80-120		6010C
Thallium	43.47		ND		41.8	104	80-120		6010C
Vanadium	50.69		11.6		41.8	94	80-120		6010C
Zinc	111.9		78.0		41.8	81	80-120		6010C

SSR = Spiked Sample Result

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM VB - IN

8-IN
ICP-AES AND ICP-MS SERIAL DILUTIONS
METALS

Lab ID: 480-165607-12

SDG No:

Lab Name: Eurofins TestAmerica, Buffalo Job No: 480-165607-2

Matrix: Solid Concentration Units: mg/Kg

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Method
Aluminum	5590		6422		15	V	6010C
Antimony	1.1	J	ND		NC		6010C
Arsenic	4.2		5.27	J	NC		6010C
Barium	67.2		78.18		16	V	6010C
Beryllium	0.27		0.407	J	NC		6010C
Cadmium	0.18	J	0.397	J	NC		6010C
Calcium	37600		44520		18	V	6010C
Chromium	7.8		9.36		20	V	6010C
Cobalt	3.6		4.01		10		6010C
Copper	37.1		41.46		12	V	6010C
Iron	9330		10870		16	^ V	6010C
Lead	120		132.5		11	V	6010C
Magnesium	12300		14170		15	V	6010C
Manganese	350		409.9		17	V	6010C
Nickel	10.5		11.33	J	8.2		6010C
Potassium	1510		1730		15	V	6010C
Selenium	ND		ND		NC		6010C
Silver	0.23	J	ND		NC		6010C
Sodium	360		417.0	J	16	V	6010C
Thallium	ND		ND		NC		6010C
Vanadium	11.6		13.20		14	V	6010C
Zinc	78.0		94.20		21	V	6010C

Calculations are performed before rounding to avoid round-off errors in calculated results.

FORM VIII-IN

5-IN
MATRIX SPIKE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 515463	Date: 01/29/2020 15:25		Prep Batch: 515442		Date: 01/29/2020 12:50						
9012B	480-165607-9	Cyanide, Total	ND		mg/Kg						F1 F2
9012B	480-165607-9 MS	Cyanide, Total	1.01	J	mg/Kg	1.31	78	85-115			F1

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM V-IN

5-IN
MATRIX SPIKE DUPLICATE SAMPLE RECOVERY
GENERAL CHEMISTRY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-165607-2

SDG No.:

Matrix: Solid

Method	Lab Sample ID	Analyte	Result	C	Unit	Spike Amount	Pct. Rec.	Limits	RPD	RPD Limit	Q
Batch ID: 515463	Date: 01/29/2020 15:26		Prep Batch: 515442		Date: 01/29/2020 12:50						
9012B	480-165607-9 MSD	Cyanide, Total	0.736	J	mg/Kg	1.20	61	85-115	32	15	F1 F2

Calculations are performed before rounding to avoid round-off errors in calculated results.
Note - Results and Reporting Limits have been adjusted for dry weight.

FORM V-IN

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information	Sampler: Mike Gutowski, Sam Cassidy	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-140735-31603.1
Client Contact: George Kisluk	Phone: (716) 923-1321	E-Mail: orlette.johnson@testamericainc.com		Page: ~~Page 1 of 5~~ 1 of 2
Company: AECOM				Job #:

Address: 257 West Genesee Street Suite 400	Due Date Requested:	Analysis Requested
City: Buffalo	TAT Requested (days): 5 Day TAT	
State, Zip: NY, 14202-2657	PO #: Callout ID: 137811	
Phone:	WO #:	
Email: george.kisluk@aecom.com	Project #: 48021570	
Project Name: 331-337 W. Main St Rochester #828102	SSOW#:	
Site:		

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (MOD) TCL list OLM04.2 + TICs	9012B - Cyanide	6010C; 7471B	8081B, 8082A, 8151A, 8270D	Total Number of containers	Special Instructions/Note:
			Preservation Code				N	N	N	N		
40N 40E C ~~Lab Dup~~ 13'	2/11/20	1210	G	Solid	N	N	X					
10N 36E C 7'	2/11/20	1330	G	Solid	N	N	X					
40N 50E C 12'	2/11/20	1500	G	Solid	N	N	X					
90N 50E C 5'	2/12/20	0840	G	Solid	N	N	X					
25N 50E C 8.5'	2/12/20	0925	G	Solid	N	N	X					
42N 20E C 11.5-12.3	2/12/20	1100	G	Solid	N	N	X					
70N 20E C 12-12.5	2/12/20	1315	G	Solid	N	N	X					
80N 35E C 4-5'	2/12/20	1416	G	Solid	N	N	X	X	X	X		
80N 35E C 9'	2/12/20	1450	G	Solid	N	N	X					
FD-200212-2	2/12/20	1420	G	Solid	N	N	X	X	X	X		
80N 35E C 11-12'	2/12/20	1500	G	Solid	N	N	X					

480-166399 Chain of Custody

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	2/14/20 0900	Aecom		2/14/20 0800	TAB
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.4 #1 ICE

Ver: 01/16/2019

Chain of Custody Record

Client Information	Sampler: Sean P. Canby	Lab PM: Johnson, Charles S	Carrier Tracking No(s):	COC No:
Client Contact: George Kozlak	Phone: (716) 923-1321	E-Mail: charles.johnson@tal	State of Origin:	Page: 2 of 2
Company: Arcadis		Accreditations Required (See note): Asbestos - NY		Job #:
Address: 257 W. Genesee St Suite 400	Due Date Requested:			
City: Buffalo	TAT Requested (days): 5 Day TAT			
State, Zip: NY 14202-2612				
Phone:	PO #:			
Email: George.Kozlak@arcadis.com	WO #:			
Project Name: 331-337 W. Main St Rochester	Project #:			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Wwater, Sesolid, Oowaste/oil, BT=Tissue, Aair)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260 TCL List	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
60N40E@5.5-9'	2/13/20	0935	G	Soil	N	N	X	1	
60N40E@10-11'	2/13/20	0937	G	Solid	N	N	X		
100N55E 7-7.5'	2/13/20	0947	G	Solid	N	N	X		
110N20E@10-10.5'	2/13/20	1207	G	Solid	N	N	X		
90N10E@6-6.5'	2/13/20	1220	G	Solid	N	N	X		

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological	☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify)	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	2/14/20 1400	Arcadis	[signature]	2/14/20 1400	TAS
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.4 #1 ICE

Ver: 09/28/2016

Comments
No additional comments.

Receipt
The samples were received on 2/14/2020 8:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.4° C.

GC/MS VOA
Method 8260C: The continuing calibration verification (CCV) associated with batch 480-517782 recovered above the upper control limit for 2-Butanone (MEK), Dibromochloromethane, Chloromethane, Bromodichloromethane, Dichlorodifluoromethane, Trichlorofluoromethane and Vinyl chloride. The sample(s) associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: 40N40E 13 (480-166399-1), 10N36E 7 (480-166399-2), 40N50E 12 (480-166399-3), 25N50E 8.5 (480-166399-5), 70N20E 12-12.5 (480-166399-7), 80N35E 4-5 (480-166399-8), FD-200212-2 (480-166399-10) and 110N20E 10-10.5 (480-166399-15).

Method 8260C: The laboratory control sample (LCS) for preparation batch 480-517852 and analytical batch 480-517782 recovered outside control limits for the following analyte: Dichlorodifluoromethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported. The following samples are impacted: 40N40E 13 (480-166399-1), 10N36E 7 (480-166399-2), 40N50E 12 (480-166399-3), 25N50E 8.5 (480-166399-5), 70N20E 12-12.5 (480-166399-7), 80N35E 4-5 (480-166399-8), FD-200212-2 (480-166399-10) and 110N20E 10-10.5 (480-166399-15).

Method 8260C: The continuing calibration verification (CCVIS) associated with batch 480-517962 recovered above the upper control limit for Carbon tetrachloride, Chloromethane, Dichlorodifluoromethane, Trichlorofluoromethane and Vinyl chloride. The samples associated with this CCVIS were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: 90N50E 5 (480-166399-4), 42N20E 11.5-12.3 (480-166399-6) and 110N20E 10-10.5 (480-166399-15).

Method 8260C: The laboratory control sample (LCS) for preparation batch 480-517933 and analytical batch 480-517962 recovered outside control limits for the following analyte: Dichlorodifluoromethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported. The following samples are impacted: 90N50E 5 (480-166399-4), 42N20E 11.5-12.3 (480-166399-6) and 110N20E 10-10.5 (480-166399-15).

Method 8260C: The following sample was analyzed at a reduced weight to bring the concentration of target analytes within the calibration range: 110N20E 10-10.5 (480-166399-15). Elevated reporting limits (RLs) are provided.

Method 8260C: The continuing calibration verification (CCVIS) associated with batch 480-517985 recovered above the upper control limit for 1,1,1-Trichloroethane, Carbon tetrachloride, Dibromochloromethane, Bromodichloromethane, Dichlorodifluoromethane and Trichlorofluoromethane. The samples associated with this CCVIS were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: 100N35E 7-7.5 (480-166399-14) and 90N16E 6-6.5 (480-166399-16).

Method 8260C: The laboratory control sample (LCS) for batch 480-517985 exceeded control limits for the following analyte: 2-Butanone. Unlike the calibration standards, this is due to the co-elution with Ethyl Acetate in the spiking solution. This does not indicate a performance issue with the spike recovery, but rather the laboratory's ability to measure the two analytes together in a combined spiking solution. Through the use of spectral analysis, the two compounds can be distinguished from one another if present in a client sample. The following samples were affected : 100N35E 7-7.5 (480-166399-14) and 90N16E 6-6.5 (480-166399-16).

Method 8260C: The laboratory control sample (LCS) for preparation batch 480-518004 and analytical batch 480-517985 recovered outside control limits for the following analytes: 1,2-Dibromo-3-Chloropropane, Dichlorodifluoromethane, Bromodichloromethane, Dibromochloromethane and cis-1,3-Dichloropropene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported. The following samples are impacted: 100N35E 7-7.5 (480-166399-14) and 90N16E 6-6.5 (480-166399-16).

Method 8260C: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 480-518004 and analytical batch 480-517985 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. The following samples were affected: (480-166399-A-16-C MS) and (480-166399-A-16-D MSD).

Method 8260C: The continuing calibration verification (CCV) associated with batch 480-518170 recovered outside acceptance criteria, low biased, for 1,2-Dichloroethane. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method 8260C: The following samples were analyzed using medium level soil analysis and diluted to bring the concentration of target analytes within the calibration range: 80N35E 9 (480-166399-9), 80N35E 11-12 (480-166399-11), 60N40E 8.5-9 (480-166399-12) and 60N40E 10-11 (480-166399-13). Elevated reporting limits (RLs) are provided.

Method 8260C: The following samples were analyzed using medium level soil analysis to bring the concentration of target analytes within the calibration range: 25N50E 8.5 (480-166399-5) and 70N20E 12-12.5 (480-166399-7). Elevated reporting limits (RLs) are provided.

Method 8260C: The following sample were analyzed using medium level soil analysis and diluted to bring the concentration of target analytes within the calibration range: 80N35E 4-5 (480-166399-8) and FD-200212-2 (480-166399-10). Elevated reporting limits (RLs) are provided.

Method 8260C: The following samples were diluted due to the nature of the sample matrix: (480-166399-A-8-C MS) and (480-166399-A-8-D MSD). Because of this dilution, the surrogate spike and matrix spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method 8260C: The following samples were analyzed using medium level soil analysis and diluted to bring the concentration of target analytes within the calibration range: (480-166399-A-8-C MS) and (480-166399-A-8-D MSD). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270D: The following samples were diluted due to color and appearance: 80N35E 4-5 (480-166399-8) and FD-200212-2 (480-166399-10). Elevated reporting limits (RL) are provided.

Method 8270D: The continuing calibration verification (CCV) associated with batch 480-518402 recovered outside acceptance criteria, low biased, for Benzaldehyde. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method 8270D: The following samples were diluted due to the nature of the sample matrix: 80N35E 4-5 (480-166399-8) and FD-200212-2 (480-166399-10). As such, surrogate recoveries are below the calibration range or are not reported, and elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method 8081B: The following samples were diluted due to the nature of the sample matrix: 80N35E 4-5 (480-166399-8) and FD-200212-2 (480-166399-10). As such, surrogate recoveries are below the calibration range, estimated and not representative. Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6010C: The Low Level Continuing Calibration Verification, (CCVL 480-518189/21) associated with batch 480-518189, contained Total Aluminium above the upper quality control limit. The associated samples were either ND for the affected analyte or contained this analyte at a concentration greater than 10X the value found in the CCVL; therefore, re-analysis of samples (LCDSRM 480-517906/3-A), (LCSSRM 480-517906/2-A) and (MB 480-517906/1-A) was not performed.

Method 6010C: The method blank for preparation batch 480-517906 and analytical batch 480-518189 contained Total Manganese above the reporting limit (RL). Associated samples 80N35E 4-5 (480-166399-8) and FD-200212-2 (480-166399-10) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
Method 9012B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for 518240 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3550C: Due to the matrix, the following samples could not be concentrated to the final method required volume: 80N35E 4-5 (480-166399-8) and FD-200212-2 (480-166399-10). The reporting limits (RLs) are elevated proportionately.

Method 3550C: Elevated reporting limits are provided for the following sample due to insufficient sample provided for preparation: FD-200212-2 (480-166399-10).

Method 3550C: The following samples required a Florisil clean-up, via 3620C, to reduce matrix interferences: 80N35E 4-5 (480-166399-8) and FD-200212-2 (480-166399-10).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

FORM V
GC/MS VOA INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Lab File ID: N1823.D BFB Injection Date: 02/19/2020

Instrument ID: HP5973N BFB Injection Time: 08:27

Analysis Batch No.: 518170

M/E	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15.0 - 40.0 % of mass 95	25.5	
75	30.0 - 60.0 % of mass 95	49.0	
95	Base Peak, 100% relative abundance	100.0	
96	5.0 - 9.0 % of mass 95	6.4	
173	Less than 2.0 % of mass 174	0.0	(0.0) 1
174	50.0 - 120.00 % of mass 95	94.5	
175	5.0 - 9.0 % of mass 174	7.3	(7.7) 1
176	95.0 - 101.0 % of mass 174	91.3	(96.7) 1
177	5.0 - 9.0 % of mass 176	5.3	(5.8) 2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS AND STANDARDS:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
	CCVIS 480-518170/3	N1824.D	02/19/2020	08:57
80N35E 9	480-166399-9	N1828.D	02/19/2020	10:52
80N35E 11-12	480-166399-11	N1829.D	02/19/2020	11:16
60N40E 8.5-9	480-166399-12	N1830.D	02/19/2020	11:39
60N40E 10-11	480-166399-13	N1831.D	02/19/2020	12:03

FORM VII
GC/MS VOA CONTINUING CALIBRATION DATA

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Lab Sample ID: CCVIS 480-518170/3 Calibration Date: 02/19/2020 08:57

Instrument ID: HP5973N Calib Start Date: 01/20/2020 17:59

GC Column: ZB-624 (20) ID: 0.18(mm) Calib End Date: 01/20/2020 20:49

Lab File ID: N1824.D Conc. Units: ug/L Heated Purge: (Y/N) N

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Dichlorodifluoromethane	Ave	1.330	1.419	0.1000	26.7	25.0	6.7	50.0
Chloromethane	Ave	2.272	2.088	0.1000	23.0	25.0	-8.1	20.0
Butadiene	Ave	2.164	1.828		21.1	25.0	-15.6	20.0
Vinyl chloride	Ave	1.729	1.506	0.1000	21.8	25.0	-12.9	20.0
Bromomethane	Ave	1.056	0.8578	0.1000	20.3	25.0	-18.8	50.0
Chloroethane	Ave	1.128	0.8826	0.1000	19.6	25.0	-21.7	50.0
Dichlorofluoromethane	Ave	2.507	1.884		18.8	25.0	-24.9*	20.0
Trichlorofluoromethane	Ave	2.178	1.776	0.1000	20.4	25.0	-18.5	20.0
Ethyl ether	Ave	1.561	1.502		24.1	25.0	-3.8	20.0
Acrolein	Ave	0.4288	0.2475		72.1	125	-42.3	50.0
1,1,2-Trichloro-1,2,2-trifluoroethane	Ave	1.179	1.077	0.1000	22.9	25.0	-8.6	20.0
1,1-Dichloroethene	Ave	1.190	1.049	0.1000	22.0	25.0	-11.9	20.0
Acetone	Ave	0.6547	0.6313	0.1000	121	125	-3.6	50.0
Iodomethane	Ave	2.373	1.888		19.9	25.0	-20.4*	20.0
Carbon disulfide	Ave	4.145	3.426	0.1000	20.7	25.0	-17.3	20.0
Allyl chloride	Ave	3.349	2.800		20.9	25.0	-16.4	20.0
Methyl acetate	Ave	1.761	1.737	0.1000	49.3	50.0	-1.3	50.0
Methylene Chloride	Lin1		1.259	0.1000	22.2	25.0	-11.3	20.0
2-Methyl-2-propanol	Ave	0.1625	0.1828		281	250	12.5	50.0
Methyl tert-butyl ether	Ave	3.933	3.409	0.1000	21.7	25.0	-13.3	20.0
trans-1,2-Dichloroethene	Ave	1.425	1.185	0.1000	20.8	25.0	-16.8	20.0
Acrylonitrile	Ave	0.8163	0.8713		267	250	6.7	20.0
Hexane	Ave	2.467	2.570		26.0	25.0	4.1	20.0
1,1-Dichloroethane	Ave	2.987	2.508	0.2000	21.0	25.0	-16.0	20.0
Vinyl acetate	Ave	4.677	4.218		45.1	50.0	-9.8	20.0
2,2-Dichloropropane	Ave	1.517	1.070		17.6	25.0	-29.4*	20.0
cis-1,2-Dichloroethene	Ave	1.475	1.359	0.1000	23.0	25.0	-7.9	20.0
2-Butanone (MEK)	Ave	1.049	1.077	0.1000	128	125	2.7	20.0
Chlorobromomethane	Ave	0.7846	0.6858		21.9	25.0	-12.6	20.0
Tetrahydrofuran	Ave	0.7047	0.7089		50.3	50.0	0.6	20.0
Chloroform	Ave	2.527	2.104	0.2000	20.8	25.0	-16.7	20.0
1,1,1-Trichloroethane	Ave	2.137	1.734	0.1000	20.3	25.0	-18.9	20.0
Cyclohexane	Ave	2.996	2.895	0.1000	24.2	25.0	-3.3	20.0
Carbon tetrachloride	Ave	1.821	1.588	0.1000	21.8	25.0	-12.8	20.0
1,1-Dichloropropene	Ave	1.805	1.660		23.0	25.0	-8.1	20.0
Benzene	Ave	5.319	4.936	0.5000	23.2	25.0	-7.2	20.0
Isobutyl alcohol	Ave	0.0774	0.0877		709	625	13.4	50.0
1,2-Dichloroethane	Ave	2.560	2.034	0.1000	19.9	25.0	-20.5*	20.0
n-Heptane	Ave	2.678	2.786		26.0	25.0	4.0	20.0
Trichloroethene	Ave	1.409	1.257	0.2000	22.3	25.0	-10.8	20.0

FORM IV
PESTICIDES METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Lab Sample ID: MB 480-518289/1-A

Matrix: Solid Date Extracted: 02/19/2020 15:12

Lab File ID:(1) 25_31-089.D Lab File ID:(2) 25_31-089.D

Date Analyzed:(1) 02/20/2020 10:37 Date Analyzed:(2) 02/20/2020 10:37

Instrument ID:(1) HP6890-25 Instrument ID:(2) HP6890-25

GC Column:(1) RTX-CLPI ID: 0.53(mm) GC Column:(2) RTX-CLPII ID: 0.53(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	DATE ANALYZED 1	DATE ANALYZED 2
	LCS 480-518289/2-A	02/20/2020 10:57	02/20/2020 10:57
80N35E 4-5	480-166399-8	02/20/2020 13:53	02/20/2020 13:53
FD-200212-2	480-166399-10	02/20/2020 14:12	02/20/2020 14:12

FORM I
PESTICIDES ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 480-518289/1-A

Matrix: Solid Lab File ID: 25_31-089.D

Analysis Method: 8081B Date Collected:

Extraction Method: 3550C Date Extracted: 02/19/2020 15:12

Sample wt/vol: 30.40(g) Date Analyzed: 02/20/2020 10:37

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 1(uL) GC Column: RTX-CLPI ID: 0.53(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 518337 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
72-54-8	4,4'-DDD	ND		1.6	0.32
72-55-9	4,4'-DDE	ND		1.6	0.35
50-29-3	4,4'-DDT	ND		1.6	0.38
309-00-2	Aldrin	ND		1.6	0.40
319-84-6	alpha-BHC	ND		1.6	0.30
5103-71-9	cis-Chlordane	ND		1.6	0.82
319-85-7	beta-BHC	0.850	J	1.6	0.30
319-86-8	delta-BHC	ND		1.6	0.31
60-57-1	Dieldrin	ND		1.6	0.39
959-98-8	Endosulfan I	ND		1.6	0.32
33213-65-9	Endosulfan II	ND		1.6	0.30
1031-07-8	Endosulfan sulfate	ND		1.6	0.31
72-20-8	Endrin	ND		1.6	0.33
7421-93-4	Endrin aldehyde	0.628	J	1.6	0.42
53494-70-5	Endrin ketone	0.623	J	1.6	0.40
58-89-9	gamma-BHC (Lindane)	ND		1.6	0.30
5103-74-2	trans-Chlordane	ND		1.6	0.52
76-44-8	Heptachlor	ND		1.6	0.36
1024-57-3	Heptachlor epoxide	ND		1.6	0.42
72-43-5	Methoxychlor	ND		1.6	0.34
8001-35-2	Toxaphene	ND		16	9.6

CAS NO.	SURROGATE	%REC	Q	LIMITS
2051-24-3	DCB Decachlorobiphenyl	100		45-120
877-09-8	Tetrachloro-m-xylene	75		30-124

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: 80N35E 4-5 Lab Sample ID: 480-166399-8

Instrument ID (1): HP6890-25 Instrument ID (2): HP6890-25

Date Analyzed (1): 02/20/2020 13:53 Date Analyzed (2): 02/20/2020 13:53

GC Column (1): RTX-CLPI ID: 0.53(mm) GC Column (2): RTX-CLPII ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
alpha-BHC	1		3.05	3.04	3.10	7.8		17.3
	2		3.58	3.56	3.62	9.3		
delta-BHC	1		3.55	3.54	3.60	7.5		54.2
	2		4.34	4.31	4.37	13		
4,4'-DDT	1		5.89	5.86	5.92	36		32.5
	2		6.87	6.81	6.87	26		
Endrin aldehyde	1		6.21	6.17	6.23	9.6		80.4
	2		6.99	6.97	7.03	22		
Endrin ketone	1		6.91	6.90	6.96	42		60.9
	2		7.85	7.81	7.87	78		

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-166399-1

SDG No.:

Client Sample ID: FD-200212-2 Lab Sample ID: 480-166399-10

Instrument ID (1): HP6890-25 Instrument ID (2): HP6890-25

Date Analyzed (1): 02/20/2020 14:12 Date Analyzed (2): 02/20/2020 14:12

GC Column (1): RTX-CLPI ID: 0.53(mm) GC Column (2): RTX-CLPII ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
alpha-BHC	1		3.05	3.04	3.10	16		14.1
	2		3.58	3.56	3.62	18		
gamma-BHC (Lindane)	1		3.31	3.30	3.36	16		124.4
	2		3.93	3.92	3.98	69		
4,4'-DDT	1		5.89	5.86	5.92	69		19.5
	2		6.87	6.81	6.87	57		
Endrin aldehyde	1		6.21	6.17	6.23	24		75.9
	2		6.99	6.97	7.03	52		
Endrin ketone	1		6.91	6.90	6.96	110		55.7
	2		7.85	7.81	7.87	190		

Chain of Custody Record 422547

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ddress:

Regulatory Program: ☐ DW ☐ NPDES ☒ RCRA ☐ Other:

TAL-8210

Client Contact	Project Manager: George Kosluk	Site Contact:	Date:	COC No:
mpany Name: Aecom	Tel/Email: george.kosluk@aecom.com	Lab Contact:	Carrier:	of COCs
dress: 257 W. Genesee St # 400	Analysis Turnaround Time			Sampler:
y/State/Zip: Buffalo NY 14202	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
one: (716) 856-4506	TAT if different from Below			Walk-in Client:
x:	☐ 2 weeks			Lab Sampling:
oject Name: Artco Industrial Complex	☐ 1 week			
e: 331-337 W. Main St Rehst. # 828102	☐ 2 days			Job / SDG No.:
O #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	PFAS EPA 537	Sample Specific Notes:
MW-145 10'-11'	4/16/20	1125	G	Soil	1	N	N	X	Limited Volume
MW-130B 7.5'-8.5'	4/15/20	1229	G	Soil	1	N	N	X	
FD-20200416-1	4/16/20	1200	G	Soil	1	N	N	X	
Equipment Rinse Blank	4/15/20	1500	G	Water	1	N	N	X	

480-169159 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☒ Disposal by Lab ☐ Archive for Months

Special Instructions/QC Requirements & Comments:
Lab Contact: Orlette S Johnson 484-685-0864 #1 ICE

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: 4.7	Corr'd:	Therm ID No.: #1

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Aecom	4/23/20		FAB	4/24/20 0810
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

05/04/2020

Job Narrative
480-169159-1

Comments
No additional comments.

Receipt
The samples were received on 4/24/2020 8:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.7° C.

LCMS
Method 537 (modified): The method blank for preparation batch 320-375563 contained Perfluorooctanesulfonic acid (PFOS) above the reporting limit (RL). All the sample results associated with this method blank were less the RL for PFOS; therefore, re-extraction and/or re-analysis of samples were not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
Method Moisture: The reference method does not list a specific holding time for this procedure; therefore, the laboratory defaults to an in-house holding time of 14 days. The following sample in analytical batch 320-375708 was prepared and/or analyzed outside this time period. MW-13OB 7.5-8.5 (480-169159-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep
Method 3535: Insufficient sample volume was available to perform a matrix spike and matrix spike duplicate (MS/MSD) associated with: preparation batch 320-375580.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-169159-1

SDG No.:

Lab File ID: 2020.05.02_A9_PFC_B_017.d Lab Sample ID: MB 320-375563/1-A

Matrix: Solid Date Extracted: 04/29/2020 18:36

Instrument ID: A9 Date Analyzed: 05/03/2020 21:50

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 320-375563/2-A	2020.05.02_A9_PFC_B_018.d	05/03/2020 22:00
MW-14S 10-11	480-169159-1	2020.05.02_A9_PFC_B_019.d	05/03/2020 22:09
MW-14S 10-11 MS	480-169159-1 MS	2020.05.02_A9_PFC_B_020.d	05/03/2020 22:18
MW-14S 10-11 MSD	480-169159-1 MSD	2020.05.02_A9_PFC_B_021.d	05/03/2020 22:28
MW-13OB 7.5-8.5	480-169159-2	2020.05.02_A9_PFC_B_022.d	05/03/2020 22:37
FD-20200416-1	480-169159-3	2020.05.02_A9_PFC_B_023.d	05/03/2020 22:46

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Sacramento Job No.: 480-169159-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 320-375563/1-A

Matrix: Solid Lab File ID: 2020.05.02_A9_PFC_B_017.d

Analysis Method: 537 (modified) Date Collected:

Extraction Method: SHAKE Date Extracted: 04/29/2020 18:36

Sample wt/vol: 5.00(g) Date Analyzed: 05/03/2020 21:50

Con. Extract Vol.: 10(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Acquity ID: 2.1(mm)

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 376161 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	0.130	J	0.20	0.028
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		0.20	0.077
307-24-4	Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029
335-67-1	Perfluorooctanoic acid (PFOA)	0.103	J	0.20	0.086
375-95-1	Perfluorononanoic acid (PFNA)	ND		0.20	0.036
335-76-2	Perfluorodecanoic acid (PFDA)	ND		0.20	0.022
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		0.20	0.035
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	0.722		0.50	0.20
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		0.20	0.039
754-91-6	Perfluorooctanesulfonamide (FOSA)	ND		0.20	0.082
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37
27619-97-2	6:2 FTS	ND		2.0	0.15
39108-34-4	8:2 FTS	ND		2.0	0.25

Chain of Custody Record 422546

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Address:

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TAL-8210

Client Contact	Project Manager: George Kistuk	Site Contact:	Date:	COC No:
Company Name: Arcom	Tel/Email: george.kistuk@arcom.com	Lab Contact: Odette Johnson	Carrier:	1 of 1 COCs
Address: 257 W. Genesee St # 400	Analysis Turnaround Time			Sampler:
City/State/Zip: Buffalo NY, 14202	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (716) 856-4506	TAT if different from Below ____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name: Arrow Industrial Boundaries	☐ 1 week			
Site: 828107	☐ 2 days			Job / SDG No.:
PO #	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	TCL VOCs, 10 TICs, 8260C	TCL SVOCs, 1,4-Dioxane	+ 20 TICs, 8270D	TCL Pest, 8081A	TCL PCBs, 8082A	TAL Metals, 6010C	TAL Mercury, 7471A	Cyanide, 9012A	Sample Specific Notes
MW-130B 7.5'-8.5'	4/15/20	1229	G	Soil	1	N	N	X								
MW-14S 8.5'-9.0'	4/16/20	1116	G	Soil	1	N	N	X								
MW-14S 10'-11'	4/16/20	1125	G	Soil	2	N	N	X	X	X	X	X	X	X	X	Limited Volume
MW-14I 8'-8.5'	4/16/20	1320	G	Soil	1	N	N	X								
MW-13I 7'-7.5'	4/20/20	0857	G	Soil	1	N	N	X								
MW-13S 7.5'-8.5'	4/20/20	1345	G	Soil	1	N	N	X								

480-169150 Chain of Custody

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other ____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☒ Disposal by Lab ☐ Archive for ____ Months

Special Instructions/QC Requirements & Comments: Lab Contact: Odette S. Johnson 484-685-0804

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temp. (°C): Obs'd: 1.7	Corr'd:	Therm ID No.: #1 ICE

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcom	4/24/20		TAB	4/24/20 0810
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Job Narrative
480-169160-1

Comments
No additional comments.

Receipt
The samples were received on 4/24/2020 8:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.7° C.

GC/MS VOA
Method 8260C: The following samples were analyzed using medium level soil analysis and diluted to bring the concentration of target analytes within the calibration range: MW-14S 8.5-9.0 (480-169160-2), MW-14S 10-11 (480-169160-3) and MW-13I 7-7.5 (480-169160-5). Elevated reporting limits (RLs) are provided.

Method 8260C: The following samples were analyzed using medium level soil analysis to bring the concentration of target analytes within the calibration range: MW-13OB 7.5-8.5 (480-169160-1), MW-14I 8-8.5 (480-169160-4), MW-13S 7.5-8.5 (480-169160-6), (480-169160-A-6-B MS) and (480-169160-A-6-C MSD). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270D: Six surrogates are used for this analysis. The laboratory's SOP allows one acid and one base of these surrogates to be outside acceptance criteria without performing re-extraction/re-analysis. The following sample contained an allowable number of surrogate compounds outside limits: MW-14S 10-11 (480-169160-3). These results have been reported and qualified.

Method 8270D: The continuing calibration verification (CCV) associated with batch 480-529092 recovered above the upper control limit for Pentachlorophenol. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated sample is impacted: MW-14S 10-11 (480-169160-3).

Method 8270D: The continuing calibration verification (CCV) associated with batch 480-529092 recovered outside acceptance criteria, low biased, for Hexachlorocyclopentadiene. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method 8270D: The laboratory control sample (LCS) for preparation batch 480-528864 and analytical batch 480-529092 recovered outside control limits for the following analytes: Pentachlorophenol. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method 8270D: The following compound has been spiked at a level above the upper range of the initial calibration: Benzaldehyde. The laboratory control sample (LCS) and/or laboratory control sample duplicate (LCSD) associated with preparation batch 480-528864 and analytical batch 480-529092 recovered within acceptable limits for this analyte and has been qualified with an "E" flag.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method 8081B: The following sample was diluted due to the nature of the sample matrix: MW-14S 10-11 (480-169160-3). As such, surrogate recoveries are below the calibration range, estimated and not representative. Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
Method 6010C: The interference check standard solution (ICSA) associated with the following samples showed results for Barium at a level greater than 2 times the limit of detection (LOD). It is believed that the solution contains trace impurities of this element / these elements and the results are not due to matrix interference. These results are consistent with those found by the manufacturer of the ICSA solution. MW-14S 10-11 (480-169160-3), (LCSSRM 480-528817/2-A) and (MB 480-528817/1-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 3550C: The following sample required a Florisil clean-up, via EPA Method 3620C, to reduce matrix interferences: MW-14S 10-11 (480-169160-3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

FORM IV
GC/MS VOA METHOD BLANK SUMMARY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Lab File ID: S6721.D Lab Sample ID: MB 480-528498/2-A

Matrix: Solid Heated Purge:(Y/N) N

Instrument ID: HP5973S Date Analyzed: 04/29/2020 10:26

GC Column: ZB-624 (20) ID: 0.18(mm)

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 480-528498/1-A	S6718.D	04/29/2020 09:06
MW-13OB 7.5-8.5	480-169160-1	S6733.D	04/29/2020 15:14
MW-14S 8.5-9.0	480-169160-2	S6734.D	04/29/2020 15:37
MW-14S 10-11	480-169160-3	S6735.D	04/29/2020 16:00
MW-14I 8-8.5	480-169160-4	S6736.D	04/29/2020 16:23
MW-13I 7-7.5	480-169160-5	S6737.D	04/29/2020 16:46
MW-13S 7.5-8.5	480-169160-6	S6738.D	04/29/2020 17:09
MW-13S 7.5-8.5 MS	480-169160-6 MS	S6739.D	04/29/2020 17:31
MW-13S 7.5-8.5 MSD	480-169160-6 MSD	S6740.D	04/29/2020 17:54

FORM I
GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 480-528498/2-A

Matrix: Solid Lab File ID: S6721.D

Analysis Method: 8260C Date Collected:

Sample wt/vol: 5(g) Date Analyzed: 04/29/2020 10:26

Soil Aliquot Vol: 100 (uL) Dilution Factor: 1

Soil Extract Vol.: 10(mL) GC Column: ZB-624 (20) ID: 0.18(mm)

% Moisture: Level: (low/med) Medium

Analysis Batch No.: 528615 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
79-20-9	Methyl acetate	ND		500	48
1634-04-4	Methyl tert-butyl ether	ND		100	38
108-87-2	Methylcyclohexane	ND		100	47
75-09-2	Methylene Chloride	55.6	J	100	20
100-42-5	Styrene	ND		100	24
127-18-4	Tetrachloroethene	ND		100	13
108-88-3	Toluene	ND		100	27
156-60-5	trans-1,2-Dichloroethene	ND		100	24
10061-02-6	trans-1,3-Dichloropropene	ND		100	9.8
79-01-6	Trichloroethene	ND		100	28
75-69-4	Trichlorofluoromethane	ND		100	47
75-01-4	Vinyl chloride	ND		100	34
1330-20-7	Xylenes, Total	ND		200	55

CAS NO.	SURROGATE	%REC	Q	LIMITS
17060-07-0	1,2-Dichloroethane-d4 (Surr)	91		53-146
460-00-4	4-Bromofluorobenzene (Surr)	106		49-148
1868-53-7	Dibromofluoromethane (Surr)	94		60-140
2037-26-5	Toluene-d8 (Surr)	102		50-149

FORM X
IDENTIFICATION SUMMARY

Lab Name: Eurofins TestAmerica, Buffalo Job No.: 480-169160-1

SDG No.:

Client Sample ID: MW-14S 10-11 Lab Sample ID: 480-169160-3

Instrument ID (1): HP6890-5 Instrument ID (2): HP6890-5

Date Analyzed (1): 04/30/2020 12:03 Date Analyzed (2): 04/30/2020 12:03

GC Column (1): RTX-CLPI ID: 0.53(mm) GC Column (2): RTX-CLPII ID: 0.53(mm)

ANALYTE	COL	PEAK	RT	RT WINDOW		CONCENTRATION		RPD
				FROM	TO	PEAK	MEAN	
4,4'-DDT	1		5.34	5.32	5.38	7.1		22.7
	2		6.58	6.54	6.60	5.7		
Endrin aldehyde	1		5.62	5.60	5.66	27		11.8
	2		6.70	6.68	6.74	24		
Methoxychlor	1		5.89	5.83	5.89	17		29.4
	2		7.26	7.23	7.29	22		
Endrin ketone	1		6.37	6.32	6.38	13		97.2
	2		7.56	7.52	7.58	4.4		

DATA USABILITY SUMMARY REPORT

For

331-337 W. Main St Rochester
WATER SAMPLES

VOA, SVOA, PESTICIDE, PCB, METALS, PFAS MERCURY &CYANIDE
SDG No. J180889

Sampling Date: February 3-4, 2021

Submitted to:

AECOM
257 West Genesee Street
Suite 400
Buffalo, New York, USA
716-856-5636

Prepared by:

Environmental Occupational & Public Health Consultants Inc. (EOPHC)
Environmental Data Validation Inc. (EDV, Inc.)
1326 Orangewood Ave
Pittsburgh, PA 15216
(412) 341-5281

Site: 331-337 W. Main St Rochester
Client: AECOM
Laboratory: Eurofins TestAmerica

SDG #: J180889
Date: April 20, 2021
Reviewer: L. Wright

Sample Identification Table

Client Sample ID	Laboratory ID	Matrix	VOC	SVOC/ SVOC-SIM	Pest/ PCB	Metals/ Mercury	PFAS	Cyanide
MN-11S	480-180889-1	Aqueous	X					
FD-20210203-2	480-180889-2	Aqueous	X					
MN-11I	480-180889-3	Aqueous	X					
MN-12S	480-180889-4	Aqueous	X					
FD-20210203-1	480-180889-5	Aqueous	X					
MN-12I	480-180889-6	Aqueous	X					
MW-11	480-180889-7	Aqueous	X					
MW-2	480-180889-8	Aqueous	X					
BMW-104I	480-180889-9	Aqueous	X					
BMW-104S	480-180889-10	Aqueous	X					
MW-13	480-180889-11	Aqueous	X	X	X	X	X	X
MN-05S	480-180889-12	Aqueous	X	X	X	X	X	X
FD-20210204-1	480-180889-13	Aqueous	X	X	X	X	X	X
MN-060B	480-180889-14	Aqueous	X					
MN-06S	480-180889-15	Aqueous	X	X*			X	X
MN-06I	480-180889-16	Aqueous	X					
MN-06D	480-180889-17	Aqueous	X					
AB-20210204	480-180889-18	Aqueous					X	
EB-20210204	480-180889-19	Aqueous					X	
TRIP BLANK	480-180889-20	Aqueous	X					

*SVOA-SIM only

The data packages contained twenty (20) aqueous samples, which included two (2) field blank, and one (1) trip blank sample. The samples were analyzed via Method SW-846 8260C, 8260D SIM, 8270D, 8082A, 8081B, 6010D/6020B, 7470A/7471B, 9010C/9012B, and USEPA Methods 537 and 537.1. The adherence of laboratory analytical performance to these methods' analytical specifications was evaluated during the data validation process. The data package was evaluated for its usability as defined by the Guidance for the Development of Data Usability Summary Reports (DER-10, 11/09). USEPA Region II standard operating procedures were used as guidance documents. According to the NYSDEC Guidance for the Development of Data Usability Summary Reports, the following QC data were evaluated: blanks, instrument tunings, calibration standards, calibration verifications, laboratory controls, surrogate recoveries, spike recoveries, and sample data. All QC data were within quality control limits, except the following issues:

Cover letter, Narrative and Data Reporting Forms (Form 1s): The deficiencies noted in the case narrative that affect data usability have been discussed in applicable sections. Data that have no impact on data usability are not discussed.

Chain of Custody (COC): All samples were present.

Preservation: Preservation was acceptable.

Holding Time: Holding times were within acceptable criteria for all samples.

Blanks Quality Control: The following samples were qualified based on blank contamination;

Pesticide

Sample ID	Compound	Qualifier
FD-20210204-1	delta-BHC	U

Calibration Quality Control: The following were qualified due to calibration issues;

SVOA

Sample ID	Compound	Qualifier
480-180889-11 480-180889-12 480-180889-13	2,4,6-Trichlorophenol 4-Chloro-3-methylphenol 4-Nitrophenol Carbazole Pentachlorophenol	UJ

SVOA-SIM

Sample ID	Compound	Qualifier
480-180889-11 480-180889-12 480-180889-13	1,4-Dioxane	J
480-180889-15	1,4-Dioxane	UJ

Laboratory Control Sample (LCS): The recoveries were acceptable.

Surrogates: The recoveries were acceptable.

Internal Standards: All results were acceptable.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD): All the results were acceptable.

Field Duplicate: RPDs are calculated when both parent and duplicate sample report detects. The following RPDs were calculated;

Compound	Sample ID Conc. (µg/L) MN-11S	Duplicate ID Conc. (µg/L) FD - 20210203-2	RPD
1,1-Dichloroethane	4.3	4.3	0%
cis-1,2-Dichloroethene	16	17	-6%
Methyl tert-butyl ether	2.1	2.3	-9%
Tetrachloroethene	1.1	1.1	0%
Trichloroethene	0.7	0.65	7%
Vinyl chloride	8.2	8.1	1%
1,4-Dioxane	0.91	0.9	1%
Perfluorobutanoic acid (PFBA)	12	12	0%
Perfluoropentanoic acid (PFPeA)	6.1	5.9	3%
Perfluorohexanoic acid (PFHxA)	3.1	3	3%
Perfluoroheptanoic acid (PFHpA)	0.55	0.5	10%
Perfluorobutanesulfonic acid (PFBS)	0.43	0.39	10%
Barium	0.068	0.069	-1%
Calcium	162	164	-1%
Iron	1.4	1.4	0%
Magnesium	51.3	51.8	-1%
Manganese	0.13	0.13	0%
Potassium	10.6	10.7	-1%
Sodium	127	127	0%
Cyanide, Total	0.0078	0.0065	18%

Compound Quantitation: The following was qualified due to deficiency;

The compound, PFOS, was flagged with the "J" qualifier for an estimated concentration. The identification of this compound is qualitative, and from a quantitative standpoint, the concentration, estimated.

PFOS

Sample Identification	Compound	Qualifier
480-180889-11	PFOS	J

Tentatively Identified Compounds: The following was qualified due to TIC issues. Tetrachloroethene and Trichloroethene were identified as TIC in the semi-volatile portion of the analysis for one sample. These volatile target analytes. They are being rejected "R" as TICs.

Sample Identification	Compound	Qualifier
480-180889-11	Tetrachloroethene and Trichloroethene	R

Additional Comments: Some Form 1s and case narratives are reporting criteria out of QC limits. If data were impacted due to the deficiency, it is discussed in the DUSR, and appropriate qualifier(s) applied.

Therefore, all discussions in the DUSR relate to all conditions that affected data usability. When there are multiple analyses, the validator presents the best run (Attachment A).

Data usability: Data qualified with the "UJ" qualifier are to be used cautiously as they are estimated data with some quality control issues. Data qualified with the "J" qualifier are to be used cautiously as they are estimated data with some quality control issues. Data qualified with the "R" qualifier are not usable due to severe quality control issues. Data qualified with the "U" qualifier are usable at the reporting limit.

