REMEDIAL INVESTIGATION WORK PLAN

SAUGERTIES TOWN LANDFILL
1765 ROUTE 212
SAUGERTIES, ULSTER COUNTY, NEW YORK 12477
NYSDEC SITE NO. 356003

Prepared for:

NEW YORK STATE OF OPPORTUNITY. | Department of Environmental Conservation

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Acronyms and Abbreviations

AMSL	Above Mean Sea Level
ASP	Analytical Services Protocol
bgs	Below Ground Surface
C&D	Construction and Demolition Debris
CAMP	Community Air Monitoring Plan
CHA	CHA Consulting, Inc. of Albany, New York
Chazen	The Chazen Companies of Poughkeepsie, NY
Class A Values	NYSDEC Technical and Operational Guidance Series 1.1.1 Class A Standards and Guidance Values
Class GA Values	NYSDEC Technical and Operational Guidance Series 1.1.1 Class GA Standards and Guidance Values
cm/sec	Centimeters Per Second
CSIA	Compound Specific Isotope Analysis
cu yds	Cubic Yards
DER	Division of Environmental Remediation
DER-10	NYSDEC DER-10, Technical Guidance for Site Investigation and Remediation
DUSRs	Data Usability Summary Reports
DMM	Division of Materials Management
EDDs	Electronic Data Deliverables
ELAP	Environmental Laboratory Approval Program
EM/RF	Electro-Magnetic/Radio Frequency
ESA	Environmental Site Assessment
FAP	Field Activities Plan
FWIA	Fish and Wildlife Impact Analysis
gpm	Gallons Per Minute
GPR	Ground Penetrating Radar
GSR	Green and Sustainable Remediation
HASP	Health and Safety Plan
HDPE	High-Density Polyethylene
HFPO-DA	Hexafluoropropylene oxide dimer acid
ILI	NYSDEC Inactive Landfill Initiative
MCL	Maximum Contaminant Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
ng/L	Nanograms Per Liter
NTUs	Nephelometric Turbidity Units
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation

Acronyms and Abbreviations (cont.)

NYSDOH	New York State Department of Health
PAHs	Polycyclic Aromatic Hydrocarbons
Parsons	Parsons of Syracuse, New York
PCBs	Polychlorinated Biphenyls
PFAS	Per- and Polyfluoroalkyl Substances
PFBS	Perfluorobutanesulfonic Acid
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PFHxS	Perfluorohexanesulfonic acid
PID	Photo-ionization Detector
PPE	Personal Protective Equipment
PLS	Professional Land Surveyor
PVC	Poly-Vinyl Chloride
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
QHHEA	Qualitative Human Health Exposure Assessment
Ramboll	Ramboll of Syracuse, New York
RCRA	Resource Conservation and Recovery Act
RIHWDS	New York State Registry of Inactive Hazardous Waste Disposal Sites
ROW	Right of Way
SC	Site Characterization
SCGs	Standards, Criteria, and Guidance
SIM	Selective Ion Monitoring
SOW	Scope of Work
SSHASP	Site-Specific HASP
SSCAMP	Site-Specific CAMP
SVOCs	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List
TOGS	Technical and Operational Guidance Series 1.1.1
TRC	TRC Engineers, Inc.
µg/l	Micrograms Per Liter
USCS	Unified Soil Classification System
USDA	United Stated Department of Agriculture
USGS	United States Geological Survey
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

Acronyms and Abbreviations (cont.)

WA	Work Assignment
Work Plan	Remedial Investigation Work Plan

1.0 Introduction

TRC Engineers, Inc. (TRC) has prepared this Remedial Investigation (RI) Work Plan (Work Plan) to describe the investigation activities to be performed at the Saugerties Town Landfill (the Site), located at 1765 Route 212, Saugerties, Ulster County, New York (refer to **Figure 1**). The Site is designated by the New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER) as Site No. 356003 under the Inactive Hazardous Waste Disposal Site Program (New York State Superfund Program). All RI activities referenced in **Sections 4.0** and **5.0** have and/or will be completed in accordance with the September 12, 2023, NYSDEC DER Work Assignment (WA) Approval Letter for Standby Engineering Services Contract No. D009812 for a Remedial Investigation, and NYSDEC DER-10, Technical Guidance for Site Investigation and Remediation (DER-10).

On-Site sampling performed by the NYSDEC Division of Material Management (DMM) in October 2017 indicated groundwater exceedances of Perfluorooctanoic acid (PFOA), Perfluorooctanesulfonic acid (PFOS), and 1,4-dioxane (1,4-D) above the then (2017) interim New York State Water Quality Council recommended maximum contaminant levels (MCLs) for drinking water in one on-site monitoring well (MW-S). The New York State Department of Health (NYSDOH) published revised Maximum Contaminant Limits (MCLs) in the State Register on August 26, 2020. The MCLs for drinking water are 10 nanograms per liter (ng/l) for both PFOA and PFOS and 1 microgram per liter (µg/l) for 1,4-D. These standards are supplemented in February 2023 with Technical and Operational Guidance Series (TOGS) No 1.1.1 Addendum, Class GA Standards and Guidance Values (Class GA Values), Raw Water Source, Human Health for PFOA (6.7 ng/l), PFOS (2.7 ng/l), and 1,4-D (0.35 µg/l). In addition and more recently on April 10, 2024, the United States Environmental Protection Agency (USEPA) finalized MCLs for PFOA (4.0 ng/l), PFOS (4.0 ng/l), Perfluorohexanesulfonic Acid (PFHxS) (10 ng/l), Perfluorononanoic acid (PFNA) (10 ng/l), Hexafluoropropylene oxide dimer acid (HFPO-DA) (10 ng/l), and mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and Perfluorobutanesulfonic acid (PFBS) (hazard index of 1 (unitless)).