ATTACHMENT A

FORM 1s

Client Sample ID: MN - 11S
Date Collected: 02/03/21 11:02
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 12:37	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 12:37	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 12:37	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 12:37	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 12:37	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 12:37	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 12:37	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 12:37	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 12:37	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 12:37	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 12:37	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 12:37	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 12:37	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 12:37	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 12:37	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 12:37	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 12:37	1
Acetone	ND		10	3.0	ug/L			02/06/21 12:37	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 12:37	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 12:37	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 12:37	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 12:37	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 12:37	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 12:37	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 12:37	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 12:37	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 12:37	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 12:37	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/06/21 12:37	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 12:37	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 12:37	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 12:37	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 12:37	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 12:37	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 12:37	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 12:37	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/06/21 12:37	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 12:37	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 12:37	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 12:37	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/06/21 12:37	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 12:37	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 12:37	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 12:37	1
Trichloroethene	ND		1.0	0.46	ug/L			02/06/21 12:37	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 12:37	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 12:37	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 12:37	1

Client Sample ID: MN - 11S — Lab Sample ID: 480-180889-1

Date Collected: 02/03/21 11:02 — **Matrix: Water**
Date Received: 02/04/21 18:25

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/06/21 12:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		77 - 120		02/06/21 12:37	1
4-Bromofluorobenzene (Surr)	100		73 - 120		02/06/21 12:37	1
Dibromofluoromethane (Surr)	102		75 - 123		02/06/21 12:37	1
Toluene-d8 (Surr)	103		80 - 120		02/06/21 12:37	1

Client Sample ID: FD - 20210203-2 — Lab Sample ID: 480-180889-2

Date Collected: 02/03/21 11:10 — **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 13:00	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 13:00	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 13:00	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 13:00	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 13:00	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 13:00	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 13:00	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 13:00	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 13:00	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 13:00	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 13:00	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 13:00	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 13:00	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 13:00	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 13:00	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 13:00	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 13:00	1
Acetone	ND		10	3.0	ug/L			02/06/21 13:00	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 13:00	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 13:00	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 13:00	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 13:00	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 13:00	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 13:00	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 13:00	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 13:00	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 13:00	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 13:00	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/06/21 13:00	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 13:00	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 13:00	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 13:00	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 13:00	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 13:00	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 13:00	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 13:00	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/06/21 13:00	1

Client Sample ID: FD - 20210203-2
Lab Sample ID: 480-180889-2

Date Collected: 02/03/21 11:10
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 13:00	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 13:00	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 13:00	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/06/21 13:00	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 13:00	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 13:00	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 13:00	1
Trichloroethene	ND		1.0	0.46	ug/L			02/06/21 13:00	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 13:00	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 13:00	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 13:00	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 13:00*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*77 - 120*		*02/06/21 13:00*	*1*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*02/06/21 13:00*	*1*
Dibromofluoromethane (Surr)	*103*		*75 - 123*		*02/06/21 13:00*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*02/06/21 13:00*	*1*

Client Sample ID: MN - 11I
Lab Sample ID: 480-180889-3

Date Collected: 02/03/21 11:49
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 13:23	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 13:23	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 13:23	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 13:23	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 13:23	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 13:23	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 13:23	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 13:23	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 13:23	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 13:23	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 13:23	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 13:23	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 13:23	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 13:23	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 13:23	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 13:23	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 13:23	1
Acetone	ND		10	3.0	ug/L			02/06/21 13:23	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 13:23	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 13:23	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 13:23	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 13:23	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 13:23	1

Client Sample ID: MN - 11I
Lab Sample ID: 480-180889-3
Date Collected: 02/03/21 11:49
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 13:23	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 13:23	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 13:23	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 13:23	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 13:23	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/06/21 13:23	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 13:23	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 13:23	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 13:23	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 13:23	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 13:23	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 13:23	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 13:23	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/06/21 13:23	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 13:23	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 13:23	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 13:23	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/06/21 13:23	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 13:23	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 13:23	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 13:23	1
Trichloroethene	ND		1.0	0.46	ug/L			02/06/21 13:23	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 13:23	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 13:23	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 13:23	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 13:23*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*77 - 120*		*02/06/21 13:23*	*1*
4-Bromofluorobenzene (Surr)	*100*		*73 - 120*		*02/06/21 13:23*	*1*
Dibromofluoromethane (Surr)	*103*		*75 - 123*		*02/06/21 13:23*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*02/06/21 13:23*	*1*

Client Sample ID: MN - 12S
Lab Sample ID: 480-180889-4
Date Collected: 02/03/21 11:50
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 13:45	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 13:45	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 13:45	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 13:45	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 13:45	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 13:45	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 13:45	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 13:45	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 13:45	1

Client Sample ID: MN - 12S
Lab Sample ID: 480-180889-4

Date Collected: 02/03/21 11:50
Matrix: Water

Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 13:45	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 13:45	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 13:45	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 13:45	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 13:45	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 13:45	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 13:45	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 13:45	1
Acetone	ND		10	3.0	ug/L			02/06/21 13:45	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 13:45	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 13:45	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 13:45	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 13:45	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 13:45	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 13:45	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 13:45	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 13:45	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 13:45	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 13:45	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/06/21 13:45	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 13:45	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 13:45	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 13:45	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 13:45	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 13:45	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 13:45	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 13:45	1
Methyl tert-butyl ether	**0.16**	**J**	1.0	0.16	ug/L			02/06/21 13:45	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 13:45	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 13:45	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 13:45	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/06/21 13:45	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 13:45	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 13:45	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 13:45	1
Trichloroethene	ND		1.0	0.46	ug/L			02/06/21 13:45	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 13:45	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 13:45	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 13:45	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 13:45*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*77 - 120*		*02/06/21 13:45*	*1*
4-Bromofluorobenzene (Surr)	*101*		*73 - 120*		*02/06/21 13:45*	*1*
Dibromofluoromethane (Surr)	*105*		*75 - 123*		*02/06/21 13:45*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*02/06/21 13:45*	*1*

Client Sample ID: FD-20210203-1
Date Collected: 02/03/21 00:00
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-5
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 14:08	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 14:08	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 14:08	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 14:08	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 14:08	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 14:08	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 14:08	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 14:08	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 14:08	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 14:08	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 14:08	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 14:08	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 14:08	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 14:08	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 14:08	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 14:08	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 14:08	1
Acetone	ND		10	3.0	ug/L			02/06/21 14:08	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 14:08	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 14:08	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 14:08	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 14:08	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 14:08	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 14:08	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 14:08	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 14:08	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 14:08	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 14:08	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/06/21 14:08	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 14:08	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 14:08	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 14:08	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 14:08	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 14:08	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 14:08	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 14:08	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/06/21 14:08	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 14:08	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 14:08	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 14:08	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/06/21 14:08	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 14:08	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 14:08	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 14:08	1
Trichloroethene	ND		1.0	0.46	ug/L			02/06/21 14:08	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 14:08	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 14:08	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 14:08	1

Client Sample ID: FD-20210203-1
Lab Sample ID: 480-180889-5

Date Collected: 02/03/21 00:00
Matrix: Water
Date Received: 02/04/21 18:25

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/06/21 14:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		77 - 120		02/06/21 14:08	1
4-Bromofluorobenzene (Surr)	100		73 - 120		02/06/21 14:08	1
Dibromofluoromethane (Surr)	101		75 - 123		02/06/21 14:08	1
Toluene-d8 (Surr)	103		80 - 120		02/06/21 14:08	1

Client Sample ID: MN-12I
Lab Sample ID: 480-180889-6

Date Collected: 02/03/21 11:45
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 14:31	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 14:31	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 14:31	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 14:31	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 14:31	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 14:31	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 14:31	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 14:31	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 14:31	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 14:31	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 14:31	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 14:31	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 14:31	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 14:31	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 14:31	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 14:31	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 14:31	1
Acetone	**5.3**	**J**	10	3.0	ug/L			02/06/21 14:31	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 14:31	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 14:31	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 14:31	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 14:31	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 14:31	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 14:31	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 14:31	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 14:31	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 14:31	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 14:31	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/06/21 14:31	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 14:31	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 14:31	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 14:31	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 14:31	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 14:31	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 14:31	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 14:31	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/06/21 14:31	1

Client Sample ID: MN-12I
Lab Sample ID: 480-180889-6
Date Collected: 02/03/21 11:45
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 14:31	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 14:31	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 14:31	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/06/21 14:31	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 14:31	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 14:31	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 14:31	1
Trichloroethene	ND		1.0	0.46	ug/L			02/06/21 14:31	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 14:31	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 14:31	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 14:31	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 14:31*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*77 - 120*		*02/06/21 14:31*	*1*
4-Bromofluorobenzene (Surr)	*96*		*73 - 120*		*02/06/21 14:31*	*1*
Dibromofluoromethane (Surr)	*100*		*75 - 123*		*02/06/21 14:31*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*02/06/21 14:31*	*1*

Client Sample ID: MW - 11
Lab Sample ID: 480-180889-7
Date Collected: 02/03/21 14:02
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		4.0	3.3	ug/L			02/06/21 14:54	4
1,1,2,2-Tetrachloroethane	ND		4.0	0.84	ug/L			02/06/21 14:54	4
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		4.0	1.2	ug/L			02/06/21 14:54	4
1,1,2-Trichloroethane	ND		4.0	0.92	ug/L			02/06/21 14:54	4
1,1-Dichloroethane	ND		4.0	1.5	ug/L			02/06/21 14:54	4
1,1-Dichloroethene	ND		4.0	1.2	ug/L			02/06/21 14:54	4
1,2,4-Trichlorobenzene	ND		4.0	1.6	ug/L			02/06/21 14:54	4
1,2-Dibromo-3-Chloropropane	ND		4.0	1.6	ug/L			02/06/21 14:54	4
1,2-Dibromoethane	ND		4.0	2.9	ug/L			02/06/21 14:54	4
1,2-Dichlorobenzene	ND		4.0	3.2	ug/L			02/06/21 14:54	4
1,2-Dichloroethane	ND		4.0	0.84	ug/L			02/06/21 14:54	4
1,2-Dichloropropane	ND		4.0	2.9	ug/L			02/06/21 14:54	4
1,3-Dichlorobenzene	ND		4.0	3.1	ug/L			02/06/21 14:54	4
1,4-Dichlorobenzene	ND		4.0	3.4	ug/L			02/06/21 14:54	4
2-Butanone (MEK)	ND		40	5.3	ug/L			02/06/21 14:54	4
2-Hexanone	ND		20	5.0	ug/L			02/06/21 14:54	4
4-Methyl-2-pentanone (MIBK)	ND		20	8.4	ug/L			02/06/21 14:54	4
Acetone	ND		40	12	ug/L			02/06/21 14:54	4
Benzene	ND		4.0	1.6	ug/L			02/06/21 14:54	4
Bromodichloromethane	ND		4.0	1.6	ug/L			02/06/21 14:54	4
Bromoform	ND		4.0	1.0	ug/L			02/06/21 14:54	4
Bromomethane	ND		4.0	2.8	ug/L			02/06/21 14:54	4
Carbon disulfide	ND		4.0	0.76	ug/L			02/06/21 14:54	4

Client Sample ID: MW - 11
Lab Sample ID: 480-180889-7

Date Collected: 02/03/21 14:02
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		4.0	1.1	ug/L			02/06/21 14:54	4
Chlorobenzene	ND		4.0	3.0	ug/L			02/06/21 14:54	4
Chloroethane	ND		4.0	1.3	ug/L			02/06/21 14:54	4
Chloroform	ND		4.0	1.4	ug/L			02/06/21 14:54	4
Chloromethane	ND		4.0	1.4	ug/L			02/06/21 14:54	4
cis-1,2-Dichloroethene	**84**		4.0	3.2	ug/L			02/06/21 14:54	4
cis-1,3-Dichloropropene	ND		4.0	1.4	ug/L			02/06/21 14:54	4
Cyclohexane	ND		4.0	0.72	ug/L			02/06/21 14:54	4
Dibromochloromethane	ND		4.0	1.3	ug/L			02/06/21 14:54	4
Dichlorodifluoromethane	ND		4.0	2.7	ug/L			02/06/21 14:54	4
Ethylbenzene	ND		4.0	3.0	ug/L			02/06/21 14:54	4
Isopropylbenzene	ND		4.0	3.2	ug/L			02/06/21 14:54	4
Methyl acetate	ND		10	5.2	ug/L			02/06/21 14:54	4
Methyl tert-butyl ether	**0.90**	**J**	4.0	0.64	ug/L			02/06/21 14:54	4
Methylcyclohexane	ND		4.0	0.64	ug/L			02/06/21 14:54	4
Methylene Chloride	ND		4.0	1.8	ug/L			02/06/21 14:54	4
Styrene	ND		4.0	2.9	ug/L			02/06/21 14:54	4
Tetrachloroethene	**140**		4.0	1.4	ug/L			02/06/21 14:54	4
Toluene	ND		4.0	2.0	ug/L			02/06/21 14:54	4
trans-1,2-Dichloroethene	ND		4.0	3.6	ug/L			02/06/21 14:54	4
trans-1,3-Dichloropropene	ND		4.0	1.5	ug/L			02/06/21 14:54	4
Trichloroethene	**70**		4.0	1.8	ug/L			02/06/21 14:54	4
Trichlorofluoromethane	ND		4.0	3.5	ug/L			02/06/21 14:54	4
Vinyl chloride	**5.6**		4.0	3.6	ug/L			02/06/21 14:54	4
Xylenes, Total	ND		8.0	2.6	ug/L			02/06/21 14:54	4

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 14:54*	*4*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*77 - 120*		*02/06/21 14:54*	*4*
4-Bromofluorobenzene (Surr)	*100*		*73 - 120*		*02/06/21 14:54*	*4*
Dibromofluoromethane (Surr)	*101*		*75 - 123*		*02/06/21 14:54*	*4*
Toluene-d8 (Surr)	*104*		*80 - 120*		*02/06/21 14:54*	*4*

Client Sample ID: MW - 2
Lab Sample ID: 480-180889-8

Date Collected: 02/03/21 15:38
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 15:17	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 15:17	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 15:17	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 15:17	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 15:17	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 15:17	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 15:17	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 15:17	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 15:17	1

Client Sample ID: MW - 2
Date Collected: 02/03/21 15:38
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-8
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 15:17	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 15:17	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 15:17	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 15:17	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 15:17	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 15:17	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 15:17	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 15:17	1
Acetone	ND		10	3.0	ug/L			02/06/21 15:17	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 15:17	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 15:17	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 15:17	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 15:17	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 15:17	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 15:17	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 15:17	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 15:17	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 15:17	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 15:17	1
cis-1,2-Dichloroethene	**8.5**		1.0	0.81	ug/L			02/06/21 15:17	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 15:17	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 15:17	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 15:17	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 15:17	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 15:17	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 15:17	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 15:17	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/06/21 15:17	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 15:17	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 15:17	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 15:17	1
Tetrachloroethene	**17**		1.0	0.36	ug/L			02/06/21 15:17	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 15:17	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 15:17	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 15:17	1
Trichloroethene	**11**		1.0	0.46	ug/L			02/06/21 15:17	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 15:17	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 15:17	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 15:17	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 15:17*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*77 - 120*		*02/06/21 15:17*	*1*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*02/06/21 15:17*	*1*
Dibromofluoromethane (Surr)	*101*		*75 - 123*		*02/06/21 15:17*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*02/06/21 15:17*	*1*

Client Sample ID: BMW - 104I
Date Collected: 02/03/21 14:00
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-9
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		40	33	ug/L			02/06/21 15:40	40
1,1,2,2-Tetrachloroethane	ND		40	8.4	ug/L			02/06/21 15:40	40
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		40	12	ug/L			02/06/21 15:40	40
1,1,2-Trichloroethane	ND		40	9.2	ug/L			02/06/21 15:40	40
1,1-Dichloroethane	ND		40	15	ug/L			02/06/21 15:40	40
1,1-Dichloroethene	ND		40	12	ug/L			02/06/21 15:40	40
1,2,4-Trichlorobenzene	ND		40	16	ug/L			02/06/21 15:40	40
1,2-Dibromo-3-Chloropropane	ND		40	16	ug/L			02/06/21 15:40	40
1,2-Dibromoethane	ND		40	29	ug/L			02/06/21 15:40	40
1,2-Dichlorobenzene	ND		40	32	ug/L			02/06/21 15:40	40
1,2-Dichloroethane	ND		40	8.4	ug/L			02/06/21 15:40	40
1,2-Dichloropropane	ND		40	29	ug/L			02/06/21 15:40	40
1,3-Dichlorobenzene	ND		40	31	ug/L			02/06/21 15:40	40
1,4-Dichlorobenzene	ND		40	34	ug/L			02/06/21 15:40	40
2-Butanone (MEK)	ND		400	53	ug/L			02/06/21 15:40	40
2-Hexanone	ND		200	50	ug/L			02/06/21 15:40	40
4-Methyl-2-pentanone (MIBK)	ND		200	84	ug/L			02/06/21 15:40	40
Acetone	ND		400	120	ug/L			02/06/21 15:40	40
Benzene	ND		40	16	ug/L			02/06/21 15:40	40
Bromodichloromethane	ND		40	16	ug/L			02/06/21 15:40	40
Bromoform	ND		40	10	ug/L			02/06/21 15:40	40
Bromomethane	ND		40	28	ug/L			02/06/21 15:40	40
Carbon disulfide	ND		40	7.6	ug/L			02/06/21 15:40	40
Carbon tetrachloride	ND		40	11	ug/L			02/06/21 15:40	40
Chlorobenzene	ND		40	30	ug/L			02/06/21 15:40	40
Chloroethane	ND		40	13	ug/L			02/06/21 15:40	40
Chloroform	ND		40	14	ug/L			02/06/21 15:40	40
Chloromethane	ND		40	14	ug/L			02/06/21 15:40	40
cis-1,2-Dichloroethene	**1600**		40	32	ug/L			02/06/21 15:40	40
cis-1,3-Dichloropropene	ND		40	14	ug/L			02/06/21 15:40	40
Cyclohexane	ND		40	7.2	ug/L			02/06/21 15:40	40
Dibromochloromethane	ND		40	13	ug/L			02/06/21 15:40	40
Dichlorodifluoromethane	ND		40	27	ug/L			02/06/21 15:40	40
Ethylbenzene	ND		40	30	ug/L			02/06/21 15:40	40
Isopropylbenzene	ND		40	32	ug/L			02/06/21 15:40	40
Methyl acetate	ND		100	52	ug/L			02/06/21 15:40	40
Methyl tert-butyl ether	ND		40	6.4	ug/L			02/06/21 15:40	40
Methylcyclohexane	ND		40	6.4	ug/L			02/06/21 15:40	40
Methylene Chloride	**19**	**J**	40	18	ug/L			02/06/21 15:40	40
Styrene	ND		40	29	ug/L			02/06/21 15:40	40
Tetrachloroethene	**3100**		40	14	ug/L			02/06/21 15:40	40
Toluene	ND		40	20	ug/L			02/06/21 15:40	40
trans-1,2-Dichloroethene	ND		40	36	ug/L			02/06/21 15:40	40
trans-1,3-Dichloropropene	ND		40	15	ug/L			02/06/21 15:40	40
Trichloroethene	**1300**		40	18	ug/L			02/06/21 15:40	40
Trichlorofluoromethane	ND		40	35	ug/L			02/06/21 15:40	40
Vinyl chloride	**49**		40	36	ug/L			02/06/21 15:40	40
Xylenes, Total	ND		80	26	ug/L			02/06/21 15:40	40

Client Sample ID: BMW - 104I — Lab Sample ID: 480-180889-9

Date Collected: 02/03/21 14:00 **Matrix: Water**
Date Received: 02/04/21 18:25

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/06/21 15:40	40

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	95		77 - 120		02/06/21 15:40	40
4-Bromofluorobenzene (Surr)	100		73 - 120		02/06/21 15:40	40
Dibromofluoromethane (Surr)	98		75 - 123		02/06/21 15:40	40
Toluene-d8 (Surr)	103		80 - 120		02/06/21 15:40	40

Client Sample ID: BMW - 104S — Lab Sample ID: 480-180889-10

Date Collected: 02/03/21 15:20 **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		2000	1600	ug/L			02/06/21 16:03	2000
1,1,2,2-Tetrachloroethane	ND		2000	420	ug/L			02/06/21 16:03	2000
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2000	620	ug/L			02/06/21 16:03	2000
1,1,2-Trichloroethane	ND		2000	460	ug/L			02/06/21 16:03	2000
1,1-Dichloroethane	ND		2000	760	ug/L			02/06/21 16:03	2000
1,1-Dichloroethene	ND		2000	580	ug/L			02/06/21 16:03	2000
1,2,4-Trichlorobenzene	ND		2000	820	ug/L			02/06/21 16:03	2000
1,2-Dibromo-3-Chloropropane	ND		2000	780	ug/L			02/06/21 16:03	2000
1,2-Dibromoethane	ND		2000	1500	ug/L			02/06/21 16:03	2000
1,2-Dichlorobenzene	ND		2000	1600	ug/L			02/06/21 16:03	2000
1,2-Dichloroethane	ND		2000	420	ug/L			02/06/21 16:03	2000
1,2-Dichloropropane	ND		2000	1400	ug/L			02/06/21 16:03	2000
1,3-Dichlorobenzene	ND		2000	1600	ug/L			02/06/21 16:03	2000
1,4-Dichlorobenzene	ND		2000	1700	ug/L			02/06/21 16:03	2000
2-Butanone (MEK)	ND		20000	2600	ug/L			02/06/21 16:03	2000
2-Hexanone	ND		10000	2500	ug/L			02/06/21 16:03	2000
4-Methyl-2-pentanone (MIBK)	ND		10000	4200	ug/L			02/06/21 16:03	2000
Acetone	ND		20000	6000	ug/L			02/06/21 16:03	2000
Benzene	ND		2000	820	ug/L			02/06/21 16:03	2000
Bromodichloromethane	ND		2000	780	ug/L			02/06/21 16:03	2000
Bromoform	ND		2000	520	ug/L			02/06/21 16:03	2000
Bromomethane	ND		2000	1400	ug/L			02/06/21 16:03	2000
Carbon disulfide	ND		2000	380	ug/L			02/06/21 16:03	2000
Carbon tetrachloride	ND		2000	540	ug/L			02/06/21 16:03	2000
Chlorobenzene	ND		2000	1500	ug/L			02/06/21 16:03	2000
Chloroethane	ND		2000	640	ug/L			02/06/21 16:03	2000
Chloroform	ND		2000	680	ug/L			02/06/21 16:03	2000
Chloromethane	ND		2000	700	ug/L			02/06/21 16:03	2000
cis-1,2-Dichloroethene	**8900**		2000	1600	ug/L			02/06/21 16:03	2000
cis-1,3-Dichloropropene	ND		2000	720	ug/L			02/06/21 16:03	2000
Cyclohexane	ND		2000	360	ug/L			02/06/21 16:03	2000
Dibromochloromethane	ND		2000	640	ug/L			02/06/21 16:03	2000
Dichlorodifluoromethane	ND		2000	1400	ug/L			02/06/21 16:03	2000
Ethylbenzene	ND		2000	1500	ug/L			02/06/21 16:03	2000
Isopropylbenzene	ND		2000	1600	ug/L			02/06/21 16:03	2000
Methyl acetate	ND		5000	2600	ug/L			02/06/21 16:03	2000
Methyl tert-butyl ether	ND		2000	320	ug/L			02/06/21 16:03	2000

Client Sample ID: BMW - 104S
Lab Sample ID: 480-180889-10
Date Collected: 02/03/21 15:20
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		2000	320	ug/L			02/06/21 16:03	2000
Methylene Chloride	**1100**	**J**	2000	880	ug/L			02/06/21 16:03	2000
Styrene	ND		2000	1500	ug/L			02/06/21 16:03	2000
Tetrachloroethene	**82000**		2000	720	ug/L			02/06/21 16:03	2000
Toluene	ND		2000	1000	ug/L			02/06/21 16:03	2000
trans-1,2-Dichloroethene	ND		2000	1800	ug/L			02/06/21 16:03	2000
trans-1,3-Dichloropropene	ND		2000	740	ug/L			02/06/21 16:03	2000
Trichloroethene	**20000**		2000	920	ug/L			02/06/21 16:03	2000
Trichlorofluoromethane	ND		2000	1800	ug/L			02/06/21 16:03	2000
Vinyl chloride	ND		2000	1800	ug/L			02/06/21 16:03	2000
Xylenes, Total	ND		4000	1300	ug/L			02/06/21 16:03	2000

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 16:03*	*2000*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*77 - 120*		*02/06/21 16:03*	*2000*
4-Bromofluorobenzene (Surr)	*100*		*73 - 120*		*02/06/21 16:03*	*2000*
Dibromofluoromethane (Surr)	*100*		*75 - 123*		*02/06/21 16:03*	*2000*
Toluene-d8 (Surr)	*104*		*80 - 120*		*02/06/21 16:03*	*2000*

Client Sample ID: MW - 13
Lab Sample ID: 480-180889-11
Date Collected: 02/04/21 11:10
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		8.0	6.6	ug/L			02/06/21 16:26	8
1,1,2,2-Tetrachloroethane	ND		8.0	1.7	ug/L			02/06/21 16:26	8
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		8.0	2.5	ug/L			02/06/21 16:26	8
1,1,2-Trichloroethane	ND		8.0	1.8	ug/L			02/06/21 16:26	8
1,1-Dichloroethane	ND		8.0	3.0	ug/L			02/06/21 16:26	8
1,1-Dichloroethene	ND		8.0	2.3	ug/L			02/06/21 16:26	8
1,2,4-Trichlorobenzene	ND		8.0	3.3	ug/L			02/06/21 16:26	8
1,2-Dibromo-3-Chloropropane	ND		8.0	3.1	ug/L			02/06/21 16:26	8
1,2-Dibromoethane	ND		8.0	5.8	ug/L			02/06/21 16:26	8
1,2-Dichlorobenzene	ND		8.0	6.3	ug/L			02/06/21 16:26	8
1,2-Dichloroethane	ND		8.0	1.7	ug/L			02/06/21 16:26	8
1,2-Dichloropropane	ND		8.0	5.8	ug/L			02/06/21 16:26	8
1,3-Dichlorobenzene	ND		8.0	6.2	ug/L			02/06/21 16:26	8
1,4-Dichlorobenzene	ND		8.0	6.7	ug/L			02/06/21 16:26	8
2-Butanone (MEK)	ND		80	11	ug/L			02/06/21 16:26	8
2-Hexanone	ND		40	9.9	ug/L			02/06/21 16:26	8
4-Methyl-2-pentanone (MIBK)	ND		40	17	ug/L			02/06/21 16:26	8
Acetone	ND		80	24	ug/L			02/06/21 16:26	8
Benzene	ND		8.0	3.3	ug/L			02/06/21 16:26	8
Bromodichloromethane	ND		8.0	3.1	ug/L			02/06/21 16:26	8
Bromoform	ND		8.0	2.1	ug/L			02/06/21 16:26	8
Bromomethane	ND		8.0	5.5	ug/L			02/06/21 16:26	8
Carbon disulfide	ND		8.0	1.5	ug/L			02/06/21 16:26	8

Client Sample ID: MW - 13
Date Collected: 02/04/21 11:10
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-11
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		8.0	2.2	ug/L			02/06/21 16:26	8
Chlorobenzene	ND		8.0	6.0	ug/L			02/06/21 16:26	8
Chloroethane	ND		8.0	2.6	ug/L			02/06/21 16:26	8
Chloroform	ND		8.0	2.7	ug/L			02/06/21 16:26	8
Chloromethane	ND		8.0	2.8	ug/L			02/06/21 16:26	8
cis-1,2-Dichloroethene	**12**		8.0	6.5	ug/L			02/06/21 16:26	8
cis-1,3-Dichloropropene	ND		8.0	2.9	ug/L			02/06/21 16:26	8
Cyclohexane	ND		8.0	1.4	ug/L			02/06/21 16:26	8
Dibromochloromethane	ND		8.0	2.6	ug/L			02/06/21 16:26	8
Dichlorodifluoromethane	ND		8.0	5.4	ug/L			02/06/21 16:26	8
Ethylbenzene	ND		8.0	5.9	ug/L			02/06/21 16:26	8
Isopropylbenzene	ND		8.0	6.3	ug/L			02/06/21 16:26	8
Methyl acetate	ND		20	10	ug/L			02/06/21 16:26	8
Methyl tert-butyl ether	**1.6**	**J**	8.0	1.3	ug/L			02/06/21 16:26	8
Methylcyclohexane	ND		8.0	1.3	ug/L			02/06/21 16:26	8
Methylene Chloride	**3.6**	**J**	8.0	3.5	ug/L			02/06/21 16:26	8
Styrene	ND		8.0	5.8	ug/L			02/06/21 16:26	8
Tetrachloroethene	**410**		8.0	2.9	ug/L			02/06/21 16:26	8
Toluene	ND		8.0	4.1	ug/L			02/06/21 16:26	8
trans-1,2-Dichloroethene	ND		8.0	7.2	ug/L			02/06/21 16:26	8
trans-1,3-Dichloropropene	ND		8.0	3.0	ug/L			02/06/21 16:26	8
Trichloroethene	**17**		8.0	3.7	ug/L			02/06/21 16:26	8
Trichlorofluoromethane	ND		8.0	7.0	ug/L			02/06/21 16:26	8
Vinyl chloride	**9.6**		8.0	7.2	ug/L			02/06/21 16:26	8
Xylenes, Total	ND		16	5.3	ug/L			02/06/21 16:26	8

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 16:26*	*8*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*77 - 120*		*02/06/21 16:26*	*8*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*02/06/21 16:26*	*8*
Dibromofluoromethane (Surr)	*106*		*75 - 123*		*02/06/21 16:26*	*8*
Toluene-d8 (Surr)	*101*		*80 - 120*		*02/06/21 16:26*	*8*

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.57**	J	0.20	0.10	ug/L		02/08/21 15:07	02/09/21 15:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*30*		*15 - 110*	*02/08/21 15:07*	*02/09/21 15:50*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-Trichlorophenol	ND		5.0	0.48	ug/L		02/08/21 14:57	02/09/21 15:01	1
2,4,6-Trichlorophenol	~~ND~~	UJ	5.0	0.61	ug/L		02/08/21 14:57	02/09/21 15:01	1
2,4-Dichlorophenol	ND		5.0	0.51	ug/L		02/08/21 14:57	02/09/21 15:01	1
2,4-Dimethylphenol	ND		5.0	0.50	ug/L		02/08/21 14:57	02/09/21 15:01	1
2,4-Dinitrophenol	ND		10	2.2	ug/L		02/08/21 14:57	02/09/21 15:01	1
2,4-Dinitrotoluene	ND		5.0	0.45	ug/L		02/08/21 14:57	02/09/21 15:01	1
2,6-Dinitrotoluene	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 15:01	1

Client Sample ID: MW - 13
Date Collected: 02/04/21 11:10
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-11
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Chloronaphthalene	ND		5.0	0.46	ug/L		02/08/21 14:57	02/09/21 15:01	1
2-Chlorophenol	ND		5.0	0.53	ug/L		02/08/21 14:57	02/09/21 15:01	1
2-Methylnaphthalene	ND		5.0	0.60	ug/L		02/08/21 14:57	02/09/21 15:01	1
2-Methylphenol	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 15:01	1
2-Nitroaniline	ND		10	0.42	ug/L		02/08/21 14:57	02/09/21 15:01	1
2-Nitrophenol	ND		5.0	0.48	ug/L		02/08/21 14:57	02/09/21 15:01	1
3,3'-Dichlorobenzidine	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 15:01	1
3-Nitroaniline	ND		10	0.48	ug/L		02/08/21 14:57	02/09/21 15:01	1
4,6-Dinitro-2-methylphenol	ND		10	2.2	ug/L		02/08/21 14:57	02/09/21 15:01	1
4-Bromophenyl phenyl ether	ND		5.0	0.45	ug/L		02/08/21 14:57	02/09/21 15:01	1
4-Chloro-3-methylphenol	ND	UJ	5.0	0.45	ug/L		02/08/21 14:57	02/09/21 15:01	1
4-Chloroaniline	ND		5.0	0.59	ug/L		02/08/21 14:57	02/09/21 15:01	1
4-Chlorophenyl phenyl ether	ND		5.0	0.35	ug/L		02/08/21 14:57	02/09/21 15:01	1
4-Methylphenol	ND		10	0.36	ug/L		02/08/21 14:57	02/09/21 15:01	1
4-Nitroaniline	ND		10	0.25	ug/L		02/08/21 14:57	02/09/21 15:01	1
4-Nitrophenol	ND	UJ	10	1.5	ug/L		02/08/21 14:57	02/09/21 15:01	1
Acenaphthene	ND		5.0	0.41	ug/L		02/08/21 14:57	02/09/21 15:01	1
Acenaphthylene	ND		5.0	0.38	ug/L		02/08/21 14:57	02/09/21 15:01	1
Acetophenone	ND		5.0	0.54	ug/L		02/08/21 14:57	02/09/21 15:01	1
Anthracene	ND		5.0	0.28	ug/L		02/08/21 14:57	02/09/21 15:01	1
Atrazine	ND		5.0	0.46	ug/L		02/08/21 14:57	02/09/21 15:01	1
Benzaldehyde	ND		5.0	0.27	ug/L		02/08/21 14:57	02/09/21 15:01	1
Benzo(a)anthracene	ND		5.0	0.36	ug/L		02/08/21 14:57	02/09/21 15:01	1
Benzo(a)pyrene	ND		5.0	0.47	ug/L		02/08/21 14:57	02/09/21 15:01	1
Benzo(b)fluoranthene	ND		5.0	0.34	ug/L		02/08/21 14:57	02/09/21 15:01	1
Benzo(g,h,i)perylene	ND		5.0	0.35	ug/L		02/08/21 14:57	02/09/21 15:01	1
Benzo(k)fluoranthene	ND		5.0	0.73	ug/L		02/08/21 14:57	02/09/21 15:01	1
Biphenyl	ND		5.0	0.65	ug/L		02/08/21 14:57	02/09/21 15:01	1
bis (2-chloroisopropyl) ether	ND		5.0	0.52	ug/L		02/08/21 14:57	02/09/21 15:01	1
Bis(2-chloroethoxy)methane	ND		5.0	0.35	ug/L		02/08/21 14:57	02/09/21 15:01	1
Bis(2-chloroethyl)ether	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 15:01	1
Bis(2-ethylhexyl) phthalate	ND		5.0	2.2	ug/L		02/08/21 14:57	02/09/21 15:01	1
Butyl benzyl phthalate	ND		5.0	1.0	ug/L		02/08/21 14:57	02/09/21 15:01	1
Caprolactam	ND		5.0	2.2	ug/L		02/08/21 14:57	02/09/21 15:01	1
Carbazole	ND	UJ	5.0	0.30	ug/L		02/08/21 14:57	02/09/21 15:01	1
Chrysene	ND		5.0	0.33	ug/L		02/08/21 14:57	02/09/21 15:01	1
Dibenz(a,h)anthracene	ND		5.0	0.42	ug/L		02/08/21 14:57	02/09/21 15:01	1
Dibenzofuran	ND		10	0.51	ug/L		02/08/21 14:57	02/09/21 15:01	1
Diethyl phthalate	ND		5.0	0.22	ug/L		02/08/21 14:57	02/09/21 15:01	1
Dimethyl phthalate	ND		5.0	0.36	ug/L		02/08/21 14:57	02/09/21 15:01	1
Di-n-butyl phthalate	ND		5.0	0.31	ug/L		02/08/21 14:57	02/09/21 15:01	1
Di-n-octyl phthalate	ND		5.0	0.47	ug/L		02/08/21 14:57	02/09/21 15:01	1
Fluoranthene	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 15:01	1
Fluorene	ND		5.0	0.36	ug/L		02/08/21 14:57	02/09/21 15:01	1
Hexachlorobenzene	ND		5.0	0.51	ug/L		02/08/21 14:57	02/09/21 15:01	1
Hexachlorobutadiene	ND		5.0	0.68	ug/L		02/08/21 14:57	02/09/21 15:01	1
Hexachlorocyclopentadiene	ND		5.0	0.59	ug/L		02/08/21 14:57	02/09/21 15:01	1
Hexachloroethane	ND		5.0	0.59	ug/L		02/08/21 14:57	02/09/21 15:01	1
Indeno(1,2,3-cd)pyrene	ND		5.0	0.47	ug/L		02/08/21 14:57	02/09/21 15:01	1

Client Sample ID: MW - 13
Date Collected: 02/04/21 11:10
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-11
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Isophorone	ND		5.0	0.43	ug/L		02/08/21 14:57	02/09/21 15:01	1
Naphthalene	ND		5.0	0.76	ug/L		02/08/21 14:57	02/09/21 15:01	1
Nitrobenzene	ND		5.0	0.29	ug/L		02/08/21 14:57	02/09/21 15:01	1
N-Nitrosodi-n-propylamine	ND		5.0	0.54	ug/L		02/08/21 14:57	02/09/21 15:01	1
N-Nitrosodiphenylamine	ND		5.0	0.51	ug/L		02/08/21 14:57	02/09/21 15:01	1
Pentachlorophenol	~~ND~~	UJ	10	2.2	ug/L		02/08/21 14:57	02/09/21 15:01	1
Phenanthrene	ND		5.0	0.44	ug/L		02/08/21 14:57	02/09/21 15:01	1
Phenol	ND		5.0	0.39	ug/L		02/08/21 14:57	02/09/21 15:01	1
Pyrene	ND		5.0	0.34	ug/L		02/08/21 14:57	02/09/21 15:01	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Trichloroethylene	R *4.5*	*~~T J N~~*	*ug/L*		*2.66*	*79-01-6*	*02/08/21 14:57*	*02/09/21 15:01*	*1*
Tetrachloroethylene	R *190*	*~~T J N~~*	*ug/L*		*4.17*	*127-18-4*	*02/08/21 14:57*	*02/09/21 15:01*	*1*
Unknown	*2.3*	*T J*	*ug/L*		*4.23*		*02/08/21 14:57*	*02/09/21 15:01*	*1*
Unknown	*62*	*T J*	*ug/L*		*4.52*		*02/08/21 14:57*	*02/09/21 15:01*	*1*
Unknown	*4.3*	*T J*	*ug/L*		*5.67*		*02/08/21 14:57*	*02/09/21 15:01*	*1*
Unknown	*3.7*	*T J*	*ug/L*		*6.64*		*02/08/21 14:57*	*02/09/21 15:01*	*1*
Unknown	*3.5*	*T J*	*ug/L*		*7.51*		*02/08/21 14:57*	*02/09/21 15:01*	*1*
Unknown	*2.8*	*T J*	*ug/L*		*8.28*		*02/08/21 14:57*	*02/09/21 15:01*	*1*
Unknown	*2.2*	*T J*	*ug/L*		*8.96*		*02/08/21 14:57*	*02/09/21 15:01*	*1*
Unknown	*1.6*	*T J*	*ug/L*		*12.31*		*02/08/21 14:57*	*02/09/21 15:01*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*111*		*41 - 120*	*02/08/21 14:57*	*02/09/21 15:01*	*1*
2-Fluorobiphenyl	*102*		*48 - 120*	*02/08/21 14:57*	*02/09/21 15:01*	*1*
2-Fluorophenol	*64*		*35 - 120*	*02/08/21 14:57*	*02/09/21 15:01*	*1*
Nitrobenzene-d5	*106*		*46 - 120*	*02/08/21 14:57*	*02/09/21 15:01*	*1*
Phenol-d5	*46*		*22 - 120*	*02/08/21 14:57*	*02/09/21 15:01*	*1*
p-Terphenyl-d14	*83*		*60 - 148*	*02/08/21 14:57*	*02/09/21 15:01*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		0.050	0.0092	ug/L		02/09/21 15:24	02/10/21 12:22	1
4,4'-DDE	ND		0.050	0.012	ug/L		02/09/21 15:24	02/10/21 12:22	1
4,4'-DDT	ND		0.050	0.011	ug/L		02/09/21 15:24	02/10/21 12:22	1
Aldrin	ND		0.050	0.0081	ug/L		02/09/21 15:24	02/10/21 12:22	1
alpha-BHC	ND		0.050	0.0077	ug/L		02/09/21 15:24	02/10/21 12:22	1
cis-Chlordane	ND		0.050	0.015	ug/L		02/09/21 15:24	02/10/21 12:22	1
beta-BHC	ND		0.050	0.025	ug/L		02/09/21 15:24	02/10/21 12:22	1
delta-BHC	ND		0.050	0.010	ug/L		02/09/21 15:24	02/10/21 12:22	1
Dieldrin	ND		0.050	0.0098	ug/L		02/09/21 15:24	02/10/21 12:22	1
Endosulfan I	ND		0.050	0.011	ug/L		02/09/21 15:24	02/10/21 12:22	1
Endosulfan II	ND		0.050	0.012	ug/L		02/09/21 15:24	02/10/21 12:22	1
Endosulfan sulfate	ND	~~F1~~	0.050	0.016	ug/L		02/09/21 15:24	02/10/21 12:22	1
Endrin	ND		0.050	0.014	ug/L		02/09/21 15:24	02/10/21 12:22	1
Endrin aldehyde	ND		0.050	0.016	ug/L		02/09/21 15:24	02/10/21 12:22	1
Endrin ketone	ND		0.050	0.012	ug/L		02/09/21 15:24	02/10/21 12:22	1
gamma-BHC (Lindane)	ND		0.050	0.0080	ug/L		02/09/21 15:24	02/10/21 12:22	1
trans-Chlordane	ND		0.050	0.011	ug/L		02/09/21 15:24	02/10/21 12:22	1
Heptachlor	ND		0.050	0.0085	ug/L		02/09/21 15:24	02/10/21 12:22	1

Client Sample ID: MW - 13
Date Collected: 02/04/21 11:10
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-11
Matrix: Water

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	ND		0.050	0.0074	ug/L		02/09/21 15:24	02/10/21 12:22	1
Methoxychlor	ND		0.050	0.014	ug/L		02/09/21 15:24	02/10/21 12:22	1
Toxaphene	ND		0.50	0.12	ug/L		02/09/21 15:24	02/10/21 12:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*69*		*20 - 120*	*02/09/21 15:24*	*02/10/21 12:22*	*1*
DCB Decachlorobiphenyl	*68*		*20 - 120*	*02/09/21 15:24*	*02/10/21 12:22*	*1*
Tetrachloro-m-xylene	*97*		*44 - 120*	*02/09/21 15:24*	*02/10/21 12:22*	*1*
Tetrachloro-m-xylene	*79*		*44 - 120*	*02/09/21 15:24*	*02/10/21 12:22*	*1*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 20:30	1
PCB-1221	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 20:30	1
PCB-1232	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 20:30	1
PCB-1242	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 20:30	1
PCB-1248	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 20:30	1
PCB-1254	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 20:30	1
PCB-1260	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 20:30	1
PCB-1262	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 20:30	1
PCB-1268	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 20:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*93*		*39 - 121*	*02/10/21 07:35*	*02/10/21 20:30*	*1*
Tetrachloro-m-xylene	*78*		*39 - 121*	*02/10/21 07:35*	*02/10/21 20:30*	*1*
DCB Decachlorobiphenyl	*132*	*S1+*	*19 - 120*	*02/10/21 07:35*	*02/10/21 20:30*	*1*
DCB Decachlorobiphenyl	*70*		*19 - 120*	*02/10/21 07:35*	*02/10/21 20:30*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**16**		4.6	2.2	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluoropentanoic acid (PFPeA)	**18**		1.8	0.45	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorohexanoic acid (PFHxA)	**11**		1.8	0.54	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluoroheptanoic acid (PFHpA)	**2.2**		1.8	0.23	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorooctanoic acid (PFOA)	**1.3**	**J**	1.8	0.79	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.25	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.29	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.51	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorobutanesulfonic acid (PFBS)	**1.3**	**J**	1.8	0.18	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.8	0.53	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.18	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorooctanesulfonic acid (PFOS)	**0.85**	**J**	1.8	0.50	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.30	ng/L		02/11/21 04:18	02/11/21 16:43	1
Perfluorooctanesulfonamide (FOSA)	ND		1.8	0.91	ng/L		02/11/21 04:18	02/11/21 16:43	1

Client Sample ID: MW - 13
Date Collected: 02/04/21 11:10
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-11
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.6	1.1	ng/L		02/11/21 04:18	02/11/21 16:43	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.6	1.2	ng/L		02/11/21 04:18	02/11/21 16:43	1
6:2 FTS	ND		4.6	2.3	ng/L		02/11/21 04:18	02/11/21 16:43	1
8:2 FTS	ND		1.8	0.42	ng/L		02/11/21 04:18	02/11/21 16:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*56*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C5 PFPeA	*65*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C2 PFHxA	*79*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C4 PFHpA	*88*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C4 PFOA	*94*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C5 PFNA	*93*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C2 PFDA	*100*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C2 PFUnA	*96*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C2 PFDoA	*86*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C2 PFTeDA	*93*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C3 PFBS	*72*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
18O2 PFHxS	*70*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C4 PFOS	*72*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
13C8 FOSA	*75*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
d3-NMeFOSAA	*74*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
d5-NEtFOSAA	*75*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
M2-6:2 FTS	*98*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*
M2-8:2 FTS	*103*		*25 - 150*	*02/11/21 04:18*	*02/11/21 16:43*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.20	0.060	mg/L		02/08/21 11:04	02/09/21 18:18	1
Antimony	ND		0.020	0.0068	mg/L		02/08/21 11:04	02/09/21 18:18	1
Arsenic	ND		0.015	0.0056	mg/L		02/08/21 11:04	02/09/21 18:18	1
Barium	**0.074**		0.0020	0.00070	mg/L		02/08/21 11:04	02/09/21 18:18	1
Beryllium	ND		0.0020	0.00030	mg/L		02/08/21 11:04	02/09/21 18:18	1
Cadmium	ND		0.0020	0.00050	mg/L		02/08/21 11:04	02/09/21 18:18	1
Calcium	**158**		0.50	0.10	mg/L		02/08/21 11:04	02/09/21 18:18	1
Chromium	**0.0011**	**J**	0.0040	0.0010	mg/L		02/08/21 11:04	02/09/21 18:18	1
Cobalt	ND		0.0040	0.00063	mg/L		02/08/21 11:04	02/09/21 18:18	1
Copper	ND		0.010	0.0016	mg/L		02/08/21 11:04	02/09/21 18:18	1
Iron	**1.7**		0.050	0.019	mg/L		02/08/21 11:04	02/09/21 18:18	1
Lead	ND		0.010	0.0030	mg/L		02/08/21 11:04	02/09/21 18:18	1
Magnesium	**45.1**		0.20	0.043	mg/L		02/08/21 11:04	02/09/21 18:18	1
Manganese	**0.29**	**B**	0.0030	0.00040	mg/L		02/08/21 11:04	02/09/21 18:18	1
Nickel	ND		0.010	0.0013	mg/L		02/08/21 11:04	02/09/21 18:18	1
Potassium	**15.7**		0.50	0.10	mg/L		02/08/21 11:04	02/09/21 18:18	1
Selenium	ND		0.025	0.0087	mg/L		02/08/21 11:04	02/09/21 18:18	1
Silver	ND		0.0060	0.0017	mg/L		02/08/21 11:04	02/09/21 18:18	1
Sodium	**109**		1.0	0.32	mg/L		02/08/21 11:04	02/09/21 18:18	1
Thallium	ND		0.020	0.010	mg/L		02/08/21 11:04	02/09/21 18:18	1
Vanadium	ND		0.0050	0.0015	mg/L		02/08/21 11:04	02/09/21 18:18	1
Zinc	ND		0.010	0.0015	mg/L		02/08/21 11:04	02/09/21 18:18	1

Client Sample ID: MW - 13 — Lab Sample ID: 480-180889-11

Date Collected: 02/04/21 11:10 — **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00012	mg/L		02/08/21 13:54	02/08/21 17:17	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	**0.0054**	**J F1**	0.010	0.0050	mg/L		02/08/21 21:22	02/09/21 19:50	1

Client Sample ID: MN - 05S — Lab Sample ID: 480-180889-12

Date Collected: 02/04/21 11:10 — **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 16:49	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 16:49	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 16:49	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 16:49	1
1,1-Dichloroethane	**4.3**		1.0	0.38	ug/L			02/06/21 16:49	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 16:49	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 16:49	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 16:49	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 16:49	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 16:49	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 16:49	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 16:49	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 16:49	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 16:49	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 16:49	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 16:49	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 16:49	1
Acetone	ND		10	3.0	ug/L			02/06/21 16:49	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 16:49	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 16:49	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 16:49	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 16:49	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 16:49	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 16:49	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 16:49	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 16:49	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 16:49	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 16:49	1
cis-1,2-Dichloroethene	**16**		1.0	0.81	ug/L			02/06/21 16:49	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 16:49	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 16:49	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 16:49	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 16:49	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 16:49	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 16:49	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 16:49	1
Methyl tert-butyl ether	**2.1**		1.0	0.16	ug/L			02/06/21 16:49	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 16:49	1

Client Sample ID: MN - 05S
Date Collected: 02/04/21 11:10
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-12
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 16:49	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 16:49	1
Tetrachloroethene	**1.1**		1.0	0.36	ug/L			02/06/21 16:49	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 16:49	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 16:49	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 16:49	1
Trichloroethene	**0.70**	**J**	1.0	0.46	ug/L			02/06/21 16:49	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 16:49	1
Vinyl chloride	**8.2**		1.0	0.90	ug/L			02/06/21 16:49	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 16:49	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 16:49*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*77 - 120*		*02/06/21 16:49*	*1*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*02/06/21 16:49*	*1*
Dibromofluoromethane (Surr)	*97*		*75 - 123*		*02/06/21 16:49*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*02/06/21 16:49*	*1*

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.91**	J	0.20	0.10	ug/L		02/08/21 15:07	02/09/21 16:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*30*		*15 - 110*	*02/08/21 15:07*	*02/09/21 16:38*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-Trichlorophenol	ND		5.0	0.48	ug/L		02/08/21 14:57	02/09/21 16:01	1
2,4,6-Trichlorophenol	~~ND~~	UJ	5.0	0.61	ug/L		02/08/21 14:57	02/09/21 16:01	1
2,4-Dichlorophenol	ND		5.0	0.51	ug/L		02/08/21 14:57	02/09/21 16:01	1
2,4-Dimethylphenol	ND		5.0	0.50	ug/L		02/08/21 14:57	02/09/21 16:01	1
2,4-Dinitrophenol	ND		10	2.2	ug/L		02/08/21 14:57	02/09/21 16:01	1
2,4-Dinitrotoluene	ND		5.0	0.45	ug/L		02/08/21 14:57	02/09/21 16:01	1
2,6-Dinitrotoluene	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 16:01	1
2-Chloronaphthalene	ND		5.0	0.46	ug/L		02/08/21 14:57	02/09/21 16:01	1
2-Chlorophenol	ND		5.0	0.53	ug/L		02/08/21 14:57	02/09/21 16:01	1
2-Methylnaphthalene	ND		5.0	0.60	ug/L		02/08/21 14:57	02/09/21 16:01	1
2-Methylphenol	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 16:01	1
2-Nitroaniline	ND		10	0.42	ug/L		02/08/21 14:57	02/09/21 16:01	1
2-Nitrophenol	ND		5.0	0.48	ug/L		02/08/21 14:57	02/09/21 16:01	1
3,3'-Dichlorobenzidine	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 16:01	1
3-Nitroaniline	ND		10	0.48	ug/L		02/08/21 14:57	02/09/21 16:01	1
4,6-Dinitro-2-methylphenol	ND		10	2.2	ug/L		02/08/21 14:57	02/09/21 16:01	1
4-Bromophenyl phenyl ether	ND		5.0	0.45	ug/L		02/08/21 14:57	02/09/21 16:01	1
4-Chloro-3-methylphenol	~~ND~~	UJ	5.0	0.45	ug/L		02/08/21 14:57	02/09/21 16:01	1
4-Chloroaniline	ND		5.0	0.59	ug/L		02/08/21 14:57	02/09/21 16:01	1
4-Chlorophenyl phenyl ether	ND		5.0	0.35	ug/L		02/08/21 14:57	02/09/21 16:01	1
4-Methylphenol	ND		10	0.36	ug/L		02/08/21 14:57	02/09/21 16:01	1
4-Nitroaniline	ND		10	0.25	ug/L		02/08/21 14:57	02/09/21 16:01	1

Client Sample ID: MN - 05S
Date Collected: 02/04/21 11:10
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-12
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Nitrophenol	~~ND~~	UJ	10	1.5	ug/L		02/08/21 14:57	02/09/21 16:01	1
Acenaphthene	ND		5.0	0.41	ug/L		02/08/21 14:57	02/09/21 16:01	1
Acenaphthylene	ND		5.0	0.38	ug/L		02/08/21 14:57	02/09/21 16:01	1
Acetophenone	ND		5.0	0.54	ug/L		02/08/21 14:57	02/09/21 16:01	1
Anthracene	ND		5.0	0.28	ug/L		02/08/21 14:57	02/09/21 16:01	1
Atrazine	ND		5.0	0.46	ug/L		02/08/21 14:57	02/09/21 16:01	1
Benzaldehyde	ND		5.0	0.27	ug/L		02/08/21 14:57	02/09/21 16:01	1
Benzo(a)anthracene	ND		5.0	0.36	ug/L		02/08/21 14:57	02/09/21 16:01	1
Benzo(a)pyrene	ND		5.0	0.47	ug/L		02/08/21 14:57	02/09/21 16:01	1
Benzo(b)fluoranthene	ND		5.0	0.34	ug/L		02/08/21 14:57	02/09/21 16:01	1
Benzo(g,h,i)perylene	ND		5.0	0.35	ug/L		02/08/21 14:57	02/09/21 16:01	1
Benzo(k)fluoranthene	ND		5.0	0.73	ug/L		02/08/21 14:57	02/09/21 16:01	1
Biphenyl	ND		5.0	0.65	ug/L		02/08/21 14:57	02/09/21 16:01	1
bis (2-chloroisopropyl) ether	ND		5.0	0.52	ug/L		02/08/21 14:57	02/09/21 16:01	1
Bis(2-chloroethoxy)methane	ND		5.0	0.35	ug/L		02/08/21 14:57	02/09/21 16:01	1
Bis(2-chloroethyl)ether	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 16:01	1
Bis(2-ethylhexyl) phthalate	ND		5.0	2.2	ug/L		02/08/21 14:57	02/09/21 16:01	1
Butyl benzyl phthalate	ND		5.0	1.0	ug/L		02/08/21 14:57	02/09/21 16:01	1
Caprolactam	ND		5.0	2.2	ug/L		02/08/21 14:57	02/09/21 16:01	1
Carbazole	~~ND~~	UJ	5.0	0.30	ug/L		02/08/21 14:57	02/09/21 16:01	1
Chrysene	ND		5.0	0.33	ug/L		02/08/21 14:57	02/09/21 16:01	1
Dibenz(a,h)anthracene	ND		5.0	0.42	ug/L		02/08/21 14:57	02/09/21 16:01	1
Dibenzofuran	ND		10	0.51	ug/L		02/08/21 14:57	02/09/21 16:01	1
Diethyl phthalate	ND		5.0	0.22	ug/L		02/08/21 14:57	02/09/21 16:01	1
Dimethyl phthalate	ND		5.0	0.36	ug/L		02/08/21 14:57	02/09/21 16:01	1
Di-n-butyl phthalate	ND		5.0	0.31	ug/L		02/08/21 14:57	02/09/21 16:01	1
Di-n-octyl phthalate	ND		5.0	0.47	ug/L		02/08/21 14:57	02/09/21 16:01	1
Fluoranthene	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 16:01	1
Fluorene	ND		5.0	0.36	ug/L		02/08/21 14:57	02/09/21 16:01	1
Hexachlorobenzene	ND		5.0	0.51	ug/L		02/08/21 14:57	02/09/21 16:01	1
Hexachlorobutadiene	ND		5.0	0.68	ug/L		02/08/21 14:57	02/09/21 16:01	1
Hexachlorocyclopentadiene	ND		5.0	0.59	ug/L		02/08/21 14:57	02/09/21 16:01	1
Hexachloroethane	ND		5.0	0.59	ug/L		02/08/21 14:57	02/09/21 16:01	1
Indeno(1,2,3-cd)pyrene	ND		5.0	0.47	ug/L		02/08/21 14:57	02/09/21 16:01	1
Isophorone	ND		5.0	0.43	ug/L		02/08/21 14:57	02/09/21 16:01	1
Naphthalene	ND		5.0	0.76	ug/L		02/08/21 14:57	02/09/21 16:01	1
Nitrobenzene	ND		5.0	0.29	ug/L		02/08/21 14:57	02/09/21 16:01	1
N-Nitrosodi-n-propylamine	ND		5.0	0.54	ug/L		02/08/21 14:57	02/09/21 16:01	1
N-Nitrosodiphenylamine	ND		5.0	0.51	ug/L		02/08/21 14:57	02/09/21 16:01	1
Pentachlorophenol	~~ND~~	UJ	10	2.2	ug/L		02/08/21 14:57	02/09/21 16:01	1
Phenanthrene	ND		5.0	0.44	ug/L		02/08/21 14:57	02/09/21 16:01	1
Phenol	ND		5.0	0.39	ug/L		02/08/21 14:57	02/09/21 16:01	1
Pyrene	ND		5.0	0.34	ug/L		02/08/21 14:57	02/09/21 16:01	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*45*	*T J*	*ug/L*		*4.52*		*02/08/21 14:57*	*02/09/21 16:01*	*1*
4-Nitro-4'-chlorodiphenylsulphoxide	*2.9*	*T J N*	*ug/L*		*5.67*	*24535-53-3*	*02/08/21 14:57*	*02/09/21 16:01*	*1*
Column Bleed	*2.9*	*T J*	*ug/L*		*6.63*		*02/08/21 14:57*	*02/09/21 16:01*	*1*
Benzoic Acid	*3.0*	*T J N*	*ug/L*		*6.87*	*65-85-0*	*02/08/21 14:57*	*02/09/21 16:01*	*1*
Unknown	*2.5*	*T J*	*ug/L*		*7.51*		*02/08/21 14:57*	*02/09/21 16:01*	*1*

Client Sample ID: MN - 05S
Date Collected: 02/04/21 11:10
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-12
Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Unknown	2.1	T J	ug/L		8.28		02/08/21 14:57	02/09/21 16:01	1
Unknown	2.0	T J	ug/L		8.96		02/08/21 14:57	02/09/21 16:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol	99		41 - 120	02/08/21 14:57	02/09/21 16:01	1
2-Fluorobiphenyl	98		48 - 120	02/08/21 14:57	02/09/21 16:01	1
2-Fluorophenol	62		35 - 120	02/08/21 14:57	02/09/21 16:01	1
Nitrobenzene-d5	95		46 - 120	02/08/21 14:57	02/09/21 16:01	1
Phenol-d5	46		22 - 120	02/08/21 14:57	02/09/21 16:01	1
p-Terphenyl-d14	67		60 - 148	02/08/21 14:57	02/09/21 16:01	1

Method: 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		0.050	0.0092	ug/L		02/09/21 15:24	02/10/21 13:01	1
4,4'-DDE	ND		0.050	0.012	ug/L		02/09/21 15:24	02/10/21 13:01	1
4,4'-DDT	ND		0.050	0.011	ug/L		02/09/21 15:24	02/10/21 13:01	1
Aldrin	ND		0.050	0.0081	ug/L		02/09/21 15:24	02/10/21 13:01	1
alpha-BHC	ND		0.050	0.0077	ug/L		02/09/21 15:24	02/10/21 13:01	1
cis-Chlordane	ND		0.050	0.015	ug/L		02/09/21 15:24	02/10/21 13:01	1
beta-BHC	ND		0.050	0.025	ug/L		02/09/21 15:24	02/10/21 13:01	1
delta-BHC	ND		0.050	0.010	ug/L		02/09/21 15:24	02/10/21 13:01	1
Dieldrin	ND		0.050	0.0098	ug/L		02/09/21 15:24	02/10/21 13:01	1
Endosulfan I	ND		0.050	0.011	ug/L		02/09/21 15:24	02/10/21 13:01	1
Endosulfan II	ND		0.050	0.012	ug/L		02/09/21 15:24	02/10/21 13:01	1
Endosulfan sulfate	ND		0.050	0.016	ug/L		02/09/21 15:24	02/10/21 13:01	1
Endrin	ND		0.050	0.014	ug/L		02/09/21 15:24	02/10/21 13:01	1
Endrin aldehyde	ND		0.050	0.016	ug/L		02/09/21 15:24	02/10/21 13:01	1
Endrin ketone	ND		0.050	0.012	ug/L		02/09/21 15:24	02/10/21 13:01	1
gamma-BHC (Lindane)	ND		0.050	0.0080	ug/L		02/09/21 15:24	02/10/21 13:01	1
trans-Chlordane	ND		0.050	0.011	ug/L		02/09/21 15:24	02/10/21 13:01	1
Heptachlor	ND		0.050	0.0085	ug/L		02/09/21 15:24	02/10/21 13:01	1
Heptachlor epoxide	ND		0.050	0.0074	ug/L		02/09/21 15:24	02/10/21 13:01	1
Methoxychlor	ND		0.050	0.014	ug/L		02/09/21 15:24	02/10/21 13:01	1
Toxaphene	ND		0.50	0.12	ug/L		02/09/21 15:24	02/10/21 13:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	71		20 - 120	02/09/21 15:24	02/10/21 13:01	1
DCB Decachlorobiphenyl	66		20 - 120	02/09/21 15:24	02/10/21 13:01	1
Tetrachloro-m-xylene	97		44 - 120	02/09/21 15:24	02/10/21 13:01	1
Tetrachloro-m-xylene	73		44 - 120	02/09/21 15:24	02/10/21 13:01	1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 21:44	1
PCB-1221	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 21:44	1
PCB-1232	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 21:44	1
PCB-1242	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 21:44	1
PCB-1248	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 21:44	1
PCB-1254	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 21:44	1
PCB-1260	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 21:44	1

Client Sample ID: MN - 05S
Lab Sample ID: 480-180889-12

Date Collected: 02/04/21 11:10
Matrix: Water

Date Received: 02/04/21 18:25

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1262	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 21:44	1
PCB-1268	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 21:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*100*		*39 - 121*	*02/10/21 07:35*	*02/10/21 21:44*	*1*
Tetrachloro-m-xylene	*86*		*39 - 121*	*02/10/21 07:35*	*02/10/21 21:44*	*1*
DCB Decachlorobiphenyl	*150*	*S1+*	*19 - 120*	*02/10/21 07:35*	*02/10/21 21:44*	*1*
DCB Decachlorobiphenyl	*83*		*19 - 120*	*02/10/21 07:35*	*02/10/21 21:44*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**12**		4.6	2.2	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluoropentanoic acid (PFPeA)	**6.1**		1.9	0.45	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorohexanoic acid (PFHxA)	**3.1**		1.9	0.54	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluoroheptanoic acid (PFHpA)	**0.55**	**J**	1.9	0.23	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorooctanoic acid (PFOA)	ND		1.9	0.79	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.25	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.51	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.68	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorobutanesulfonic acid (PFBS)	**0.43**	**J**	1.9	0.19	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.9	0.53	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.9	0.18	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.9	0.50	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.9	0.30	ng/L		02/11/21 04:18	02/11/21 17:10	1
Perfluorooctanesulfonamide (FOSA)	ND		1.9	0.91	ng/L		02/11/21 04:18	02/11/21 17:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.6	1.1	ng/L		02/11/21 04:18	02/11/21 17:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.6	1.2	ng/L		02/11/21 04:18	02/11/21 17:10	1
6:2 FTS	ND		4.6	2.3	ng/L		02/11/21 04:18	02/11/21 17:10	1
8:2 FTS	ND		1.9	0.43	ng/L		02/11/21 04:18	02/11/21 17:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*57*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C5 PFPeA	*65*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C2 PFHxA	*77*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C4 PFHpA	*84*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C4 PFOA	*100*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C5 PFNA	*96*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C2 PFDA	*94*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C2 PFUnA	*94*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C2 PFDoA	*86*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C2 PFTeDA	*85*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C3 PFBS	*72*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
18O2 PFHxS	*70*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C4 PFOS	*73*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
13C8 FOSA	*76*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*

Client Sample ID: MN - 05S — Lab Sample ID: 480-180889-12

Date Collected: 02/04/21 11:10 — **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
d3-NMeFOSAA	*71*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
d5-NEtFOSAA	*75*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
M2-6:2 FTS	*93*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*
M2-8:2 FTS	*99*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:10*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.20	0.060	mg/L		02/08/21 11:04	02/09/21 18:48	1
Antimony	ND		0.020	0.0068	mg/L		02/08/21 11:04	02/09/21 18:48	1
Arsenic	ND		0.015	0.0056	mg/L		02/08/21 11:04	02/09/21 18:48	1
Barium	**0.068**		0.0020	0.00070	mg/L		02/08/21 11:04	02/09/21 18:48	1
Beryllium	ND		0.0020	0.00030	mg/L		02/08/21 11:04	02/09/21 18:48	1
Cadmium	ND		0.0020	0.00050	mg/L		02/08/21 11:04	02/09/21 18:48	1
Calcium	**162**		0.50	0.10	mg/L		02/08/21 11:04	02/09/21 18:48	1
Chromium	ND		0.0040	0.0010	mg/L		02/08/21 11:04	02/09/21 18:48	1
Cobalt	ND		0.0040	0.00063	mg/L		02/08/21 11:04	02/09/21 18:48	1
Copper	ND		0.010	0.0016	mg/L		02/08/21 11:04	02/09/21 18:48	1
Iron	**1.4**		0.050	0.019	mg/L		02/08/21 11:04	02/09/21 18:48	1
Lead	ND		0.010	0.0030	mg/L		02/08/21 11:04	02/09/21 18:48	1
Magnesium	**51.3**		0.20	0.043	mg/L		02/08/21 11:04	02/09/21 18:48	1
Manganese	**0.13**	**B**	0.0030	0.00040	mg/L		02/08/21 11:04	02/09/21 18:48	1
Nickel	ND		0.010	0.0013	mg/L		02/08/21 11:04	02/09/21 18:48	1
Potassium	**10.6**		0.50	0.10	mg/L		02/08/21 11:04	02/09/21 18:48	1
Selenium	ND		0.025	0.0087	mg/L		02/08/21 11:04	02/09/21 18:48	1
Silver	ND		0.0060	0.0017	mg/L		02/08/21 11:04	02/09/21 18:48	1
Sodium	**127**		1.0	0.32	mg/L		02/08/21 11:04	02/09/21 18:48	1
Thallium	ND		0.020	0.010	mg/L		02/08/21 11:04	02/09/21 18:48	1
Vanadium	ND		0.0050	0.0015	mg/L		02/08/21 11:04	02/09/21 18:48	1
Zinc	ND		0.010	0.0015	mg/L		02/08/21 11:04	02/09/21 18:48	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00012	mg/L		02/08/21 13:54	02/08/21 17:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	**0.0078**	**J**	0.010	0.0050	mg/L		02/08/21 21:22	02/09/21 20:07	1

Client Sample ID: FD-20210204-1 — Lab Sample ID: 480-180889-13

Date Collected: 02/04/21 00:00 — **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 17:12	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 17:12	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 17:12	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 17:12	1
1,1-Dichloroethane	**4.3**		1.0	0.38	ug/L			02/06/21 17:12	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 17:12	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 17:12	1

Client Sample ID: FD-20210204-1
Lab Sample ID: 480-180889-13

Date Collected: 02/04/21 00:00
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 17:12	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 17:12	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 17:12	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 17:12	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 17:12	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 17:12	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 17:12	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 17:12	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 17:12	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 17:12	1
Acetone	ND		10	3.0	ug/L			02/06/21 17:12	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 17:12	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 17:12	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 17:12	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 17:12	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 17:12	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 17:12	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 17:12	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 17:12	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 17:12	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 17:12	1
cis-1,2-Dichloroethene	**17**		1.0	0.81	ug/L			02/06/21 17:12	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 17:12	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 17:12	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 17:12	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 17:12	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 17:12	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 17:12	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 17:12	1
Methyl tert-butyl ether	**2.3**		1.0	0.16	ug/L			02/06/21 17:12	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 17:12	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 17:12	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 17:12	1
Tetrachloroethene	**1.1**		1.0	0.36	ug/L			02/06/21 17:12	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 17:12	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 17:12	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 17:12	1
Trichloroethene	**0.65**	**J**	1.0	0.46	ug/L			02/06/21 17:12	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 17:12	1
Vinyl chloride	**8.1**		1.0	0.90	ug/L			02/06/21 17:12	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 17:12	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 17:12*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*77 - 120*		*02/06/21 17:12*	*1*
4-Bromofluorobenzene (Surr)	*102*		*73 - 120*		*02/06/21 17:12*	*1*
Dibromofluoromethane (Surr)	*106*		*75 - 123*		*02/06/21 17:12*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*02/06/21 17:12*	*1*

Client Sample ID: FD-20210204-1
Lab Sample ID: 480-180889-13

Date Collected: 02/04/21 00:00
Matrix: Water

Date Received: 02/04/21 18:25

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	J 0.90		0.20	0.10	ug/L		02/08/21 15:07	02/09/21 17:02	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*25*		*15 - 110*	*02/08/21 15:07*	*02/09/21 17:02*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-Trichlorophenol	ND		5.0	0.48	ug/L		02/08/21 14:57	02/09/21 16:30	1
2,4,6-Trichlorophenol	~~ND~~	UJ	5.0	0.61	ug/L		02/08/21 14:57	02/09/21 16:30	1
2,4-Dichlorophenol	ND		5.0	0.51	ug/L		02/08/21 14:57	02/09/21 16:30	1
2,4-Dimethylphenol	ND		5.0	0.50	ug/L		02/08/21 14:57	02/09/21 16:30	1
2,4-Dinitrophenol	ND		10	2.2	ug/L		02/08/21 14:57	02/09/21 16:30	1
2,4-Dinitrotoluene	ND		5.0	0.45	ug/L		02/08/21 14:57	02/09/21 16:30	1
2,6-Dinitrotoluene	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 16:30	1
2-Chloronaphthalene	ND		5.0	0.46	ug/L		02/08/21 14:57	02/09/21 16:30	1
2-Chlorophenol	ND		5.0	0.53	ug/L		02/08/21 14:57	02/09/21 16:30	1
2-Methylnaphthalene	ND		5.0	0.60	ug/L		02/08/21 14:57	02/09/21 16:30	1
2-Methylphenol	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 16:30	1
2-Nitroaniline	ND		10	0.42	ug/L		02/08/21 14:57	02/09/21 16:30	1
2-Nitrophenol	ND		5.0	0.48	ug/L		02/08/21 14:57	02/09/21 16:30	1
3,3'-Dichlorobenzidine	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 16:30	1
3-Nitroaniline	ND		10	0.48	ug/L		02/08/21 14:57	02/09/21 16:30	1
4,6-Dinitro-2-methylphenol	ND		10	2.2	ug/L		02/08/21 14:57	02/09/21 16:30	1
4-Bromophenyl phenyl ether	ND		5.0	0.45	ug/L		02/08/21 14:57	02/09/21 16:30	1
4-Chloro-3-methylphenol	~~ND~~	UJ	5.0	0.45	ug/L		02/08/21 14:57	02/09/21 16:30	1
4-Chloroaniline	ND		5.0	0.59	ug/L		02/08/21 14:57	02/09/21 16:30	1
4-Chlorophenyl phenyl ether	ND		5.0	0.35	ug/L		02/08/21 14:57	02/09/21 16:30	1
4-Methylphenol	ND		10	0.36	ug/L		02/08/21 14:57	02/09/21 16:30	1
4-Nitroaniline	ND		10	0.25	ug/L		02/08/21 14:57	02/09/21 16:30	1
4-Nitrophenol	~~ND~~	UJ	10	1.5	ug/L		02/08/21 14:57	02/09/21 16:30	1
Acenaphthene	ND		5.0	0.41	ug/L		02/08/21 14:57	02/09/21 16:30	1
Acenaphthylene	ND		5.0	0.38	ug/L		02/08/21 14:57	02/09/21 16:30	1
Acetophenone	ND		5.0	0.54	ug/L		02/08/21 14:57	02/09/21 16:30	1
Anthracene	ND		5.0	0.28	ug/L		02/08/21 14:57	02/09/21 16:30	1
Atrazine	ND		5.0	0.46	ug/L		02/08/21 14:57	02/09/21 16:30	1
Benzaldehyde	ND		5.0	0.27	ug/L		02/08/21 14:57	02/09/21 16:30	1
Benzo(a)anthracene	ND		5.0	0.36	ug/L		02/08/21 14:57	02/09/21 16:30	1
Benzo(a)pyrene	ND		5.0	0.47	ug/L		02/08/21 14:57	02/09/21 16:30	1
Benzo(b)fluoranthene	ND		5.0	0.34	ug/L		02/08/21 14:57	02/09/21 16:30	1
Benzo(g,h,i)perylene	ND		5.0	0.35	ug/L		02/08/21 14:57	02/09/21 16:30	1
Benzo(k)fluoranthene	ND		5.0	0.73	ug/L		02/08/21 14:57	02/09/21 16:30	1
Biphenyl	ND		5.0	0.65	ug/L		02/08/21 14:57	02/09/21 16:30	1
bis (2-chloroisopropyl) ether	ND		5.0	0.52	ug/L		02/08/21 14:57	02/09/21 16:30	1
Bis(2-chloroethoxy)methane	ND		5.0	0.35	ug/L		02/08/21 14:57	02/09/21 16:30	1
Bis(2-chloroethyl)ether	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 16:30	1
Bis(2-ethylhexyl) phthalate	ND		5.0	2.2	ug/L		02/08/21 14:57	02/09/21 16:30	1
Butyl benzyl phthalate	ND		5.0	1.0	ug/L		02/08/21 14:57	02/09/21 16:30	1
Caprolactam	ND		5.0	2.2	ug/L		02/08/21 14:57	02/09/21 16:30	1
Carbazole	~~ND~~	UJ	5.0	0.30	ug/L		02/08/21 14:57	02/09/21 16:30	1
Chrysene	ND		5.0	0.33	ug/L		02/08/21 14:57	02/09/21 16:30	1

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Date Collected: 02/04/21 00:00
Matrix: Water

Date Received: 02/04/21 18:25

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dibenz(a,h)anthracene	ND		5.0	0.42	ug/L		02/08/21 14:57	02/09/21 16:30	1
Dibenzofuran	ND		10	0.51	ug/L		02/08/21 14:57	02/09/21 16:30	1
Diethyl phthalate	ND		5.0	0.22	ug/L		02/08/21 14:57	02/09/21 16:30	1
Dimethyl phthalate	ND		5.0	0.36	ug/L		02/08/21 14:57	02/09/21 16:30	1
Di-n-butyl phthalate	ND		5.0	0.31	ug/L		02/08/21 14:57	02/09/21 16:30	1
Di-n-octyl phthalate	ND		5.0	0.47	ug/L		02/08/21 14:57	02/09/21 16:30	1
Fluoranthene	ND		5.0	0.40	ug/L		02/08/21 14:57	02/09/21 16:30	1
Fluorene	ND		5.0	0.36	ug/L		02/08/21 14:57	02/09/21 16:30	1
Hexachlorobenzene	ND		5.0	0.51	ug/L		02/08/21 14:57	02/09/21 16:30	1
Hexachlorobutadiene	ND		5.0	0.68	ug/L		02/08/21 14:57	02/09/21 16:30	1
Hexachlorocyclopentadiene	ND		5.0	0.59	ug/L		02/08/21 14:57	02/09/21 16:30	1
Hexachloroethane	ND		5.0	0.59	ug/L		02/08/21 14:57	02/09/21 16:30	1
Indeno(1,2,3-cd)pyrene	ND		5.0	0.47	ug/L		02/08/21 14:57	02/09/21 16:30	1
Isophorone	ND		5.0	0.43	ug/L		02/08/21 14:57	02/09/21 16:30	1
Naphthalene	ND		5.0	0.76	ug/L		02/08/21 14:57	02/09/21 16:30	1
Nitrobenzene	ND		5.0	0.29	ug/L		02/08/21 14:57	02/09/21 16:30	1
N-Nitrosodi-n-propylamine	ND		5.0	0.54	ug/L		02/08/21 14:57	02/09/21 16:30	1
N-Nitrosodiphenylamine	ND		5.0	0.51	ug/L		02/08/21 14:57	02/09/21 16:30	1
Pentachlorophenol	~~ND~~	UJ	10	2.2	ug/L		02/08/21 14:57	02/09/21 16:30	1
Phenanthrene	ND		5.0	0.44	ug/L		02/08/21 14:57	02/09/21 16:30	1
Phenol	ND		5.0	0.39	ug/L		02/08/21 14:57	02/09/21 16:30	1
Pyrene	ND		5.0	0.34	ug/L		02/08/21 14:57	02/09/21 16:30	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*45*	*T J*	*ug/L*		*4.52*		*02/08/21 14:57*	*02/09/21 16:30*	*1*
Unknown	*2.7*	*T J*	*ug/L*		*5.67*		*02/08/21 14:57*	*02/09/21 16:30*	*1*
Unknown	*2.3*	*T J*	*ug/L*		*6.64*		*02/08/21 14:57*	*02/09/21 16:30*	*1*
Unknown	*2.8*	*T J*	*ug/L*		*6.87*		*02/08/21 14:57*	*02/09/21 16:30*	*1*
Unknown	*1.7*	*T J*	*ug/L*		*7.37*		*02/08/21 14:57*	*02/09/21 16:30*	*1*
Unknown	*2.1*	*T J*	*ug/L*		*7.51*		*02/08/21 14:57*	*02/09/21 16:30*	*1*
Unknown	*2.0*	*T J*	*ug/L*		*8.28*		*02/08/21 14:57*	*02/09/21 16:30*	*1*
Unknown	*1.9*	*T J*	*ug/L*		*8.96*		*02/08/21 14:57*	*02/09/21 16:30*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol	*123*	*S1+*	*41 - 120*	*02/08/21 14:57*	*02/09/21 16:30*	*1*
2-Fluorobiphenyl	*98*		*48 - 120*	*02/08/21 14:57*	*02/09/21 16:30*	*1*
2-Fluorophenol	*74*		*35 - 120*	*02/08/21 14:57*	*02/09/21 16:30*	*1*
Nitrobenzene-d5	*100*		*46 - 120*	*02/08/21 14:57*	*02/09/21 16:30*	*1*
Phenol-d5	*53*		*22 - 120*	*02/08/21 14:57*	*02/09/21 16:30*	*1*
p-Terphenyl-d14	*78*		*60 - 148*	*02/08/21 14:57*	*02/09/21 16:30*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		0.050	0.0092	ug/L		02/09/21 15:24	02/10/21 13:20	1
4,4'-DDE	ND		0.050	0.012	ug/L		02/09/21 15:24	02/10/21 13:20	1
4,4'-DDT	ND		0.050	0.011	ug/L		02/09/21 15:24	02/10/21 13:20	1
Aldrin	ND		0.050	0.0081	ug/L		02/09/21 15:24	02/10/21 13:20	1
alpha-BHC	ND		0.050	0.0077	ug/L		02/09/21 15:24	02/10/21 13:20	1
cis-Chlordane	ND		0.050	0.015	ug/L		02/09/21 15:24	02/10/21 13:20	1
beta-BHC	ND		0.050	0.025	ug/L		02/09/21 15:24	02/10/21 13:20	1

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Date Collected: 02/04/21 00:00
Matrix: Water

Date Received: 02/04/21 18:25

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
delta-BHC	.05 U 0.013	~~J B~~	0.050	0.010	ug/L		02/09/21 15:24	02/10/21 13:20	1
Dieldrin	ND		0.050	0.0098	ug/L		02/09/21 15:24	02/10/21 13:20	1
Endosulfan I	ND		0.050	0.011	ug/L		02/09/21 15:24	02/10/21 13:20	1
Endosulfan II	ND		0.050	0.012	ug/L		02/09/21 15:24	02/10/21 13:20	1
Endosulfan sulfate	ND		0.050	0.016	ug/L		02/09/21 15:24	02/10/21 13:20	1
Endrin	ND		0.050	0.014	ug/L		02/09/21 15:24	02/10/21 13:20	1
Endrin aldehyde	ND		0.050	0.016	ug/L		02/09/21 15:24	02/10/21 13:20	1
Endrin ketone	ND		0.050	0.012	ug/L		02/09/21 15:24	02/10/21 13:20	1
gamma-BHC (Lindane)	ND		0.050	0.0080	ug/L		02/09/21 15:24	02/10/21 13:20	1
trans-Chlordane	ND		0.050	0.011	ug/L		02/09/21 15:24	02/10/21 13:20	1
Heptachlor	ND		0.050	0.0085	ug/L		02/09/21 15:24	02/10/21 13:20	1
Heptachlor epoxide	ND		0.050	0.0074	ug/L		02/09/21 15:24	02/10/21 13:20	1
Methoxychlor	ND		0.050	0.014	ug/L		02/09/21 15:24	02/10/21 13:20	1
Toxaphene	ND		0.50	0.12	ug/L		02/09/21 15:24	02/10/21 13:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*73*		*20 - 120*	*02/09/21 15:24*	*02/10/21 13:20*	*1*
DCB Decachlorobiphenyl	*67*		*20 - 120*	*02/09/21 15:24*	*02/10/21 13:20*	*1*
Tetrachloro-m-xylene	*96*		*44 - 120*	*02/09/21 15:24*	*02/10/21 13:20*	*1*
Tetrachloro-m-xylene	*75*		*44 - 120*	*02/09/21 15:24*	*02/10/21 13:20*	*1*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 21:57	1
PCB-1221	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 21:57	1
PCB-1232	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 21:57	1
PCB-1242	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 21:57	1
PCB-1248	ND		0.50	0.18	ug/L		02/10/21 07:35	02/10/21 21:57	1
PCB-1254	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 21:57	1
PCB-1260	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 21:57	1
PCB-1262	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 21:57	1
PCB-1268	ND		0.50	0.25	ug/L		02/10/21 07:35	02/10/21 21:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*96*		*39 - 121*	*02/10/21 07:35*	*02/10/21 21:57*	*1*
Tetrachloro-m-xylene	*81*		*39 - 121*	*02/10/21 07:35*	*02/10/21 21:57*	*1*
DCB Decachlorobiphenyl	*145*	*S1+*	*19 - 120*	*02/10/21 07:35*	*02/10/21 21:57*	*1*
DCB Decachlorobiphenyl	*80*		*19 - 120*	*02/10/21 07:35*	*02/10/21 21:57*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**12**		4.6	2.2	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluoropentanoic acid (PFPeA)	**5.9**		1.8	0.45	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorohexanoic acid (PFHxA)	**3.0**		1.8	0.53	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluoroheptanoic acid (PFHpA)	**0.50**	**J**	1.8	0.23	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorooctanoic acid (PFOA)	ND		1.8	0.78	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.25	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		02/11/21 04:18	02/11/21 17:19	1

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Lab Sample ID: 480-180889-13
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.67	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorobutanesulfonic acid (PFBS)	**0.39**	**J**	1.8	0.18	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.8	0.52	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.17	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.8	0.50	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L		02/11/21 04:18	02/11/21 17:19	1
Perfluorooctanesulfonamide (FOSA)	ND		1.8	0.90	ng/L		02/11/21 04:18	02/11/21 17:19	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.6	1.1	ng/L		02/11/21 04:18	02/11/21 17:19	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.6	1.2	ng/L		02/11/21 04:18	02/11/21 17:19	1
6:2 FTS	ND		4.6	2.3	ng/L		02/11/21 04:18	02/11/21 17:19	1
8:2 FTS	ND		1.8	0.42	ng/L		02/11/21 04:18	02/11/21 17:19	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*59*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C5 PFPeA	*68*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C2 PFHxA	*82*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C4 PFHpA	*89*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C4 PFOA	*101*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C5 PFNA	*95*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C2 PFDA	*97*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C2 PFUnA	*90*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C2 PFDoA	*96*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C2 PFTeDA	*100*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C3 PFBS	*74*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
18O2 PFHxS	*71*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C4 PFOS	*76*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
13C8 FOSA	*74*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
d3-NMeFOSAA	*62*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
d5-NEtFOSAA	*74*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
M2-6:2 FTS	*95*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*
M2-8:2 FTS	*98*		*25 - 150*	*02/11/21 04:18*	*02/11/21 17:19*	*1*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	ND		0.20	0.060	mg/L		02/08/21 11:04	02/09/21 18:52	1
Antimony	ND		0.020	0.0068	mg/L		02/08/21 11:04	02/09/21 18:52	1
Arsenic	ND		0.015	0.0056	mg/L		02/08/21 11:04	02/09/21 18:52	1
Barium	**0.069**		0.0020	0.00070	mg/L		02/08/21 11:04	02/09/21 18:52	1
Beryllium	ND		0.0020	0.00030	mg/L		02/08/21 11:04	02/09/21 18:52	1
Cadmium	ND		0.0020	0.00050	mg/L		02/08/21 11:04	02/09/21 18:52	1
Calcium	**164**		0.50	0.10	mg/L		02/08/21 11:04	02/09/21 18:52	1
Chromium	ND		0.0040	0.0010	mg/L		02/08/21 11:04	02/09/21 18:52	1
Cobalt	ND		0.0040	0.00063	mg/L		02/08/21 11:04	02/09/21 18:52	1
Copper	ND		0.010	0.0016	mg/L		02/08/21 11:04	02/09/21 18:52	1
Iron	**1.4**		0.050	0.019	mg/L		02/08/21 11:04	02/09/21 18:52	1
Lead	ND		0.010	0.0030	mg/L		02/08/21 11:04	02/09/21 18:52	1

Client Sample ID: FD-20210204-1 — Lab Sample ID: 480-180889-13

Date Collected: 02/04/21 00:00 — **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 6010C - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Magnesium	**51.8**		0.20	0.043	mg/L		02/08/21 11:04	02/09/21 18:52	1
Manganese	**0.13**	**B**	0.0030	0.00040	mg/L		02/08/21 11:04	02/09/21 18:52	1
Nickel	ND		0.010	0.0013	mg/L		02/08/21 11:04	02/09/21 18:52	1
Potassium	**10.7**		0.50	0.10	mg/L		02/08/21 11:04	02/09/21 18:52	1
Selenium	ND		0.025	0.0087	mg/L		02/08/21 11:04	02/09/21 18:52	1
Silver	ND		0.0060	0.0017	mg/L		02/08/21 11:04	02/09/21 18:52	1
Sodium	**127**		1.0	0.32	mg/L		02/08/21 11:04	02/09/21 18:52	1
Thallium	ND		0.020	0.010	mg/L		02/08/21 11:04	02/09/21 18:52	1
Vanadium	ND		0.0050	0.0015	mg/L		02/08/21 11:04	02/09/21 18:52	1
Zinc	ND		0.010	0.0015	mg/L		02/08/21 11:04	02/09/21 18:52	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00012	mg/L		02/08/21 13:54	02/08/21 17:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	**0.0065**	**J F1**	0.010	0.0050	mg/L		02/08/21 21:22	02/09/21 20:09	1

Client Sample ID: MN - 060B — Lab Sample ID: 480-180889-14

Date Collected: 02/04/21 13:55 — **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 17:36	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 17:36	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 17:36	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 17:36	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 17:36	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 17:36	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 17:36	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 17:36	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 17:36	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 17:36	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 17:36	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 17:36	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 17:36	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 17:36	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 17:36	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 17:36	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 17:36	1
Acetone	ND		10	3.0	ug/L			02/06/21 17:36	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 17:36	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 17:36	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 17:36	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 17:36	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 17:36	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 17:36	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 17:36	1

Client Sample ID: MN - 060B — Lab Sample ID: 480-180889-14

Date Collected: 02/04/21 13:55 **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 17:36	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 17:36	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 17:36	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/06/21 17:36	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 17:36	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 17:36	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 17:36	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 17:36	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 17:36	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 17:36	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 17:36	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/06/21 17:36	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 17:36	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 17:36	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 17:36	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/06/21 17:36	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 17:36	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 17:36	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 17:36	1
Trichloroethene	ND		1.0	0.46	ug/L			02/06/21 17:36	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 17:36	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 17:36	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 17:36	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 17:36*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*77 - 120*		*02/06/21 17:36*	*1*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*02/06/21 17:36*	*1*
Dibromofluoromethane (Surr)	*98*		*75 - 123*		*02/06/21 17:36*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*02/06/21 17:36*	*1*

Client Sample ID: MN - 06S — Lab Sample ID: 480-180889-15

Date Collected: 02/04/21 14:10 **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 17:59	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 17:59	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 17:59	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 17:59	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 17:59	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 17:59	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 17:59	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 17:59	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 17:59	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 17:59	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 17:59	1

Client Sample ID: MN - 06S
Lab Sample ID: 480-180889-15

Date Collected: 02/04/21 14:10
Matrix: Water

Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 17:59	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 17:59	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 17:59	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 17:59	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 17:59	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 17:59	1
Acetone	ND		10	3.0	ug/L			02/06/21 17:59	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 17:59	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 17:59	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 17:59	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 17:59	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 17:59	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 17:59	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 17:59	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 17:59	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 17:59	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 17:59	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/06/21 17:59	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 17:59	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 17:59	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 17:59	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 17:59	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 17:59	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 17:59	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 17:59	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/06/21 17:59	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 17:59	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 17:59	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 17:59	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/06/21 17:59	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 17:59	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 17:59	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 17:59	1
Trichloroethene	ND		1.0	0.46	ug/L			02/06/21 17:59	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 17:59	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 17:59	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 17:59	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 17:59*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*77 - 120*		*02/06/21 17:59*	*1*
4-Bromofluorobenzene (Surr)	*101*		*73 - 120*		*02/06/21 17:59*	*1*
Dibromofluoromethane (Surr)	*103*		*75 - 123*		*02/06/21 17:59*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*02/06/21 17:59*	*1*

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	~~ND~~ UJ		0.20	0.10	ug/L		02/08/21 15:07	02/09/21 17:25	1

Client Sample ID: MN - 06S
Date Collected: 02/04/21 14:10
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-15
Matrix: Water

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	31		15 - 110	02/08/21 15:07	02/09/21 17:25	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**15**		4.9	2.3	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluoropentanoic acid (PFPeA)	**3.8**		1.9	0.48	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorohexanoic acid (PFHxA)	**3.4**		1.9	0.56	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluoroheptanoic acid (PFHpA)	**2.8**		1.9	0.24	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorooctanoic acid (PFOA)	**6.4**		1.9	0.83	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.26	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.30	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.1	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.53	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.3	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.71	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorobutanesulfonic acid (PFBS)	**1.4**	**J**	1.9	0.19	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorohexanesulfonic acid (PFHxS)	**1.1**	**J**	1.9	0.55	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.9	0.18	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorooctanesulfonic acid (PFOS)	**2.7**	**I** J	1.9	0.53	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.9	0.31	ng/L		02/11/21 04:18	02/11/21 17:28	1
Perfluorooctanesulfonamide (FOSA)	ND		1.9	0.95	ng/L		02/11/21 04:18	02/11/21 17:28	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.9	1.2	ng/L		02/11/21 04:18	02/11/21 17:28	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.9	1.3	ng/L		02/11/21 04:18	02/11/21 17:28	1
6:2 FTS	ND		4.9	2.4	ng/L		02/11/21 04:18	02/11/21 17:28	1
8:2 FTS	ND		1.9	0.45	ng/L		02/11/21 04:18	02/11/21 17:28	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	51		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C5 PFPeA	67		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C2 PFHxA	81		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C4 PFHpA	90		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C4 PFOA	99		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C5 PFNA	98		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C2 PFDA	97		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C2 PFUnA	92		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C2 PFDoA	88		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C2 PFTeDA	84		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C3 PFBS	73		25 - 150	02/11/21 04:18	02/11/21 17:28	1
18O2 PFHxS	71		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C4 PFOS	75		25 - 150	02/11/21 04:18	02/11/21 17:28	1
13C8 FOSA	79		25 - 150	02/11/21 04:18	02/11/21 17:28	1
d3-NMeFOSAA	63		25 - 150	02/11/21 04:18	02/11/21 17:28	1
d5-NEtFOSAA	65		25 - 150	02/11/21 04:18	02/11/21 17:28	1
M2-6:2 FTS	102		25 - 150	02/11/21 04:18	02/11/21 17:28	1
M2-8:2 FTS	100		25 - 150	02/11/21 04:18	02/11/21 17:28	1

Client Sample ID: MN - 06I
Date Collected: 02/04/21 14:25
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-16
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		20	16	ug/L			02/06/21 18:22	20
1,1,2,2-Tetrachloroethane	ND		20	4.2	ug/L			02/06/21 18:22	20
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		20	6.2	ug/L			02/06/21 18:22	20
1,1,2-Trichloroethane	ND		20	4.6	ug/L			02/06/21 18:22	20
1,1-Dichloroethane	ND		20	7.6	ug/L			02/06/21 18:22	20
1,1-Dichloroethene	ND		20	5.8	ug/L			02/06/21 18:22	20
1,2,4-Trichlorobenzene	ND		20	8.2	ug/L			02/06/21 18:22	20
1,2-Dibromo-3-Chloropropane	ND		20	7.8	ug/L			02/06/21 18:22	20
1,2-Dibromoethane	ND		20	15	ug/L			02/06/21 18:22	20
1,2-Dichlorobenzene	ND		20	16	ug/L			02/06/21 18:22	20
1,2-Dichloroethane	ND		20	4.2	ug/L			02/06/21 18:22	20
1,2-Dichloropropane	ND		20	14	ug/L			02/06/21 18:22	20
1,3-Dichlorobenzene	ND		20	16	ug/L			02/06/21 18:22	20
1,4-Dichlorobenzene	ND		20	17	ug/L			02/06/21 18:22	20
2-Butanone (MEK)	ND		200	26	ug/L			02/06/21 18:22	20
2-Hexanone	ND		100	25	ug/L			02/06/21 18:22	20
4-Methyl-2-pentanone (MIBK)	ND		100	42	ug/L			02/06/21 18:22	20
Acetone	ND		200	60	ug/L			02/06/21 18:22	20
Benzene	ND		20	8.2	ug/L			02/06/21 18:22	20
Bromodichloromethane	ND		20	7.8	ug/L			02/06/21 18:22	20
Bromoform	ND		20	5.2	ug/L			02/06/21 18:22	20
Bromomethane	ND		20	14	ug/L			02/06/21 18:22	20
Carbon disulfide	ND		20	3.8	ug/L			02/06/21 18:22	20
Carbon tetrachloride	ND		20	5.4	ug/L			02/06/21 18:22	20
Chlorobenzene	ND		20	15	ug/L			02/06/21 18:22	20
Chloroethane	ND		20	6.4	ug/L			02/06/21 18:22	20
Chloroform	ND		20	6.8	ug/L			02/06/21 18:22	20
Chloromethane	ND		20	7.0	ug/L			02/06/21 18:22	20
cis-1,2-Dichloroethene	**1300**		20	16	ug/L			02/06/21 18:22	20
cis-1,3-Dichloropropene	ND		20	7.2	ug/L			02/06/21 18:22	20
Cyclohexane	ND		20	3.6	ug/L			02/06/21 18:22	20
Dibromochloromethane	ND		20	6.4	ug/L			02/06/21 18:22	20
Dichlorodifluoromethane	ND		20	14	ug/L			02/06/21 18:22	20
Ethylbenzene	ND		20	15	ug/L			02/06/21 18:22	20
Isopropylbenzene	ND		20	16	ug/L			02/06/21 18:22	20
Methyl acetate	ND		50	26	ug/L			02/06/21 18:22	20
Methyl tert-butyl ether	ND		20	3.2	ug/L			02/06/21 18:22	20
Methylcyclohexane	ND		20	3.2	ug/L			02/06/21 18:22	20
Methylene Chloride	ND		20	8.8	ug/L			02/06/21 18:22	20
Styrene	ND		20	15	ug/L			02/06/21 18:22	20
Tetrachloroethene	**160**		20	7.2	ug/L			02/06/21 18:22	20
Toluene	ND		20	10	ug/L			02/06/21 18:22	20
trans-1,2-Dichloroethene	ND		20	18	ug/L			02/06/21 18:22	20
trans-1,3-Dichloropropene	ND		20	7.4	ug/L			02/06/21 18:22	20
Trichloroethene	**280**		20	9.2	ug/L			02/06/21 18:22	20
Trichlorofluoromethane	ND		20	18	ug/L			02/06/21 18:22	20
Vinyl chloride	**27**		20	18	ug/L			02/06/21 18:22	20
Xylenes, Total	ND		40	13	ug/L			02/06/21 18:22	20

Client Sample ID: MN - 06I
Date Collected: 02/04/21 14:25
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-16
Matrix: Water

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/06/21 18:22	20

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		77 - 120		02/06/21 18:22	20
4-Bromofluorobenzene (Surr)	100		73 - 120		02/06/21 18:22	20
Dibromofluoromethane (Surr)	100		75 - 123		02/06/21 18:22	20
Toluene-d8 (Surr)	106		80 - 120		02/06/21 18:22	20

Client Sample ID: MN - 06D
Date Collected: 02/04/21 16:00
Date Received: 02/04/21 18:25

Lab Sample ID: 480-180889-17
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 18:45	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 18:45	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 18:45	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 18:45	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 18:45	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 18:45	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 18:45	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 18:45	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 18:45	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 18:45	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 18:45	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 18:45	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 18:45	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 18:45	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 18:45	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 18:45	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 18:45	1
Acetone	ND		10	3.0	ug/L			02/06/21 18:45	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 18:45	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 18:45	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 18:45	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 18:45	1
Carbon disulfide	**1.0**		1.0	0.19	ug/L			02/06/21 18:45	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 18:45	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 18:45	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 18:45	1
Chloroform	ND		1.0	0.34	ug/L			02/06/21 18:45	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 18:45	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/06/21 18:45	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 18:45	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 18:45	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 18:45	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 18:45	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 18:45	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 18:45	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 18:45	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/06/21 18:45	1

Client Sample ID: MN - 06D
Lab Sample ID: 480-180889-17
Date Collected: 02/04/21 16:00
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 18:45	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 18:45	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 18:45	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/06/21 18:45	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 18:45	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 18:45	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 18:45	1
Trichloroethene	ND		1.0	0.46	ug/L			02/06/21 18:45	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 18:45	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 18:45	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 18:45	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 18:45*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*77 - 120*		*02/06/21 18:45*	*1*
4-Bromofluorobenzene (Surr)	*101*		*73 - 120*		*02/06/21 18:45*	*1*
Dibromofluoromethane (Surr)	*105*		*75 - 123*		*02/06/21 18:45*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*02/06/21 18:45*	*1*

Client Sample ID: AB - 20210204
Lab Sample ID: 480-180889-18
Date Collected: 02/04/21 16:30
Matrix: Water
Date Received: 02/04/21 18:25

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		4.8	2.3	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluoropentanoic acid (PFPeA)	ND		1.9	0.47	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorohexanoic acid (PFHxA)	ND		1.9	0.55	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluoroheptanoic acid (PFHpA)	ND		1.9	0.24	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorooctanoic acid (PFOA)	ND		1.9	0.81	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorononanoic acid (PFNA)	ND		1.9	0.26	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorodecanoic acid (PFDA)	ND		1.9	0.29	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluoroundecanoic acid (PFUnA)	ND		1.9	1.0	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorododecanoic acid (PFDoA)	ND		1.9	0.52	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorotridecanoic acid (PFTriA)	ND		1.9	1.2	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.9	0.69	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.9	0.19	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.9	0.54	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.9	0.18	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.9	0.51	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.9	0.30	ng/L		02/11/21 04:18	02/11/21 17:37	1
Perfluorooctanesulfonamide (FOSA)	ND		1.9	0.93	ng/L		02/11/21 04:18	02/11/21 17:37	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		4.8	1.1	ng/L		02/11/21 04:18	02/11/21 17:37	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		4.8	1.2	ng/L		02/11/21 04:18	02/11/21 17:37	1
6:2 FTS	ND		4.8	2.4	ng/L		02/11/21 04:18	02/11/21 17:37	1
8:2 FTS	ND		1.9	0.44	ng/L		02/11/21 04:18	02/11/21 17:37	1

Client Sample ID: AB - 20210204 — Lab Sample ID: 480-180889-18

Date Collected: 02/04/21 16:30 — **Matrix: Water**
Date Received: 02/04/21 18:25

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	70		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C5 PFPeA	76		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C2 PFHxA	79		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C4 PFHpA	87		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C4 PFOA	101		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C5 PFNA	93		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C2 PFDA	93		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C2 PFUnA	88		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C2 PFDoA	98		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C2 PFTeDA	91		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C3 PFBS	71		25 - 150	02/11/21 04:18	02/11/21 17:37	1
18O2 PFHxS	68		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C4 PFOS	72		25 - 150	02/11/21 04:18	02/11/21 17:37	1
13C8 FOSA	74		25 - 150	02/11/21 04:18	02/11/21 17:37	1
d3-NMeFOSAA	74		25 - 150	02/11/21 04:18	02/11/21 17:37	1
d5-NEtFOSAA	73		25 - 150	02/11/21 04:18	02/11/21 17:37	1
M2-6:2 FTS	89		25 - 150	02/11/21 04:18	02/11/21 17:37	1
M2-8:2 FTS	91		25 - 150	02/11/21 04:18	02/11/21 17:37	1

Client Sample ID: EB - 20210204 — Lab Sample ID: 480-180889-19

Date Collected: 02/04/21 16:35 — **Matrix: Water**
Date Received: 02/04/21 18:25

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		5.0	2.4	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluoropentanoic acid (PFPeA)	ND		2.0	0.49	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorononanoic acid (PFNA)	ND		2.0	0.27	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.73	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.57	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.19	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.32	ng/L		02/11/21 04:18	02/11/21 18:05	1
Perfluorooctanesulfonamide (FOSA)	ND		2.0	0.98	ng/L		02/11/21 04:18	02/11/21 18:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		5.0	1.2	ng/L		02/11/21 04:18	02/11/21 18:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		5.0	1.3	ng/L		02/11/21 04:18	02/11/21 18:05	1
6:2 FTS	ND		5.0	2.5	ng/L		02/11/21 04:18	02/11/21 18:05	1
8:2 FTS	ND		2.0	0.46	ng/L		02/11/21 04:18	02/11/21 18:05	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	71		25 - 150	02/11/21 04:18	02/11/21 18:05	1

Client Sample ID: EB - 20210204
Lab Sample ID: 480-180889-19

Date Collected: 02/04/21 16:35
Matrix: Water
Date Received: 02/04/21 18:25

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C5 PFPeA	*79*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C2 PFHxA	*81*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C4 PFHpA	*85*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C4 PFOA	*101*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C5 PFNA	*94*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C2 PFDA	*99*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C2 PFUnA	*87*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C2 PFDoA	*95*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C2 PFTeDA	*96*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C3 PFBS	*72*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
18O2 PFHxS	*68*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C4 PFOS	*73*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
13C8 FOSA	*74*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
d3-NMeFOSAA	*75*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
d5-NEtFOSAA	*78*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
M2-6:2 FTS	*86*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*
M2-8:2 FTS	*90*		*25 - 150*	*02/11/21 04:18*	*02/11/21 18:05*	*1*

Client Sample ID: TRIP BLANK
Lab Sample ID: 480-180889-20

Date Collected: 02/04/21 00:00
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/06/21 19:08	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/06/21 19:08	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/06/21 19:08	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/06/21 19:08	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/06/21 19:08	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/06/21 19:08	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/06/21 19:08	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/06/21 19:08	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/06/21 19:08	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/06/21 19:08	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/06/21 19:08	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/06/21 19:08	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/06/21 19:08	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/06/21 19:08	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/06/21 19:08	1
2-Hexanone	ND		5.0	1.2	ug/L			02/06/21 19:08	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/06/21 19:08	1
Acetone	ND		10	3.0	ug/L			02/06/21 19:08	1
Benzene	ND		1.0	0.41	ug/L			02/06/21 19:08	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/06/21 19:08	1
Bromoform	ND		1.0	0.26	ug/L			02/06/21 19:08	1
Bromomethane	ND		1.0	0.69	ug/L			02/06/21 19:08	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/06/21 19:08	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/06/21 19:08	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/06/21 19:08	1
Chloroethane	ND		1.0	0.32	ug/L			02/06/21 19:08	1

Client Sample ID: TRIP BLANK
Lab Sample ID: 480-180889-20

Date Collected: 02/04/21 00:00
Matrix: Water
Date Received: 02/04/21 18:25

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroform	ND		1.0	0.34	ug/L			02/06/21 19:08	1
Chloromethane	ND		1.0	0.35	ug/L			02/06/21 19:08	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/06/21 19:08	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/06/21 19:08	1
Cyclohexane	ND		1.0	0.18	ug/L			02/06/21 19:08	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/06/21 19:08	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/06/21 19:08	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/06/21 19:08	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/06/21 19:08	1
Methyl acetate	ND		2.5	1.3	ug/L			02/06/21 19:08	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/06/21 19:08	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/06/21 19:08	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/06/21 19:08	1
Styrene	ND		1.0	0.73	ug/L			02/06/21 19:08	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/06/21 19:08	1
Toluene	ND		1.0	0.51	ug/L			02/06/21 19:08	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/06/21 19:08	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/06/21 19:08	1
Trichloroethene	ND		1.0	0.46	ug/L			02/06/21 19:08	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/06/21 19:08	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/06/21 19:08	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/06/21 19:08	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/06/21 19:08*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*77 - 120*		*02/06/21 19:08*	*1*
4-Bromofluorobenzene (Surr)	*100*		*73 - 120*		*02/06/21 19:08*	*1*
Dibromofluoromethane (Surr)	*106*		*75 - 123*		*02/06/21 19:08*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*02/06/21 19:08*	*1*

ATTACHMENT B

CASE NARRATIVE & COC

Sample Summary

Client: New York State D.E.C.
Job ID: 480-180889-1
Project/Site: 331-337 W. Main St Rochester #828102

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-180889-1	MN - 11S	Water	02/03/21 11:02	02/04/21 18:25	
480-180889-2	FD - 20210203-2	Water	02/03/21 11:10	02/04/21 18:25	
480-180889-3	MN - 11I	Water	02/03/21 11:49	02/04/21 18:25	
480-180889-4	MN - 12S	Water	02/03/21 11:50	02/04/21 18:25	
480-180889-5	FD-20210203-1	Water	02/03/21 00:00	02/04/21 18:25	
480-180889-6	MN-12I	Water	02/03/21 11:45	02/04/21 18:25	
480-180889-7	MW - 11	Water	02/03/21 14:02	02/04/21 18:25	
480-180889-8	MW - 2	Water	02/03/21 15:38	02/04/21 18:25	
480-180889-9	BMW - 104I	Water	02/03/21 14:00	02/04/21 18:25	
480-180889-10	BMW - 104S	Water	02/03/21 15:20	02/04/21 18:25	
480-180889-11	MW - 13	Water	02/04/21 11:10	02/04/21 18:25	
480-180889-12	MN - 05S	Water	02/04/21 11:10	02/04/21 18:25	
480-180889-13	FD-20210204-1	Water	02/04/21 00:00	02/04/21 18:25	
480-180889-14	MN - 060B	Water	02/04/21 13:55	02/04/21 18:25	
480-180889-15	MN - 06S	Water	02/04/21 14:10	02/04/21 18:25	
480-180889-16	MN - 06I	Water	02/04/21 14:25	02/04/21 18:25	
480-180889-17	MN - 06D	Water	02/04/21 16:00	02/04/21 18:25	
480-180889-18	AB - 20210204	Water	02/04/21 16:30	02/04/21 18:25	
480-180889-19	EB - 20210204	Water	02/04/21 16:35	02/04/21 18:25	
480-180889-20	TRIP BLANK	Water	02/04/21 00:00	02/04/21 18:25	

Job Narrative
480-180889-1

Receipt
The samples were received on 2/4/2021 6:25 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 4 coolers at receipt time were 2.5º C, 2.8º C, 2.9º C and 3.1º C.