Under NYSDEC's Inactive Landfill Initiative (ILI), sampling of private drinking water wells within ½ mile from the Site has been ongoing since 2017. Following multiple rounds of sampling performed from 2017 to present, several private drinking water wells have been found to contain groundwater with concentrations of PFOA, PFOS, and 1,4-D that exceed Class GA Values and NYSDOH MCLs. It should be noted that several wells have detectable concentrations below Class GA Values and NYSDOH MCLs, and that these properties have been provided with an alternate water supply while the investigation of the landfill continues.

In 1994, Clough, Harbour, and Associates (CHA) of Albany, New York investigated the original landfill located in the northern portion of the Site (shown on **Figure 2** as Original Waste Limit

Disposal Area) using test pits to evaluate whether hazardous wastes had been disposed of in that area. The test pits revealed that mixed solid waste and construction debris had been disposed of, and that the capping techniques appeared to be consistent with NYSDEC landfill closure regulations that were in effect at the time the Original Waste Limits Disposal Area was closed. TRC's review of the test pit logs indicates that the extent of the waste was not delineated to the south and east.

The purpose of the RI activities described in this Work Plan is to expand upon prior investigations by further defining the nature and extent of soil and groundwater contamination and obtain additional information regarding environmental conditions (e.g., soil and groundwater) both on-Site and off-Site to inform the Qualitative Human Health Exposure Assessment (QHHEA).

2.0 Site Description and History

2.1 Site Location and Setting

The Site is located at 1765 Route 212, west of John Joy Road, in the Town of Saugerties. The Site is an irregularly shaped parcel approximately 44 acres in size and identified on the Ulster County Tax Map as parcel number 27.4-6-4.100. The Site is currently owned by the Town of Saugerties and can be accessed via Route 212 to the north.

An 11-acre, inactive, capped landfill (Closed Landfill) is located in the southeast portion of the Site. The northwest portion of the Site is utilized as a garbage and recycling transfer station, operated by the Town of Saugerties. East of and adjacent to the transfer station is an animal shelter, also operated by the Town of Saugerties. The western portion of the Site is predominantly wooded; however, TRC understands the Town of Saugerties will be building a new animal shelter in that area. A solar farm was installed in 2020 and covers much of the landfill cap and additional areas north of the landfill mound. A Site Location Map and Site Layout Map showing the aforementioned features are provided on **Figures 1** and **2**, respectively.

2.2 Site Geology and Hydrogeology

As reported in the *October 2021 Final Site Characterization Report* and *November 2022 Site Characterization Report Addendum*, both completed by CDM Smith of Latham, New York (CDM Smith) on behalf of the NYSDEC, the Site is overlain by a thin veneer of glacial till overburden that is up to 10 feet thick (e.g., at the southern property boundary by the MW-6 monitoring well cluster) and is absent in other parts of the Site. Below the overburden is bedrock consisting of interbedded shale and sandstone of the Plattekill Formation.

The water-bearing unit of interest underlying the Site is the fractured bedrock aquifer, as the overburden is understood to not be saturated. Previous reports have noted that the Site occupies a topographic high and have characterized groundwater flow as being radial in all directions from the highest portions of the Site. A northeast-southwest divide underlies the landfill. Under most of the Site, groundwater flows to the southeast. To the north of the divide, groundwater flows to the northwest. A comparison between groundwater elevations measured in the shallow (25 to 50 feet below ground surface (bgs)) and deep (60 to 90 feet bgs) bedrock indicates a downward vertical gradient in the vicinity of the groundwater divide.

Previous field mapping and borehole geophysics of MW-7D indicated that the predominant fractures are nearly vertical and are oriented north-northeast to-south-southwest. The secondary fracture set, approximated perpendicular to the primarily set, is also steeply dipping.

2.3 Topography and Site Drainage

The Site is located in the foothills east of the Catskill Mountains. The foothills form southwest/northeast trending steps or benches that descend from northwest to southeast. The Site is located on one of the benched areas. The Site's current topography includes existing bedrock walls and a flat quarried bedrock surface in the northeast and the landfill mound rising 50 feet above the surrounding ground surface in the southeast. The landfill area is situated below a bench that underlies the current transfer station parking lot, and above a bench that includes several residential properties (located southeast of the Site).

Surface water is present south and east of the landfill mound. Additionally, surface water gathers at the base of a hill southeast of the transfer station parking lot and flows east through a drainage ditch and then south across the Site before discharging to the flooded wetland east of the Site.