GC/MS VOA
Method 8260C: The following samples were diluted to bring the concentration of target analytes within the calibration range: MW - 11 (480-180889-7), BMW - 104I (480-180889-9), BMW - 104S (480-180889-10), MW - 13 (480-180889-11), MW - 13 (480-180889-11[MS]), MW - 13 (480-180889-11[MSD]) and MN - 06I (480-180889-16). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270D: The continuing calibration verification (CCV) associated with batch 480-568786 recovered outside acceptance criteria, low biased, for 2,4,6-Trichlorophenol, 4-Chloro-3-methylphenol, 4-Nitrophenol, Carbazole and Pentachlorophenol. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method 8270D: The minimum response factor (RF) criteria for the continuing calibration verification (CCV) analyzed in batch 480-568786 was outside criteria for the following analyte(s): 4-Chloro-3-methylphenol. As indicated in the reference method, sample analysis may proceed; however, any detection or non-detection for the affected analyte(s) is considered estimated.

Method 8270D: The following compound has been spiked at a level above the upper range of the initial calibration: Pentachlorophenol. The laboratory control sample (LCS), matrix spike (MS) and matrix spike duplicate (MSD) associated with preparation batch 480-568692 and analytical batch 480-568786 recovered within acceptable limits for this analyte and has been qualified with an "E" flag.

Method 8270D: Six surrogates are used for this analysis. The laboratory's SOP allows one acid and one base of these surrogates to be outside acceptance criteria without performing re-extraction/re-analysis. The following sample contained an allowable number of surrogate compounds outside limits: FD-20210204-1 (480-180889-13). These results have been reported and qualified.

Method 8270D SIM ID: The 1,4-Dioxane results reported for samples MW - 13 (480-180889-11[MS]) and MW - 13 (480-180889-11[MSD]) have an "E" flag qualifier indicating the results are over the calibration range on the raw data. The actual amounts are within the calibration range; however, the "E" flag is generated based upon the bias corrected concentration. The LIMS system calculates a bias correction based on the recovery of the 1,4-Dioxane-d8 isotope.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
Method 8081B: The continuing calibration verification (CCV) associated with batch 480-568888 recovered above the upper control limit for Endrin aldehyde. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: MW - 13 (480-180889-11), MN - 05S (480-180889-12) and FD-20210204-1 (480-180889-13).

Method 8081B: The matrix spike duplicate (MSD) recoveries for preparation batch 480-568839 and analytical batch 480-568888 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits. MW - 13 (480-180889-11)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

LCMS
Method 537 (modified): The “I” qualifier means the transition mass ratio for the indicated analyte was outside of the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. However, analyst judgement was used to positively identify the analyte.

MN - 06S (480-180889-15)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Method 3535: The following samples are brown and contained a thin layer of sediment at the bottom of the bottle prior to extraction: MW - 13 (480-180889-11), MW - 13 (480-180889-11[MS]), MW - 13 (480-180889-11[MSD]) and MN - 06S (480-180889-15).

320-460989
Method: 3535 PFC-W

Method 3535: The following samples are yellow and contained floating particulates in the sample bottle prior to extraction: MN - 05S (480-180889-12) and FD-20210204-1 (480-180889-13).

320-460989
Method: 3535 PFC-W

Method 3535: The following sample was cloudy after extraction/final volume: MN - 06S (480-180889-15).

320-460989
Method: 3535 PFC-W

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: S. Connelly / T. Urban	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-156514-34518.1
Client Contact: Mr. Benjamin Rung	Phone:	E-Mail: Orlette.Johnson@Eurofinset.com	State of Origin:	Page: Page ~~1 of 2~~ 1 of 2
Company: New York State D.E.C.	PWSID:			Job #:
Address: 625 Broadway 12th Floor	Due Date Requested:			
City: Albany	TAT Requested (days): STD			
State, Zip: NY, 12233-7017	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Callout ID: 137811			
Email: benjamin.rung@dec.ny.gov	WO #:			
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (MOD) TCL list OLM04.2 + TICs	PFC_IDA - PFAS, Standard List (21 Analytes)	8082A - TCL PCBs - SOM01.0	8081B - TCL Pesticides - OLM04.2	8270D - (MOD) TCL SVOA - OLM04.2 + TICs	6010C, 7470A	8270D_SIM_MS_ID - 1,4-dioxane	9012B - Cyanide, Total						Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	N	N	N	N	D	N	B							
MW-11S	2/03/21	1102	G	Water	N	N	X													3	
FD-20210203-2	2/03/21	1110	G	Water	N	N	X													3	
MW-11I	2/03/21	1149	G	Water	N	N	X													3	
MW-12S	2/03/21	1050	G	Water	N	N	X													3	
FD-20210203-1	2/03/21	-	G	Water	N	N	X													3	
MW-12I	2/03/21	1145	G	Water	N	N	X													3	
MW-11	2/03/21	1402	G	Water	N	N	X													3	
MW-2	2/03/21	1538	G	Water	N	N	X													3	
BMW-104I	2/03/21	1400	G	Water	N	N	X													3	
BMW-104S	2/03/21	1520	G	Water	N	N	X													3	
				Water																	

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Sean P. Connelly	2/04/21 @ 1825	Arcom		2/4/21	Eurofins
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.8, 3.1, 2.5, 2.9 #1

Ver: 11/01/2020

DATA USABILITY SUMMARY REPORT

For

331-337 W. Main St Rochester
WATER SAMPLES

VOA
SDG No. J180933

Sampling Date: February 5, 2021

Submitted to:

AECOM
257 West Genesee Street
Suite 400
Buffalo, New York, USA
716-856-5636

Prepared by:

Environmental Occupational & Public Health Consultants Inc. (EOPHC)
Environmental Data Validation Inc. (EDV, Inc.)
1326 Orangewood Ave
Pittsburgh, PA 15216
(412) 341-5281

Site: 331-337 W. Main St Rochester
Client: AECOM
Laboratory: Eurofins TestAmerica

SDG #: J180933
Date: April 10, 2021
Reviewer: L. Wright

Sample Identification Table

Client Sample ID	Laboratory ID	Matrix	VOC
MN-12D	480-180933-1	Aqueous	X
MN-11D	480-180933-2	Aqueous	X
MW-06	480-180933-3	Aqueous	X
MW-04R	480-180933-4	Aqueous	X
MW-03	480-180933-5	Aqueous	X
TB-20210205	480-180933-6	Aqueous	X

*SVOA-SIM only

The data packages contained six (6) aqueous samples, which included one (1) trip blank sample. The samples were analyzed via Method SW-846 8260C. The adherence of laboratory analytical performance to this methods' analytical specifications was evaluated during the data validation process. The data package was evaluated for its usability as defined by the Guidance for the Development of Data Usability Summary Reports (DER-10, 11/09). USEPA Region II standard operating procedures were used as guidance documents. According to the NYSDEC Guidance for the Development of Data Usability Summary Reports, the following QC data were evaluated: blanks, instrument tunings, calibration standards, calibration verifications, laboratory controls, surrogate recoveries, spike recoveries, and sample data. All QC data were within quality control limits, except the following issues:

Cover letter, Narrative and Data Reporting Forms (Form 1s): The deficiencies noted in the case narrative that affect data usability have been discussed in applicable sections. Data that have no impact on data usability are not discussed.

Chain of Custody (COC): All samples were present.

Preservation: Preservation was acceptable.

Holding Time: Holding times were within acceptable criteria for all samples.

Blanks Quality Control: The blanks were acceptable.

Calibration Quality Control: The calibration was acceptable.

Laboratory Control Sample (LCS): The results were acceptable.

Surrogates: The recoveries were acceptable.

Internal Standards: All results were acceptable.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD): All the results are acceptable.

Field Duplicate: No field duplicates were presented with this SDG.

Compound Quantitation: The results were acceptable.

Tentatively Identified Compounds: No TICs were reported.

Additional Comments: Some Form 1s and case narratives are reporting criteria out of QC limits. If data were impacted due to the deficiency, it is discussed in the DUSR, and appropriate qualifier(s) applied. Therefore, all discussions in the DUSR relate to all conditions that affected data usability. When there are multiple analyses, the validator presents the best run (Attachment A).

Data usability: Data qualified with the "UJ" qualifier are to be used cautiously as they are estimated data with some quality control issues. Data qualified with the "J" qualifier are to be used cautiously as they are estimated data with some quality control issues. Data qualified with the "R" qualifier are not usable due to severe quality control issues. Data qualified with the "U" qualifier are usable at the reporting limit.

ATTACHMENT A

FORM 1s

Client Sample ID: MN-12D
Date Collected: 02/05/21 10:15
Date Received: 02/05/21 16:09

Lab Sample ID: 480-180933-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/08/21 17:52	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/08/21 17:52	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/08/21 17:52	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/08/21 17:52	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/08/21 17:52	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/08/21 17:52	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/08/21 17:52	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/08/21 17:52	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/08/21 17:52	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/08/21 17:52	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/08/21 17:52	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/08/21 17:52	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/08/21 17:52	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/08/21 17:52	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/08/21 17:52	1
2-Hexanone	ND		5.0	1.2	ug/L			02/08/21 17:52	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/08/21 17:52	1
Acetone	ND		10	3.0	ug/L			02/08/21 17:52	1
Benzene	ND		1.0	0.41	ug/L			02/08/21 17:52	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/08/21 17:52	1
Bromoform	ND		1.0	0.26	ug/L			02/08/21 17:52	1
Bromomethane	ND		1.0	0.69	ug/L			02/08/21 17:52	1
Carbon disulfide	**1.0**		1.0	0.19	ug/L			02/08/21 17:52	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/08/21 17:52	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/08/21 17:52	1
Chloroethane	ND		1.0	0.32	ug/L			02/08/21 17:52	1
Chloroform	ND		1.0	0.34	ug/L			02/08/21 17:52	1
Chloromethane	ND		1.0	0.35	ug/L			02/08/21 17:52	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/08/21 17:52	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/08/21 17:52	1
Cyclohexane	ND		1.0	0.18	ug/L			02/08/21 17:52	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/08/21 17:52	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/08/21 17:52	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/08/21 17:52	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/08/21 17:52	1
Methyl acetate	ND		2.5	1.3	ug/L			02/08/21 17:52	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/08/21 17:52	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/08/21 17:52	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/08/21 17:52	1
Styrene	ND		1.0	0.73	ug/L			02/08/21 17:52	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/08/21 17:52	1
Toluene	ND		1.0	0.51	ug/L			02/08/21 17:52	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/08/21 17:52	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/08/21 17:52	1
Trichloroethene	ND		1.0	0.46	ug/L			02/08/21 17:52	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/08/21 17:52	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/08/21 17:52	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/08/21 17:52	1

Client Sample ID: MN-12D
Lab Sample ID: 480-180933-1
Date Collected: 02/05/21 10:15
Matrix: Water
Date Received: 02/05/21 16:09

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/08/21 17:52	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		77 - 120		02/08/21 17:52	1
4-Bromofluorobenzene (Surr)	94		73 - 120		02/08/21 17:52	1
Dibromofluoromethane (Surr)	91		75 - 123		02/08/21 17:52	1
Toluene-d8 (Surr)	90		80 - 120		02/08/21 17:52	1

Client Sample ID: MN-11D
Lab Sample ID: 480-180933-2
Date Collected: 02/05/21 11:35
Matrix: Water
Date Received: 02/05/21 16:09

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/08/21 18:17	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/08/21 18:17	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/08/21 18:17	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/08/21 18:17	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/08/21 18:17	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/08/21 18:17	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/08/21 18:17	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/08/21 18:17	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/08/21 18:17	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/08/21 18:17	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/08/21 18:17	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/08/21 18:17	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/08/21 18:17	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/08/21 18:17	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/08/21 18:17	1
2-Hexanone	ND		5.0	1.2	ug/L			02/08/21 18:17	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/08/21 18:17	1
Acetone	ND		10	3.0	ug/L			02/08/21 18:17	1
Benzene	ND		1.0	0.41	ug/L			02/08/21 18:17	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/08/21 18:17	1
Bromoform	ND		1.0	0.26	ug/L			02/08/21 18:17	1
Bromomethane	ND		1.0	0.69	ug/L			02/08/21 18:17	1
Carbon disulfide	**0.48**	**J**	1.0	0.19	ug/L			02/08/21 18:17	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/08/21 18:17	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/08/21 18:17	1
Chloroethane	ND		1.0	0.32	ug/L			02/08/21 18:17	1
Chloroform	ND		1.0	0.34	ug/L			02/08/21 18:17	1
Chloromethane	ND		1.0	0.35	ug/L			02/08/21 18:17	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/08/21 18:17	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/08/21 18:17	1
Cyclohexane	ND		1.0	0.18	ug/L			02/08/21 18:17	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/08/21 18:17	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/08/21 18:17	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/08/21 18:17	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/08/21 18:17	1
Methyl acetate	ND		2.5	1.3	ug/L			02/08/21 18:17	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/08/21 18:17	1

Client Sample ID: MN-11D
Date Collected: 02/05/21 11:35
Date Received: 02/05/21 16:09

Lab Sample ID: 480-180933-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		1.0	0.16	ug/L			02/08/21 18:17	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/08/21 18:17	1
Styrene	ND		1.0	0.73	ug/L			02/08/21 18:17	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/08/21 18:17	1
Toluene	ND		1.0	0.51	ug/L			02/08/21 18:17	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/08/21 18:17	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/08/21 18:17	1
Trichloroethene	ND		1.0	0.46	ug/L			02/08/21 18:17	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/08/21 18:17	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/08/21 18:17	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/08/21 18:17	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/08/21 18:17*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*90*		*77 - 120*		*02/08/21 18:17*	*1*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*02/08/21 18:17*	*1*
Dibromofluoromethane (Surr)	*89*		*75 - 123*		*02/08/21 18:17*	*1*
Toluene-d8 (Surr)	*89*		*80 - 120*		*02/08/21 18:17*	*1*

Client Sample ID: MW-06
Date Collected: 02/05/21 13:02
Date Received: 02/05/21 16:09

Lab Sample ID: 480-180933-3
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/08/21 18:42	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/08/21 18:42	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/08/21 18:42	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/08/21 18:42	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/08/21 18:42	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/08/21 18:42	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/08/21 18:42	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/08/21 18:42	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/08/21 18:42	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/08/21 18:42	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/08/21 18:42	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/08/21 18:42	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/08/21 18:42	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/08/21 18:42	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/08/21 18:42	1
2-Hexanone	ND		5.0	1.2	ug/L			02/08/21 18:42	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/08/21 18:42	1
Acetone	ND		10	3.0	ug/L			02/08/21 18:42	1
Benzene	ND		1.0	0.41	ug/L			02/08/21 18:42	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/08/21 18:42	1
Bromoform	ND		1.0	0.26	ug/L			02/08/21 18:42	1
Bromomethane	ND		1.0	0.69	ug/L			02/08/21 18:42	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/08/21 18:42	1

Client Sample ID: MW-06
Lab Sample ID: 480-180933-3
Date Collected: 02/05/21 13:02
Matrix: Water
Date Received: 02/05/21 16:09

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/08/21 18:42	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/08/21 18:42	1
Chloroethane	ND		1.0	0.32	ug/L			02/08/21 18:42	1
Chloroform	ND		1.0	0.34	ug/L			02/08/21 18:42	1
Chloromethane	ND		1.0	0.35	ug/L			02/08/21 18:42	1
cis-1,2-Dichloroethene	**41**		1.0	0.81	ug/L			02/08/21 18:42	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/08/21 18:42	1
Cyclohexane	ND		1.0	0.18	ug/L			02/08/21 18:42	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/08/21 18:42	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/08/21 18:42	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/08/21 18:42	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/08/21 18:42	1
Methyl acetate	ND		2.5	1.3	ug/L			02/08/21 18:42	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/08/21 18:42	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/08/21 18:42	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/08/21 18:42	1
Styrene	ND		1.0	0.73	ug/L			02/08/21 18:42	1
Tetrachloroethene	**80**		1.0	0.36	ug/L			02/08/21 18:42	1
Toluene	ND		1.0	0.51	ug/L			02/08/21 18:42	1
trans-1,2-Dichloroethene	**0.98**	**J**	1.0	0.90	ug/L			02/08/21 18:42	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/08/21 18:42	1
Trichloroethene	**11**		1.0	0.46	ug/L			02/08/21 18:42	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/08/21 18:42	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/08/21 18:42	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/08/21 18:42	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/08/21 18:42*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*77 - 120*		*02/08/21 18:42*	*1*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*02/08/21 18:42*	*1*
Dibromofluoromethane (Surr)	*93*		*75 - 123*		*02/08/21 18:42*	*1*
Toluene-d8 (Surr)	*94*		*80 - 120*		*02/08/21 18:42*	*1*

Client Sample ID: MW-04R
Lab Sample ID: 480-180933-4
Date Collected: 02/05/21 14:00
Matrix: Water
Date Received: 02/05/21 16:09

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		4.0	3.3	ug/L			02/08/21 19:07	4
1,1,2,2-Tetrachloroethane	ND		4.0	0.84	ug/L			02/08/21 19:07	4
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		4.0	1.2	ug/L			02/08/21 19:07	4
1,1,2-Trichloroethane	ND		4.0	0.92	ug/L			02/08/21 19:07	4
1,1-Dichloroethane	ND		4.0	1.5	ug/L			02/08/21 19:07	4
1,1-Dichloroethene	ND		4.0	1.2	ug/L			02/08/21 19:07	4
1,2,4-Trichlorobenzene	ND		4.0	1.6	ug/L			02/08/21 19:07	4
1,2-Dibromo-3-Chloropropane	ND		4.0	1.6	ug/L			02/08/21 19:07	4
1,2-Dibromoethane	ND		4.0	2.9	ug/L			02/08/21 19:07	4

Client Sample ID: MW-04R
Date Collected: 02/05/21 14:00
Date Received: 02/05/21 16:09

Lab Sample ID: 480-180933-4
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		4.0	3.2	ug/L			02/08/21 19:07	4
1,2-Dichloroethane	ND		4.0	0.84	ug/L			02/08/21 19:07	4
1,2-Dichloropropane	ND		4.0	2.9	ug/L			02/08/21 19:07	4
1,3-Dichlorobenzene	ND		4.0	3.1	ug/L			02/08/21 19:07	4
1,4-Dichlorobenzene	ND		4.0	3.4	ug/L			02/08/21 19:07	4
2-Butanone (MEK)	ND		40	5.3	ug/L			02/08/21 19:07	4
2-Hexanone	ND		20	5.0	ug/L			02/08/21 19:07	4
4-Methyl-2-pentanone (MIBK)	ND		20	8.4	ug/L			02/08/21 19:07	4
Acetone	ND		40	12	ug/L			02/08/21 19:07	4
Benzene	ND		4.0	1.6	ug/L			02/08/21 19:07	4
Bromodichloromethane	ND		4.0	1.6	ug/L			02/08/21 19:07	4
Bromoform	ND		4.0	1.0	ug/L			02/08/21 19:07	4
Bromomethane	ND		4.0	2.8	ug/L			02/08/21 19:07	4
Carbon disulfide	ND		4.0	0.76	ug/L			02/08/21 19:07	4
Carbon tetrachloride	ND		4.0	1.1	ug/L			02/08/21 19:07	4
Chlorobenzene	ND		4.0	3.0	ug/L			02/08/21 19:07	4
Chloroethane	ND		4.0	1.3	ug/L			02/08/21 19:07	4
Chloroform	ND		4.0	1.4	ug/L			02/08/21 19:07	4
Chloromethane	ND		4.0	1.4	ug/L			02/08/21 19:07	4
cis-1,2-Dichloroethene	ND		4.0	3.2	ug/L			02/08/21 19:07	4
cis-1,3-Dichloropropene	ND		4.0	1.4	ug/L			02/08/21 19:07	4
Cyclohexane	ND		4.0	0.72	ug/L			02/08/21 19:07	4
Dibromochloromethane	ND		4.0	1.3	ug/L			02/08/21 19:07	4
Dichlorodifluoromethane	ND		4.0	2.7	ug/L			02/08/21 19:07	4
Ethylbenzene	ND		4.0	3.0	ug/L			02/08/21 19:07	4
Isopropylbenzene	ND		4.0	3.2	ug/L			02/08/21 19:07	4
Methyl acetate	ND		10	5.2	ug/L			02/08/21 19:07	4
Methyl tert-butyl ether	ND		4.0	0.64	ug/L			02/08/21 19:07	4
Methylcyclohexane	ND		4.0	0.64	ug/L			02/08/21 19:07	4
Methylene Chloride	**3.1**	**J**	4.0	1.8	ug/L			02/08/21 19:07	4
Styrene	ND		4.0	2.9	ug/L			02/08/21 19:07	4
Tetrachloroethene	ND		4.0	1.4	ug/L			02/08/21 19:07	4
Toluene	ND		4.0	2.0	ug/L			02/08/21 19:07	4
trans-1,2-Dichloroethene	ND		4.0	3.6	ug/L			02/08/21 19:07	4
trans-1,3-Dichloropropene	ND		4.0	1.5	ug/L			02/08/21 19:07	4
Trichloroethene	ND		4.0	1.8	ug/L			02/08/21 19:07	4
Trichlorofluoromethane	ND		4.0	3.5	ug/L			02/08/21 19:07	4
Vinyl chloride	ND		4.0	3.6	ug/L			02/08/21 19:07	4
Xylenes, Total	ND		8.0	2.6	ug/L			02/08/21 19:07	4

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/08/21 19:07*	*4*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*77 - 120*		*02/08/21 19:07*	*4*
4-Bromofluorobenzene (Surr)	*96*		*73 - 120*		*02/08/21 19:07*	*4*
Dibromofluoromethane (Surr)	*90*		*75 - 123*		*02/08/21 19:07*	*4*
Toluene-d8 (Surr)	*91*		*80 - 120*		*02/08/21 19:07*	*4*

Client Sample ID: MW-03
Date Collected: 02/05/21 14:24
Date Received: 02/05/21 16:09

Lab Sample ID: 480-180933-5
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		4.0	3.3	ug/L			02/08/21 19:32	4
1,1,2,2-Tetrachloroethane	ND		4.0	0.84	ug/L			02/08/21 19:32	4
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		4.0	1.2	ug/L			02/08/21 19:32	4
1,1,2-Trichloroethane	ND		4.0	0.92	ug/L			02/08/21 19:32	4
1,1-Dichloroethane	ND		4.0	1.5	ug/L			02/08/21 19:32	4
1,1-Dichloroethene	ND		4.0	1.2	ug/L			02/08/21 19:32	4
1,2,4-Trichlorobenzene	ND		4.0	1.6	ug/L			02/08/21 19:32	4
1,2-Dibromo-3-Chloropropane	ND		4.0	1.6	ug/L			02/08/21 19:32	4
1,2-Dibromoethane	ND		4.0	2.9	ug/L			02/08/21 19:32	4
1,2-Dichlorobenzene	ND		4.0	3.2	ug/L			02/08/21 19:32	4
1,2-Dichloroethane	ND		4.0	0.84	ug/L			02/08/21 19:32	4
1,2-Dichloropropane	ND		4.0	2.9	ug/L			02/08/21 19:32	4
1,3-Dichlorobenzene	ND		4.0	3.1	ug/L			02/08/21 19:32	4
1,4-Dichlorobenzene	ND		4.0	3.4	ug/L			02/08/21 19:32	4
2-Butanone (MEK)	ND		40	5.3	ug/L			02/08/21 19:32	4
2-Hexanone	ND		20	5.0	ug/L			02/08/21 19:32	4
4-Methyl-2-pentanone (MIBK)	ND		20	8.4	ug/L			02/08/21 19:32	4
Acetone	ND		40	12	ug/L			02/08/21 19:32	4
Benzene	ND		4.0	1.6	ug/L			02/08/21 19:32	4
Bromodichloromethane	ND		4.0	1.6	ug/L			02/08/21 19:32	4
Bromoform	ND		4.0	1.0	ug/L			02/08/21 19:32	4
Bromomethane	ND		4.0	2.8	ug/L			02/08/21 19:32	4
Carbon disulfide	ND		4.0	0.76	ug/L			02/08/21 19:32	4
Carbon tetrachloride	ND		4.0	1.1	ug/L			02/08/21 19:32	4
Chlorobenzene	ND		4.0	3.0	ug/L			02/08/21 19:32	4
Chloroethane	ND		4.0	1.3	ug/L			02/08/21 19:32	4
Chloroform	ND		4.0	1.4	ug/L			02/08/21 19:32	4
Chloromethane	ND		4.0	1.4	ug/L			02/08/21 19:32	4
cis-1,2-Dichloroethene	ND		4.0	3.2	ug/L			02/08/21 19:32	4
cis-1,3-Dichloropropene	ND		4.0	1.4	ug/L			02/08/21 19:32	4
Cyclohexane	ND		4.0	0.72	ug/L			02/08/21 19:32	4
Dibromochloromethane	ND		4.0	1.3	ug/L			02/08/21 19:32	4
Dichlorodifluoromethane	ND		4.0	2.7	ug/L			02/08/21 19:32	4
Ethylbenzene	ND		4.0	3.0	ug/L			02/08/21 19:32	4
Isopropylbenzene	ND		4.0	3.2	ug/L			02/08/21 19:32	4
Methyl acetate	ND		10	5.2	ug/L			02/08/21 19:32	4
Methyl tert-butyl ether	ND		4.0	0.64	ug/L			02/08/21 19:32	4
Methylcyclohexane	ND		4.0	0.64	ug/L			02/08/21 19:32	4
Methylene Chloride	**3.5**	**J**	4.0	1.8	ug/L			02/08/21 19:32	4
Styrene	ND		4.0	2.9	ug/L			02/08/21 19:32	4
Tetrachloroethene	ND		4.0	1.4	ug/L			02/08/21 19:32	4
Toluene	ND		4.0	2.0	ug/L			02/08/21 19:32	4
trans-1,2-Dichloroethene	ND		4.0	3.6	ug/L			02/08/21 19:32	4
trans-1,3-Dichloropropene	ND		4.0	1.5	ug/L			02/08/21 19:32	4
Trichloroethene	ND		4.0	1.8	ug/L			02/08/21 19:32	4
Trichlorofluoromethane	ND		4.0	3.5	ug/L			02/08/21 19:32	4
Vinyl chloride	ND		4.0	3.6	ug/L			02/08/21 19:32	4
Xylenes, Total	ND		8.0	2.6	ug/L			02/08/21 19:32	4

Client Sample ID: MW-03
Lab Sample ID: 480-180933-5
Date Collected: 02/05/21 14:24
Matrix: Water
Date Received: 02/05/21 16:09

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/08/21 19:32	4

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		77 - 120		02/08/21 19:32	4
4-Bromofluorobenzene (Surr)	98		73 - 120		02/08/21 19:32	4
Dibromofluoromethane (Surr)	92		75 - 123		02/08/21 19:32	4
Toluene-d8 (Surr)	91		80 - 120		02/08/21 19:32	4

Client Sample ID: TB-20210205
Lab Sample ID: 480-180933-6
Date Collected: 02/05/21 00:00
Matrix: Water
Date Received: 02/05/21 16:09

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/08/21 19:57	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/08/21 19:57	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/08/21 19:57	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/08/21 19:57	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/08/21 19:57	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/08/21 19:57	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/08/21 19:57	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/08/21 19:57	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/08/21 19:57	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/08/21 19:57	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/08/21 19:57	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/08/21 19:57	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/08/21 19:57	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/08/21 19:57	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/08/21 19:57	1
2-Hexanone	ND		5.0	1.2	ug/L			02/08/21 19:57	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/08/21 19:57	1
Acetone	ND		10	3.0	ug/L			02/08/21 19:57	1
Benzene	ND		1.0	0.41	ug/L			02/08/21 19:57	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/08/21 19:57	1
Bromoform	ND		1.0	0.26	ug/L			02/08/21 19:57	1
Bromomethane	ND		1.0	0.69	ug/L			02/08/21 19:57	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/08/21 19:57	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/08/21 19:57	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/08/21 19:57	1
Chloroethane	ND		1.0	0.32	ug/L			02/08/21 19:57	1
Chloroform	ND		1.0	0.34	ug/L			02/08/21 19:57	1
Chloromethane	ND		1.0	0.35	ug/L			02/08/21 19:57	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/08/21 19:57	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/08/21 19:57	1
Cyclohexane	ND		1.0	0.18	ug/L			02/08/21 19:57	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/08/21 19:57	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/08/21 19:57	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/08/21 19:57	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/08/21 19:57	1
Methyl acetate	ND		2.5	1.3	ug/L			02/08/21 19:57	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/08/21 19:57	1

Client Sample ID: TB-20210205
Lab Sample ID: 480-180933-6

Date Collected: 02/05/21 00:00
Matrix: Water

Date Received: 02/05/21 16:09

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		1.0	0.16	ug/L			02/08/21 19:57	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/08/21 19:57	1
Styrene	ND		1.0	0.73	ug/L			02/08/21 19:57	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/08/21 19:57	1
Toluene	ND		1.0	0.51	ug/L			02/08/21 19:57	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/08/21 19:57	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/08/21 19:57	1
Trichloroethene	ND		1.0	0.46	ug/L			02/08/21 19:57	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/08/21 19:57	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/08/21 19:57	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/08/21 19:57	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/08/21 19:57*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*77 - 120*		*02/08/21 19:57*	*1*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*02/08/21 19:57*	*1*
Dibromofluoromethane (Surr)	*92*		*75 - 123*		*02/08/21 19:57*	*1*
Toluene-d8 (Surr)	*92*		*80 - 120*		*02/08/21 19:57*	*1*

ATTACHMENT B

CASE NARRATIVE & COC

Sample Summary

Client: New York State D.E.C.
Job ID: 480-180933-1
Project/Site: 331-337 W. Main St Rochester #828102

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-180933-1	MN-12D	Water	02/05/21 10:15	02/05/21 16:09	
480-180933-2	MN-11D	Water	02/05/21 11:35	02/05/21 16:09	
480-180933-3	MW-06	Water	02/05/21 13:02	02/05/21 16:09	
480-180933-4	MW-04R	Water	02/05/21 14:00	02/05/21 16:09	
480-180933-5	MW-03	Water	02/05/21 14:24	02/05/21 16:09	
480-180933-6	TB-20210205	Water	02/05/21 00:00	02/05/21 16:09	

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: T. Urban/S. Connelly	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-156514-34518.3
Client Contact: Mr. Benjamin Rung	Phone:	E-Mail: Orlette.Johnson@Eurofinset.com	State of Origin: NY	Page: Page 3 of 7
Company: New York State D.E.C.	PWSID:			Job #:
Address: 625 Broadway 12th Floor	Due Date Requested:			
City: Albany	TAT Requested (days): standard			
State, Zip: NY, 12233-7017	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Callout ID: 137811			
Email: benjamin.rung@dec.ny.gov	WO #:			
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	MS	8260C - (MOD) TCL list OLM04.2 + TICs	PFC_IDA - PFAS, Standard List (21 Analytes)	8082A - TCL PCBs - SOM01.0	8081B - TCL Pesticides - OLM04.2	8270D - (MOD) TCL SVOA - OLM04.2 + TICs	6010C, 7470A	8270D_SIM_MS_ID - 1,4-dioxane	9012B - Cyanide, Total	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A				N	D				
MN-12D	2/5/2021	1015	G	Water	N	N	X								3	
MN-11D	2/5/2021	1135	G	Water	N	N	X								3	
MW-06	2/5/21	1302	G	Water	N	N	X								3	
MW-04R	2/5/21	1400	G	Water	N	N	X								3	
MW-03	2/5/21	1424	G	Water	N	N	X								3	
TB-20210205	2/5/21	—	G	Water	N	N	X								2	
				Water												
				Water												
				Water												
				Water												
				Water												

480-180933 Chain of Custody

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained long-
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Month

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Tom Urban/Tom Urban	2/5/21 16:09	AECOM		2/5/21 16:09	TA
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 3.6 #1 ICE

DATA USABILITY SUMMARY REPORT

For

331-337 W. Main St Rochester
WATER SAMPLES

VOA
SDG No. J181130

Sampling Date: February 8-10, 2021

Submitted to:

AECOM
257 West Genesee Street
Suite 400
Buffalo, New York, USA
716-856-5636

Prepared by:

Environmental Occupational & Public Health Consultants Inc. (EOPHC)
Environmental Data Validation Inc. (EDV, Inc.)
1326 Orangewood Ave
Pittsburgh, PA 15216
(412) 341-5281

Site: 331-337 W. Main St Rochester
Client: AECOM
Laboratory: Eurofins TestAmerica

SDG #: J181130
Date: April 10, 2021
Reviewer: L. Wright

Sample Identification Table

Client Sample ID	Laboratory ID	Matrix	VOC
BMW-102S	480-181130-1	Aqueous	X
BMW-102I	480-181130-2	Aqueous	X
BMW-102D	480-181130-3	Aqueous	X
BMW-103S	480-181130-4	Aqueous	X
MW-15	480-181130-5	Aqueous	X
MW-14	480-181130-6	Aqueous	X
MW-12	480-181130-7	Aqueous	X
MW-101	480-181130-8	Aqueous	X
MW-01	480-181130-9	Aqueous	X
MN-03D	480-181130-10	Aqueous	X
MN-01D	480-181130-11	Aqueous	X
MN-02D	480-181130-12	Aqueous	X
MN-03I	480-181130-13	Aqueous	X
MN-02S	480-181130-14	Aqueous	X
MN-03S	480-181130-15	Aqueous	X
MN-02I	480-181130-16	Aqueous	X
MN-01S	480-181130-17	Aqueous	X
MN-01I	480-181130-18	Aqueous	X
MN-05I	480-181130-19	Aqueous	X
MN-04S	480-181130-20	Aqueous	X
MN-04I	480-181130-21	Aqueous	X
MN-04D	480-181130-22	Aqueous	X
MN-05D	480-181130-23	Aqueous	X
TB-20210208-10	480-181130-24	Aqueous	X

*SVOA-SIM only

The data packages contained twenty-four (24) aqueous samples, which included one (1) trip blank sample. The samples were analyzed via Method SW-846 8260C. The adherence of laboratory analytical performance to this methods' analytical specifications was evaluated during the data validation process. The data package was evaluated for its usability as defined by the Guidance for the Development of Data Usability Summary Reports (DER-10, 11/09). USEPA Region II standard operating procedures were used as guidance documents. According to the NYSDEC Guidance for the Development of Data Usability Summary Reports, the following QC data were evaluated: blanks, instrument tunings, calibration standards, calibration verifications, laboratory controls, surrogate recoveries, spike recoveries, and sample data. All QC data were within quality control limits, except the following issues:

Cover letter, Narrative and Data Reporting Forms (Form 1s): The deficiencies noted in the case narrative that affect data usability have been discussed in applicable sections. Data that have no impact on data usability are not discussed.

Chain of Custody (COC): All samples were present.

Preservation: Preservation was acceptable.

Holding Time: Holding times were within acceptable criterion for all samples.

Blanks Quality Control: The blanks were acceptable.

Calibration Quality Control: The calibration was acceptable.

Laboratory Control Sample (LCS): The results were acceptable.

Surrogates: The recoveries were acceptable.

Internal Standards: All results were acceptable.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD): All the results are acceptable.

Field Duplicate: No field duplicates were presented with this SDG.

Compound Quantitation: Quantitations were acceptable.

Tentatively Identified Compounds: No TICs were indentified in these samples..

Additional Comments: Some Form 1s and case narratives are reporting criteria out of QC limits. If data were impacted due to the deficiency, it is discussed in the DUSR and appropriate qualifier(s) applied. Therefore, all discussions in the DUSR relate to all conditions that affected data usability. When there are multiple analyses, the validator presents the best run (Attachment A).

Sample 480-181130-19 was presented as a hybrid of its original and diluted analyses.

Data usability: Data qualified with the "UJ" qualifier are to be used cautiously as they are estimated data with some quality control issues. Data qualified with the "J" qualifier are to be used cautiously as they are estimated data with some quality control issues. Data qualified with the "R" qualifier are not usable due to severe quality control issues. Data qualified with the "U" qualifier are usable at the reporting limit.

ATTACHMENT A

FORM 1s

Client Sample ID: BMW-102S
Date Collected: 02/08/21 11:25
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		100	82	ug/L			02/12/21 13:33	100
1,1,2,2-Tetrachloroethane	ND		100	21	ug/L			02/12/21 13:33	100
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		100	31	ug/L			02/12/21 13:33	100
1,1,2-Trichloroethane	ND		100	23	ug/L			02/12/21 13:33	100
1,1-Dichloroethane	ND		100	38	ug/L			02/12/21 13:33	100
1,1-Dichloroethene	ND		100	29	ug/L			02/12/21 13:33	100
1,2,4-Trichlorobenzene	ND		100	41	ug/L			02/12/21 13:33	100
1,2-Dibromo-3-Chloropropane	ND		100	39	ug/L			02/12/21 13:33	100
1,2-Dibromoethane	ND		100	73	ug/L			02/12/21 13:33	100
1,2-Dichlorobenzene	ND		100	79	ug/L			02/12/21 13:33	100
1,2-Dichloroethane	ND		100	21	ug/L			02/12/21 13:33	100
1,2-Dichloropropane	ND		100	72	ug/L			02/12/21 13:33	100
1,3-Dichlorobenzene	ND		100	78	ug/L			02/12/21 13:33	100
1,4-Dichlorobenzene	ND		100	84	ug/L			02/12/21 13:33	100
2-Butanone (MEK)	ND		1000	130	ug/L			02/12/21 13:33	100
2-Hexanone	ND		500	120	ug/L			02/12/21 13:33	100
4-Methyl-2-pentanone (MIBK)	ND		500	210	ug/L			02/12/21 13:33	100
Acetone	ND		1000	300	ug/L			02/12/21 13:33	100
Benzene	ND		100	41	ug/L			02/12/21 13:33	100
Bromodichloromethane	ND		100	39	ug/L			02/12/21 13:33	100
Bromoform	ND		100	26	ug/L			02/12/21 13:33	100
Bromomethane	ND		100	69	ug/L			02/12/21 13:33	100
Carbon disulfide	ND		100	19	ug/L			02/12/21 13:33	100
Carbon tetrachloride	ND		100	27	ug/L			02/12/21 13:33	100
Chlorobenzene	ND		100	75	ug/L			02/12/21 13:33	100
Chloroethane	ND		100	32	ug/L			02/12/21 13:33	100
Chloroform	ND		100	34	ug/L			02/12/21 13:33	100
Chloromethane	ND		100	35	ug/L			02/12/21 13:33	100
cis-1,2-Dichloroethene	**330**		100	81	ug/L			02/12/21 13:33	100
cis-1,3-Dichloropropene	ND		100	36	ug/L			02/12/21 13:33	100
Cyclohexane	ND		100	18	ug/L			02/12/21 13:33	100
Dibromochloromethane	ND		100	32	ug/L			02/12/21 13:33	100
Dichlorodifluoromethane	ND		100	68	ug/L			02/12/21 13:33	100
Ethylbenzene	ND		100	74	ug/L			02/12/21 13:33	100
Isopropylbenzene	ND		100	79	ug/L			02/12/21 13:33	100
Methyl acetate	ND		250	130	ug/L			02/12/21 13:33	100
Methyl tert-butyl ether	ND		100	16	ug/L			02/12/21 13:33	100
Methylcyclohexane	ND		100	16	ug/L			02/12/21 13:33	100
Methylene Chloride	ND		100	44	ug/L			02/12/21 13:33	100
Styrene	ND		100	73	ug/L			02/12/21 13:33	100
Tetrachloroethene	**3400**		100	36	ug/L			02/12/21 13:33	100
Toluene	ND		100	51	ug/L			02/12/21 13:33	100
trans-1,2-Dichloroethene	ND		100	90	ug/L			02/12/21 13:33	100
trans-1,3-Dichloropropene	ND		100	37	ug/L			02/12/21 13:33	100
Trichloroethene	**470**		100	46	ug/L			02/12/21 13:33	100
Trichlorofluoromethane	ND		100	88	ug/L			02/12/21 13:33	100
Vinyl chloride	ND		100	90	ug/L			02/12/21 13:33	100
Xylenes, Total	ND		200	66	ug/L			02/12/21 13:33	100

Client Sample ID: BMW-102S
Lab Sample ID: 480-181130-1
Date Collected: 02/08/21 11:25
Matrix: Water
Date Received: 02/11/21 16:19

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/12/21 13:33	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		77 - 120		02/12/21 13:33	100
4-Bromofluorobenzene (Surr)	102		73 - 120		02/12/21 13:33	100
Dibromofluoromethane (Surr)	104		75 - 123		02/12/21 13:33	100
Toluene-d8 (Surr)	100		80 - 120		02/12/21 13:33	100

Client Sample ID: BMW-102I
Lab Sample ID: 480-181130-2
Date Collected: 02/08/21 12:00
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/12/21 13:57	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/12/21 13:57	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/12/21 13:57	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/12/21 13:57	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/12/21 13:57	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/12/21 13:57	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/12/21 13:57	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/12/21 13:57	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/12/21 13:57	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/12/21 13:57	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/12/21 13:57	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/12/21 13:57	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/12/21 13:57	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/12/21 13:57	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/12/21 13:57	1
2-Hexanone	ND		5.0	1.2	ug/L			02/12/21 13:57	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/12/21 13:57	1
Acetone	ND		10	3.0	ug/L			02/12/21 13:57	1
Benzene	ND		1.0	0.41	ug/L			02/12/21 13:57	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/12/21 13:57	1
Bromoform	ND		1.0	0.26	ug/L			02/12/21 13:57	1
Bromomethane	ND		1.0	0.69	ug/L			02/12/21 13:57	1
Carbon disulfide	**0.19**	**J**	1.0	0.19	ug/L			02/12/21 13:57	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/12/21 13:57	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/12/21 13:57	1
Chloroethane	ND		1.0	0.32	ug/L			02/12/21 13:57	1
Chloroform	ND		1.0	0.34	ug/L			02/12/21 13:57	1
Chloromethane	ND		1.0	0.35	ug/L			02/12/21 13:57	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/12/21 13:57	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/12/21 13:57	1
Cyclohexane	ND		1.0	0.18	ug/L			02/12/21 13:57	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/12/21 13:57	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/12/21 13:57	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/12/21 13:57	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/12/21 13:57	1
Methyl acetate	ND		2.5	1.3	ug/L			02/12/21 13:57	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/12/21 13:57	1

Client Sample ID: BMW-102I
Lab Sample ID: 480-181130-2
Date Collected: 02/08/21 12:00
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		1.0	0.16	ug/L			02/12/21 13:57	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/12/21 13:57	1
Styrene	ND		1.0	0.73	ug/L			02/12/21 13:57	1
Tetrachloroethene	**0.50**	**J**	1.0	0.36	ug/L			02/12/21 13:57	1
Toluene	ND		1.0	0.51	ug/L			02/12/21 13:57	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/12/21 13:57	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/12/21 13:57	1
Trichloroethene	ND		1.0	0.46	ug/L			02/12/21 13:57	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/12/21 13:57	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/12/21 13:57	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/12/21 13:57	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/12/21 13:57*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*77 - 120*		*02/12/21 13:57*	*1*
4-Bromofluorobenzene (Surr)	*102*		*73 - 120*		*02/12/21 13:57*	*1*
Dibromofluoromethane (Surr)	*103*		*75 - 123*		*02/12/21 13:57*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*02/12/21 13:57*	*1*

Client Sample ID: BMW-102D
Lab Sample ID: 480-181130-3
Date Collected: 02/08/21 15:40
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		2.0	1.6	ug/L			02/12/21 14:21	2
1,1,2,2-Tetrachloroethane	ND		2.0	0.42	ug/L			02/12/21 14:21	2
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	0.62	ug/L			02/12/21 14:21	2
1,1,2-Trichloroethane	ND		2.0	0.46	ug/L			02/12/21 14:21	2
1,1-Dichloroethane	ND		2.0	0.76	ug/L			02/12/21 14:21	2
1,1-Dichloroethene	ND		2.0	0.58	ug/L			02/12/21 14:21	2
1,2,4-Trichlorobenzene	ND		2.0	0.82	ug/L			02/12/21 14:21	2
1,2-Dibromo-3-Chloropropane	ND		2.0	0.78	ug/L			02/12/21 14:21	2
1,2-Dibromoethane	ND		2.0	1.5	ug/L			02/12/21 14:21	2
1,2-Dichlorobenzene	ND		2.0	1.6	ug/L			02/12/21 14:21	2
1,2-Dichloroethane	ND		2.0	0.42	ug/L			02/12/21 14:21	2
1,2-Dichloropropane	ND		2.0	1.4	ug/L			02/12/21 14:21	2
1,3-Dichlorobenzene	ND		2.0	1.6	ug/L			02/12/21 14:21	2
1,4-Dichlorobenzene	ND		2.0	1.7	ug/L			02/12/21 14:21	2
2-Butanone (MEK)	**8.5**	**J**	20	2.6	ug/L			02/12/21 14:21	2
2-Hexanone	ND		10	2.5	ug/L			02/12/21 14:21	2
4-Methyl-2-pentanone (MIBK)	ND		10	4.2	ug/L			02/12/21 14:21	2
Acetone	**80**		20	6.0	ug/L			02/12/21 14:21	2
Benzene	ND		2.0	0.82	ug/L			02/12/21 14:21	2
Bromodichloromethane	ND		2.0	0.78	ug/L			02/12/21 14:21	2
Bromoform	ND		2.0	0.52	ug/L			02/12/21 14:21	2
Bromomethane	ND		2.0	1.4	ug/L			02/12/21 14:21	2
Carbon disulfide	**13**		2.0	0.38	ug/L			02/12/21 14:21	2

Client Sample ID: BMW-102D
Lab Sample ID: 480-181130-3
Date Collected: 02/08/21 15:40
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		2.0	0.54	ug/L			02/12/21 14:21	2
Chlorobenzene	ND		2.0	1.5	ug/L			02/12/21 14:21	2
Chloroethane	ND		2.0	0.64	ug/L			02/12/21 14:21	2
Chloroform	ND		2.0	0.68	ug/L			02/12/21 14:21	2
Chloromethane	ND		2.0	0.70	ug/L			02/12/21 14:21	2
cis-1,2-Dichloroethene	ND		2.0	1.6	ug/L			02/12/21 14:21	2
cis-1,3-Dichloropropene	ND		2.0	0.72	ug/L			02/12/21 14:21	2
Cyclohexane	**11**		2.0	0.36	ug/L			02/12/21 14:21	2
Dibromochloromethane	ND		2.0	0.64	ug/L			02/12/21 14:21	2
Dichlorodifluoromethane	ND		2.0	1.4	ug/L			02/12/21 14:21	2
Ethylbenzene	**5.3**		2.0	1.5	ug/L			02/12/21 14:21	2
Isopropylbenzene	ND		2.0	1.6	ug/L			02/12/21 14:21	2
Methyl acetate	ND		5.0	2.6	ug/L			02/12/21 14:21	2
Methyl tert-butyl ether	ND		2.0	0.32	ug/L			02/12/21 14:21	2
Methylcyclohexane	**23**		2.0	0.32	ug/L			02/12/21 14:21	2
Methylene Chloride	ND		2.0	0.88	ug/L			02/12/21 14:21	2
Styrene	ND		2.0	1.5	ug/L			02/12/21 14:21	2
Tetrachloroethene	**3.0**		2.0	0.72	ug/L			02/12/21 14:21	2
Toluene	**1.8**	**J**	2.0	1.0	ug/L			02/12/21 14:21	2
trans-1,2-Dichloroethene	ND		2.0	1.8	ug/L			02/12/21 14:21	2
trans-1,3-Dichloropropene	ND		2.0	0.74	ug/L			02/12/21 14:21	2
Trichloroethene	ND		2.0	0.92	ug/L			02/12/21 14:21	2
Trichlorofluoromethane	ND		2.0	1.8	ug/L			02/12/21 14:21	2
Vinyl chloride	ND		2.0	1.8	ug/L			02/12/21 14:21	2
Xylenes, Total	**22**		4.0	1.3	ug/L			02/12/21 14:21	2

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Unknown	*29*	*T J*	*ug/L*		*1.82*			*02/12/21 14:21*	*2*
Pentane, 2-methyl-	*18*	*T J N*	*ug/L*		*2.83*	*107-83-5*		*02/12/21 14:21*	*2*
Pentane, 3-methyl-	*12*	*T J N*	*ug/L*		*3.05*	*96-14-0*		*02/12/21 14:21*	*2*
Hexane	*10*	*T J N*	*ug/L*		*3.28*	*110-54-3*		*02/12/21 14:21*	*2*
Cyclopentane, methyl-	*10*	*T J N*	*ug/L*		*3.78*	*96-37-7*		*02/12/21 14:21*	*2*
m-Xylene & p-Xylene	*17*		*ug/L*		*7.28*	*179601-23-1*		*02/12/21 14:21*	*2*
Benzene, 1-ethyl-2-methyl-	*9.4*	*T J N*	*ug/L*		*8.28*	*611-14-3*		*02/12/21 14:21*	*2*
Benzene, 1,3,5-trimethyl-	*9.6*	*T J N*	*ug/L*		*8.35*	*108-67-8*		*02/12/21 14:21*	*2*
Benzene, 1,2,3-trimethyl-	*13*	*T J N*	*ug/L*		*8.66*	*526-73-8*		*02/12/21 14:21*	*2*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*77 - 120*		*02/12/21 14:21*	*2*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*02/12/21 14:21*	*2*
Dibromofluoromethane (Surr)	*98*		*75 - 123*		*02/12/21 14:21*	*2*
Toluene-d8 (Surr)	*99*		*80 - 120*		*02/12/21 14:21*	*2*

Client Sample ID: BMW-103S
Lab Sample ID: 480-181130-4
Date Collected: 02/08/21 11:47
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		5.0	4.1	ug/L			02/12/21 14:45	5

Client Sample ID: BMW-103S
Lab Sample ID: 480-181130-4

Date Collected: 02/08/21 11:47
Matrix: Water

Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2,2-Tetrachloroethane	ND		5.0	1.1	ug/L			02/12/21 14:45	5
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.0	1.6	ug/L			02/12/21 14:45	5
1,1,2-Trichloroethane	ND		5.0	1.2	ug/L			02/12/21 14:45	5
1,1-Dichloroethane	ND		5.0	1.9	ug/L			02/12/21 14:45	5
1,1-Dichloroethene	ND		5.0	1.5	ug/L			02/12/21 14:45	5
1,2,4-Trichlorobenzene	ND		5.0	2.1	ug/L			02/12/21 14:45	5
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/L			02/12/21 14:45	5
1,2-Dibromoethane	ND		5.0	3.7	ug/L			02/12/21 14:45	5
1,2-Dichlorobenzene	ND		5.0	4.0	ug/L			02/12/21 14:45	5
1,2-Dichloroethane	ND		5.0	1.1	ug/L			02/12/21 14:45	5
1,2-Dichloropropane	ND		5.0	3.6	ug/L			02/12/21 14:45	5
1,3-Dichlorobenzene	ND		5.0	3.9	ug/L			02/12/21 14:45	5
1,4-Dichlorobenzene	ND		5.0	4.2	ug/L			02/12/21 14:45	5
2-Butanone (MEK)	ND		50	6.6	ug/L			02/12/21 14:45	5
2-Hexanone	ND		25	6.2	ug/L			02/12/21 14:45	5
4-Methyl-2-pentanone (MIBK)	ND		25	11	ug/L			02/12/21 14:45	5
Acetone	ND		50	15	ug/L			02/12/21 14:45	5
Benzene	**3.4**	**J**	5.0	2.1	ug/L			02/12/21 14:45	5
Bromodichloromethane	ND		5.0	2.0	ug/L			02/12/21 14:45	5
Bromoform	ND		5.0	1.3	ug/L			02/12/21 14:45	5
Bromomethane	ND		5.0	3.5	ug/L			02/12/21 14:45	5
Carbon disulfide	ND		5.0	0.95	ug/L			02/12/21 14:45	5
Carbon tetrachloride	ND		5.0	1.4	ug/L			02/12/21 14:45	5
Chlorobenzene	ND		5.0	3.8	ug/L			02/12/21 14:45	5
Chloroethane	ND		5.0	1.6	ug/L			02/12/21 14:45	5
Chloroform	ND		5.0	1.7	ug/L			02/12/21 14:45	5
Chloromethane	ND		5.0	1.8	ug/L			02/12/21 14:45	5
cis-1,2-Dichloroethene	**240**	**F1**	5.0	4.1	ug/L			02/12/21 14:45	5
cis-1,3-Dichloropropene	ND		5.0	1.8	ug/L			02/12/21 14:45	5
Cyclohexane	**2.0**	**J**	5.0	0.90	ug/L			02/12/21 14:45	5
Dibromochloromethane	ND		5.0	1.6	ug/L			02/12/21 14:45	5
Dichlorodifluoromethane	ND		5.0	3.4	ug/L			02/12/21 14:45	5
Ethylbenzene	ND		5.0	3.7	ug/L			02/12/21 14:45	5
Isopropylbenzene	ND		5.0	4.0	ug/L			02/12/21 14:45	5
Methyl acetate	ND		13	6.5	ug/L			02/12/21 14:45	5
Methyl tert-butyl ether	ND		5.0	0.80	ug/L			02/12/21 14:45	5
Methylcyclohexane	ND		5.0	0.80	ug/L			02/12/21 14:45	5
Methylene Chloride	ND		5.0	2.2	ug/L			02/12/21 14:45	5
Styrene	ND		5.0	3.7	ug/L			02/12/21 14:45	5
Tetrachloroethene	ND		5.0	1.8	ug/L			02/12/21 14:45	5
Toluene	ND		5.0	2.6	ug/L			02/12/21 14:45	5
trans-1,2-Dichloroethene	ND		5.0	4.5	ug/L			02/12/21 14:45	5
trans-1,3-Dichloropropene	ND		5.0	1.9	ug/L			02/12/21 14:45	5
Trichloroethene	ND		5.0	2.3	ug/L			02/12/21 14:45	5
Trichlorofluoromethane	ND		5.0	4.4	ug/L			02/12/21 14:45	5
Vinyl chloride	**7.3**		5.0	4.5	ug/L			02/12/21 14:45	5
Xylenes, Total	ND		10	3.3	ug/L			02/12/21 14:45	5

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/12/21 14:45*	*5*

Client Sample ID: BMW-103S
Lab Sample ID: 480-181130-4

Date Collected: 02/08/21 11:47
Matrix: Water
Date Received: 02/11/21 16:19

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*77 - 120*		*02/12/21 14:45*	*5*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*02/12/21 14:45*	*5*
Dibromofluoromethane (Surr)	*105*		*75 - 123*		*02/12/21 14:45*	*5*
Toluene-d8 (Surr)	*101*		*80 - 120*		*02/12/21 14:45*	*5*

Client Sample ID: MW-15
Lab Sample ID: 480-181130-5

Date Collected: 02/08/21 15:12
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1000	820	ug/L			02/12/21 15:09	1000
1,1,2,2-Tetrachloroethane	ND		1000	210	ug/L			02/12/21 15:09	1000
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1000	310	ug/L			02/12/21 15:09	1000
1,1,2-Trichloroethane	ND		1000	230	ug/L			02/12/21 15:09	1000
1,1-Dichloroethane	ND		1000	380	ug/L			02/12/21 15:09	1000
1,1-Dichloroethene	ND		1000	290	ug/L			02/12/21 15:09	1000
1,2,4-Trichlorobenzene	ND		1000	410	ug/L			02/12/21 15:09	1000
1,2-Dibromo-3-Chloropropane	ND		1000	390	ug/L			02/12/21 15:09	1000
1,2-Dibromoethane	ND		1000	730	ug/L			02/12/21 15:09	1000
1,2-Dichlorobenzene	ND		1000	790	ug/L			02/12/21 15:09	1000
1,2-Dichloroethane	ND		1000	210	ug/L			02/12/21 15:09	1000
1,2-Dichloropropane	ND		1000	720	ug/L			02/12/21 15:09	1000
1,3-Dichlorobenzene	ND		1000	780	ug/L			02/12/21 15:09	1000
1,4-Dichlorobenzene	ND		1000	840	ug/L			02/12/21 15:09	1000
2-Butanone (MEK)	ND		10000	1300	ug/L			02/12/21 15:09	1000
2-Hexanone	ND		5000	1200	ug/L			02/12/21 15:09	1000
4-Methyl-2-pentanone (MIBK)	ND		5000	2100	ug/L			02/12/21 15:09	1000
Acetone	ND		10000	3000	ug/L			02/12/21 15:09	1000
Benzene	ND		1000	410	ug/L			02/12/21 15:09	1000
Bromodichloromethane	ND		1000	390	ug/L			02/12/21 15:09	1000
Bromoform	ND		1000	260	ug/L			02/12/21 15:09	1000
Bromomethane	ND		1000	690	ug/L			02/12/21 15:09	1000
Carbon disulfide	ND		1000	190	ug/L			02/12/21 15:09	1000
Carbon tetrachloride	ND		1000	270	ug/L			02/12/21 15:09	1000
Chlorobenzene	ND		1000	750	ug/L			02/12/21 15:09	1000
Chloroethane	ND		1000	320	ug/L			02/12/21 15:09	1000
Chloroform	ND		1000	340	ug/L			02/12/21 15:09	1000
Chloromethane	ND		1000	350	ug/L			02/12/21 15:09	1000
cis-1,2-Dichloroethene	**880**	**J**	1000	810	ug/L			02/12/21 15:09	1000
cis-1,3-Dichloropropene	ND		1000	360	ug/L			02/12/21 15:09	1000
Cyclohexane	ND		1000	180	ug/L			02/12/21 15:09	1000
Dibromochloromethane	ND		1000	320	ug/L			02/12/21 15:09	1000
Dichlorodifluoromethane	ND		1000	680	ug/L			02/12/21 15:09	1000
Ethylbenzene	ND		1000	740	ug/L			02/12/21 15:09	1000
Isopropylbenzene	ND		1000	790	ug/L			02/12/21 15:09	1000
Methyl acetate	ND		2500	1300	ug/L			02/12/21 15:09	1000
Methyl tert-butyl ether	ND		1000	160	ug/L			02/12/21 15:09	1000
Methylcyclohexane	ND		1000	160	ug/L			02/12/21 15:09	1000
Methylene Chloride	ND		1000	440	ug/L			02/12/21 15:09	1000

Client Sample ID: MW-15
Lab Sample ID: 480-181130-5
Date Collected: 02/08/21 15:12
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	ND		1000	730	ug/L			02/12/21 15:09	1000
Tetrachloroethene	**27000**		1000	360	ug/L			02/12/21 15:09	1000
Toluene	ND		1000	510	ug/L			02/12/21 15:09	1000
trans-1,2-Dichloroethene	ND		1000	900	ug/L			02/12/21 15:09	1000
trans-1,3-Dichloropropene	ND		1000	370	ug/L			02/12/21 15:09	1000
Trichloroethene	**880**	**J**	1000	460	ug/L			02/12/21 15:09	1000
Trichlorofluoromethane	ND		1000	880	ug/L			02/12/21 15:09	1000
Vinyl chloride	ND		1000	900	ug/L			02/12/21 15:09	1000
Xylenes, Total	ND		2000	660	ug/L			02/12/21 15:09	1000

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/12/21 15:09*	*1000*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*77 - 120*		*02/12/21 15:09*	*1000*
4-Bromofluorobenzene (Surr)	*96*		*73 - 120*		*02/12/21 15:09*	*1000*
Dibromofluoromethane (Surr)	*105*		*75 - 123*		*02/12/21 15:09*	*1000*
Toluene-d8 (Surr)	*97*		*80 - 120*		*02/12/21 15:09*	*1000*

Client Sample ID: MW-14
Lab Sample ID: 480-181130-6
Date Collected: 02/08/21 15:30
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/12/21 15:34	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/12/21 15:34	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/12/21 15:34	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/12/21 15:34	1
1,1-Dichloroethane	**2.2**		1.0	0.38	ug/L			02/12/21 15:34	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/12/21 15:34	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/12/21 15:34	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/12/21 15:34	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/12/21 15:34	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/12/21 15:34	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/12/21 15:34	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/12/21 15:34	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/12/21 15:34	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/12/21 15:34	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/12/21 15:34	1
2-Hexanone	ND		5.0	1.2	ug/L			02/12/21 15:34	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/12/21 15:34	1
Acetone	ND		10	3.0	ug/L			02/12/21 15:34	1
Benzene	ND		1.0	0.41	ug/L			02/12/21 15:34	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/12/21 15:34	1
Bromoform	ND		1.0	0.26	ug/L			02/12/21 15:34	1
Bromomethane	ND		1.0	0.69	ug/L			02/12/21 15:34	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/12/21 15:34	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/12/21 15:34	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/12/21 15:34	1

Client Sample ID: MW-14
Lab Sample ID: 480-181130-6

Date Collected: 02/08/21 15:30
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.32	ug/L			02/12/21 15:34	1
Chloroform	ND		1.0	0.34	ug/L			02/12/21 15:34	1
Chloromethane	ND		1.0	0.35	ug/L			02/12/21 15:34	1
cis-1,2-Dichloroethene	**61**		1.0	0.81	ug/L			02/12/21 15:34	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/12/21 15:34	1
Cyclohexane	**0.30**	**J**	1.0	0.18	ug/L			02/12/21 15:34	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/12/21 15:34	1
Dichlorodifluoromethane	ND		1.0	0.68	ug/L			02/12/21 15:34	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/12/21 15:34	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/12/21 15:34	1
Methyl acetate	ND		2.5	1.3	ug/L			02/12/21 15:34	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/12/21 15:34	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/12/21 15:34	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/12/21 15:34	1
Styrene	ND		1.0	0.73	ug/L			02/12/21 15:34	1
Tetrachloroethene	**0.55**	**J**	1.0	0.36	ug/L			02/12/21 15:34	1
Toluene	ND		1.0	0.51	ug/L			02/12/21 15:34	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/12/21 15:34	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/12/21 15:34	1
Trichloroethene	**0.99**	**J**	1.0	0.46	ug/L			02/12/21 15:34	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/12/21 15:34	1
Vinyl chloride	**45**		1.0	0.90	ug/L			02/12/21 15:34	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/12/21 15:34	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/12/21 15:34*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*77 - 120*		*02/12/21 15:34*	*1*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*02/12/21 15:34*	*1*
Dibromofluoromethane (Surr)	*102*		*75 - 123*		*02/12/21 15:34*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*02/12/21 15:34*	*1*

Client Sample ID: MW-12
Lab Sample ID: 480-181130-7

Date Collected: 02/09/21 10:24
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		2.0	1.6	ug/L			02/12/21 15:58	2
1,1,2,2-Tetrachloroethane	ND		2.0	0.42	ug/L			02/12/21 15:58	2
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	0.62	ug/L			02/12/21 15:58	2
1,1,2-Trichloroethane	ND		2.0	0.46	ug/L			02/12/21 15:58	2
1,1-Dichloroethane	ND		2.0	0.76	ug/L			02/12/21 15:58	2
1,1-Dichloroethene	ND		2.0	0.58	ug/L			02/12/21 15:58	2
1,2,4-Trichlorobenzene	ND		2.0	0.82	ug/L			02/12/21 15:58	2
1,2-Dibromo-3-Chloropropane	ND		2.0	0.78	ug/L			02/12/21 15:58	2
1,2-Dibromoethane	ND		2.0	1.5	ug/L			02/12/21 15:58	2
1,2-Dichlorobenzene	ND		2.0	1.6	ug/L			02/12/21 15:58	2
1,2-Dichloroethane	ND		2.0	0.42	ug/L			02/12/21 15:58	2

Client Sample ID: MW-12
Date Collected: 02/09/21 10:24
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-7
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		2.0	1.4	ug/L			02/12/21 15:58	2
1,3-Dichlorobenzene	ND		2.0	1.6	ug/L			02/12/21 15:58	2
1,4-Dichlorobenzene	ND		2.0	1.7	ug/L			02/12/21 15:58	2
2-Butanone (MEK)	ND		20	2.6	ug/L			02/12/21 15:58	2
2-Hexanone	ND		10	2.5	ug/L			02/12/21 15:58	2
4-Methyl-2-pentanone (MIBK)	ND		10	4.2	ug/L			02/12/21 15:58	2
Acetone	ND		20	6.0	ug/L			02/12/21 15:58	2
Benzene	ND		2.0	0.82	ug/L			02/12/21 15:58	2
Bromodichloromethane	ND		2.0	0.78	ug/L			02/12/21 15:58	2
Bromoform	ND		2.0	0.52	ug/L			02/12/21 15:58	2
Bromomethane	ND		2.0	1.4	ug/L			02/12/21 15:58	2
Carbon disulfide	ND		2.0	0.38	ug/L			02/12/21 15:58	2
Carbon tetrachloride	ND		2.0	0.54	ug/L			02/12/21 15:58	2
Chlorobenzene	ND		2.0	1.5	ug/L			02/12/21 15:58	2
Chloroethane	ND		2.0	0.64	ug/L			02/12/21 15:58	2
Chloroform	ND		2.0	0.68	ug/L			02/12/21 15:58	2
Chloromethane	ND		2.0	0.70	ug/L			02/12/21 15:58	2
cis-1,2-Dichloroethene	**14**		2.0	1.6	ug/L			02/12/21 15:58	2
cis-1,3-Dichloropropene	ND		2.0	0.72	ug/L			02/12/21 15:58	2
Cyclohexane	ND		2.0	0.36	ug/L			02/12/21 15:58	2
Dibromochloromethane	ND		2.0	0.64	ug/L			02/12/21 15:58	2
Dichlorodifluoromethane	ND		2.0	1.4	ug/L			02/12/21 15:58	2
Ethylbenzene	ND		2.0	1.5	ug/L			02/12/21 15:58	2
Isopropylbenzene	ND		2.0	1.6	ug/L			02/12/21 15:58	2
Methyl acetate	ND		5.0	2.6	ug/L			02/12/21 15:58	2
Methyl tert-butyl ether	**0.76**	**J**	2.0	0.32	ug/L			02/12/21 15:58	2
Methylcyclohexane	ND		2.0	0.32	ug/L			02/12/21 15:58	2
Methylene Chloride	ND		2.0	0.88	ug/L			02/12/21 15:58	2
Styrene	ND		2.0	1.5	ug/L			02/12/21 15:58	2
Tetrachloroethene	**66**		2.0	0.72	ug/L			02/12/21 15:58	2
Toluene	ND		2.0	1.0	ug/L			02/12/21 15:58	2
trans-1,2-Dichloroethene	ND		2.0	1.8	ug/L			02/12/21 15:58	2
trans-1,3-Dichloropropene	ND		2.0	0.74	ug/L			02/12/21 15:58	2
Trichloroethene	**18**		2.0	0.92	ug/L			02/12/21 15:58	2
Trichlorofluoromethane	ND		2.0	1.8	ug/L			02/12/21 15:58	2
Vinyl chloride	**2.8**		2.0	1.8	ug/L			02/12/21 15:58	2
Xylenes, Total	ND		4.0	1.3	ug/L			02/12/21 15:58	2

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/12/21 15:58*	*2*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*77 - 120*		*02/12/21 15:58*	*2*
4-Bromofluorobenzene (Surr)	*98*		*73 - 120*		*02/12/21 15:58*	*2*
Dibromofluoromethane (Surr)	*108*		*75 - 123*		*02/12/21 15:58*	*2*
Toluene-d8 (Surr)	*97*		*80 - 120*		*02/12/21 15:58*	*2*

Client Sample ID: MW-101
Date Collected: 02/09/21 11:26
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-8
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		25	21	ug/L			02/14/21 12:04	25
1,1,2,2-Tetrachloroethane	ND		25	5.3	ug/L			02/14/21 12:04	25
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		25	7.8	ug/L			02/14/21 12:04	25
1,1,2-Trichloroethane	ND		25	5.8	ug/L			02/14/21 12:04	25
1,1-Dichloroethane	ND		25	9.5	ug/L			02/14/21 12:04	25
1,1-Dichloroethene	ND		25	7.3	ug/L			02/14/21 12:04	25
1,2,4-Trichlorobenzene	ND		25	10	ug/L			02/14/21 12:04	25
1,2-Dibromo-3-Chloropropane	ND		25	9.8	ug/L			02/14/21 12:04	25
1,2-Dibromoethane	ND		25	18	ug/L			02/14/21 12:04	25
1,2-Dichlorobenzene	ND		25	20	ug/L			02/14/21 12:04	25
1,2-Dichloroethane	ND		25	5.3	ug/L			02/14/21 12:04	25
1,2-Dichloropropane	ND		25	18	ug/L			02/14/21 12:04	25
1,3-Dichlorobenzene	ND		25	20	ug/L			02/14/21 12:04	25
1,4-Dichlorobenzene	ND		25	21	ug/L			02/14/21 12:04	25
2-Butanone (MEK)	ND		250	33	ug/L			02/14/21 12:04	25
2-Hexanone	ND		130	31	ug/L			02/14/21 12:04	25
4-Methyl-2-pentanone (MIBK)	ND		130	53	ug/L			02/14/21 12:04	25
Acetone	ND		250	75	ug/L			02/14/21 12:04	25
Benzene	ND		25	10	ug/L			02/14/21 12:04	25
Bromodichloromethane	ND		25	9.8	ug/L			02/14/21 12:04	25
Bromoform	ND		25	6.5	ug/L			02/14/21 12:04	25
Bromomethane	ND		25	17	ug/L			02/14/21 12:04	25
Carbon disulfide	ND		25	4.8	ug/L			02/14/21 12:04	25
Carbon tetrachloride	ND		25	6.8	ug/L			02/14/21 12:04	25
Chlorobenzene	ND		25	19	ug/L			02/14/21 12:04	25
Chloroethane	ND		25	8.0	ug/L			02/14/21 12:04	25
Chloroform	ND		25	8.5	ug/L			02/14/21 12:04	25
Chloromethane	ND		25	8.8	ug/L			02/14/21 12:04	25
cis-1,2-Dichloroethene	**100**		25	20	ug/L			02/14/21 12:04	25
cis-1,3-Dichloropropene	ND		25	9.0	ug/L			02/14/21 12:04	25
Cyclohexane	ND	F1	25	4.5	ug/L			02/14/21 12:04	25
Dibromochloromethane	ND		25	8.0	ug/L			02/14/21 12:04	25
Dichlorodifluoromethane	ND	*+	25	17	ug/L			02/14/21 12:04	25
Ethylbenzene	ND		25	19	ug/L			02/14/21 12:04	25
Isopropylbenzene	ND		25	20	ug/L			02/14/21 12:04	25
Methyl acetate	ND		63	33	ug/L			02/14/21 12:04	25
Methyl tert-butyl ether	ND		25	4.0	ug/L			02/14/21 12:04	25
Methylcyclohexane	ND		25	4.0	ug/L			02/14/21 12:04	25
Methylene Chloride	ND		25	11	ug/L			02/14/21 12:04	25
Styrene	ND		25	18	ug/L			02/14/21 12:04	25
Tetrachloroethene	**1300**		25	9.0	ug/L			02/14/21 12:04	25
Toluene	ND		25	13	ug/L			02/14/21 12:04	25
trans-1,2-Dichloroethene	ND		25	23	ug/L			02/14/21 12:04	25
trans-1,3-Dichloropropene	ND		25	9.3	ug/L			02/14/21 12:04	25
Trichloroethene	**51**		25	12	ug/L			02/14/21 12:04	25
Trichlorofluoromethane	ND		25	22	ug/L			02/14/21 12:04	25
Vinyl chloride	ND		25	23	ug/L			02/14/21 12:04	25
Xylenes, Total	ND		50	17	ug/L			02/14/21 12:04	25

Client Sample ID: MW-101
Lab Sample ID: 480-181130-8

Date Collected: 02/09/21 11:26
Matrix: Water
Date Received: 02/11/21 16:19

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/14/21 12:04	25

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		77 - 120		02/14/21 12:04	25
4-Bromofluorobenzene (Surr)	96		73 - 120		02/14/21 12:04	25
Dibromofluoromethane (Surr)	101		75 - 123		02/14/21 12:04	25
Toluene-d8 (Surr)	98		80 - 120		02/14/21 12:04	25

Client Sample ID: MW-01
Lab Sample ID: 480-181130-9

Date Collected: 02/09/21 10:55
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 12:28	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 12:28	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 12:28	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 12:28	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 12:28	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 12:28	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 12:28	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 12:28	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 12:28	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 12:28	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 12:28	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 12:28	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 12:28	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 12:28	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 12:28	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 12:28	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 12:28	1
Acetone	ND		10	3.0	ug/L			02/14/21 12:28	1
Benzene	ND		1.0	0.41	ug/L			02/14/21 12:28	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 12:28	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 12:28	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 12:28	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/14/21 12:28	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 12:28	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 12:28	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 12:28	1
Chloroform	**0.72**	**J**	1.0	0.34	ug/L			02/14/21 12:28	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 12:28	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/14/21 12:28	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 12:28	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 12:28	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 12:28	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 12:28	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 12:28	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 12:28	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 12:28	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 12:28	1

Client Sample ID: MW-01
Lab Sample ID: 480-181130-9

Date Collected: 02/09/21 10:55
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 12:28	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 12:28	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 12:28	1
Tetrachloroethene	**0.84**	**J**	1.0	0.36	ug/L			02/14/21 12:28	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 12:28	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 12:28	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 12:28	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 12:28	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 12:28	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/14/21 12:28	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 12:28	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 12:28*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*105*		*77 - 120*		*02/14/21 12:28*	*1*
4-Bromofluorobenzene (Surr)	*104*		*73 - 120*		*02/14/21 12:28*	*1*
Dibromofluoromethane (Surr)	*104*		*75 - 123*		*02/14/21 12:28*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*02/14/21 12:28*	*1*

Client Sample ID: MN-03D
Lab Sample ID: 480-181130-10

Date Collected: 02/09/21 13:56
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		5.0	4.1	ug/L			02/14/21 12:52	5
1,1,2,2-Tetrachloroethane	ND		5.0	1.1	ug/L			02/14/21 12:52	5
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		5.0	1.6	ug/L			02/14/21 12:52	5
1,1,2-Trichloroethane	ND		5.0	1.2	ug/L			02/14/21 12:52	5
1,1-Dichloroethane	ND		5.0	1.9	ug/L			02/14/21 12:52	5
1,1-Dichloroethene	ND		5.0	1.5	ug/L			02/14/21 12:52	5
1,2,4-Trichlorobenzene	ND		5.0	2.1	ug/L			02/14/21 12:52	5
1,2-Dibromo-3-Chloropropane	ND		5.0	2.0	ug/L			02/14/21 12:52	5
1,2-Dibromoethane	ND		5.0	3.7	ug/L			02/14/21 12:52	5
1,2-Dichlorobenzene	ND		5.0	4.0	ug/L			02/14/21 12:52	5
1,2-Dichloroethane	ND		5.0	1.1	ug/L			02/14/21 12:52	5
1,2-Dichloropropane	ND		5.0	3.6	ug/L			02/14/21 12:52	5
1,3-Dichlorobenzene	ND		5.0	3.9	ug/L			02/14/21 12:52	5
1,4-Dichlorobenzene	ND		5.0	4.2	ug/L			02/14/21 12:52	5
2-Butanone (MEK)	ND		50	6.6	ug/L			02/14/21 12:52	5
2-Hexanone	ND		25	6.2	ug/L			02/14/21 12:52	5
4-Methyl-2-pentanone (MIBK)	ND		25	11	ug/L			02/14/21 12:52	5
Acetone	ND		50	15	ug/L			02/14/21 12:52	5
Benzene	ND		5.0	2.1	ug/L			02/14/21 12:52	5
Bromodichloromethane	ND		5.0	2.0	ug/L			02/14/21 12:52	5
Bromoform	ND		5.0	1.3	ug/L			02/14/21 12:52	5
Bromomethane	ND		5.0	3.5	ug/L			02/14/21 12:52	5
Carbon disulfide	ND		5.0	0.95	ug/L			02/14/21 12:52	5

Client Sample ID: MN-03D
Lab Sample ID: 480-181130-10
Date Collected: 02/09/21 13:56
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		5.0	1.4	ug/L			02/14/21 12:52	5
Chlorobenzene	ND		5.0	3.8	ug/L			02/14/21 12:52	5
Chloroethane	ND		5.0	1.6	ug/L			02/14/21 12:52	5
Chloroform	ND		5.0	1.7	ug/L			02/14/21 12:52	5
Chloromethane	ND		5.0	1.8	ug/L			02/14/21 12:52	5
cis-1,2-Dichloroethene	ND		5.0	4.1	ug/L			02/14/21 12:52	5
cis-1,3-Dichloropropene	ND		5.0	1.8	ug/L			02/14/21 12:52	5
Cyclohexane	ND		5.0	0.90	ug/L			02/14/21 12:52	5
Dibromochloromethane	ND		5.0	1.6	ug/L			02/14/21 12:52	5
Dichlorodifluoromethane	ND	*+	5.0	3.4	ug/L			02/14/21 12:52	5
Ethylbenzene	ND		5.0	3.7	ug/L			02/14/21 12:52	5
Isopropylbenzene	ND		5.0	4.0	ug/L			02/14/21 12:52	5
Methyl acetate	ND		13	6.5	ug/L			02/14/21 12:52	5
Methyl tert-butyl ether	ND		5.0	0.80	ug/L			02/14/21 12:52	5
Methylcyclohexane	ND		5.0	0.80	ug/L			02/14/21 12:52	5
Methylene Chloride	ND		5.0	2.2	ug/L			02/14/21 12:52	5
Styrene	ND		5.0	3.7	ug/L			02/14/21 12:52	5
Tetrachloroethene	ND		5.0	1.8	ug/L			02/14/21 12:52	5
Toluene	ND		5.0	2.6	ug/L			02/14/21 12:52	5
trans-1,2-Dichloroethene	ND		5.0	4.5	ug/L			02/14/21 12:52	5
trans-1,3-Dichloropropene	ND		5.0	1.9	ug/L			02/14/21 12:52	5
Trichloroethene	ND		5.0	2.3	ug/L			02/14/21 12:52	5
Trichlorofluoromethane	ND		5.0	4.4	ug/L			02/14/21 12:52	5
Vinyl chloride	ND		5.0	4.5	ug/L			02/14/21 12:52	5
Xylenes, Total	ND		10	3.3	ug/L			02/14/21 12:52	5

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 12:52*	*5*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*77 - 120*		*02/14/21 12:52*	*5*
4-Bromofluorobenzene (Surr)	*103*		*73 - 120*		*02/14/21 12:52*	*5*
Dibromofluoromethane (Surr)	*103*		*75 - 123*		*02/14/21 12:52*	*5*
Toluene-d8 (Surr)	*102*		*80 - 120*		*02/14/21 12:52*	*5*

Client Sample ID: MN-01D
Lab Sample ID: 480-181130-11
Date Collected: 02/09/21 14:50
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 13:16	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 13:16	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 13:16	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 13:16	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 13:16	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 13:16	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 13:16	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 13:16	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 13:16	1

Client Sample ID: MN-01D
Date Collected: 02/09/21 14:50
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-11
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 13:16	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 13:16	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 13:16	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 13:16	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 13:16	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 13:16	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 13:16	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 13:16	1
Acetone	**4.3**	**J**	10	3.0	ug/L			02/14/21 13:16	1
Benzene	**0.58**	**J**	1.0	0.41	ug/L			02/14/21 13:16	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 13:16	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 13:16	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 13:16	1
Carbon disulfide	**4.5**		1.0	0.19	ug/L			02/14/21 13:16	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 13:16	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 13:16	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 13:16	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 13:16	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 13:16	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/14/21 13:16	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 13:16	1
Cyclohexane	**19**		1.0	0.18	ug/L			02/14/21 13:16	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 13:16	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 13:16	1
Ethylbenzene	**5.4**		1.0	0.74	ug/L			02/14/21 13:16	1
Isopropylbenzene	**0.84**	**J**	1.0	0.79	ug/L			02/14/21 13:16	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 13:16	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 13:16	1
Methylcyclohexane	**16**		1.0	0.16	ug/L			02/14/21 13:16	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 13:16	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 13:16	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 13:16	1
Toluene	**4.3**		1.0	0.51	ug/L			02/14/21 13:16	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 13:16	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 13:16	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 13:16	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 13:16	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/14/21 13:16	1
Xylenes, Total	**32**		2.0	0.66	ug/L			02/14/21 13:16	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Butane, 2-methyl-	*11*	*T J N*	*ug/L*		*2.03*	*78-78-4*		*02/14/21 13:16*	*1*
Pentane	*17*	*T J N*	*ug/L*		*2.29*	*109-66-0*		*02/14/21 13:16*	*1*
Pentane, 2-methyl-	*11*	*T J N*	*ug/L*		*3.21*	*107-83-5*		*02/14/21 13:16*	*1*
Hexane	*8.2*	*T J N*	*ug/L*		*3.72*	*110-54-3*		*02/14/21 13:16*	*1*
Unknown	*12*	*T J*	*ug/L*		*4.31*			*02/14/21 13:16*	*1*
m-Xylene & p-Xylene	*25*		*ug/L*		*8.82*	*179601-23-1*		*02/14/21 13:16*	*1*
o-Xylene	*7.3*		*ug/L*		*9.25*	*95-47-6*		*02/14/21 13:16*	*1*
Benzene, 1-ethyl-2-methyl-	*7.3*	*T J N*	*ug/L*		*10.14*	*611-14-3*		*02/14/21 13:16*	*1*
Benzene, 1,3,5-trimethyl-	*9.9*	*T J N*	*ug/L*		*10.60*	*108-67-8*		*02/14/21 13:16*	*1*

Client Sample ID: MN-01D
Date Collected: 02/09/21 14:50
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-11
Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*77 - 120*		*02/14/21 13:16*	*1*
4-Bromofluorobenzene (Surr)	*101*		*73 - 120*		*02/14/21 13:16*	*1*
Dibromofluoromethane (Surr)	*102*		*75 - 123*		*02/14/21 13:16*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*02/14/21 13:16*	*1*

Client Sample ID: MN-02D
Date Collected: 02/09/21 15:45
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-12
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		2.0	1.6	ug/L			02/14/21 13:40	2
1,1,2,2-Tetrachloroethane	ND		2.0	0.42	ug/L			02/14/21 13:40	2
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		2.0	0.62	ug/L			02/14/21 13:40	2
1,1,2-Trichloroethane	ND		2.0	0.46	ug/L			02/14/21 13:40	2
1,1-Dichloroethane	ND		2.0	0.76	ug/L			02/14/21 13:40	2
1,1-Dichloroethene	ND		2.0	0.58	ug/L			02/14/21 13:40	2
1,2,4-Trichlorobenzene	ND		2.0	0.82	ug/L			02/14/21 13:40	2
1,2-Dibromo-3-Chloropropane	ND		2.0	0.78	ug/L			02/14/21 13:40	2
1,2-Dibromoethane	ND		2.0	1.5	ug/L			02/14/21 13:40	2
1,2-Dichlorobenzene	ND		2.0	1.6	ug/L			02/14/21 13:40	2
1,2-Dichloroethane	ND		2.0	0.42	ug/L			02/14/21 13:40	2
1,2-Dichloropropane	ND		2.0	1.4	ug/L			02/14/21 13:40	2
1,3-Dichlorobenzene	ND		2.0	1.6	ug/L			02/14/21 13:40	2
1,4-Dichlorobenzene	ND		2.0	1.7	ug/L			02/14/21 13:40	2
2-Butanone (MEK)	ND		20	2.6	ug/L			02/14/21 13:40	2
2-Hexanone	ND		10	2.5	ug/L			02/14/21 13:40	2
4-Methyl-2-pentanone (MIBK)	ND		10	4.2	ug/L			02/14/21 13:40	2
Acetone	ND		20	6.0	ug/L			02/14/21 13:40	2
Benzene	ND		2.0	0.82	ug/L			02/14/21 13:40	2
Bromodichloromethane	ND		2.0	0.78	ug/L			02/14/21 13:40	2
Bromoform	ND		2.0	0.52	ug/L			02/14/21 13:40	2
Bromomethane	ND		2.0	1.4	ug/L			02/14/21 13:40	2
Carbon disulfide	ND		2.0	0.38	ug/L			02/14/21 13:40	2
Carbon tetrachloride	ND		2.0	0.54	ug/L			02/14/21 13:40	2
Chlorobenzene	ND		2.0	1.5	ug/L			02/14/21 13:40	2
Chloroethane	ND		2.0	0.64	ug/L			02/14/21 13:40	2
Chloroform	ND		2.0	0.68	ug/L			02/14/21 13:40	2
Chloromethane	ND		2.0	0.70	ug/L			02/14/21 13:40	2
cis-1,2-Dichloroethene	ND		2.0	1.6	ug/L			02/14/21 13:40	2
cis-1,3-Dichloropropene	ND		2.0	0.72	ug/L			02/14/21 13:40	2
Cyclohexane	ND		2.0	0.36	ug/L			02/14/21 13:40	2
Dibromochloromethane	ND		2.0	0.64	ug/L			02/14/21 13:40	2
Dichlorodifluoromethane	ND	*+	2.0	1.4	ug/L			02/14/21 13:40	2
Ethylbenzene	ND		2.0	1.5	ug/L			02/14/21 13:40	2
Isopropylbenzene	ND		2.0	1.6	ug/L			02/14/21 13:40	2
Methyl acetate	ND		5.0	2.6	ug/L			02/14/21 13:40	2
Methyl tert-butyl ether	ND		2.0	0.32	ug/L			02/14/21 13:40	2
Methylcyclohexane	ND		2.0	0.32	ug/L			02/14/21 13:40	2
Methylene Chloride	ND		2.0	0.88	ug/L			02/14/21 13:40	2

Client Sample ID: MN-02D
Lab Sample ID: 480-181130-12
Date Collected: 02/09/21 15:45
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Styrene	ND		2.0	1.5	ug/L			02/14/21 13:40	2
Tetrachloroethene	ND		2.0	0.72	ug/L			02/14/21 13:40	2
Toluene	ND		2.0	1.0	ug/L			02/14/21 13:40	2
trans-1,2-Dichloroethene	ND		2.0	1.8	ug/L			02/14/21 13:40	2
trans-1,3-Dichloropropene	ND		2.0	0.74	ug/L			02/14/21 13:40	2
Trichloroethene	ND		2.0	0.92	ug/L			02/14/21 13:40	2
Trichlorofluoromethane	ND		2.0	1.8	ug/L			02/14/21 13:40	2
Vinyl chloride	ND		2.0	1.8	ug/L			02/14/21 13:40	2
Xylenes, Total	ND		4.0	1.3	ug/L			02/14/21 13:40	2

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 13:40*	*2*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*77 - 120*		*02/14/21 13:40*	*2*
4-Bromofluorobenzene (Surr)	*101*		*73 - 120*		*02/14/21 13:40*	*2*
Dibromofluoromethane (Surr)	*106*		*75 - 123*		*02/14/21 13:40*	*2*
Toluene-d8 (Surr)	*99*		*80 - 120*		*02/14/21 13:40*	*2*

Client Sample ID: MN-03I
Lab Sample ID: 480-181130-13
Date Collected: 02/10/21 09:18
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 14:04	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 14:04	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 14:04	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 14:04	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 14:04	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 14:04	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 14:04	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 14:04	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 14:04	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 14:04	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 14:04	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 14:04	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 14:04	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 14:04	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 14:04	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 14:04	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 14:04	1
Acetone	ND		10	3.0	ug/L			02/14/21 14:04	1
Benzene	ND		1.0	0.41	ug/L			02/14/21 14:04	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 14:04	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 14:04	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 14:04	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/14/21 14:04	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 14:04	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 14:04	1

Client Sample ID: MN-03I
Lab Sample ID: 480-181130-13
Date Collected: 02/10/21 09:18
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 14:04	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 14:04	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 14:04	1
cis-1,2-Dichloroethene	**3.3**		1.0	0.81	ug/L			02/14/21 14:04	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 14:04	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 14:04	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 14:04	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 14:04	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 14:04	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 14:04	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 14:04	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 14:04	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 14:04	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 14:04	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 14:04	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 14:04	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 14:04	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 14:04	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 14:04	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 14:04	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 14:04	1
Vinyl chloride	**2.7**		1.0	0.90	ug/L			02/14/21 14:04	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 14:04	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 14:04*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*77 - 120*		*02/14/21 14:04*	*1*
4-Bromofluorobenzene (Surr)	*103*		*73 - 120*		*02/14/21 14:04*	*1*
Dibromofluoromethane (Surr)	*100*		*75 - 123*		*02/14/21 14:04*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*02/14/21 14:04*	*1*

Client Sample ID: MN-02S
Lab Sample ID: 480-181130-14
Date Collected: 02/10/21 09:26
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 14:28	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 14:28	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 14:28	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 14:28	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 14:28	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 14:28	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 14:28	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 14:28	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 14:28	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 14:28	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 14:28	1

Client Sample ID: MN-02S
Date Collected: 02/10/21 09:26
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-14
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 14:28	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 14:28	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 14:28	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 14:28	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 14:28	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 14:28	1
Acetone	ND		10	3.0	ug/L			02/14/21 14:28	1
Benzene	ND		1.0	0.41	ug/L			02/14/21 14:28	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 14:28	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 14:28	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 14:28	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/14/21 14:28	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 14:28	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 14:28	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 14:28	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 14:28	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 14:28	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/14/21 14:28	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 14:28	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 14:28	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 14:28	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 14:28	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 14:28	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 14:28	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 14:28	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 14:28	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 14:28	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 14:28	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 14:28	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 14:28	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 14:28	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 14:28	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 14:28	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 14:28	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 14:28	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/14/21 14:28	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 14:28	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 14:28*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*77 - 120*		*02/14/21 14:28*	*1*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*02/14/21 14:28*	*1*
Dibromofluoromethane (Surr)	*96*		*75 - 123*		*02/14/21 14:28*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*02/14/21 14:28*	*1*

Client Sample ID: MN-03S
Date Collected: 02/10/21 09:53
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-15
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 14:53	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 14:53	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 14:53	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 14:53	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 14:53	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 14:53	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 14:53	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 14:53	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 14:53	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 14:53	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 14:53	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 14:53	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 14:53	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 14:53	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 14:53	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 14:53	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 14:53	1
Acetone	ND		10	3.0	ug/L			02/14/21 14:53	1
Benzene	ND		1.0	0.41	ug/L			02/14/21 14:53	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 14:53	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 14:53	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 14:53	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/14/21 14:53	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 14:53	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 14:53	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 14:53	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 14:53	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 14:53	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/14/21 14:53	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 14:53	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 14:53	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 14:53	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 14:53	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 14:53	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 14:53	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 14:53	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 14:53	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 14:53	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 14:53	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 14:53	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 14:53	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 14:53	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 14:53	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 14:53	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 14:53	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 14:53	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/14/21 14:53	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 14:53	1

Client Sample ID: MN-03S
Lab Sample ID: 480-181130-15
Date Collected: 02/10/21 09:53
Matrix: Water
Date Received: 02/11/21 16:19

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/14/21 14:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		77 - 120		02/14/21 14:53	1
4-Bromofluorobenzene (Surr)	98		73 - 120		02/14/21 14:53	1
Dibromofluoromethane (Surr)	98		75 - 123		02/14/21 14:53	1
Toluene-d8 (Surr)	98		80 - 120		02/14/21 14:53	1

Client Sample ID: MN-02I
Lab Sample ID: 480-181130-16
Date Collected: 02/10/21 09:54
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 15:17	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 15:17	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 15:17	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 15:17	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 15:17	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 15:17	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 15:17	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 15:17	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 15:17	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 15:17	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 15:17	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 15:17	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 15:17	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 15:17	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 15:17	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 15:17	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 15:17	1
Acetone	ND		10	3.0	ug/L			02/14/21 15:17	1
Benzene	ND		1.0	0.41	ug/L			02/14/21 15:17	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 15:17	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 15:17	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 15:17	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/14/21 15:17	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 15:17	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 15:17	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 15:17	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 15:17	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 15:17	1
cis-1,2-Dichloroethene	**5.2**		1.0	0.81	ug/L			02/14/21 15:17	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 15:17	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 15:17	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 15:17	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 15:17	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 15:17	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 15:17	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 15:17	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 15:17	1

Client Sample ID: MN-02I
Lab Sample ID: 480-181130-16
Date Collected: 02/10/21 09:54
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 15:17	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 15:17	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 15:17	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 15:17	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 15:17	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 15:17	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 15:17	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 15:17	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 15:17	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/14/21 15:17	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 15:17	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 15:17*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*100*		*77 - 120*		*02/14/21 15:17*	*1*
4-Bromofluorobenzene (Surr)	*100*		*73 - 120*		*02/14/21 15:17*	*1*
Dibromofluoromethane (Surr)	*102*		*75 - 123*		*02/14/21 15:17*	*1*
Toluene-d8 (Surr)	*98*		*80 - 120*		*02/14/21 15:17*	*1*

Client Sample ID: MN-01S
Lab Sample ID: 480-181130-17
Date Collected: 02/10/21 10:35
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 15:41	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 15:41	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 15:41	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 15:41	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 15:41	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 15:41	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 15:41	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 15:41	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 15:41	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 15:41	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 15:41	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 15:41	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 15:41	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 15:41	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 15:41	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 15:41	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 15:41	1
Acetone	ND		10	3.0	ug/L			02/14/21 15:41	1
Benzene	ND		1.0	0.41	ug/L			02/14/21 15:41	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 15:41	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 15:41	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 15:41	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/14/21 15:41	1

Client Sample ID: MN-01S
Lab Sample ID: 480-181130-17

Date Collected: 02/10/21 10:35
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 15:41	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 15:41	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 15:41	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 15:41	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 15:41	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/14/21 15:41	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 15:41	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 15:41	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 15:41	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 15:41	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 15:41	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 15:41	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 15:41	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 15:41	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 15:41	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 15:41	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 15:41	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 15:41	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 15:41	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 15:41	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 15:41	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 15:41	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 15:41	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/14/21 15:41	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 15:41	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 15:41*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*77 - 120*		*02/14/21 15:41*	*1*
4-Bromofluorobenzene (Surr)	*99*		*73 - 120*		*02/14/21 15:41*	*1*
Dibromofluoromethane (Surr)	*98*		*75 - 123*		*02/14/21 15:41*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*02/14/21 15:41*	*1*

Client Sample ID: MN-01I
Lab Sample ID: 480-181130-18

Date Collected: 02/10/21 11:25
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 16:05	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 16:05	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 16:05	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 16:05	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 16:05	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 16:05	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 16:05	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 16:05	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 16:05	1

Client Sample ID: MN-01I
Date Collected: 02/10/21 11:25
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-18
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 16:05	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 16:05	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 16:05	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 16:05	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 16:05	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 16:05	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 16:05	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 16:05	1
Acetone	ND		10	3.0	ug/L			02/14/21 16:05	1
Benzene	**0.54**	**J**	1.0	0.41	ug/L			02/14/21 16:05	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 16:05	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 16:05	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 16:05	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/14/21 16:05	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 16:05	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 16:05	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 16:05	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 16:05	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 16:05	1
cis-1,2-Dichloroethene	**2.8**		1.0	0.81	ug/L			02/14/21 16:05	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 16:05	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 16:05	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 16:05	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 16:05	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 16:05	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 16:05	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 16:05	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 16:05	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 16:05	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 16:05	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 16:05	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 16:05	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 16:05	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 16:05	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 16:05	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 16:05	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 16:05	1
Vinyl chloride	**8.7**		1.0	0.90	ug/L			02/14/21 16:05	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 16:05	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 16:05*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*77 - 120*		*02/14/21 16:05*	*1*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*02/14/21 16:05*	*1*
Dibromofluoromethane (Surr)	*97*		*75 - 123*		*02/14/21 16:05*	*1*
Toluene-d8 (Surr)	*99*		*80 - 120*		*02/14/21 16:05*	*1*

Client Sample ID: MN-05I
Date Collected: 02/10/21 13:23
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-19
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 16:29	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 16:29	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 16:29	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 16:29	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 16:29	1
1,1-Dichloroethene	**0.54**	**J**	1.0	0.29	ug/L			02/14/21 16:29	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 16:29	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 16:29	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 16:29	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 16:29	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 16:29	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 16:29	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 16:29	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 16:29	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 16:29	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 16:29	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 16:29	1
Acetone	ND		10	3.0	ug/L			02/14/21 16:29	1
Benzene	**5.3**		1.0	0.41	ug/L			02/14/21 16:29	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 16:29	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 16:29	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 16:29	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/14/21 16:29	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 16:29	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 16:29	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 16:29	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 16:29	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 16:29	1
cis-1,2-Dichloroethene	**270**	**E**	1.0	0.81	ug/L			02/14/21 16:29	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 16:29	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 16:29	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 16:29	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 16:29	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 16:29	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 16:29	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 16:29	1
Methyl tert-butyl ether	**0.22**	**J**	1.0	0.16	ug/L			02/14/21 16:29	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 16:29	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 16:29	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 16:29	1
Tetrachloroethene	**1.1**		1.0	0.36	ug/L			02/14/21 16:29	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 16:29	1
trans-1,2-Dichloroethene	**1.1**		1.0	0.90	ug/L			02/14/21 16:29	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 16:29	1
Trichloroethene	**0.98**	**J**	1.0	0.46	ug/L			02/14/21 16:29	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 16:29	1
Vinyl chloride	**26**		1.0	0.90	ug/L			02/14/21 16:29	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 16:29	1

*10X dilution

Client Sample ID: MN-05I
Date Collected: 02/10/21 13:23
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-19
Matrix: Water

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/14/21 16:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		77 - 120		02/14/21 16:29	1
4-Bromofluorobenzene (Surr)	103		73 - 120		02/14/21 16:29	1
Dibromofluoromethane (Surr)	100		75 - 123		02/14/21 16:29	1
Toluene-d8 (Surr)	98		80 - 120		02/14/21 16:29	1

Method: 8260C - Volatile Organic Compounds by GC/MS - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		10	8.2	ug/L			02/15/21 11:09	10
1,1,2,2-Tetrachloroethane	ND		10	2.1	ug/L			02/15/21 11:09	10
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		10	3.1	ug/L			02/15/21 11:09	10
1,1,2-Trichloroethane	ND		10	2.3	ug/L			02/15/21 11:09	10
1,1-Dichloroethane	ND		10	3.8	ug/L			02/15/21 11:09	10
1,1-Dichloroethene	ND	*+	10	2.9	ug/L			02/15/21 11:09	10
1,2,4-Trichlorobenzene	ND		10	4.1	ug/L			02/15/21 11:09	10
1,2-Dibromo-3-Chloropropane	ND		10	3.9	ug/L			02/15/21 11:09	10
1,2-Dibromoethane	ND		10	7.3	ug/L			02/15/21 11:09	10
1,2-Dichlorobenzene	ND		10	7.9	ug/L			02/15/21 11:09	10
1,2-Dichloroethane	ND		10	2.1	ug/L			02/15/21 11:09	10
1,2-Dichloropropane	ND		10	7.2	ug/L			02/15/21 11:09	10
1,3-Dichlorobenzene	ND		10	7.8	ug/L			02/15/21 11:09	10
1,4-Dichlorobenzene	ND		10	8.4	ug/L			02/15/21 11:09	10
2-Butanone (MEK)	ND		100	13	ug/L			02/15/21 11:09	10
2-Hexanone	ND		50	12	ug/L			02/15/21 11:09	10
4-Methyl-2-pentanone (MIBK)	ND		50	21	ug/L			02/15/21 11:09	10
Acetone	ND		100	30	ug/L			02/15/21 11:09	10
Benzene	ND		10	4.1	ug/L			02/15/21 11:09	10
Bromodichloromethane	ND		10	3.9	ug/L			02/15/21 11:09	10
Bromoform	ND		10	2.6	ug/L			02/15/21 11:09	10
Bromomethane	ND		10	6.9	ug/L			02/15/21 11:09	10
Carbon disulfide	ND		10	1.9	ug/L			02/15/21 11:09	10
Carbon tetrachloride	ND		10	2.7	ug/L			02/15/21 11:09	10
Chlorobenzene	ND		10	7.5	ug/L			02/15/21 11:09	10
Chloroethane	ND		10	3.2	ug/L			02/15/21 11:09	10
Chloroform	ND		10	3.4	ug/L			02/15/21 11:09	10
Chloromethane	ND		10	3.5	ug/L			02/15/21 11:09	10
cis-1,2-Dichloroethene	**270**		10	8.1	ug/L			02/15/21 11:09	10
cis-1,3-Dichloropropene	ND		10	3.6	ug/L			02/15/21 11:09	10
Cyclohexane	ND	*+	10	1.8	ug/L			02/15/21 11:09	10
Dibromochloromethane	ND		10	3.2	ug/L			02/15/21 11:09	10
Dichlorodifluoromethane	ND		10	6.8	ug/L			02/15/21 11:09	10
Ethylbenzene	ND		10	7.4	ug/L			02/15/21 11:09	10
Isopropylbenzene	ND		10	7.9	ug/L			02/15/21 11:09	10
Methyl acetate	ND		25	13	ug/L			02/15/21 11:09	10
Methyl tert-butyl ether	ND		10	1.6	ug/L			02/15/21 11:09	10
Methylcyclohexane	ND		10	1.6	ug/L			02/15/21 11:09	10
Methylene Chloride	ND		10	4.4	ug/L			02/15/21 11:09	10
Styrene	ND		10	7.3	ug/L			02/15/21 11:09	10

Client Sample ID: MN-05I
Date Collected: 02/10/21 13:23
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-19
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS - DL (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	ND		10	3.6	ug/L			02/15/21 11:09	10
Toluene	ND		10	5.1	ug/L			02/15/21 11:09	10
trans-1,2-Dichloroethene	ND		10	9.0	ug/L			02/15/21 11:09	10
trans-1,3-Dichloropropene	ND		10	3.7	ug/L			02/15/21 11:09	10
Trichloroethene	ND		10	4.6	ug/L			02/15/21 11:09	10
Trichlorofluoromethane	ND		10	8.8	ug/L			02/15/21 11:09	10
Vinyl chloride	**26**		10	9.0	ug/L			02/15/21 11:09	10
Xylenes, Total	ND		20	6.6	ug/L			02/15/21 11:09	10

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/15/21 11:09*	*10*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*77 - 120*		*02/15/21 11:09*	*10*
4-Bromofluorobenzene (Surr)	*100*		*73 - 120*		*02/15/21 11:09*	*10*
Dibromofluoromethane (Surr)	*96*		*75 - 123*		*02/15/21 11:09*	*10*
Toluene-d8 (Surr)	*97*		*80 - 120*		*02/15/21 11:09*	*10*

Client Sample ID: MN-04S
Date Collected: 02/10/21 10:57
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-20
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 16:53	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 16:53	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 16:53	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 16:53	1
1,1-Dichloroethane	**2.7**		1.0	0.38	ug/L			02/14/21 16:53	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 16:53	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 16:53	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 16:53	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 16:53	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 16:53	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 16:53	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 16:53	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 16:53	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 16:53	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 16:53	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 16:53	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 16:53	1
Acetone	ND		10	3.0	ug/L			02/14/21 16:53	1
Benzene	ND		1.0	0.41	ug/L			02/14/21 16:53	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 16:53	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 16:53	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 16:53	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/14/21 16:53	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 16:53	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 16:53	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 16:53	1

Client Sample ID: MN-04S
Lab Sample ID: 480-181130-20
Date Collected: 02/10/21 10:57
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroform	ND		1.0	0.34	ug/L			02/14/21 16:53	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 16:53	1
cis-1,2-Dichloroethene	**8.3**		1.0	0.81	ug/L			02/14/21 16:53	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 16:53	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 16:53	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 16:53	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 16:53	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 16:53	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 16:53	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 16:53	1
Methyl tert-butyl ether	**2.4**		1.0	0.16	ug/L			02/14/21 16:53	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 16:53	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 16:53	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 16:53	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 16:53	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 16:53	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 16:53	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 16:53	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 16:53	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 16:53	1
Vinyl chloride	**5.9**		1.0	0.90	ug/L			02/14/21 16:53	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 16:53	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 16:53*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*77 - 120*		*02/14/21 16:53*	*1*
4-Bromofluorobenzene (Surr)	*98*		*73 - 120*		*02/14/21 16:53*	*1*
Dibromofluoromethane (Surr)	*99*		*75 - 123*		*02/14/21 16:53*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*02/14/21 16:53*	*1*

Client Sample ID: MN-04I
Lab Sample ID: 480-181130-21
Date Collected: 02/10/21 11:29
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		40	33	ug/L			02/14/21 17:17	40
1,1,2,2-Tetrachloroethane	ND		40	8.4	ug/L			02/14/21 17:17	40
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		40	12	ug/L			02/14/21 17:17	40
1,1,2-Trichloroethane	ND		40	9.2	ug/L			02/14/21 17:17	40
1,1-Dichloroethane	ND		40	15	ug/L			02/14/21 17:17	40
1,1-Dichloroethene	ND		40	12	ug/L			02/14/21 17:17	40
1,2,4-Trichlorobenzene	ND		40	16	ug/L			02/14/21 17:17	40
1,2-Dibromo-3-Chloropropane	ND		40	16	ug/L			02/14/21 17:17	40
1,2-Dibromoethane	ND		40	29	ug/L			02/14/21 17:17	40
1,2-Dichlorobenzene	ND		40	32	ug/L			02/14/21 17:17	40
1,2-Dichloroethane	ND		40	8.4	ug/L			02/14/21 17:17	40
1,2-Dichloropropane	ND		40	29	ug/L			02/14/21 17:17	40

Client Sample ID: MN-04I
Date Collected: 02/10/21 11:29
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-21
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3-Dichlorobenzene	ND		40	31	ug/L			02/14/21 17:17	40
1,4-Dichlorobenzene	ND		40	34	ug/L			02/14/21 17:17	40
2-Butanone (MEK)	ND		400	53	ug/L			02/14/21 17:17	40
2-Hexanone	ND		200	50	ug/L			02/14/21 17:17	40
4-Methyl-2-pentanone (MIBK)	ND		200	84	ug/L			02/14/21 17:17	40
Acetone	ND		400	120	ug/L			02/14/21 17:17	40
Benzene	ND		40	16	ug/L			02/14/21 17:17	40
Bromodichloromethane	ND		40	16	ug/L			02/14/21 17:17	40
Bromoform	ND		40	10	ug/L			02/14/21 17:17	40
Bromomethane	ND		40	28	ug/L			02/14/21 17:17	40
Carbon disulfide	**11**	**J**	40	7.6	ug/L			02/14/21 17:17	40
Carbon tetrachloride	ND		40	11	ug/L			02/14/21 17:17	40
Chlorobenzene	ND		40	30	ug/L			02/14/21 17:17	40
Chloroethane	ND		40	13	ug/L			02/14/21 17:17	40
Chloroform	ND		40	14	ug/L			02/14/21 17:17	40
Chloromethane	ND		40	14	ug/L			02/14/21 17:17	40
cis-1,2-Dichloroethene	**280**		40	32	ug/L			02/14/21 17:17	40
cis-1,3-Dichloropropene	ND		40	14	ug/L			02/14/21 17:17	40
Cyclohexane	ND		40	7.2	ug/L			02/14/21 17:17	40
Dibromochloromethane	ND		40	13	ug/L			02/14/21 17:17	40
Dichlorodifluoromethane	ND	*+	40	27	ug/L			02/14/21 17:17	40
Ethylbenzene	ND		40	30	ug/L			02/14/21 17:17	40
Isopropylbenzene	ND		40	32	ug/L			02/14/21 17:17	40
Methyl acetate	ND		100	52	ug/L			02/14/21 17:17	40
Methyl tert-butyl ether	ND		40	6.4	ug/L			02/14/21 17:17	40
Methylcyclohexane	ND		40	6.4	ug/L			02/14/21 17:17	40
Methylene Chloride	ND		40	18	ug/L			02/14/21 17:17	40
Styrene	ND		40	29	ug/L			02/14/21 17:17	40
Tetrachloroethene	**2100**		40	14	ug/L			02/14/21 17:17	40
Toluene	ND		40	20	ug/L			02/14/21 17:17	40
trans-1,2-Dichloroethene	ND		40	36	ug/L			02/14/21 17:17	40
trans-1,3-Dichloropropene	ND		40	15	ug/L			02/14/21 17:17	40
Trichloroethene	**280**		40	18	ug/L			02/14/21 17:17	40
Trichlorofluoromethane	ND		40	35	ug/L			02/14/21 17:17	40
Vinyl chloride	ND		40	36	ug/L			02/14/21 17:17	40
Xylenes, Total	ND		80	26	ug/L			02/14/21 17:17	40

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 17:17*	*40*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*101*		*77 - 120*		*02/14/21 17:17*	*40*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*02/14/21 17:17*	*40*
Dibromofluoromethane (Surr)	*101*		*75 - 123*		*02/14/21 17:17*	*40*
Toluene-d8 (Surr)	*95*		*80 - 120*		*02/14/21 17:17*	*40*

Client Sample ID: MN-04D
Date Collected: 02/10/21 13:36
Date Received: 02/11/21 16:19

Lab Sample ID: 480-181130-22
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 17:41	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 17:41	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 17:41	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 17:41	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 17:41	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 17:41	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 17:41	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 17:41	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 17:41	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 17:41	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 17:41	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 17:41	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 17:41	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 17:41	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 17:41	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 17:41	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 17:41	1
Acetone	ND		10	3.0	ug/L			02/14/21 17:41	1
Benzene	ND		1.0	0.41	ug/L			02/14/21 17:41	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 17:41	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 17:41	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 17:41	1
Carbon disulfide	**0.63**	**J**	1.0	0.19	ug/L			02/14/21 17:41	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 17:41	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 17:41	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 17:41	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 17:41	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 17:41	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/14/21 17:41	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 17:41	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 17:41	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 17:41	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 17:41	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 17:41	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 17:41	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 17:41	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 17:41	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 17:41	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 17:41	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 17:41	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 17:41	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 17:41	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 17:41	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 17:41	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 17:41	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 17:41	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/14/21 17:41	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 17:41	1

Client Sample ID: MN-04D
Lab Sample ID: 480-181130-22
Date Collected: 02/10/21 13:36
Matrix: Water
Date Received: 02/11/21 16:19

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
Tentatively Identified Compound	None		ug/L					02/14/21 17:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		77 - 120		02/14/21 17:41	1
4-Bromofluorobenzene (Surr)	96		73 - 120		02/14/21 17:41	1
Dibromofluoromethane (Surr)	103		75 - 123		02/14/21 17:41	1
Toluene-d8 (Surr)	98		80 - 120		02/14/21 17:41	1

Client Sample ID: MN-05D
Lab Sample ID: 480-181130-23
Date Collected: 02/10/21 14:45
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 18:05	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 18:05	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 18:05	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 18:05	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 18:05	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 18:05	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 18:05	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 18:05	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 18:05	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 18:05	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 18:05	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 18:05	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 18:05	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 18:05	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 18:05	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 18:05	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 18:05	1
Acetone	ND		10	3.0	ug/L			02/14/21 18:05	1
Benzene	ND		1.0	0.41	ug/L			02/14/21 18:05	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 18:05	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 18:05	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 18:05	1
Carbon disulfide	**0.81**	**J**	1.0	0.19	ug/L			02/14/21 18:05	1
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 18:05	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 18:05	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 18:05	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 18:05	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 18:05	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/14/21 18:05	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 18:05	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 18:05	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 18:05	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 18:05	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 18:05	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 18:05	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 18:05	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 18:05	1

Client Sample ID: MN-05D
Lab Sample ID: 480-181130-23

Date Collected: 02/10/21 14:45
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 18:05	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 18:05	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 18:05	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 18:05	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 18:05	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 18:05	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 18:05	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 18:05	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 18:05	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/14/21 18:05	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 18:05	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 18:05*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*104*		*77 - 120*		*02/14/21 18:05*	*1*
4-Bromofluorobenzene (Surr)	*101*		*73 - 120*		*02/14/21 18:05*	*1*
Dibromofluoromethane (Surr)	*102*		*75 - 123*		*02/14/21 18:05*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*02/14/21 18:05*	*1*

Client Sample ID: TB-20210208-10
Lab Sample ID: 480-181130-24

Date Collected: 02/08/21 00:00
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	ND		1.0	0.82	ug/L			02/14/21 18:29	1
1,1,2,2-Tetrachloroethane	ND		1.0	0.21	ug/L			02/14/21 18:29	1
1,1,2-Trichloro-1,2,2-trifluoroethane	ND		1.0	0.31	ug/L			02/14/21 18:29	1
1,1,2-Trichloroethane	ND		1.0	0.23	ug/L			02/14/21 18:29	1
1,1-Dichloroethane	ND		1.0	0.38	ug/L			02/14/21 18:29	1
1,1-Dichloroethene	ND		1.0	0.29	ug/L			02/14/21 18:29	1
1,2,4-Trichlorobenzene	ND		1.0	0.41	ug/L			02/14/21 18:29	1
1,2-Dibromo-3-Chloropropane	ND		1.0	0.39	ug/L			02/14/21 18:29	1
1,2-Dibromoethane	ND		1.0	0.73	ug/L			02/14/21 18:29	1
1,2-Dichlorobenzene	ND		1.0	0.79	ug/L			02/14/21 18:29	1
1,2-Dichloroethane	ND		1.0	0.21	ug/L			02/14/21 18:29	1
1,2-Dichloropropane	ND		1.0	0.72	ug/L			02/14/21 18:29	1
1,3-Dichlorobenzene	ND		1.0	0.78	ug/L			02/14/21 18:29	1
1,4-Dichlorobenzene	ND		1.0	0.84	ug/L			02/14/21 18:29	1
2-Butanone (MEK)	ND		10	1.3	ug/L			02/14/21 18:29	1
2-Hexanone	ND		5.0	1.2	ug/L			02/14/21 18:29	1
4-Methyl-2-pentanone (MIBK)	ND		5.0	2.1	ug/L			02/14/21 18:29	1
Acetone	ND		10	3.0	ug/L			02/14/21 18:29	1
Benzene	ND		1.0	0.41	ug/L			02/14/21 18:29	1
Bromodichloromethane	ND		1.0	0.39	ug/L			02/14/21 18:29	1
Bromoform	ND		1.0	0.26	ug/L			02/14/21 18:29	1
Bromomethane	ND		1.0	0.69	ug/L			02/14/21 18:29	1
Carbon disulfide	ND		1.0	0.19	ug/L			02/14/21 18:29	1

Client Sample ID: TB-20210208-10
Lab Sample ID: 480-181130-24

Date Collected: 02/08/21 00:00
Matrix: Water
Date Received: 02/11/21 16:19

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbon tetrachloride	ND		1.0	0.27	ug/L			02/14/21 18:29	1
Chlorobenzene	ND		1.0	0.75	ug/L			02/14/21 18:29	1
Chloroethane	ND		1.0	0.32	ug/L			02/14/21 18:29	1
Chloroform	ND		1.0	0.34	ug/L			02/14/21 18:29	1
Chloromethane	ND		1.0	0.35	ug/L			02/14/21 18:29	1
cis-1,2-Dichloroethene	ND		1.0	0.81	ug/L			02/14/21 18:29	1
cis-1,3-Dichloropropene	ND		1.0	0.36	ug/L			02/14/21 18:29	1
Cyclohexane	ND		1.0	0.18	ug/L			02/14/21 18:29	1
Dibromochloromethane	ND		1.0	0.32	ug/L			02/14/21 18:29	1
Dichlorodifluoromethane	ND	*+	1.0	0.68	ug/L			02/14/21 18:29	1
Ethylbenzene	ND		1.0	0.74	ug/L			02/14/21 18:29	1
Isopropylbenzene	ND		1.0	0.79	ug/L			02/14/21 18:29	1
Methyl acetate	ND		2.5	1.3	ug/L			02/14/21 18:29	1
Methyl tert-butyl ether	ND		1.0	0.16	ug/L			02/14/21 18:29	1
Methylcyclohexane	ND		1.0	0.16	ug/L			02/14/21 18:29	1
Methylene Chloride	ND		1.0	0.44	ug/L			02/14/21 18:29	1
Styrene	ND		1.0	0.73	ug/L			02/14/21 18:29	1
Tetrachloroethene	ND		1.0	0.36	ug/L			02/14/21 18:29	1
Toluene	ND		1.0	0.51	ug/L			02/14/21 18:29	1
trans-1,2-Dichloroethene	ND		1.0	0.90	ug/L			02/14/21 18:29	1
trans-1,3-Dichloropropene	ND		1.0	0.37	ug/L			02/14/21 18:29	1
Trichloroethene	ND		1.0	0.46	ug/L			02/14/21 18:29	1
Trichlorofluoromethane	ND		1.0	0.88	ug/L			02/14/21 18:29	1
Vinyl chloride	ND		1.0	0.90	ug/L			02/14/21 18:29	1
Xylenes, Total	ND		2.0	0.66	ug/L			02/14/21 18:29	1

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
Tentatively Identified Compound	*None*		*ug/L*					*02/14/21 18:29*	*1*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*77 - 120*		*02/14/21 18:29*	*1*
4-Bromofluorobenzene (Surr)	*97*		*73 - 120*		*02/14/21 18:29*	*1*
Dibromofluoromethane (Surr)	*97*		*75 - 123*		*02/14/21 18:29*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*02/14/21 18:29*	*1*

ATTACHMENT B

CASE NARRATIVE & COC

Sample Summary

Client: New York State D.E.C.
Job ID: 480-181130-1
Project/Site: 331-337 W. Main St Rochester #828102

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
480-181130-1	BMW-102S	Water	02/08/21 11:25	02/11/21 16:19	
480-181130-2	BMW-102I	Water	02/08/21 12:00	02/11/21 16:19	
480-181130-3	BMW-102D	Water	02/08/21 15:40	02/11/21 16:19	
480-181130-4	BMW-103S	Water	02/08/21 11:47	02/11/21 16:19	
480-181130-5	MW-15	Water	02/08/21 15:12	02/11/21 16:19	
480-181130-6	MW-14	Water	02/08/21 15:30	02/11/21 16:19	
480-181130-7	MW-12	Water	02/09/21 10:24	02/11/21 16:19	
480-181130-8	MW-101	Water	02/09/21 11:26	02/11/21 16:19	
480-181130-9	MW-01	Water	02/09/21 10:55	02/11/21 16:19	
480-181130-10	MN-03D	Water	02/09/21 13:56	02/11/21 16:19	
480-181130-11	MN-01D	Water	02/09/21 14:50	02/11/21 16:19	
480-181130-12	MN-02D	Water	02/09/21 15:45	02/11/21 16:19	
480-181130-13	MN-03I	Water	02/10/21 09:18	02/11/21 16:19	
480-181130-14	MN-02S	Water	02/10/21 09:26	02/11/21 16:19	
480-181130-15	MN-03S	Water	02/10/21 09:53	02/11/21 16:19	
480-181130-16	MN-02I	Water	02/10/21 09:54	02/11/21 16:19	
480-181130-17	MN-01S	Water	02/10/21 10:35	02/11/21 16:19	
480-181130-18	MN-01I	Water	02/10/21 11:25	02/11/21 16:19	
480-181130-19	MN-05I	Water	02/10/21 13:23	02/11/21 16:19	
480-181130-20	MN-04S	Water	02/10/21 10:57	02/11/21 16:19	
480-181130-21	MN-04I	Water	02/10/21 11:29	02/11/21 16:19	
480-181130-22	MN-04D	Water	02/10/21 13:36	02/11/21 16:19	
480-181130-23	MN-05D	Water	02/10/21 14:45	02/11/21 16:19	
480-181130-24	TB-20210208-10	Water	02/08/21 00:00	02/11/21 16:19	

Job Narrative
480-181130-1

Comments
No additional comments.

Receipt
The samples were received on 2/10/2021 4:19 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.8º C.

GC/MS VOA
Method 8260C: The following samples were diluted to bring the concentration of target analytes within the calibration range: BMW-102S (480-181130-1), BMW-103S (480-181130-4), MW-15 (480-181130-5), MW-12 (480-181130-7), (480-181130-B-4 MS) and (480-181130-B-4 MSD). Elevated reporting limits (RLs) are provided.

Method 8260C: The following volatiles sample was diluted due to foaming at the time of purging during the original sample analysis: BMW-102D (480-181130-3). Elevated reporting limits (RLs) are provided.

Method 8260C: The continuing calibration verification (CCV) associated with batch 480-569415 recovered above the upper control limit for Trichlorofluoromethane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: MW-101 (480-181130-8), MW-01 (480-181130-9), MN-03D (480-181130-10), MN-01D (480-181130-11), MN-02D (480-181130-12), MN-03I (480-181130-13), MN-02S (480-181130-14), MN-03S (480-181130-15), MN-02I (480-181130-16), MN-01S (480-181130-17), MN-01I (480-181130-18), MN-05I (480-181130-19), MN-04S (480-181130-20), MN-04I (480-181130-21), MN-04D (480-181130-22), MN-05D (480-181130-23) and TB-20210208-10 (480-181130-24).

Method 8260C: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 480-569415 recovered outside control limits for the following analyte: Dichlorodifluoromethane. This analyte was biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported. The associated samples are impacted: MW-101 (480-181130-8), MW-01 (480-181130-9), MN-03D (480-181130-10), MN-01D (480-181130-11), MN-02D (480-181130-12), MN-03I (480-181130-13), MN-02S (480-181130-14), MN-03S (480-181130-15), MN-02I (480-181130-16), MN-01S (480-181130-17), MN-01I (480-181130-18), MN-05I (480-181130-19), MN-04S (480-181130-20), MN-04I (480-181130-21), MN-04D (480-181130-22), MN-05D (480-181130-23) and TB-20210208-10 (480-181130-24).

Method 8260C: The following samples were diluted to bring the concentration of target analytes within the calibration range: MW-101 (480-181130-8), MN-04I (480-181130-21), (480-181130-B-8 MS) and (480-181130-B-8 MSD). Elevated reporting limits (RLs) are provided.

Method 8260C: The following volatiles samples were diluted due to foaming at the time of purging during the original sample analysis: MN-03D (480-181130-10) and MN-02D (480-181130-12). Elevated reporting limits (RLs) are provided.

Method 8260C: The following sample was diluted to bring the concentration of target analytes within the calibration range: MN-05I (480-181130-19). Elevated reporting limits (RLs) are provided.

Method 8260C: The laboratory control sample (LCS) for analytical batch 480-569422 recovered outside control limits for the following analytes: Cyclohexane and 1,1-Dichloroethene. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported. The associated sample is impacted: MN-05I (480-181130-19).

Method 8260C: The continuing calibration verification (CCV) associated with batch 480-569422 recovered above the upper control limit for Carbon disulfide and Cyclohexane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated sample is impacted: MN-05I (480-181130-19).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

DATA USABILITY SUMMARY REPORT

For

331-337 W. Main St Rochester
WATER SAMPLES

VOA, SVOA, PESTICIDE, PCB, METALS, MERCURY &CYANIDE
SDG No. J181150

Sampling Date: February 11, 2021

Submitted to:

AECOM
257 West Genesee Street
Suite 400
Buffalo, New York, USA
716-856-5636

Prepared by:

Environmental Occupational & Public Health Consultants Inc. (EOPHC)
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Site: 331-337 W. Main St Rochester
Client: AECOM
Laboratory: Eurofins TestAmerica

SDG #: J 181150
Date: April 10, 2021
Reviewer: L. Wright

Sample Identification Table

Client Sample ID	Laboratory ID	Matrix	VOC	SVOC	Pest/PCB/ Metals	Reactive & Total Cyanide
MW-14S	480-181150-1	Aqueous	X	X	X	X
MW-130B	480-181150-2	Aqueous	X	X	X	X
MW-13S	480-181150-3	Aqueous	X			
MW-150B	480-181150-4	Aqueous	X			
MW-13I	480-181150-5	Aqueous	X	X	X	X
MW-14I	480-181150-6	Aqueous	X			
TB-20210211	480-181150-7	Aqueous	X			

The data packages contained seven (7) aqueous samples, which included one (1) trip blank sample. The samples were analyzed via Method SW-846 8260C, 8260D SIM, 8270D, 8082A, 8081B, 6010D/6020B, 7470A/7471B, and 9010C/9012B. The samples were analyzed via Method SW-846 8260C. The adherence of laboratory analytical performance to this methods' analytical specifications was evaluated during the data validation process. The data package was evaluated for its usability as defined by the Guidance for the Development of Data Usability Summary Reports (DER-10, 11/09). USEPA Region II standard operating procedures were used as guidance documents. According to the NYSDEC Guidance for the Development of Data Usability Summary Reports, the following QC data were evaluated: blanks, instrument tunings, calibration standards, calibration verifications, laboratory controls, surrogate recoveries, spike recoveries, and sample data. All QC data were within quality control limits, except the following issues:

Cover letter, Narrative and Data Reporting Forms (Form 1s): The deficiencies noted in the case narrative that affect data usability have been discussed in applicable sections. Data that have no impact on data usability are not discussed.

Chain of Custody (COC): All samples were present.

Preservation: Preservation was acceptable.

Holding Time: Holding times were within acceptable criterion for all samples.

Blanks Quality Control: The following were qualified due to blank deficiency;

Sample Identification	Compound	Qualifier
480-181150-2 480-181150-3	Total cyanide	U
480-181150-1	Total cyanide	UJ*

*See Sample Duplicate Section

Calibration Quality Control: The calibration was acceptable.

Laboratory Control Sample (LCS): The results are acceptable.

Surrogates: The recoveries were acceptable.

Internal Standards: All results were acceptable.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD): All the results are acceptable.

Sample Duplicate: The RPD for total cyanide exceeded the QClimits and this resulted in one sample result being qualified as estimated "J," (480-181150-1). The sample was also impacted by blank contamination and resulted in a final qualifier of "UJ" being applied. See Blanks Section.

Field Duplicate: No field duplicates were present in this SDG.

Compound Quantitation: Quantitations were acceptable. Results reported above the method detection limit (MDL) but below the reporting limit (RL) are considered estimated (J). The following were qualified due to deficiency.

The percent difference using the second column for 4,4-DDT was reported to be 43%. The laboratory had previously qualified the compound in the affected compound to be estimated. No further qualification was necessary.

Tentatively Identified Compounds: Several compounds reported as TICs are volatile target compounds. These compounds were rejected as SVOA TICs.

Sample Identification	Compound	Qualifier
480-181150-1	Cyclohexane Trichloroethylene Tetrachloroethylene	R
480-181150-2	Cyclohexane Trichloroethylene Tetrachloroethylene Toluene p-xylene	R
480-181150-5	Benzene Trichloroethylene Tetrachloroethylene	R

Additional Comments: Some Form 1s and case narratives are reporting criteria out of QC limits. If data were impacted due to the deficiency, it is discussed in the DUSR and appropriate qualifier(s) applied. Therefore, all discussions in the DUSR relate to all conditions that affected data usability. When there are multiple analyses, the validator presents the best run (Attachment A).

The laboratory reported analyses for reactive cyanide on its Form 1s. However, the COC requested total cyanide. The validator therefore did not validate this data.

Data usability: Data qualified with the "UJ" qualifier are to be used cautiously as they are estimated data

with some quality control issues. Data qualified with the "J" qualifier are to be used cautiously as they are estimated data with some quality control issues. Data qualified with the "R" qualifier are not usable due to severe quality control issues. Data qualified with the "U" qualifier are usable at the reporting limit.

ATTACHMENT A

FORM 1s

Client Sample ID: MW-14S

Date Collected: 02/11/21 09:38
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-1

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
)G)G)(I4<C,Ä4À.0C7/.	1#		F*'	F)'	IJ=K			'F=)*=F)!)*$>L	F*'
)G)GFGF:(0H7<C,Ä4À.0C7/.	1#		F*'	* >	I J=K			' F=)*=F)!)*$>L	F*'
)G)GF(H<C,Ä4À()GFGF(04-M,IÄ4À.0C7/.	1#		F*'	?&	I J=K			' F=)*=F)!)*$>L	F*'
)G)GF(H<C,Ä4À.0C7/.	1#		F*'	* &	I J=K			' F=)*=F)!)*$>L	F*'
)G)(#-<C,Ä4À.0C7/.	1#		F*'	L*	I J=K			' F=)*=F)!)*$>L	F*'
)G)(#-<C,Ä4À.0C./.	1#		F*'	?>	I J=K			' F=)*=F)!)*$>L	F*'
)GFG%(HC,Ä4À ./N./.	1#		F*'	) "	IJ=K			'F=)*=F)!)*$>L	F*'
)GF(#- 4ÀOÄ(>(+C,Ä4ÀP4ÀP7/.	1#		F*'	L&	I J=K			' F=)*=F)!)*$>L	F*'
)GF(#- 4ÀOÄ.0C7/.	1#		F*'	) &'	IJ=K			'F=)*=F)!)*$>L	F*'
)GF(#-<C,Ä4À ./N./.	1#		F*'	F"	IJ=K			'F=)*=F)!)*$>L	F*'
)GF(#-<C,Ä4À.0C7/.	1#		F*'	* >	I J=K			' F=)*=F)!)*$>L	F*'
)GF(#-<C,Ä4ÀP4ÀP7/.	1#		F*'	) &'	IJ=K			'F=)*=F)!)*$>L	F*'
)G>(#-<C,Ä4À ./N./.	1#		F*'	F"	IJ=K			'F=)*=F)!)*$>L	F*'
)G%(#-<C,Ä4À ./N./.	1#		F*'	F)'	IJ=K			'F=)*=F)!)*$>L	F*'
F(QI07/À/.!RA9ST	1#		F*"	>>'	I J=K			' F=)*=F)!)*$>L	F*'
F(U.V7/À/.	1#		)>"	>)'	I J=K			' F=)*=F)!)*$>L	F*'
%(A.0CW,(F(P./07/À/.!RA"QST	1#		)>"	*>'	I J=K			' F=)*=F)!)*$>L	F*'
X<.0À/.	1#		F*"	?*'	I J=K			' F=)*=F)!)*$>L	F*'
Q./N./.	1 #		F*'	) "	IJ=K			'F=)*=F)!)*$>L	F*'
Q4ÀOÄY-<C,Ä4ÀO.0C7/.	1#		F*'	L&	I J=K			' F=)*=F)!)*$>L	F*'
Q4ÀOÀMÄ4O	1#		F*'	Z*	I J=K			' F=)*=F)!)*$>L	F*'
Q4ÀOÀO.0C7/.	1#		F*'	) ?'	IJ=K			'F=)*=F)!)*$>L	F*'
+74 À/!Y-DI,M-Y.	1#		F*'	%&	I J=K			' F=)*=F)!)*$>L	F*'
+74 À/!0.047<C,Ä4-Y.	1#		F*'	Z&	I J=K			' F=)*=F)!)*$>L	F*'
+C,Ä4À ./N./.	1#		F*'	) L'	IJ=K			'F=)*=F)!)*$>L	F*'
+C,Ä4À.0C7/.	1#		F*'	&'	I J=K			' F=)*=F)!)*$>L	F*'
+C,Ä4ÀMÄ4O	1 #		F*'	&*	I J=K			' F=)*=F)!)*$>L	F*'
+C,Ä4ÀO.0C7/.	1#		F*'	&&	I J=K			' F=)*=F)!)*$>L	F*'
cis-1,2-Dichloroethene	**1900**		F*'	F"	IJ=K			'F=)*=F)!)*$>L	F*'
<-D()G>(#-<C,Ä4ÀP4ÀP./.	1 #		F*'	L'	I J=K			' F=)*=F)!)*$>L	F*'
+W<,ÄC.V7/.	1#		F*'	%	I J=K			' F=)*=F)!)*$>L	F*'
#- 4ÀOÄ<C,Ä4ÀO.0C7/.	1#		F*'	&'	I J=K			' F=)*=F)!)*$>L	F*'
#-<C,Ä4ÄY-M,IÄ4ÀO.0C7/.	1#		F*'	) ?'	IJ=K			'F=)*=F)!)*$>L	F*'
90CW, ./N./.	1#		F*'	) L'	IJ=K			'F=)*=F)!)*$>L	F*'
"DÀP4ÀPW, ./N./.	1#		F*'	F"	IJ=K			'F=)*=F)!)*$>L	F*'
A.0CW,!7<.070.	1#		Z>'	>>'	IJ=K			'F=)*=F)!)*$>L	F*'
A.0CW,!0.40(I0W,!.0C.4	1#		F*'	%	I J=K			' F=)*=F)!)*$>L	F*'
A.0CW,<W<,ÄC.V7/.	1#		F*'	%	I J=K			' F=)*=F)!)*$>L	F*'
A.0CW,./.!+C,Ä4-Y.	1#		F*'	))'	IJ=K			'F=)*=F)!)*$>L	F*'
60W4./.	1#		F*'	) &'	IJ=K			'F=)*=F)!)*$>L	F*'
Tetrachloroethene	**14000**		F*'	L'	I J=K			' F=)*=F)!)*$>L	F*'
HÄ,I./.	1#		F*'	) >'	IJ=K			'F=)*=F)!)*$>L	F*'
047/D()GF(#-<C,Ä4À.0C./.	1#		F*'	F>'	IJ=K			'F=)*=F)!)*$>L	F*'
047/D()G>(#-<C,Ä4ÀP4ÀP./.	1#		F*'	L>	I J=K			' F=)*=F)!)*$>L	F*'
Trichloroethene	**1800**		F*'	) F'	IJ=K			'F=)*=F)!)*$>L	F*'
H4<C,Ä4ÀM,IÄ4ÀO.0C7/.	1#		F*'	FF'	IJ=K			'F=)*=F)!)*$>L	F*'
[-/W,!<C,Ä4-Y.	1#		F*'	F>'	IJ=K			'F=)*=F)!)*$>L	F*'
\W,./.DG!HÄ07,	1#		*"	) ?'	IJ=K			'F=)*=F)!)*$>L	F*'

Client Sample ID: MW-14S

Date Collected: 02/11/21 09:38
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-1

Matrix: Water

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
ĀÀ !"!#$À%&'()À !##À)'+,-./)*	*0, À*		*/123*					*45267256'6789:*	*574*

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
6;5<=#>?%,@,À!?" Ä<)A'BC/@@D	*64A*		*EE<654*		*45267256'6789:*	*574*
A<F@,-,%/,@,GÀ HÀ À'BC/@@D*	*644*		*E9<654*		*45267256'6789:*	*574*
=#G@,-,%/,@,-À!?" À'BC/@@D*	*64A*		*E7<659*		*45267256'6789:*	*574*
Ā%/À Ä<)I'BC/@@D	*:E*		*I4 <654*		*45267256'6789:*	*574*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
FG%G?%(HC,Ä4ÀPC./À,	1#		*8'	' 8%&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
FG%GZ(HC,Ä4ÀPC./À,	1#		*8'	' 8Z)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
FG%(#-<C,Ä4ÀPC./À,	1#		*8'	' 8*)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
FG%(#-O.0CW,PC./À,	1#		*8'	' 8*'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
FG%(#-/-04ÀPC./À,	1#		)'	F8F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
FG%(#-/-04À0À,I./.	1#		*8'	' 8%*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
FGZ(#-/-04À0À,I./.	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
F(+C,Ä4À/7PC0C7,./.	1#		*8'	' 8%Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
F(+C,Ä4ÀPC./À,	1#		*8'	' 8*>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
F(A.0CW,/7PC0C7,./.	1#		*8'	' 8Z'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
F(A.0CW,PC./À,	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
F(1-04À7/-,-/.	1#		)'	'8%F	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
F(1-04ÀPC./À,	1#		*8'	' 8%&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
>G>](#-<C,Ä4À ./N-Y-/.	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
>(1-04À7/-,-/.	1#		)'	'8%&	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
%GZ(#-/-04À(F(O.0CW,PC./À,	1#		)'	F8F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
%(Q4ÀOÀPC./W,!PC./W,!.0C.4	1#		*8'	' 8%*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
%(+C,Ä4À(>(O.0CW,PC./À,	1#		*8'	' 8%*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
%(+C,Ä4À7/-,-/.	1#		*8'	' 8*L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
%(+C,Ä4ÀPC./W,!PC./W,!.0C.4	1#		*8'	' 8>*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
%(A.0CW,PC./À,	1#		)'	'8>Z	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
%(1-04À7/-,-/.	1#		)'	'8F*	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
%(1-04ÀPC./À,	1#		)'	)8*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
X<./7PC0C./.	1#		*8'	' 8%)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
X<./7PC0CW,./.	1#		*8'	' 8>&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
X<.0ÀPC./À/.	1#		*8'	' 8*%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
X/0C47<./.	1#		*8'	' 8F&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
X047N-/.	1#		*8'	' 8%Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Q./N7,Y.CWY.	1#		*8'	' 8F?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Q./NÀR7T7/0C47<./.	1#		*8'	' 8>Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Q./NÀR7TPW4./.	1#		*8'	' 8%?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Q./NÀR TM,IÀ47/0C./.	1#		*8'	' 8>%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Q./NÀRJGCG-TP.4W,./.	1#		*8'	' 8>*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Q./NÀR5TM,IÀ47/0C./.	1#		*8'	' 8?>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Q-PC./W,	1#		*8'	' 8Z*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
-D!RF(<C,Ä4Ä-DÄP4ÀPW,T!.0C.4	1#		*8'	' 8*F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Q-DRF(<C,Ä4Ä.0CÀVWTO.0C7/.	1#		*8'	' 8>*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Q-DRF(<C,Ä4Ä.0CW,T.0C.4	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Q-DRF(.0CW,C.VW,T!PC0C7,70.	1#		*8'	F8F	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Butyl benzyl phthalate	**1.1**	**J**	*8'	)8'	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)

Client Sample ID: MW-14S

Date Collected: 02/11/21 09:38
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-1

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
+7P4À,7<07O	1#		*8'	F8F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
+74 7NÀ,.	1#		*8'	' 8>'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
+C4WD./.	1#		*8'	' 8>>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
#- ./NR7GCT7/0C47<./.	1#		*8'	' 8%F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
#- ./NÀMI47/	1#		)'	'8*)	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
#-.0CW,!PC0C7,70.	1#		*8'	' 8FF	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
#-O.0CW,!PC0C7,70.	1#		*8'	' 8>Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
#-(/(I0W,!PC0C7,70.	1#		*8'	' 8>)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
#-(/(À<0W,!PC0C7,70.	1#		*8'	' 8%?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
^,IÀ47/0C./.	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
^,IÀ4./.	1#		*8'	' 8>Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
U.V7<C,À4À ./N./.	1#		*8'	' 8*)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
U.V7<C,À4À I07Y-./.	1#		*8'	' 8Z&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
U.V7<C,À4À<W<,ÀP./07Y-./.	1#		*8'	' 8*L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
U.V7<C,À4À.0C7/.	1#		*8'	' 8*L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
"/Y./ÀR)GFG>(<YTPW4./.	1#		*8'	' 8%?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
"DÀPCÀ4À/.	1#		*8'	' 8%>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
17PC0C7,./.	1#		*8'	' 8?Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
1-04À ./N./.	1#		*8'	' 8FL	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
1(1-04ÀDÀY-(/(P4ÀPW,7O-/.	1#		*8'	' 8*%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
1(1-04ÀDÀY-PC./W,7O-/.	1#		*8'	' 8*)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
:./07<C,À4ÀPC./À,	1#		)'	F8F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
Phenanthrene	**0.73**	**J**	*8'	' 8%%	J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
:C./À,	1#		*8'	' 8>L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)
:W4./.	1#		*8'	' 8>%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$)'	)

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
J K ,L	*5M9*	*Ā'N*	*/123*		*5M76*		*4526E256'6784A*	*4526I256'6:864*	*6*
O!?À Ä;'6;5<)#>?%,@,<;'BPD<	*96*	*Ā'N'0*	*/123*		*5MQA*	*67Q<7:<5*	*4526E256'6784A*	*4526I256'6:864*	*6*
J K ,L	*AM7*	*Ā'N*	*/123*		*5M:Q*		*4526E256'6784A*	*4526I256'6:864*	*6*
+&>%,?ÄR" Ä	R *AM4*	*~~Ā'N'0~~*	*/123*		*9M65*	*664<I5<E*	*4526E256'6784A*	*4526I256'6:864*	*6*
J K ,L	*664*	*Ā'N*	*/123*		*9M9:*		*4526E256'6784A*	*4526I256'6:864*	*6*
Ā@>?%,@,Ä!?&%Ä Ä	R *564*	*~~Ā'N'0~~*	*/123*		*9MQI*	*E:<46<Q*	*4526E256'6784A*	*4526I256'6:864*	*6*
ĀÄ!@">?%,@,Ä!?&%Ä Ä	R *6744*	*~~Ā'N'0~~*	*/123*		*AM:9*	*65E<6I<A*	*4526E256'6784A*	*4526I256'6:864*	*6*
J K ,L	*974*	*Ā'N*	*/123*		*AM:Q*		*4526E256'6784A*	*4526I256'6:864*	*6*
J K ,L	*E6*	*Ā'N*	*/123*		*7M54*		*4526E256'6784A*	*4526I256'6:864*	*6*
FÄ H,#>'S>#)	*9M6*	*Ā'N'0*	*/123*		*EMA4*	*Q7<I7<4*	*4526E256'6784A*	*4526I256'6:864*	*6*
ĀÄ!@")Ä>" ,#>'">#)	*5M9*	*Ā'N'0*	*/123*		*64ME:*	*7AA<Q9<I*	*4526E256'6784A*	*4526I256'6:864*	*6*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
5;A;Q<@G@,-,.?Ä ,%	*:A*		*A6 <654*	*4526E256'6784A*	*4526I256'6:864*	*6*
5<T%/,@,G#.?Ä &%	*: 7*		*AI <654*	*4526E256'6784A*	*4526I256'6:864*	*6*
5<T%/,@,.?Ä ,%	*E4*		*97 <654*	*4526E256'6784A*	*4526I256'6:864*	*6*
0#!@,GÄ HÄ Ä<)7	*:4*		*AQ<654*	*4526E256'6784A*	*4526I256'6:864*	*6*
U?Ä ,%<)7	*AE*		*55 <654*	*4526E256'6784A*	*4526I256'6:864*	*6*
.<ĀÄ@.?Ä &%<)6A	*E5*		*Q4<6AI*	*4526E256'6784A*	*4526I256'6:864*	*6*

Method: 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
%G%](###	1#		'8'*'	' 8"LF	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)

Client Sample Results

Client Sample ID: MW-14S **Lab Sample ID: 480-181150-1**
Date Collected: 02/11/21 09:38 **Matrix: Water**
Date Received: 02/11/21 15:30

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
%G%](##9	1#		'8'*'	' 8')F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
%G%](##H	1#		'8'*'	' 8'))	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
X,Y4-/	1#		'8'*'	' 8"&)	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
7,PC7(QU+	1 #		'8'*'	' 8"??	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
<-D(+C,Ä4Y7/.	1#		'8'*'	' 8')*	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
.07(QU+	1 #		'8'*'	' 8'F*	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
Y.,07(QU+	1 #		'8'*'	' 8')'	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
#-.,Y4-/	1#		'8'*'	' 8"L&	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
9/YÄDI,M7/!"	1 #		'8'*'	' 8'))	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
9/YÄDI,M7/!""	1#		'8'*'	' 8')F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
9/YÄDI,M7/!DI,M70.	1 #		'8'*'	' 8')Z	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
9/Y4-/	1#		'8'*'	' 8')%	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
Endrin aldehyde	**0.027**	**J**	'8'*'	' 8')Z	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
9/Y4-/!5.0Ä/.	1#		'8'*'	' 8')F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
J7OO7(QU+!RK-/Y7/.T	1#		'8'*'	' 8"&'	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
047/D(+C,Ä4Y7/.	1#		'8'*'	' 8'))	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
U.P07<C,Ä4	1#		'8'*'	' 8"&*	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
U.P07<C,Ä4!.PÄV-Y.	1#		'8'*'	' 8"?%	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
A.0CÄVW<C,Ä4	1#		'8'*'	' 8')%	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)
HÄV7PC./.	1#		'8*'	'8)F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$>>	)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
=+F'=Ä>">?%,@,G#.?Ä &%	*AE*		*54 <654*	*4526E256'4I89A*	*4526E256'6Q899*	*6*
=+F'=Ä>">?%,@,G#.?Ä &%	*A6*		*54 <654*	*4526E256'4I89A*	*4526E256'6Q899*	*6*
ĀÄ!@">?%,@,<-<R&%Ä Ä	*I6*		*AA<654*	*4526E256'4I89A*	*4526E256'6Q899*	*6*
ĀÄ!@">?%,@,<-<R&%Ä Ä	*A:*		*AA<654*	*4526E256'4I89A*	*4526E256'6Q899*	*6*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
:+Q()')Z	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$>'	)
:+Q()FF)	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$>'	)
:+Q()F>F	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$>'	)
:+Q()F%F	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$>'	)
:+Q()F%&	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$>'	)
:+Q()F*%	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$>'	)
:+Q()FZ'	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$>'	)
:+Q()FZF	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$>'	)
:+Q()FZ&	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$>'	)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
ĀÄ!@">?%,@,<-<R&%Ä Ä	*QQ*		*9: <656*	*4526Q256'4:86E*	*4526I256'44894*	*6*
ĀÄ!@">?%,@,<-<R&%Ä Ä	*QI*		*9: <656*	*4526Q256'4:86E*	*4526I256'44894*	*6*
=+F'=Ä>">?%,@,G#.?Ä &%	*7:*		*6: <654*	*4526Q256'4:86E*	*4526I256'44894*	*6*
=+F'=Ä>">?%,@,G#.?Ä &%	*Q6*		*6: <654*	*4526Q256'4:86E*	*4526I256'44894*	*6*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
X,IO-/IO	1 #		' 8F'	' 8'Z'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
X/0-OÄ/W	1#		'8'F'	' 8"Z&	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
X4D./-<	1#		'8')*	' 8"*Z	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)

Client Sample ID: MW-14S
Date Collected: 02/11/21 09:38
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-1
Matrix: Water

Method: 6010C - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	**0.12**		'8"F'	'8""?'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
Q.4W,,-IO	1#		'8"F'	'8""='	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
+7YO-IO	1#		'8"F'	'8""*'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
Calcium	**140**		'8*'	'8)'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
+C4ÀO-IO	1#		'8"%'	'8")'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
+Ä 7,0	1#		'8"%'	'8""Z>	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
+ÄPP.4	1#		'8')'	' 8")Z	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
Iron	**1.8**		'8'*'	' 8')L	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
K.7Y	1#		'8')'	' 8"=>'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
Magnesium	**45.0**		'8F'	'8'%=>	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
Manganese	**0.26**		'8"=>'	'8""%'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
1-<5.,	1#		'8')'	' 8")=>	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
Potassium	**37.0**	**B**	'8*'	'8)'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
6.,./-IO	1#		'8'F*	' 8"&?	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
6-,_.4	1#		'8"Z'	'8")?	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
Sodium	**576**		)8'	' 8>F	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
HC7,,-IO	1#		'8'F'	' 8')'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
[7/7Y-IO	1#		'8"*'	'8")*	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)
Zinc	**0.0029**	**J**	'8')'	' 8")*	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F)	)

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
A.4<I4W	1#		'8""F'	'8"")F	OJ=K		'F=)*=F)!)F$*>	' F=)*=F)!)Z$FF	)

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	UJ 0.010	B J	'8')'	' 8"'*'	OJ=K		'F=)?=F)!)Z$*Z	' F=)&=F)!)L$%&	)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
+W7/-Y.G!B.7<0-_.	1#		)'8'	)'8'	OJ=K		'F=)*=F)!'L$)F	' F=)Z=F)!)Z$F&	)

Client Sample ID: MW-130B
Date Collected: 02/11/21 09:53
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
)G)G)(I4<C,Ä4Ä.0C7/.	1#		)'"	&F'	I J=K			' F=)*=F)!)Z$'%	)'"
)G)GFGF(0I47<C,Ä4Ä.0C7/.	1#		)'"	F)'	I J=K			' F=)*=F)!)Z$'%	)'"
)G)GF(#I<C,Ä4Ä()GFGF(04-M,IÄ4Ä.0C7/.	1#		)'"	>)'	I J=K			' F=)*=F)!)Z$'%	)'"
)G)GF(#I<C,Ä4Ä.0C7/.	1#		)'"	F>'	I J=K			' F=)*=F)!)Z$'%	)'"
)G)(#-<C,Ä4Ä.0C7/.	1#		)'"	>&'	I J=K			' F=)*=F)!)Z$'%	)'"
)G)(#-<C,Ä4Ä.0C./.	1#		)'"	FL'	I J=K			' F=)*=F)!)Z$'%	)'"
)GFG%4I<C,Ä4Ä ./N./.	1#		)'"	%)'	I J=K			' F=)*=F)!)Z$'%	)'"
)GF(#- 4ÀOÄ(>(+C,Ä4ÄP4ÄP7/.	1#		)'"	>L'	I J=K			' F=)*=F)!)Z$'%	)'"
)GF(#- 4ÀOÄ.0C7/.	1#		)'"	?>'	I J=K			' F=)*=F)!)Z$'%	)'"
)GF(#-<C,Ä4Ä ./N./.	1#		)'"	?L'	I J=K			' F=)*=F)!)Z$'%	)'"
)GF(#-<C,Ä4Ä.0C7/.	1#		)'"	F)'	I J=K			' F=)*=F)!)Z$'%	)'"
)GF(#-<C,Ä4ÄP4ÄP7/.	1#		)'"	?F'	I J=K			' F=)*=F)!)Z$'%	)'"
)G>(#-<C,Ä4Ä ./N./.	1#		)'"	?&'	I J=K			' F=)*=F)!)Z$'%	)'"
)G%(#-<C,Ä4Ä ./N./.	1#		)'"	&%'	I J=K			' F=)*=F)!)Z$'%	)'"

Client Sample ID: MW-130B

Date Collected: 02/11/21 09:53
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-2

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
F(QI07/À/.!RA9ST	1#		)""	)>"	IJ=K			'F=)*=F)!)Z$'%	) '"
F(U.V7/À/.	1#		*""	)F"	IJ=K			'F=)*=F)!)Z$'%	) '"
%(A.0CW,(F(P./07/À/.!RA"QST	1#		*""	F)"	IJ=K			'F=)*=F)!)Z$'%	) '"
X<.0À/.	1#		)""	>""	IJ=K			'F=)*=F)!)Z$'%	) '"
Q./N./.	1#		)""	%)'	I J=K			' F=)*=F)!)Z$'%	)""
Q4ÀOÀY-<C,Ä4ÀO.0C7/.	1#		)""	>L'	I J=K			' F=)*=F)!)Z$'%	)""
Q4ÀOÀMÀ4O	1#		)""	FZ'	I J=K			' F=)*=F)!)Z$'%	)""
Q4ÀOÀO.0C7/.	1#		)""	ZL'	I J=K			' F=)*=F)!)Z$'%	)""
+74 À/!Y-DI,M-Y.	1#		)""	)L'	I J=K			' F=)*=F)!)Z$'%	)""
+74 À/!0.047<C,Ä4-Y.	1#		)""	F?'	I J=K			' F=)*=F)!)Z$'%	)""
+C,Ä4À ./N./.	1#		)""	?*'	I J=K			' F=)*=F)!)Z$'%	)""
+C,Ä4À.0C7/.	1#		)""	>F'	I J=K			' F=)*=F)!)Z$'%	)""
+C,Ä4ÀMÀ4O	1#		)""	>%'	I J=K			' F=)*=F)!)Z$'%	)""
+C,Ä4ÀO.0C7/.	1#		)""	>*'	I J=K			' F=)*=F)!)Z$'%	)""
cis-1,2-Dichloroethene	**6500**		)""	&)'	I J=K			' F=)*=F)!)Z$'%	)""
<-D()G>(#-<C,Ä4ÀP4ÀP./.	1#		)""	>Z'	I J=K			' F=)*=F)!)Z$'%	)""
+W<,ÀC.V7/.	1#		)""	)&'	I J=K			' F=)*=F)!)Z$'%	)""
#- 4ÀOÀ<C,Ä4ÀO.0C7/.	1#		)""	>F'	I J=K			' F=)*=F)!)Z$'%	)""
#-<C,Ä4ÀY-M,IÀ4ÀO.0C7/.	1#		)""	Z&'	I J=K			' F=)*=F)!)Z$'%	)""
90CW, ./N./.	1#		)""	?%'	I J=K			' F=)*=F)!)Z$'%	)""
"DÀP4ÀPW, ./N./.	1#		)""	?L'	I J=K			' F=)*=F)!)Z$'%	)""
A.0CW,!7<.070.	1#		F*"	)>"	IJ=K			'F=)*=F)!)Z$'%	) '"
A.0CW,!0.40(I0W,!.0C.4	1#		)""	)Z'	I J=K			' F=)*=F)!)Z$'%	)""
A.0CW,<W<,ÀC.V7/.	1#		)""	)Z'	I J=K			' F=)*=F)!)Z$'%	)""
A.0CW,./.!+C,Ä4-Y.	1#		)""	%%'	I J=K			' F=)*=F)!)Z$'%	)""
60W4./.	1#		)""	?>'	I J=K			' F=)*=F)!)Z$'%	)""
Tetrachloroethene	**56000**		)""	>Z'	I J=K			' F=)*=F)!)Z$'%	)""
HÄ,I./.	1#		)""	*)'	I J=K			' F=)*=F)!)Z$'%	)""
047/D()GF(#-<C,Ä4À.0C./.	1#		)""	L"	I J=K			' F=)*=F)!)Z$'%	)""
047/D()G>(#-<C,Ä4ÀP4ÀP./.	1#		)""	>?'	I J=K			' F=)*=F)!)Z$'%	)""
Trichloroethene	**9400**		)""	%Z'	I J=K			' F=)*=F)!)Z$'%	)""
H4-<C,Ä4ÀM,IÀ4ÀO.0C7/.	1#		)""	&&'	I J=K			' F=)*=F)!)Z$'%	)""
[-/W,!<C,Ä4-Y.	1#		)""	L"	I J=K			' F=)*=F)!)Z$'%	)""
\W,./.DG!HÄ07,	1#		F""	ZZ'	I J=K			' F=)*=F)!)Z$'%	)""

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
ĀÀ !"!#$À%&'()À !##À)'+,-./)*	*0, Ā*		*/123*					*45267256'6Q84A*	*6444*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
6;5<=#>?%,@,À!?" Ā<)A'BC/@@D	*64Q*		*EE<654*		*45267256'6Q84A*	*6444*
A<F@,-,%/,@,GÀ HÀ Ā'BC/@@D*	*644*		*E9<654*		*45267256'6Q84A*	*6444*
=#G@,-,%/,@,-À!?" Ā'BC/@@D*	*64Q*		*E7<659*		*45267256'6Q84A*	*6444*
Ā%/Ā Ā<)I'BC/@@D	*:I*		*I4 <654*		*45267256'6Q84A*	*6444*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
FG%G%(HC,Ä4ÀPC./Ä,	1#		*8'	' 8%&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
FG%GZ(HC,Ä4ÀPC./Ä,	1#		*8'	' 8Z)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
FG%(#-<C,Ä4ÀPC./Ä,	1#		*8'	' 8*)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
FG%(#-O.0CW,PC./Ä,	1#		*8'	' 8*'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)

Client Sample ID: MW-130B

Date Collected: 02/11/21 09:53
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-2

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
FG%(#-/-04ÀPC./À,	1#		)'	F8F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
FG%(#-/-04À0À,I./.	1#		*8'	' 8%*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
FGZ(#-/-04À0À,I./.	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
F(+C,Ä4À/7PC0C7,./.	1#		*8'	' 8%Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
F(+C,Ä4ÀPC./À,	1#		*8'	' 8*>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
F(A.0CW,/7PC0C7,./.	1#		*8'	' 8Z'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
F(A.0CW,PC./À,	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
F(1-04À7/-,-/.	1#		)'	'8%F	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
F(1-04ÀPC./À,	1#		*8'	' 8%&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
>G>](#-<C,Ä4À ./N-Y-/.	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
>(1-04À7/-,-/.	1#		)'	'8%&	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
%GZ(#-/-04À(F(O.0CW,PC./À,	1#		)'	F8F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
%(Q4ÀOÀPC./W,!PC./W,!.0C.4	1#		*8'	' 8%*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
%(+C,Ä4À(>(O.0CW,PC./À,	1#		*8'	' 8%*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
%(+C,Ä4À7/-,-/.	1#		*8'	' 8*L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
%(+C,Ä4ÀPC./W,!PC./W,!.0C.4	1#		*8'	' 8>*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
%(A.0CW,PC./À,	1#		)'	'8>Z	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
%(1-04À7/-,-/.	1#		)'	'8F*	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
%(1-04ÀPC./À,	1#		)'	)8*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
X<./7PC0C./.	1#		*8'	' 8%)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
X<./7PC0CW,./.	1#		*8'	' 8>&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
X<.0ÀPC./À/.	1#		*8'	' 8*%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
X/0C47<./.	1#		*8'	' 8F&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
X047N-/.	1#		*8'	' 8%Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Q./N7,Y.CWY.	1#		*8'	' 8F?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Q./NÀR7T7/0C47<./.	1#		*8'	' 8>Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Q./NÀR7TPW4./.	1#		*8'	' 8%?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Q./NÀR TM,IÀ47/0C./.	1#		*8'	' 8>%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Q./NÀRJGCG-TP.4W,./.	1#		*8'	' 8>*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Q./NÀR5TM,IÀ47/0C./.	1#		*8'	' 8?>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Q-PC./W,	1#		*8'	' 8Z*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
-D!RF(<C,Ä4À-DÀP4ÀPW,T!.0C.4	1#		*8'	' 8*F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Q-DRF(<C,Ä4À.0CÀVWTO.0C7/.	1#		*8'	' 8>*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Q-DRF(<C,Ä4À.0CW,T.0C.4	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Q-DRF(.0CW,C.VW,T!PC0C7,70.	1#		*8'	F8F	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Butyl benzyl phthalate	**4.7**	**J**	*8'	) 8'	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
+7P4À,7<07O	1#		*8'	F8F	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
+74 7NÀ,.	1#		*8'	' 8>'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
+C4WD./.	1#		*8'	' 8>>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
#- ./NR7GCT7/0C47<./.	1#		*8'	' 8%F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
#- ./NÀMI47/	1#		)'	'8*)	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Diethyl phthalate	**0.80**	**J**	*8'	' 8FF	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
#-O.0CW,!PC0C7,70.	1#		*8'	' 8>Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Di-n-butyl phthalate	**3.2**	**J**	*8'	' 8>)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
#-(/(Ä<0W,!PC0C7,70.	1#		*8'	' 8%?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Fluoranthene	**0.45**	**J**	*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
^,IÀ4./.	1#		*8'	' 8>Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
U.V7<C,Ä4À ./N./.	1#		*8'	' 8*)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
U.V7<C,Ä4À I07Y-./.	1#		*8'	' 8Z&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)

Client Sample ID: MW-130B

Date Collected: 02/11/21 09:53
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-2

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
U.V7<C,Ä4Ä<W<,ÄP./07Y-./.	1#		*8'	' 8*L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
U.V7<C,Ä4Ä.0C7/.	1#		*8'	' 8*L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
"/Y./ÄR)GFG>(<YTPW4./.	1#		*8'	' 8%?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
"DÄPCÄ4Ä/.	1#		*8'	' 8%>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Naphthalene	**3.4**	**J**	*8'	' 8?Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
1-04Ä ./N./.	1#		*8'	' 8FL	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
1(1-04ÄDÄY-(/(P4ÄPW,7O-/.	1#		*8'	' 8*%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
1(1-04ÄDÄY-PC./W,7O-/.	1#		*8'	' 8*)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
:./07<C,Ä4ÄPC./Ä,	1#		)'	F8F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
Phenanthrene	**0.73**	**J**	*8'	' 8%%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
:C./Ä,	1#		*8'	' 8>L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)
:W4./.	1#		*8'	' 8>%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!)L$>&	)

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
J K ,L	*IME*	*Ā'N*	*/123*		*5M76*		*4526E256'6784A*	*4526I256'6:89I*	*6*
O!?Ä Ä;'6;5<)#>?%,@,<;'BPD<	*:I*	*Ā'N'0*	*/123*		*5MQA*	*67Q<7:<5*	*4526E256'6784A*	*4526I256'6:89I*	*6*
+&>%,?ÄR" Ä	R *64*	*Ā'N'0*	*/123*		*9M6A*	*664<I5<E*	*4526E256'6784A*	*4526I256'6:89I*	*6*
J K ,L	*:5*	*Ā'N*	*/123*		*9M9:*		*4526E256'6784A*	*4526I256'6:89I*	*6*
Ā@>?%,@,Ä!?&%Ä Ä	R *65*	*Ā'N'0*	*/123*		*9ME6*	*E:<46<Q*	*4526E256'6784A*	*4526I256'6:89I*	*6*
Ā%/Ä Ä	*:M5*	*Ā'N'0*	*/123*		*AMA:*	*64I<II<9*	*4526E256'6784A*	*4526I256'6:89I*	*6*
ĀÄ!@">?%,@,Ä!?&%Ä Ä	*6744*	*Ā'N'0*	*/123*		*AM:5*	*65E<6I<A*	*4526E256'6784A*	*4526I256'6:89I*	*6*
J K ,L	*76*	*Ā'N*	*/123*		*7M54*		*4526E256'6784A*	*4526I256'6:89I*	*6*
.<V&%Ä Ä	R *:M:*	*Ā'N'0*	*/123*		*7ME6*	*64Q<A5<9*	*4526E256'6784A*	*4526I256'6:89I*	*6*
FÄ HÄ Ä;'B6<-Ä!?&%Ä!?&%D<	*6A*	*Ā'N'0*	*/123*		*7M:7*	*:I<I5<I*	*4526E256'6784A*	*4526I256'6:89I*	*6*
FÄ HÄ Ä;'.@,.&%<	*6I*	*Ā'N'0*	*/123*		*QM6I*	*649<Q7<6*	*4526E256'6784A*	*4526I256'6:89I*	*6*
FÄ HÄ Ä;'6<Ä!?&%<5<-Ä!?&%<	*9A*	*Ā'N'0*	*/123*		*QM59*	*Q6<6A<9*	*4526E256'6784A*	*4526I256'6:89I*	*6*
FÄ HÄ Ä;'6;9;7<!@#-Ä!?&%<	*54*	*Ā'N'0*	*/123*		*QM5:*	*64I<QE<I*	*4526E256'6784A*	*4526I256'6:89I*	*6*
FÄ HÄ Ä;'6;5;A<!@#-Ä!?&%<	*644*	*Ā'N'0*	*/123*		*QMAE*	*:7<Q9<Q*	*4526E256'6784A*	*4526I256'6:89I*	*6*
( )" Ä	*5I*	*Ā'N'0*	*/123*		*QMEI*	*A:Q<6<E*	*4526E256'6784A*	*4526I256'6:89I*	*6*
FÄ HÄ Ä;'6;5<)#Ä!?&%<	*IMQ*	*Ā'N'0*	*/123*		*QMIE*	*697<46<9*	*4526E256'6784A*	*4526I256'6:89I*	*6*
FÄ HÄ Ä;'5<Ä!?&%<6;A<)#-Ä!?&%<	*7MQ*	*Ā'N'0*	*/123*		*EM44*	*6E7I<II<:*	*4526E256'6784A*	*4526I256'6:89I*	*6*
FÄ HÄ Ä;'A<Ä!?&%<6;5<)#-Ä!?&%<	*64*	*Ā'N'0*	*/123*		*EM4Q*	*:9A<I4<7*	*4526E256'6784A*	*4526I256'6:89I*	*6*
J K ,L	*EM7*	*Ā'N*	*/123*		*EMAI*		*4526E256'6784A*	*4526I256'6:89I*	*6*
J K ,L	*EME*	*Ā'N*	*/123*		*: M:I*		*4526E256'6784A*	*4526I256'6:89I*	*6*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
5;A;Q<@G@,-,.?Ä ,%	*:4*		*A6 <654*	*4526E256'6784A*	*4526I256'6:89I*	*6*
5<T%/,@,G#.?Ä &%	*: 9*		*AI <654*	*4526E256'6784A*	*4526I256'6:89I*	*6*
5<T%/,@,.?Ä ,%	*QQ*		*97 <654*	*4526E256'6784A*	*4526I256'6:89I*	*6*
0#!@,GÄ HÄ Ä<)7	*II*		*AQ<654*	*4526E256'6784A*	*4526I256'6:89I*	*6*
U?Ä ,%<)7	*AE*		*55 <654*	*4526E256'6784A*	*4526I256'6:89I*	*6*
.<ĀÄ@.?Ä &%<)6A	*Q7*		*Q4<6AI*	*4526E256'6784A*	*4526I256'6:89I*	*6*

Method: 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
%G%](###	1#		'8'*'	' 8"LF	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
%G%](##9	1#		'8'*'	' 8')F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
%G%](##H	1#		'8'*'	' 8'))	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
X,Y4-/	1#		'8'*'	' 8"&)	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
7,PC7(QU+	1#		'8'*'	' 8"??	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)

9I4ÄM-/D!ID0XO.4-<7G!QM7,Ä

Client Sample Results

Client Sample ID: MW-130B
Date Collected: 02/11/21 09:53
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-2
Matrix: Water

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<-D(+C,Ä4Y7/.	1#		'8'*'	' 8')*	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
.07(QU+	1#		'8'*'	' 8'F*	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
Y.,07(QU+	1#		'8'*'	' 8')'	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
#-.,Y4-/	1#		'8'*'	' 8"L&	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
9/YÄDI,M7/!"	1#		'8'*'	' 8'))	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
9/YÄDI,M7/!""	1#		'8'*'	' 8')F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
9/YÄDI,M7/!DI,M70.	1#		'8'*'	' 8')Z	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
9/Y4-/	1#		'8'*'	' 8')%	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
Endrin aldehyde	**0.41**		'8'*'	' 8')Z	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
9/Y4-/!5.0Ä/.	1#		'8'*'	' 8')F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
J7OO7(QU+!RK-/Y7/.T	1#		'8'*'	' 8"&'	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
047/D(+C,Ä4Y7/.	1#		'8'*'	' 8'))	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
U.P07<C,Ä4	1#		'8'*'	' 8"&*	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
U.P07<C,Ä4!.PÄV-Y.	1#		'8'*'	' 8"?%	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
A.0CÄVW<C,Ä4	1#		'8'*'	' 8')%	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)
HÄV7PC./.	1#		'8*'	'8)F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)Z$*>	)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
=+F'=Ä>">?%,@,G#.?Ä &%	*7E*		*54 <654*	*4526E256'4I89A*	*4526E256'6Q879*	*6*
=+F'=Ä>">?%,@,G#.?Ä &%	*75*		*54 <654*	*4526E256'4I89A*	*4526E256'6Q879*	*6*
ĀÄ!@">?%,@,<-<R&%Ä Ä	*I6*		*AA<654*	*4526E256'4I89A*	*4526E256'6Q879*	*6*
ĀÄ!@">?%,@,<-<R&%Ä Ä	*A:*		*AA<654*	*4526E256'4I89A*	*4526E256'6Q879*	*6*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
:+Q()')Z	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$%Z	)
:+Q()FF)	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$%Z	)
:+Q()F>F	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$%Z	)
:+Q()F%F	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$%Z	)
:+Q()F%&	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$%Z	)
:+Q()F*%	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$%Z	)
:+Q()FZ'	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$%Z	)
:+Q()FZF	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$%Z	)
:+Q()FZ&	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!"$%Z	)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
ĀÄ!@">?%,@,<-<R&%Ä Ä	*Q:*		*9: <656*	*4526Q256'4:86E*	*4526I256'448AQ*	*6*
ĀÄ!@">?%,@,<-<R&%Ä Ä	*E5*		*9: <656*	*4526Q256'4:86E*	*4526I256'448AQ*	*6*
=+F'=Ä>">?%,@,G#.?Ä &%	*Q5*		*6: <654*	*4526Q256'4:86E*	*4526I256'448AQ*	*6*
=+F'=Ä>">?%,@,G#.?Ä &%	*QA*		*6: <654*	*4526Q256'4:86E*	*4526I256'448AQ*	*6*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
X,IO-/IO	1#		' 8F'	' 8'Z'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
X/0-OÄ/W	1#		'8'F'	' 8"Z&	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
X4D./-<	1#		'8')*	' 8"*Z	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
Barium	**0.13**		'8"F'	'8""?'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
Q.4W,,-IO	1#		'8"F'	'8"">'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
+7YO-IO	1#		'8"F'	'8""*'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
Calcium	**125**		'8*'	'8)'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)

Client Sample ID: MW-130B

Date Collected: 02/11/21 09:53
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-2

Matrix: Water

Method: 6010C - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
+C4ÀO-IO	1#		'8"%'	'8")'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
+Ä 7,0	1#		'8"%'	'8"'Z>	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
+ÄPP.4	1#		'8')'	' 8")Z	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
Iron	**1.7**		'8'*'	' 8')L	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
K.7Y	1#		'8')'	' 8">'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
Magnesium	**38.8**		'8F'	'8'%>	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
Manganese	**1.1**		'8">'	'8"'%'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
Nickel	**0.0016**	**J**	'8')'	' 8")>	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
Potassium	**96.0**	**B**	'8*'	'8)'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
6.,./-IO	1#		'8'F*	' 8"&?	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
6-,_.4	1#		'8"Z'	'8")?	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
Sodium	**281**		)8'	' 8>F	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
HC7,,-IO	1#		'8'F'	' 8')'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
[7/7Y-IO	1#		'8"*'	'8")*	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)
`-/<	1#		'8')'	' 8")*	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$F*	)

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
A.4<I4W	1#		'8"'F'	'8"')F	OJ=K		'F=)*=F)!)F$*>	' F=)*=F)!)Z$F%	)

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	U **0.0072**	~~J B~~	'8')'	' 8"'*'	OJ=K		'F=)?=F)!)Z$*Z	' F=)&=F)!)L$*)	)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
+W7/-Y.G!B.7<0-_.	1#		)'8'	)'8'	OJ=K		'F=)*=F)!'L$)F	' F=)Z=F)!)Z$>F	)

Client Sample ID: MW-13S

Date Collected: 02/11/21 11:00
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-3

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
)G)G)(~~I4~~<C,Ä4Ä.0C7/.	1#		%"	>>'	IJ=K			'F=)*=F)!)Z$F&	%"
)G)GFGF(~~0H~~7<C,Ä4Ä.0C7/.	1#		%"	&%	I J=K			' F=)*=F)!)Z$F&	%"
)G)GF(~~H~~<C,Ä4Ä()GFGF(04-M,IÄ4Ä.0C7/.	1#		%"	) F'	IJ=K			'F=)*=F)!)Z$F&	%"
)G)GF(~~H~~<C,Ä4Ä.0C7/.	1#		%"	LF	I J=K			' F=)*=F)!)Z$F&	%"
)G)(#-<C,Ä4Ä.0C7/.	1#		%"	) *'	IJ=K			'F=)*=F)!)Z$F&	%"
)G)(#-<C,Ä4Ä.0C./.	1#		%"	) F'	IJ=K			'F=)*=F)!)Z$F&	%"
)GFG%(~~H~~C,Ä4Ä ./N./.	1#		%"	) Z'	IJ=K			'F=)*=F)!)Z$F&	%"
)GF(#- 4ÀOÄ(>(+C,Ä4ÀP4ÀP7/.	1#		%"	) Z'	IJ=K			'F=)*=F)!)Z$F&	%"
)GF(#- 4ÀOÄ.0C7/.	1#		%"	FL'	IJ=K			'F=)*=F)!)Z$F&	%"
)GF(#-<C,Ä4Ä ./N./.	1#		%"	>F'	IJ=K			'F=)*=F)!)Z$F&	%"
)GF(#-<C,Ä4Ä.0C7/.	1#		%"	&%	I J=K			' F=)*=F)!)Z$F&	%"
)GF(#-<C,Ä4ÀP4ÀP7/.	1#		%"	FL'	IJ=K			'F=)*=F)!)Z$F&	%"
)G>(#-<C,Ä4Ä ./N./.	1#		%"	>)'	IJ=K			'F=)*=F)!)Z$F&	%"
)G%(#-<C,Ä4Ä ./N./.	1#		%"	>%'	IJ=K			'F=)*=F)!)Z$F&	%"
F(QI07/Ä/.!RA9ST	1#		%"'	*>'	I J=K			' F=)*=F)!)Z$F&	%"
F(U.V7/Ä/.	1#		F"'	*"	I J=K			' F=)*=F)!)Z$F&	%"
%(A.0CW,(F(P./07/Ä/.!RA"QST	1#		F"'	&%'	I J=K			' F=)*=F)!)Z$F&	%"
X<.0Ä/.	1#		%"'	)F"	IJ=K			'F=)*=F)!)Z$F&	%"

Client Sample ID: MW-13S — Lab Sample ID: 480-181150-3

Date Collected: 02/11/21 11:00 — **Matrix: Water**

Date Received: 02/11/21 15:30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Q./N./.	1#		%"	) Z'	IJ=K			'F=)*=F)!)Z$F&	%"
Q4ÄOÄY-<C,Ä4ÄO.0C7/.	1#		%"	) Z'	IJ=K			'F=)*=F)!)Z$F&	%"
Q4ÄOÄMÄ4O	1#		%"	) "	IJ=K			'F=)*=F)!)Z$F&	%"
Q4ÄOÄO.0C7/.	1#		%"	F&'	IJ=K			'F=)*=F)!)Z$F&	%"
+74 Ä/!Y-DI,M-Y.	1#		%"	?Z	I J=K			' F=)*=F)!)Z$F&	%"
+74 Ä/!0.047<C,Ä4-Y.	1#		%"	))'	IJ=K			'F=)*=F)!)Z$F&	%"
+C,Ä4Ä ./N./.	1#		%"	>"	IJ=K			'F=)*=F)!)Z$F&	%"
+C,Ä4Ä.0C7/.	1#		%"	) >'	IJ=K			'F=)*=F)!)Z$F&	%"
+C,Ä4ÄMÄ4O	1 #		%"	) %'	IJ=K			'F=)*=F)!)Z$F&	%"
+C,Ä4ÄO.0C7/.	1#		%"	) %'	IJ=K			'F=)*=F)!)Z$F&	%"
cis-1,2-Dichloroethene	**520**		%"	>F'	IJ=K			'F=)*=F)!)Z$F&	%"
<-D()G>(#-<C,Ä4ÄP4ÄP./.	1 #		%"	) %'	IJ=K			'F=)*=F)!)Z$F&	%"
+W<,ÄC.V7/.	1#		%"	?F	I J=K			' F=)*=F)!)Z$F&	%"
#- 4ÄOÄ<C,Ä4ÄO.0C7/.	1#		%"	) >'	IJ=K			'F=)*=F)!)Z$F&	%"
#-<C,Ä4ÄY-M,IÄ4ÄO.0C7/.	1#		%"	F?'	IJ=K			'F=)*=F)!)Z$F&	%"
90CW, ./N./.	1#		%"	>"	IJ=K			'F=)*=F)!)Z$F&	%"
"DÄP4ÄPW, ./N./.	1#		%"	>F'	IJ=K			'F=)*=F)!)Z$F&	%"
A.0CW,!7<.070.	1#		)'"	*F'	I J=K			' F=)*=F)!)Z$F&	%"
A.0CW,!0.40(I0W,!.0C.4	1#		%"	Z%	I J=K			' F=)*=F)!)Z$F&	%"
A.0CW,<W<,ÄC.V7/.	1#		%"	Z%	I J=K			' F=)*=F)!)Z$F&	%"
A.0CW,./.!+C,Ä4-Y.	1#		%"	) &'	IJ=K			'F=)*=F)!)Z$F&	%"
60W4./.	1#		%"	FL'	IJ=K			'F=)*=F)!)Z$F&	%"
Tetrachloroethene	**16000**		%"	) %'	IJ=K			'F=)*=F)!)Z$F&	%"
HÄ,I./.	1#		%"	F"	IJ=K			'F=)*=F)!)Z$F&	%"
047/D()GF(#-<C,Ä4Ä.0C./.	1#		%"	>Z'	IJ=K			'F=)*=F)!)Z$F&	%"
047/D()G>(#-<C,Ä4ÄP4ÄP./.	1#		%"	) *'	IJ=K			'F=)*=F)!)Z$F&	%"
Trichloroethene	**900**		%"	) &'	IJ=K			'F=)*=F)!)Z$F&	%"
H4-<C,Ä4ÄM,IÄ4ÄO.0C7/.	1#		%"	>*'	IJ=K			'F=)*=F)!)Z$F&	%"
[-/W,!<C,Ä4-Y.	1#		%"	>Z'	IJ=K			'F=)*=F)!)Z$F&	%"
\W,./.DG!HÄ07,	1#		&"	FZ'	IJ=K			'F=)*=F)!)Z$F&	%"

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
ĀÄ !"!#$Ä%&'()Ä !##Ä)'+,-./)*	*0, Ä*		*/123*					*45267256'6Q85I*	*A44*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
6;5<=#>?%,@,Ä!?" Ä<)A'BC/@@D	*64A*		*EE<654*		*45267256'6Q85I*	*A44*
A<F@,-,%/,@,GÄ HÄ Ä'BC/@@D*	*646*		*E9<654*		*45267256'6Q85I*	*A44*
=#G@,-,%/,@,-Ä!?" Ä'BC/@@D*	*646*		*E7<659*		*45267256'6Q85I*	*A44*
Ā%/Ä Ä<)I'BC/@@D	*:E*		*I4 <654*		*45267256'6Q85I*	*A44*

Client Sample ID: MW-150B — Lab Sample ID: 480-181150-4

Date Collected: 02/11/21 11:04 — **Matrix: Water**

Date Received: 02/11/21 15:30

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
)G)G)(H4-<C,Ä4Ä.0C7/.	1#		F'	)Z	IJ=K			'F=)*=F)!)Z$*F	F'
)G)GFGF-(0H47<C,Ä4Ä.0C7/.	1#		F'	%8F	I J=K			' F=)*=F)!)Z$*F	F'
)G)GF(#H<C,Ä4Ä()GFGF(04-M,IÄ4Ä.0C7/.	1#		F'	Z8F	I J=K			' F=)*=F)!)Z$*F	F'
)G)GF(#H<C,Ä4Ä.0C7/.	1#		F'	%8Z	I J=K			' F=)*=F)!)Z$*F	F'

9I4ÄM-/D#ID0XO.4-<7G!QM7,Ä

Client Sample ID: MW-150B

Date Collected: 02/11/21 11:04
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-4

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
)G)(#-<C,Ä4Ä.0C7/.	1#		F'	?8Z	I J=K			' F=)*=F)!)Z$*F	F'
)G)(#-<C,Ä4Ä.0C./.	1#		F'	*8&	I J=K			' F=)*=F)!)Z$*F	F'
)GFG%4HC,Ä4Ä ./N./.	1#		F'	&8F	I J=K			' F=)*=F)!)Z$*F	F'
)GF(#- 4ÀOÄ(>(+C,Ä4ÀP4ÀP7/.	1#		F'	?8&	I J=K			' F=)*=F)!)Z$*F	F'
)GF(#- 4ÀOÄ.0C7/.	1#		F'	)*	IJ=K			'F=)*=F)!)Z$*F	F'
)GF(#-<C,Ä4Ä ./N./.	1#		F'	)Z	IJ=K			'F=)*=F)!)Z$*F	F'
)GF(#-<C,Ä4Ä.0C7/.	1#		F'	%8F	I J=K			' F=)*=F)!)Z$*F	F'
)GF(#-<C,Ä4ÀP4ÀP7/.	1#		F'	)%	IJ=K			'F=)*=F)!)Z$*F	F'
)G>(#-<C,Ä4Ä ./N./.	1#		F'	)Z	IJ=K			'F=)*=F)!)Z$*F	F'
)G%(#-<C,Ä4Ä ./N./.	1#		F'	)?	IJ=K			'F=)*=F)!)Z$*F	F'
F(QI07/À/.!RA9ST	1#		F"	FZ	I J=K			' F=)*=F)!)Z$*F	F'
F(U.V7/À/.	1#		)"	F*	I J=K			' F=)*=F)!)Z$*F	F'
%(A.0CW,(F(P./07/À/.!RA"QST	1#		)"	%F	I J=K			' F=)*=F)!)Z$*F	F'
X<.0À/.	1#		F"	Z'	I J=K			' F=)*=F)!)Z$*F	F'
Q./N./.	1 #		F'	&8F	I J=K			' F=)*=F)!)Z$*F	F'
Q4ÀOÄY-<C,Ä4ÀO.0C7/.	1#		F'	?8&	I J=K			' F=)*=F)!)Z$*F	F'
Q4ÀOÀMÀ4O	1#		F'	*8F	I J=K			' F=)*=F)!)Z$*F	F'
Q4ÀOÀO.0C7/.	1#		F'	)%	IJ=K			'F=)*=F)!)Z$*F	F'
+74 À/!Y-DI,M-Y.	1#		F'	>8&	I J=K			' F=)*=F)!)Z$*F	F'
+74 À/!0.047<C,Ä4-Y.	1#		F'	*8%	I J=K			' F=)*=F)!)Z$*F	F'
+C,Ä4Ä ./N./.	1#		F'	)*	IJ=K			'F=)*=F)!)Z$*F	F'
+C,Ä4Ä.0C7/.	1#		F'	Z8%	I J=K			' F=)*=F)!)Z$*F	F'
+C,Ä4ÀMÀ4O	1 #		F'	Z8&	I J=K			' F=)*=F)!)Z$*F	F'
+C,Ä4ÀO.0C7/.	1#		F'	?8'	I J=K			' F=)*=F)!)Z$*F	F'
<-D()GF(#-<C,Ä4Ä.0C./.	1#		F'	)Z	IJ=K			'F=)*=F)!)Z$*F	F'
<-D()G>(#-<C,Ä4ÀP4ÀP./.	1 #		F'	?8F	I J=K			' F=)*=F)!)Z$*F	F'
+W<,ÀC.V7/.	1#		F'	>8Z	I J=K			' F=)*=F)!)Z$*F	F'
#- 4ÀOÄ<C,Ä4ÀO.0C7/.	1#		F'	Z8%	I J=K			' F=)*=F)!)Z$*F	F'
#-<C,Ä4ÀY-M,IÄ4ÀO.0C7/.	1#		F'	)%	IJ=K			'F=)*=F)!)Z$*F	F'
90CW, ./N./.	1#		F'	)*	IJ=K			'F=)*=F)!)Z$*F	F'
"DÀP4ÀPW, ./N./.	1#		F'	)Z	IJ=K			'F=)*=F)!)Z$*F	F'
A.0CW,!7<.070.	1#		*'	FZ	IJ=K			'F=)*=F)!)Z$*F	F'
A.0CW,!0.40(I0W,!.0C.4	1#		F'	>8F	I J=K			' F=)*=F)!)Z$*F	F'
A.0CW,<W<,ÀC.V7/.	1#		F'	>8F	I J=K			' F=)*=F)!)Z$*F	F'
A.0CW,./.!+C,Ä4-Y.	1#		F'	&8&	I J=K			' F=)*=F)!)Z$*F	F'
60W4./.	1#		F'	)*	IJ=K			'F=)*=F)!)Z$*F	F'
Tetrachloroethene	**1400**		F'	?8F	I J=K			' F=)*=F)!)Z$*F	F'
HÄ,I./.	1#		F'	)'	IJ=K			'F=)*=F)!)Z$*F	F'
047/D()GF(#-<C,Ä4Ä.0C./.	1#		F'	)&	IJ=K			'F=)*=F)!)Z$*F	F'
047/D()G>(#-<C,Ä4ÀP4ÀP./.	1#		F'	?8%	I J=K			' F=)*=F)!)Z$*F	F'
Trichloroethene	**36**		F'	L8F	I J=K			' F=)*=F)!)Z$*F	F'
H4-<C,Ä4ÀM,IÄ4ÀO.0C7/.	1#		F'	)&	IJ=K			'F=)*=F)!)Z$*F	F'
[-/W,!<C,Ä4-Y.	1#		F'	)&	IJ=K			'F=)*=F)!)Z$*F	F'
\W,./.DG!HÄ07,	1#		%'	)>	IJ=K			'F=)*=F)!)Z$*F	F'

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
ĀÄ !"!#$Ä%&'()Ä !##Ä)'+,-./)*	*0, Ä*		*/123*					*45267256'6Q875*	*54*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
6;5<=#>?%,@,Ä!?" Ä<)A'BC/@@D	*647*		*EE<654*		*45267256'6Q875*	*54*

9I4ÀM-/D!ID0XO.4-<7G!QM7,Ä

Client Sample ID: MW-150B — Lab Sample ID: 480-181150-4

Date Collected: 02/11/21 11:04 — **Matrix: Water**

Date Received: 02/11/21 15:30

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
A<F@,-,*%/,@,GÀ HÀ À'BC/@@D	::		E9 <654		45267256'6Q875	54
=#G@,-,*%/,@,-Ä!?" À'BC/@@D	64:		E7 <659		45267256'6Q875	54
Ā%/Ä Ä<)I'BC/@@D	::		I4 <654		45267256'6Q875	54

Client Sample ID: MW-13I — Lab Sample ID: 480-181150-5

Date Collected: 02/11/21 13:00 — **Matrix: Water**

Date Received: 02/11/21 15:30

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
)G)G)(I4<C,Ä4Ä.0C7/.	1#		F"	) Z'	IJ=K			'F=)*=F)!)?$)Z	F"
)G)GFGF(0I47<C,Ä4Ä.0C7/.	1#		F"	%F	I J=K			' F=)*=F)!)?$)Z	F"
)G)GF(#I<C,Ä4Ä()GFGF(04-M,IÄ4Ä.0C7/.	1#		F"	ZF	I J=K			' F=)*=F)!)?$)Z	F"
)G)GF(#I<C,Ä4Ä.0C7/.	1#		F"	%Z	I J=K			' F=)*=F)!)?$)Z	F"
)G)(#-<C,Ä4Ä.0C7/.	1#		F"	?Z	I J=K			' F=)*=F)!)?$)Z	F"
)G)(#-<C,Ä4Ä.0C./.	1#		F"	* &	I J=K			' F=)*=F)!)?$)Z	F"
)GFG%4(HC,Ä4Ä ./N./.	1#		F"	&F	I J=K			' F=)*=F)!)?$)Z	F"
)GF(#- 4ÀOÄ(>(+C,Ä4ÀP4ÀP7/.	1#		F"	?&	I J=K			' F=)*=F)!)?$)Z	F"
)GF(#- 4ÀOÄ.0C7/.	1#		F"	) *'	IJ=K			'F=)*=F)!)?$)Z	F"
)GF(#-<C,Ä4Ä ./N./.	1#		F"	) Z'	IJ=K			'F=)*=F)!)?$)Z	F"
)GF(#-<C,Ä4Ä.0C7/.	1#		F"	%F	I J=K			' F=)*=F)!)?$)Z	F"
)GF(#-<C,Ä4ÀP4ÀP7/.	1#		F"	) %'	IJ=K			'F=)*=F)!)?$)Z	F"
)G>(#-<C,Ä4Ä ./N./.	1#		F"	) Z'	IJ=K			'F=)*=F)!)?$)Z	F"
)G%(#-<C,Ä4Ä ./N./.	1#		F"	) ?'	IJ=K			'F=)*=F)!)?$)Z	F"
F(QI07/Ä/.!RA9ST	1#		F'"	FZ'	I J=K			' F=)*=F)!)?$)Z	F"
F(U.V7/Ä/.	1#		)'"	F*'	I J=K			' F=)*=F)!)?$)Z	F"
%(A.0CW,(F(P./07/Ä/.!RA"QST	1#		)'"	%F'	I J=K			' F=)*=F)!)?$)Z	F"
X<.0Ä/.	1#		F'"	Z"	I J=K			' F=)*=F)!)?$)Z	F"
Q./N./.	1 #		F"	&F	I J=K			' F=)*=F)!)?$)Z	F"
Q4ÀOÄY-<C,Ä4ÀO.0C7/.	1#		F"	?&	I J=K			' F=)*=F)!)?$)Z	F"
Q4ÀOÀMÄ4O	1#		F"	* F	I J=K			' F=)*=F)!)?$)Z	F"
Q4ÀOÄO.0C7/.	1#		F"	) %'	IJ=K			'F=)*=F)!)?$)Z	F"
+74 Ä/!Y-DI,M-Y.	1#		F"	>&	I J=K			' F=)*=F)!)?$)Z	F"
+74 Ä/!0.047<C,Ä4-Y.	1#		F"	* %	I J=K			' F=)*=F)!)?$)Z	F"
+C,Ä4Ä ./N./.	1#		F"	) *'	IJ=K			'F=)*=F)!)?$)Z	F"
+C,Ä4Ä.0C7/.	1#		F"	Z%	I J=K			' F=)*=F)!)?$)Z	F"
+C,Ä4ÀMÄ4O	1 #		F"	Z&	I J=K			' F=)*=F)!)?$)Z	F"
+C,Ä4ÀO.0C7/.	1#		F"	?'	I J=K			' F=)*=F)!)?$)Z	F"
cis-1,2-Dichloroethene	**600**		F"	) Z'	IJ=K			'F=)*=F)!)?$)Z	F"
<-D()G>(#-<C,Ä4ÀP4ÀP./.	1 #		F"	?F	I J=K			' F=)*=F)!)?$)Z	F"
+W<,ÀC.V7/.	1#		F"	>Z	I J=K			' F=)*=F)!)?$)Z	F"
#- 4ÀOÄ<C,Ä4ÀO.0C7/.	1#		F"	Z%	I J=K			' F=)*=F)!)?$)Z	F"
#-<C,Ä4ÀY-M,IÄ4ÀO.0C7/.	1#		F"	) %'	IJ=K			'F=)*=F)!)?$)Z	F"
90CW, ./N./.	1#		F"	) *'	IJ=K			'F=)*=F)!)?$)Z	F"
"DÀP4ÀPW, ./N./.	1#		F"	) Z'	IJ=K			'F=)*=F)!)?$)Z	F"
A.0CW,!7<.070.	1#		*"	FZ'	IJ=K			'F=)*=F)!)?$)Z	F"
A.0CW,!0.40(I0W,!.0C.4	1#		F"	>F	I J=K			' F=)*=F)!)?$)Z	F"
A.0CW,<W<,ÀC.V7/.	1#		F"	>F	I J=K			' F=)*=F)!)?$)Z	F"
A.0CW,./.!+C,Ä4-Y.	1#		F"	&&	I J=K			' F=)*=F)!)?$)Z	F"

Client Sample ID: MW-13I

Date Collected: 02/11/21 13:00
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-5

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
60W4./.	1#		F"	) *'	IJ=K			'F=)*=F)!)?$)Z	F"
Tetrachloroethene	**8700**		F"	?F	I J=K			' F=)*=F)!)?$)Z	F"
HÄ,I./.	1#		F"	) "	IJ=K			'F=)*=F)!)?$)Z	F"
047/D()GF(#-<C,Ä4Ä.0C./.	1#		F"	) &'	IJ=K			'F=)*=F)!)?$)Z	F"
047/D()G>(#-<C,Ä4ÄP4ÄP./.	1#		F"	?%	I J=K			' F=)*=F)!)?$)Z	F"
Trichloroethene	**730**		F"	LF	I J=K			' F=)*=F)!)?$)Z	F"
H4-<C,Ä4ÄM,IÄ4ÄO.0C7/.	1#		F"	) &'	IJ=K			'F=)*=F)!)?$)Z	F"
[-/W,!<C,Ä4-Y.	1#		F"	) &'	IJ=K			'F=)*=F)!)?$)Z	F"
\W,./.DG!HÄ07,	1#		%"	) >'	IJ=K			'F=)*=F)!)?$)Z	F"

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
ĀÄ !"!#$Ä%&'()Ä !##Ä)'+,-./)*	*0, Ä*		*/123*					*45267256'6E86Q*	*544*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
6;5<=#>?%,@,Ä!?" Ä<)A'BC/@@D	*649*		*EE<654*		*45267256'6E86Q*	*544*
A<F@,-,%/,@,GÄ HÄ Ä'BC/@@D*	*::*		*E9<654*		*45267256'6E86Q*	*544*
=#G@,-,%/,@,-Ä!?" Ä'BC/@@D*	*644*		*E7<659*		*45267256'6E86Q*	*544*
Ā,%/Ä Ä<)I'BC/@@D	*:I*		*I4 <654*		*45267256'6E86Q*	*544*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
FG%G%(HC,Ä4ÄPC./Ä,	1#		*8'	' 8%&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
FG%GZ(HC,Ä4ÄPC./Ä,	1#		*8'	' 8Z)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
FG%(#-<C,Ä4ÄPC./Ä,	1#		*8'	' 8*)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
FG%(#-O.0CW,PC./Ä,	1#		*8'	' 8*'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
FG%(#-/-04ÄPC./Ä,	1#		)'	F8F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
FG%(#-/-04Ä0Ä,I./.	1#		*8'	' 8%*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
FGZ(#-/-04Ä0Ä,I./.	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
F(+C,Ä4Ä/7PC0C7,./.	1#		*8'	' 8%Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
F(+C,Ä4ÄPC./Ä,	1#		*8'	' 8*>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
F(A.0CW,/7PC0C7,./.	1#		*8'	' 8Z'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
F(A.0CW,PC./Ä,	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
F(1-04Ä7/-,-/.	1#		)'	'8%F	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
F(1-04ÄPC./Ä,	1#		*8'	' 8%&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
>G>](#-<C,Ä4Ä ./N-Y-/.	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
>(1-04Ä7/-,-/.	1#		)'	'8%&	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
%GZ(#-/-04Ä(F(O.0CW,PC./Ä,	1#		)'	F8F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
%(Q4ÄOÄPC./W,!PC./W,!.0C.4	1#		*8'	' 8%*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
%(+C,Ä4Ä(>(O.0CW,PC./Ä,	1#		*8'	' 8%*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
%(+C,Ä4Ä7/-,-/.	1#		*8'	' 8*L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
%(+C,Ä4ÄPC./W,!PC./W,!.0C.4	1#		*8'	' 8>*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
%(A.0CW,PC./Ä,	1#		)'	'8>Z	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
%(1-04Ä7/-,-/.	1#		)'	'8F*	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
%(1-04ÄPC./Ä,	1#		)'	)8*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
X<./7PC0C./.	1#		*8'	' 8%)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
X<./7PC0CW,./.	1#		*8'	' 8>&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
X<.0ÄPC./Ä/.	1#		*8'	' 8*%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
X/0C47<./.	1#		*8'	' 8F&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
X047N-/.	1#		*8'	' 8%Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
Q./N7,Y.CWY.	1#		*8'	' 8F?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)

9I4ÄM-/D!ID0XO.4-<7G!QM7,Ä

Client Sample ID: MW-13I

Date Collected: 02/11/21 13:00
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-5

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Q./NÀR7T7/0C47<./.	1#		*8'	' 8>Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
Q./NÀR7TPW4./.	1#		*8'	' 8%?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
Q./NÀR TM,IÀ47/0C./.	1#		*8'	' 8>%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
Q./NÀRJGCG-TP.4W,./.	1#		*8'	' 8>*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
Q./NÀR5TM,IÀ47/0C./.	1#		*8'	' 8?>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
Q-PC./W,	1#		*8'	' 8Z*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
-D!RF(<C,À4À-DÀP4ÀPW,T!.0C.4	1#		*8'	' 8*F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
Q-DRF(<C,À4À.0CÀVWTO.0C7/.	1#		*8'	' 8>*	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
Q-DRF(<C,À4À.0CW,T.0C.4	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
Q-DRF(.0CW,C.VW,T!PC0C7,70.	1#		*8'	F8F	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
QI0W,! ./NW,!PC0C7,70.	1#		*8'	)8'	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
+7P4À,7<07O	1#		*8'	F8F	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
+74 7NÀ,.	1#		*8'	' 8>'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
+C4WD./.	1#		*8'	' 8>>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
#- ./NR7GCT7/0C47<./.	1#		*8'	' 8%F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
#- ./NÀMI47/	1#		)'	'8*)	IJ=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
#-.0CW,!PC0C7,70.	1#		*8'	' 8FF	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
#-O.0CW,!PC0C7,70.	1#		*8'	' 8>Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
#-(// I0W,!PC0C7,70.	1#		*8'	' 8>)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
#-(/(À<0W,!PC0C7,70.	1#		*8'	' 8%?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
^,IÀ47/0C./.	1#		*8'	' 8%'	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
^,IÀ4./.	1#		*8'	' 8>Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
U.V7<C,À4À ./N./.	1#		*8'	' 8*)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
U.V7<C,À4À I07Y-./.	1#		*8'	' 8Z&	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
U.V7<C,À4À<W<,ÀP./07Y-./.	1#		*8'	' 8*L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
U.V7<C,À4À.0C7/.	1#		*8'	' 8*L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
"/Y./ÀR)GFG>(<YTPW4./.	1#		*8'	' 8%?	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
"DÀPCÀ4À/.	1#		*8'	' 8%>	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
17PC0C7,./.	1#		*8'	' 8?Z	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
1-04À ./N./.	1#		*8'	' 8FL	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
1(1-04ÀDÀY-(/(P4ÀPW,7O-/.	1#		*8'	' 8*%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
1(1-04ÀDÀY-PC./W,7O-/.	1#		*8'	' 8*)	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
:./07<C,À4ÀPC./À,	1#		)'	F8F	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
:C./7/0C4./.	1#		*8'	' 8%%	J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
:C./À,	1#		*8'	' 8>L	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)
:W4./.	1#		*8'	' 8>%	I J=K		'F=)?=F)!)*$'%	' F=)&=F)!F'$'Z	)

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
S>À!#>'">#)	*9M6*	*Ā'N'0*	*/123*		*5MA9*	*QA<6:<E*	*4526E256'6784A*	*4526I256'5484Q*	*6*
J K ,L	*9M4*	*Ā'N*	*/123*		*5M75*		*4526E256'6784A*	*4526I256'5484Q*	*6*
O!?À À;'6;5<)#>?%,@,<;'BOD<	*EME*	*Ā'N'0*	*/123*		*5MQ7*	*67Q<Q4<7*	*4526E256'6784A*	*4526I256'5484Q*	*6*
J K ,L	*65*	*Ā'N*	*/123*		*5M:Q*		*4526E256'6784A*	*4526I256'5484Q*	*6*
+&>%,?ÀR" Ä	*69*	*Ā'N'0*	*/123*		*9M6Q*	*664<I5<E*	*4526E256'6784A*	*4526I256'5484Q*	*6*
FÄ HÄ Ä	R	*5MQĀ'N'0*	*/123*		*9M55*	*E6<A9<5*	*4526E256'6784A*	*4526I256'5484Q*	*6*
J K ,L	*9M5*	*Ā'N*	*/123*		*9M99*		*4526E256'6784A*	*4526I256'5484Q*	*6*
J K ,L	*664*	*Ā'N*	*/123*		*9MA4*		*4526E256'6784A*	*4526I256'5484Q*	*6*
Ā@>?%,@,Ä!?&%Ä Ä	R	*IQ Ā'N'0*	*/123*		*9MQI*	*E:<46<Q*	*4526E256'6784A*	*4526I256'5484Q*	*6*
ĀÄ!@">?%,@,Ä!?&%Ä Ä	R	*6A44 Ā'N'0*	*/123*		*AM:A*	*65E<6I<A*	*4526E256'6784A*	*4526I256'5484Q*	*6*
5<UÄ !Ä "%;'5<-Ä!?&%<		*6MI Ā'N'0*	*/123*		*7M6*	*Q59<9Q<:*	*4526E256'6784A*	*4526I256'5484Q*	*6*
J K ,L		*QA Ā'N*	*/123*		*7M6:*		*4526E256'6784A*	*4526I256'5484Q*	*6*

Client Sample ID: MW-13I

Date Collected: 02/11/21 13:00
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-5

Matrix: Water

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
FÀ HÀ À;'6;9<)#-Ā!?&%<	6MI	Ā'N'0	/123		7M75	64I<9I<9	4526E256'6784A	4526I256'5484Q	6
=,)Ā>" ,#>'">#)	EMI	Ā'N'0	/123		: M5I	6A9<4E<E	4526E256'6784A	4526I256'5484Q	6
6<W>!")Ā>Ā Ā	AMEĀ'N'0		/123		66M5I	665<II<:	4526E256'6784A	4526I256'5484Q	6

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
5;A;Q<@G@,-,.?Ā ,%	:E		A6 <654	4526E256'6784A	4526I256'5484Q	6
5<T%/,@,G#.?Ā &%	: :		AI <654	4526E256'6784A	4526I256'5484Q	6
5<T%/,@,.?Ā ,%	E7		97 <654	4526E256'6784A	4526I256'5484Q	6
0#!@,GÀ HÀ Ā<)7	:Q		AQ<654	4526E256'6784A	4526I256'5484Q	6
U?Ā ,%<)7	79		55 <654	4526E256'6784A	4526I256'5484Q	6
.<ĀÄ@.?Ā &%<)6A	QQ		Q4<6AI	4526E256'6784A	4526I256'5484Q	6

Method: 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
%G%](###	1#		'8'*'	' 8"LF	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
%G%](##9	1#		'8'*'	' 8')F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
4,4'-DDT	**0.011**	**J**	'8'*'	' 8'))	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
X,Y4-/	1#		'8'*'	' 8"&)	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
7,PC7(QU+	1 #		'8'*'	' 8"??	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
<-D(+C,Ä4Y7/.	1#		'8'*'	' 8')*	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
.07(QU+	1 #		'8'*'	' 8'F*	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
Y.,07(QU+	1 #		'8'*'	' 8')'	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
#-.,Y4-/	1#		'8'*'	' 8"L&	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
9/YÀDI,M7/!"	1 #		'8'*'	' 8'))	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
9/YÀDI,M7/!""	1#		'8'*'	' 8')F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
9/YÀDI,M7/!DI,M70.	1 #		'8'*'	' 8')Z	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
9/Y4-/	1#		'8'*'	' 8')%	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
9/Y4-/!7,Y.CWY.	1#		'8'*'	' 8')Z	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
9/Y4-/!5.0À/.	1#		'8'*'	' 8')F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
J7OO7(QU+!RK-/Y7/.T	1#		'8'*'	' 8"&'	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
047/D(+C,Ä4Y7/.	1#		'8'*'	' 8'))	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
U.P07<C,Ä4	1#		'8'*'	' 8"&*	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
U.P07<C,Ä4!.PÄV-Y.	1#		'8'*'	' 8"?%	I J=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
A.0CÄVW<C,Ä4	1#		'8'*'	' 8')%	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)
HÄV7PC./.	1#		'8*'	'8)F	IJ=K		'F=)?=F)!'&$>%	' F=)?=F)!)?$)>	)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
=+F'=Ä>">?%,@,G#.?Ā &%	75		54 <654	4526E256'4I89A	4526E256'6E869	6
=+F'=Ä>">?%,@,G#.?Ā &%	AQ		54 <654	4526E256'4I89A	4526E256'6E869	6
ĀÄ!@">?%,@,<-<R&%Ā Ā	:6		AA<654	4526E256'4I89A	4526E256'6E869	6
ĀÄ!@">?%,@,<-<R&%Ā Ā	7E		AA<654	4526E256'4I89A	4526E256'6E869	6

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
:+Q()')Z	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!')$'F	)
:+Q()FF)	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!')$'F	)
:+Q()F>F	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!')$'F	)
:+Q()F%F	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!')$'F	)
:+Q()F%&	1#		'8*'	'8)&	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!')$'F	)
:+Q()F*%	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!')$'F	)

Client Sample ID: MW-13I

Date Collected: 02/11/21 13:00
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-5

Matrix: Water

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
:+Q()FZ'	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!')$'F	)
:+Q()FZF	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!')$'F	)
:+Q()FZ&	1#		'8*'	'8F*	IJ=K		'F=)Z=F)!'L$)?	' F=)&=F)!')$'F	)

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
ĀÀ!@">?%,@,<-<R&%Ā À	*Q9*		*9: <656*	*4526Q256'4:86E*	*4526I256'46845*	*6*
ĀÀ!@">?%,@,<-<R&%Ā À	*QQ*		*9: <656*	*4526Q256'4:86E*	*4526I256'46845*	*6*
=+F'=À>">?%,@,G#.?Ā &%	*7I*		*6: <654*	*4526Q256'4:86E*	*4526I256'46845*	*6*
=+F'=À>">?%,@,G#.?Ā &%	*Q6*		*6: <654*	*4526Q256'4:86E*	*4526I256'46845*	*6*

Method: 6010C - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	**0.45**		'8F'	'8'Z'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
X/0-OÀ/W	1#		'8'F'	' 8"Z&	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
X4D./-<	1#		'8')*	' 8"*Z	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Barium	**0.14**		'8"F'	'8"'?'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Q.4W,,-IO	1#		'8"F'	'8"'>'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
+7YO-IO	1#		'8"F'	'8"'*'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Calcium	**176**		'8*'	'8)'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Chromium	**0.0025**	**J**	'8"%'	'8")'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
+Ā 7,0	1#		'8"%'	'8"'Z>	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Copper	**0.0044**	**J**	'8')'	' 8")Z	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Iron	**3.8**		'8'*'	' 8')L	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
K.7Y	1#		'8')'	' 8">'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Magnesium	**53.2**		'8F'	'8'%>	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Manganese	**0.15**		'8">'	'8"'%'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Nickel	**0.0040**	**J**	'8')'	' 8")>	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Potassium	**32.4**	**B**	'8*'	'8)'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
6.,./-IO	1#		'8'F*	' 8"&?	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
6-,_.4	1#		'8"Z'	'8")?	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Sodium	**851**		)8'	' 8>F	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
HC7,,-IO	1#		'8'F'	' 8')'	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
[7/7Y-IO	1#		'8"*'	'8")*	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)
Zinc	**0.0078**	**J**	'8')'	' 8")*	OJ=K		'F=)*=F)!'L$*F	' F=)*=F)!)L$FL	)

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
A.4<I4W	1#		'8"'F'	'8"')F	OJ=K		'F=)*=F)!)F$*>	' F=)*=F)!)Z$FL	)

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	U **0.0068**	~~J B~~	'8')'	' 8"*'	OJ=K		'F=)?=F)!)Z$*Z	' F=)&=F)!)L$*%	)

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
+W7/-Y.G!B.7<0-_.	1#		)'8'	)'8'	OJ=K		'F=)*=F)!'L$)F	' F=)Z=F)!)Z$>>	)

Client Sample ID: MW-14I

Date Collected: 02/11/21 13:50
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-6

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
)G)G)(I4<C,Ä4Ä.0C7/.	1#		*'	%)	IJ=K			'F=)*=F)!)?$%)	*'
)G)GFGF:(0H7<C,Ä4Ä.0C7/.	1#		*'	))	IJ=K			'F=)*=F)!)?$%)	*'
)G)GF(H<C,Ä4Ä()GFGF(04-M,IÄ4Ä.0C7/.	1#		*'	)Z	IJ=K			'F=)*=F)!)?$%)	*'
)G)GF(H<C,Ä4Ä.0C7/.	1#		*'	)F	IJ=K			'F=)*=F)!)?$%)	*'
)G)(#-<C,Ä4Ä.0C7/.	1#		*'	)L	IJ=K			'F=)*=F)!)?$%)	*'
)G)(#-<C,Ä4Ä.0C./.	1#		*'	)*	IJ=K			'F=)*=F)!)?$%)	*'
)GFG%(HC,Ä4Ä ./N./.	1#		*'	F)	IJ=K			'F=)*=F)!)?$%)	*'
)GF(#- 4ÀOÄ(>(+C,Ä4ÀP4ÀP7/.	1#		*'	F'	IJ=K			'F=)*=F)!)?$%)	*'
)GF(#- 4ÀOÄ.0C7/.	1#		*'	>?	IJ=K			'F=)*=F)!)?$%)	*'
)GF(#-<C,Ä4Ä ./N./.	1#		*'	%'	IJ=K			'F=)*=F)!)?$%)	*'
)GF(#-<C,Ä4Ä.0C7/.	1#		*'	))	IJ=K			'F=)*=F)!)?$%)	*'
)GF(#-<C,Ä4ÀP4ÀP7/.	1#		*'	>Z	IJ=K			'F=)*=F)!)?$%)	*'
)G>(#-<C,Ä4Ä ./N./.	1#		*'	>L	IJ=K			'F=)*=F)!)?$%)	*'
)G%(#-<C,Ä4Ä ./N./.	1#		*'	%F	IJ=K			'F=)*=F)!)?$%)	*'
F(QI07/Ä/.!RA9ST	1#		*"	ZZ	I J=K			' F=)*=F)!)?$%)	*'
F(U.V7/Ä/.	1#		F*'	ZF	I J=K			' F=)*=F)!)?$%)	*'
%(A.0CW,(F(P./07/Ä/.!RA"QST	1#		F*'	))'	IJ=K			'F=)*=F)!)?$%)	*'
X<.0Ä/.	1#		*"	) *'	IJ=K			'F=)*=F)!)?$%)	*'
Q./N./.	1 #		*'	F)	IJ=K			'F=)*=F)!)?$%)	*'
Q4ÀOÄY-<C,Ä4ÀO.0C7/.	1#		*'	F'	IJ=K			'F=)*=F)!)?$%)	*'
Q4ÀOÄMÄ4O	1#		*'	)>	IJ=K			'F=)*=F)!)?$%)	*'
Q4ÀOÄO.0C7/.	1#		*'	>*	IJ=K			'F=)*=F)!)?$%)	*'
+74 Ä/!Y-DI,M-Y.	1#		*'	L8*	I J=K			' F=)*=F)!)?$%)	*'
+74 Ä/!0.047<C,Ä4-Y.	1#		*'	)%	IJ=K			'F=)*=F)!)?$%)	*'
+C,Ä4Ä ./N./.	1#		*'	>&	IJ=K			'F=)*=F)!)?$%)	*'
+C,Ä4Ä.0C7/.	1#		*'	)Z	IJ=K			'F=)*=F)!)?$%)	*'
+C,Ä4ÀMÄ4O	1 #		*'	)?	IJ=K			'F=)*=F)!)?$%)	*'
+C,Ä4ÀO.0C7/.	1#		*'	)&	IJ=K			'F=)*=F)!)?$%)	*'
cis-1,2-Dichloroethene	**1200**		*'	%)	IJ=K			'F=)*=F)!)?$%)	*'
<-D()G>(#-<C,Ä4ÀP4ÀP./.	1 #		*'	)&	IJ=K			'F=)*=F)!)?$%)	*'
+W<,ÄC.V7/.	1#		*'	L8'	I J=K			' F=)*=F)!)?$%)	*'
#- 4ÀOÄ<C,Ä4ÀO.0C7/.	1#		*'	)Z	IJ=K			'F=)*=F)!)?$%)	*'
#-<C,Ä4ÄY-M,IÄ4ÀO.0C7/.	1#		*'	>%	IJ=K			'F=)*=F)!)?$%)	*'
90CW, ./N./.	1#		*'	>?	IJ=K			'F=)*=F)!)?$%)	*'
"DÄP4ÄPW, ./N./.	1#		*'	%'	IJ=K			'F=)*=F)!)?$%)	*'
A.0CW,!7<.070.	1#		)>'	Z*	I J=K			' F=)*=F)!)?$%)	*'
A.0CW,!0.40(I0W,!.0C.4	1#		*'	&8'	I J=K			' F=)*=F)!)?$%)	*'
A.0CW,<W<,ÄC.V7/.	1#		*'	&8'	I J=K			' F=)*=F)!)?$%)	*'
A.0CW,./.!+C,Ä4-Y.	1#		*'	FF	IJ=K			'F=)*=F)!)?$%)	*'
60W4./.	1#		*'	>?	IJ=K			'F=)*=F)!)?$%)	*'
Tetrachloroethene	**2300**		*'	)&	IJ=K			'F=)*=F)!)?$%)	*'
HÄ,I./.	1#		*'	FZ	IJ=K			'F=)*=F)!)?$%)	*'
047/D()GF(#-<C,Ä4Ä.0C./.	1#		*'	%*	IJ=K			'F=)*=F)!)?$%)	*'
047/D()G>(#-<C,Ä4ÄP4ÄP./.	1#		*'	)L	IJ=K			'F=)*=F)!)?$%)	*'
Trichloroethene	**470**		*'	F>	IJ=K			'F=)*=F)!)?$%)	*'
H4<C,Ä4ÀM,IÄ4ÀO.0C7/.	1#		*'	%%	IJ=K			'F=)*=F)!)?$%)	*'
Vinyl chloride	**85**		*'	%*	IJ=K			'F=)*=F)!)?$%)	*'
\W,./.DG!HÄ07,	1#		)"	>>	I J=K			' F=)*=F)!)?$%)	*'

Client Sample Results

Client Sample ID: MW-14I
Date Collected: 02/11/21 13:50
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-6
Matrix: Water

Tentatively Identified Compound	Est. Result	Qualifier	Unit	D	RT	CAS No.	Prepared	Analyzed	Dil Fac
ĀÀ !"!#$Ā%&'()Ā !#*#Ā)'+,-.,/)	0, Ā		/123					45267256'6E8A6	74

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
6;5<=#>?%,@,Ā!?" Ā<)A'BC/@@D	64A		EE<654		45267256'6E8A6	74
A<F@,-,*%/,@,GĀ HĀ Ā'BC/@@D	:I		E9<654		45267256'6E8A6	74
=#G@,-,*%/,@,-Ā!?" Ā'BC/@@D	647		E7<659		45267256'6E8A6	74
Ā%/Ā Ā<)I'BC/@@D	:7		I4 <654		45267256'6E8A6	74

Client Sample ID: TB-20210211
Date Collected: 02/11/21 00:00
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-7
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
)G)G)(I4<C,Ä4Ä.0C7/.	1#		)8'	' 8&F	I J=K			' F=)*=F)!)&$'*	)
)G)GFGF-(0I47<C,Ä4Ä.0C7/.	1#		)8'	' 8F)	I J=K			' F=)*=F)!)&$'*	)
)G)GF(II<C,Ä4Ä()GFGF(04-M,IÄ4Ä.0C7/.	1#		)8'	' 8>)	I J=K			' F=)*=F)!)&$'*	)
)G)GF(II<C,Ä4Ä.0C7/.	1#		)8'	' 8F>	I J=K			' F=)*=F)!)&$'*	)
)G)(#-<C,Ä4Ä.0C7/.	1#		)8'	' 8>&	I J=K			' F=)*=F)!)&$'*	)
)G)(#-<C,Ä4Ä.0C./.	1#		)8'	' 8FL	I J=K			' F=)*=F)!)&$'*	)
)GFG%{I<C,Ä4Ä ./N./.	1#		)8'	' 8%)	I J=K			' F=)*=F)!)&$'*	)
)GF(#- 4ÀOÄ(>(+C,Ä4ÀP4ÀP7/.	1#		)8'	' 8>L	I J=K			' F=)*=F)!)&$'*	)
)GF(#- 4ÀOÄ.0C7/.	1#		)8'	' 8?>	I J=K			' F=)*=F)!)&$'*	)
)GF(#-<C,Ä4Ä ./N./.	1#		)8'	' 8?L	I J=K			' F=)*=F)!)&$'*	)
)GF(#-<C,Ä4Ä.0C7/.	1#		)8'	' 8F)	I J=K			' F=)*=F)!)&$'*	)
)GF(#-<C,Ä4ÀP4ÀP7/.	1#		)8'	' 8?F	I J=K			' F=)*=F)!)&$'*	)
)G>(#-<C,Ä4Ä ./N./.	1#		)8'	' 8?&	I J=K			' F=)*=F)!)&$'*	)
)G%(#-<C,Ä4Ä ./N./.	1#		)8'	' 8&%I	J=K			' F=)*=F)!)&$'*	)
F(QI07/Ä/.!RA9ST	1#		)'	)8>	I J=K			' F=)*=F)!)&$'*	)
F(U.V7/Ä/.	1#		*8'	) 8F	IJ=K			'F=)*=F)!)&$'*	)
%(A.0CW,(F(P./07/Ä/.!RA"QST	1#		*8'	F8)	IJ=K			'F=)*=F)!)&$'*	)
X<.0Ä/.	1#		)'	>8'	I J=K			' F=)*=F)!)&$'*	)
Q./N./.	1#		)8'	' 8%)	I J=K			' F=)*=F)!)&$'*	)
Q4ÀOÄY-<C,Ä4ÀO.0C7/.	1#		)8'	' 8>L	I J=K			' F=)*=F)!)&$'*	)
Q4ÀOÀMÄ4O	1#		)8'	' 8FZ	I J=K			' F=)*=F)!)&$'*	)
Q4ÀOÄO.0C7/.	1#		)8'	' 8ZL	I J=K			' F=)*=F)!)&$'*	)
+74 Ä/!Y-DI,M-Y.	1#		)8'	' 8)L	I J=K			' F=)*=F)!)&$'*	)
+74 Ä/!0.047<C,Ä4-Y.	1#		)8'	' 8F?	I J=K			' F=)*=F)!)&$'*	)
+C,Ä4Ä ./N./.	1#		)8'	' 8?*	I J=K			' F=)*=F)!)&$'*	)
+C,Ä4Ä.0C7/.	1#		)8'	' 8>F	I J=K			' F=)*=F)!)&$'*	)
+C,Ä4ÀMÄ4O	1#		)8'	' 8>%	I J=K			' F=)*=F)!)&$'*	)
+C,Ä4ÄO.0C7/.	1#		)8'	' 8>*	I J=K			' F=)*=F)!)&$'*	)
<-D()GF(#-<C,Ä4Ä.0C./.	1#		)8'	' 8&)	I J=K			' F=)*=F)!)&$'*	)
<-D()G>(#-<C,Ä4ÀP4ÄP./.	1#		)8'	' 8>Z	I J=K			' F=)*=F)!)&$'*	)
+W<,ÄC.V7/.	1#		)8'	' 8)&	I J=K			' F=)*=F)!)&$'*	)
#- 4ÀOÄ<C,Ä4ÄO.0C7/.	1#		)8'	' 8>F	I J=K			' F=)*=F)!)&$'*	)
#-<C,Ä4ÄY-M,IÄ4ÄO.0C7/.	1#		)8'	' 8Z&	I J=K			' F=)*=F)!)&$'*	)
90CW, ./N./.	1#		)8'	' 8?%	I J=K			' F=)*=F)!)&$'*	)
"DÀP4ÀPW, ./N./.	1#		)8'	' 8?L	I J=K			' F=)*=F)!)&$'*	)
A.0CW,!7<.070.	1#		F8*	) 8>	IJ=K			'F=)*=F)!)&$'*	)
A.0CW,!0.40(I0W,!.0C.4	1#		)8'	' 8)Z	I J=K			' F=)*=F)!)&$'*	)

Client Sample ID: TB-20210211

Date Collected: 02/11/21 00:00
Date Received: 02/11/21 15:30

Lab Sample ID: 480-181150-7

Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
A.0CW,<W<,ÄC.V7/.	1#		)8'	' 8)Z	I J=K			' F=)*=F)!)&$'*	)
A.0CW,./.!+C,Ä4-Y.	1#		)8'	' 8%%	I J=K			' F=)*=F)!)&$'*	)
60W4./.	1#		)8'	' 8?>	I J=K			' F=)*=F)!)&$'*	)
H 047<C,Ä4Ä.0C./.	1#		)8'	' 8>Z	I J=K			' F=)*=F)!)&$'*	)
HÄ,I./.	1#		)8'	' 8*)	I J=K			' F=)*=F)!)&$'*	)
047/D()GF(#-<C,Ä4Ä.0C./.	1#		)8'	' 8L'	I J=K			' F=)*=F)!)&$'*	)
047/D()G>(#-<C,Ä4ÄP4ÄP./.	1#		)8'	' 8>?	I J=K			' F=)*=F)!)&$'*	)
H4-<C,Ä4Ä.0C./.	1#		)8'	' 8%Z	I J=K			' F=)*=F)!)&$'*	)
H4-<C,Ä4ÄM,IÄ4ÄO.0C7/.	1#		)8'	' 8&&	I J=K			' F=)*=F)!)&$'*	)
[-/W,!<C,Ä4-Y.	1#		)8'	' 8L'	I J=K			' F=)*=F)!)&$'*	)
\W,./.DG!HÄ07,	1#		F8'	' 8ZZ	I J=K			' F=)*=F)!)&$'*	)

Tentatively Identified Compound	*Est. Result*	*Qualifier*	*Unit*	*D*	*RT*	*CAS No.*	*Prepared*	*Analyzed*	*Dil Fac*
ĀÄ !'"!#$Ä%&'()Ä !##Ä)'+,-./)*	*0, Ä*		*/123*					*45267256'6I847*	*6*

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
6;5<=#>?%,@,Ä!?" Ä<)A'BC/@@D	*64Q*		*EE<654*		*45267256'6I847*	*6*
A<F@,-,%/,@,GÄ HÄ Ä'BC/@@D*	*645*		*E9<654*		*45267256'6I847*	*6*
=#G@,-,%/,@,-Ä!?" Ä'BC/@@D*	*644*		*E7<659*		*45267256'6I847*	*6*
Ā%/Ä Ä<)I'BC/@@D	*:7*		*I4 <654*		*45267256'6I847*	*6*

ATTACHMENT B

CASE NARRATIVE & COC

Receipt
ĀÀ !"#$%& "!' (!( ) *+ ,!-.!/0 110/2/1!3432!567!!8.& ""!-9À ('* " !.-9 ,!: &-';!9À !"#$%& "!#((*+ ,!*.!<--,!)-.,*9*-.;!#.,!'À (! (=>*(,;!%(-% (&?!%(" (+ ,!#.,!-.!*) 7!!ĀÀ !9 $% (#9>("!-@!9 À !/!)--& ("!#9!( ) *%9!9*$!' (!/7AB!C!#.,!37/B!C7

GC/MS VOA
6 9À-,!A/D2C4!ĀÀ !@-&&-'*.<!"#$%& "!' (!,*&>9 ,!9-!:(*.<!9À !) -.) .9(#9*-.!-@!9#(< 9!#.#&?9 "!'*9À*.!9À !)#&*:(#9*-.!(#.< 4!6 EF1GH!
IGA2F1A11J2F1K;!6EF132L!IGA2F1A11J2F/K;!6EF13H!IGA2F1A11J2F3K;!6EF1J2L!IGA2F1A11J2FGK;!6EF13M!IGA2F1A11J2FJK!#.,!6EF1GM!
IGA2F1A11J2FDK7!!N& +#9 ,!(%-(9*.<!&*$*9"!IOP"K!#(!%(-+*, ,7

Q-!#,,*9*-.#&!#.#&?9*)#&!-(!=>#&*9?!*""> "!' (!.-9 ,;!-9À (!9À #.!9À-" !, ")(*: ,!#:-+ !-(!*.!9À !R @*.*9*-."0S&-""#(?!%#< 7

GC/MS Semi VOA
Q-!#.#&?9*)#&!-(!=>#&*9?!*""> "!' (!.-9 ,;!-9À (!9À#.!9À-" !, ")(*: ,!*.!9À !R @*.*9*-."0S&-""#(?!%#< 7

GC Semi VOA
6 9À-,!A2A1L4!ĀÀ !)-.9*.>*.<!)#&*:(#9*-.!+ (*@*)#9*-.!ICCTK!#"" -)*#9 ,!'*9À!:#9)À!GA2FJDUV/V!( )-+ (,!#:-+ !9À !>%% (!)-.9(-& !&*$*9!
@-(!6 9À-W?)À&-(7!!ĀÀ !"#$%& "!#""-)*#9 ,!'*9À!9À*"!CCT!' (!.- .F, 9)9"!@-(!9À !#@)9 ,!#.#&?9 "X!9À (@-(;!9À !,#9#!À#+ !: .!
(%-(9 ,7!!ĀÀ !#""-)*#9 ,!"#$%& "!#(!*$%#)9 ,4!6EF1GH!IGA2F 1A11J2F1K;!6EF132L!IGA2F1A11J2F/K!#.,!6EF13M!IGA2F1A11J2FJK7!

6 9À-,!A2A/Y4!ĀÀ !@-&&-'*.<!"#$%& "!#(!#""-)*#9 ,!'*9À!#!)-.9* .>*.<!)#&*:(#9*-.!+ (*@*)#9*-.!ICCTMH!GA2FJDUADG0D!#.,!CCT!
GA2FJDUADG0/AK!9À#9!À#,!( )-+ (* "!@-(!9À !">((-<#9 9(#)À&-(F$FW?& . !9À#9!' (!: &-'!#)) %9#.) !&*$*9"4!6EF1GH!IGA2F 1A11J2F1K;!
6EF132L!IGA2F1A11J2F/K!#.,!6EF13M!IGA2F1A11J2FJK7!ĀÀ !")-.,#(? !">((-<#9 !R)#)À&-(-:*%À .?&!*"!'9À*.!&*$*9"7!ĀÀ (@-(;!9À !
,#9#!À#"!: .!(%-(9 ,7

Q-!#,,*9*-.#&!#.#&?9*)#&!-(!=>#&*9?!*""> "!' (!.-9 ,;!-9À (!9À #.!9À-" !, ")(*: ,!#:-+ !-(!*.!9À !R @*.*9*-."0S&-""#(?!%#< 7

Metals
6 9À-,!D212C4!ĀÀ !&-'!& + &!)-.9*.>*.<!)#&*:(#9*-.!+ (*@*)#9*-.!ICCTP!GA2FJDUDJ/0/DK!( )-+ (,!#:-+ !9À !>%% (!)-.9(-&!&*$*9!@ Ā-9#&!
5-9#""*>$7!!ĀÀ !"#$%& "!#""-)*#9 ,!'*9À!9À*"!CCTP !' (! *9À (!& ""!9À#.!9À !(%-(9*.<!&*$*9!OPK!@-(!9À*"!#.#&?9 !-(!)-.9#*. !9À*"!
#.#&?9 !#9!#!)-.) .9(#9*-.!<(#9 (!9À#.!12Z!9À !+#&> !@->.,!*.! 9À !CCTPX!9À (@-(;!(F#.#&?"*"!-@!"#$%& "!IPCH!GA2FJDUGJ20#F;Y
I6L!GA2FJDUGJ201FYK!'#"!.-9!% (@-($,7

Q-!#,,*9*-.#&!#.#&?9*)#&!-(!=>#&*9?!*""> "!' (!.-9 ,;!-9À (!9À #.!9À-" !, ")(*: ,!#:-+ !-(!*.!9À !R @*.*9*-."0S&-""#(?!%#< 7

General Chemistry
Q-!#.#&?9*)#&!-(!=>#&*9?!*""> "!' (!.-9 ,;!-9À (!9À#.!9À-" !, ")(*: ,!*.!9À !R @*.*9*-."0S&-""#(?!%#< 7

Organic Prep
Q-!#.#&?9*)#&!-(!=>#&*9?!*""> "!' (!.-9 ,;!-9À (!9À#.!9À-" !, ")(*: ,!*.!9À !R @*.*9*-."0S&-""#(?!%#< 7

Sample Summary

+,-./0$!1.2! 3À45!6070.!#898+8 ĀÀ !"#$!%&'()&))*'()
:4À;.<0=6-0.$!>>)(>>?!@8!A7-/!60!BÀ<C.D0.4!E&F&)'F

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
%&'()&))*'()	A @()%6	@70.4	'F=)) =F)!'G$>&	'F=))=F)!)*$>'	
%&'()&))*'(F	A @()>'H	@70.4	'F=)) =F)!'G$*>	'F=))=F)!)*$>'	
%&'()&))*'(>	A @()>6	@70.4	' F=⟫ =F)!)) $''	' F=⟫ =F)!)*$>'	
%&'()&))*'(%	A @()*'H	@70.4	' F=⟫ =F)!)) $'%	' F=⟫ =F)!)*$>'	
%&'()&))*'(*	A @()>''	@70.4	'F=)) =F)!)>$''	'F=))=F)!)*$>'	
%&'()&))*'(I	A @()%''	@70.4	'F=)) =F)!)>$*'	'F=))=F)!)*$>'	
%&'()&))*'(?	JH(F'F)'F))	@70.4	'F=)) =F)!'$''	'F=))=F)!)*$>'	

Eurofins TestAmerica, Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Phone: 716-691-2600 Fax: 716-691-7991

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: T. Urban / S. Connelly	Lab PM: Johnson, Orlette S	Carrier Tracking No(s):	COC No: 480-156514-34518.7
Client Contact: Mr. Benjamin Rung	Phone:	E-Mail: Orlette.Johnson@Eurofinset.com	State of Origin: NY	Page: Page 7 of 7
Company: New York State D.E.C.	PWSID:			Job #:
Address: 625 Broadway 12th Floor	Due Date Requested:			
City: Albany	TAT Requested (days): Standard			
State, Zip: NY, 12233-7017	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Callout ID: 137811			
Email: benjamin.rung@dec.ny.gov	WO #:			
Project Name: 331-337 W. Main St Rochester #828102	Project #: 48021570			
Site:	SSOW#:			

Analysis Requested

480-181150 Chain of Custody

Preservation Codes:
A - HCL
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
L - EDA
Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260C - (MOD) TCL list OLM04.2 + TICs	PFC_IDA - PFAS, Standard List (21 Analytes)	8082A - TCL PCBs - SOM01.0	8081B - TCL Pesticides - OLM04.2	8270D - (MOD) TCL SVOA - OLM04.2 + TICs	6010C, 7470A	8270D_SIM_MS_ID - 1,4-	9012B - Cyanide, Total	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	N	N	N	N	D	N	B		
MW-14S	2/11/21	0938	G	Water	N	N	X		X	X	X	X		X	11	
MW-130B	2/11/21	0953	G	Water	N	N	X		X	X	X	X		X	11	
MW-135	2/11/21	1100	G	Water	N	N	X								3	
MW-150B	2/11/21	1104	G	Water	N	N	X								3	
MW-13I	2/11/21	1300	G	Water	N	N	X		X	X	X	X		X	11	
MW-14I	2/11/21	1350	G	Water	N	N	X								3	
TB-20210211	2/11/21	-	G	water	N	N	X								2	trip Blank

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment: Prof OF-F	
Relinquished by: Tom Urban	Date/Time: 2/11/21 @ 830	Company: AECOM	Received by:	Date/Time:
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 2/11/21 1530

Company: TMO2

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2-8 32 #1

Ver: 11/01/2020

DATA USABILITY SUMMARY REPORT

For

331-337 W. Main St Rochester
WATER SAMPLES

VOA
SDG No. J183061

Sampling Date: April 8, 2021

Submitted to:

AECOM
257 West Genesee Street
Suite 400
Buffalo, New York, USA
716-856-5636

Prepared by:

Environmental Occupational & Public Health Consultants Inc. (EOPHC)
Environmental Data Validation Inc. (EDV, Inc.)
1326 Orangewood Ave
Pittsburgh, PA 15216
(412) 341-5281

Site: 331-337 W. Main St Rochester
SDG #: J183061
Client: AECOM
Date: May 20, 2021

Laboratory: Eurofins TestAmerica
Reviewer: Denise McGuire

Sample Identification Table

Client Sample ID	Laboratory ID	Matrix	VOC
MN-9D	480-183061-1	Aqueous	X
MN-8D	480-183061-2	Aqueous	X
TB-040821	480-183061-3	Aqueous	X

The data packages contained three (3) aqueous samples, which included one (1) trip blank sample. The samples were analyzed via Method SW-846 8260C. The adherence of laboratory analytical performance to these methods' analytical specifications was evaluated during the data validation process. The data package was evaluated for its usability as defined by the Guidance for the Development of Data Usability Summary Reports (DER-10, 11/09). USEPA Region II standard operating procedures were used as guidance documents. According to the NYSDEC Guidance for the Development of Data Usability Summary Reports, the following QC data were evaluated: blanks, instrument tunings, calibration standards, calibration verifications, laboratory controls, surrogate recoveries, spike recoveries, and sample data. All QC data were within quality control limits, except the following issues:

The following Attachments are a part of this report— all validated Form 1s are presented in Attachment A. All Case Narrative and Chain of Custody (COC) records are presented in Attachment B.

All QC data were within quality control limits, except the following issues:

Cover letter, Narrative and Data Reporting Forms (Form 1s): The deficiencies noted in the case narrative that affect data usability have been discussed in applicable sections. Data that have no impact on data usability are not discussed.

Chain of Custody (COC): All samples were present.

Preservation: Preservation was acceptable.

Holding Time: Holding times were within acceptable criterion for all samples.

Blanks Quality Control: No blank contamination was present.

Calibration Quality Control: Calibrations were acceptable.

Laboratory Control Sample (LCS): The recoveries are acceptable.

Surrogates: The recoveries were acceptable.

Internal Standards: All results were acceptable.

Matrix Spike (MS)/Matrix Spike Duplicate (MSD): All the results are acceptable.

Field Duplicate: No field duplicate samples were collected.

Compound Quantitation: Quantitations were acceptable. Elevated detection limits were reported for samples MN-9D and MN-8D. Results reported above the method detection limit (MDL) but below the reporting limit (RL) are considered estimated (J).

Tentatively Identified Compounds: TICs were acceptable as reported.

Additional Comments: Some Form 1s and case narratives are reporting criteria out of QC limits. If data were impacted due to the deficiency, it is discussed in the DUSR and appropriate qualifier(s) applied. Therefore, all discussions in the DUSR relate to all conditions that affected data usability. When there are multiple analyses, the validator presents the best run (Attachment A).

Data usability: Data qualified with the "UJ" qualifier are to be used cautiously as they are estimated data with some quality control issues. Data qualified with the "J" qualifier are to be used cautiously as they are estimated data with some quality control issues. Data qualified with the "R" qualifier are not usable due to severe quality control issues. Data qualified with the "U" qualifier are usable at the reporting limit.