Precipitation runs off radially from the covered landfill to the outer edge of the mound, where it either infiltrates into shallow bedrock or runs off to the lower-lying areas to the north, south, east, and west. A Land Surface Elevation Contour Map showing the Site's topographic features is provided on **Figure 3**.

2.4 Site Features and Use

The Site is a former municipally owned and operated solid waste disposal facility. Currently, the Town of Saugerties operates a transfer station, which accepts household waste from the surrounding area, and an animal shelter. The Site is listed by Ulster County as property class 852 – Landfill within a commercial neighborhood.

The Closed Landfill occupies 11 acres of the southeast portion of the Site. The landfill was closed and capped with a geomembrane and soil cover system in 1997. A leachate collection system and passive soil gas venting layer were also installed. The landfill closure was performed in general accordance with the Closure Plan and was approved by the NYSDEC.

The Site currently implements a post-closure monitoring program consisting of routine groundwater sampling, surface water sampling, and Site inspections in accordance with 6 New York Codes, Rules, and Regulations (NYCRR) Part 360. The most recent inspection report available for review is dated October 12, 2022, and is discussed in **Section 2.7.9**.

Woodlands are present off-site, south of the landfill mound, and in the southwest portion of the Site. An approximately 8-acre solar farm was installed in 2020 and covers much of the landfill cap and areas north of the landfill mound and north of the transfer station.

Access to the Site is provided through a locked gate at the driveway entrance to Route 212, and a gate house is located north of the transfer station and recycling building. Additional fencing within the Site surrounds the solar arrays, landfill, and an area west of the landfill mound which has been cleared and graded for the construction of a new animal shelter.

As discussed above, TRC understands the Town of Saugerties will be building a new animal shelter in the western part of the Site, west of the landfill. In July and August 2022, a well (identified throughout this Work Plan as TS-ASW) was drilled to supply non-potable water to this building. TRC, including the NYSDOH and NYSDEC, understand that TS-ASW is planned for non-potable use and that bottled water will be provided for potable uses.

The well was drilled by Jim Wild Well Drilling of Gardiner, New York using air rotary and cable tool methods to a depth of 500 feet bgs and was finished with a 6-inch diameter steel casing to approximately 118 feet bgs, with approximately 2 feet of casing remaining above ground surface. Bedrock was encountered at approximately 10 feet bgs, and the well completion report indicates the bedrock was shale. The well completion report indicates that a yield test was conducted on August 1, 2022, and a stabilized discharge of 3 to 5 gallons per minute (gpm) was observed.

2.5 Off-Site Features and Use

The Site is surrounded by a mix of commercial and residential properties. Located approximately 1,200 feet south of the Site is a residential community located along John Joy Road and Sawood Lane. Additional residences are located west of the Site along Artist Road. Based on TRC's understanding, the residential homes within these neighborhoods are connected to private water wells and no public municipal water supplies the area. Historically, the area surrounding the Site consisted of vacant, wooded land from 1942 through 1978. Residences are first visible in the 1978 aerial photograph and reached their present-day extents by 1994.

A used car lot is located west of the Site, and several parcels to the northwest of the Site contain automotive and material storage areas. A parcel of cleared land, immediately east of the Site at the end of Fel Qui Road (identified as "Cleared Parcel on **Figure 2**), has reportedly been the location of an unlicensed dumping operation which has affected drainage and caused flooding east of the Site, as shown on **Figure 2**.

2.6 Site History / Past Use

In 1970, the Town of Saugerties purchased the Site to operate it as a landfill when the nearby Town of Woodstock refused to accept out-of-town wastes. Prior to 1970 the Site was used for agriculture.

Initially, refuse was disposed of in three trenches excavated by the Town in the northern portion of the Site (identified as the "Original Waste Limit Disposal Area" on **Figures 2** and **5**). In addition to typical municipal solid waste, the three trenches in the northern portion of the Site reportedly received 750 tons of grinding sludge, 350 tons of grinding swarf, and 55 cubic yards of wastewater treatment sludge per year for several years from a local electronics manufacturer, Ferroxcube. The sludge and grinding swarf reportedly contained elevated levels of iron oxide, zinc oxide, and manganese oxide. The area was graded with a soil cover in the 1970's.

After the original trenches were filled, the Town began landfilling municipal solid waste in the southern portion of the Site (identified as "Closed Landfill Limits" on **Figures 2** and **5**). The exact depth of landfilled materials is unknown, but the landfill closure report indicated that Town employees estimated that the depth of the first "cell" is 30 to 40 feet bgs. To prepare the Site for use as a landfill, the Town reportedly mined and sold shale to a private contractor. Additionally, a portion of the Closed Landfill was formerly used as a quarry by the Town to provide cover for the landfill. The Saugerties Landfill operated from 1970 through 1996, when landfill operations ceased.

The March 1996 Landfill Closure Plan included specifications for the construction of a final cover system, gas venting layer, and leachate collection system. Construction activities commenced in June 1996 and were completed in April 1997. The landfill was subsequently closed and capped with a geomembrane and soil cover system in 1997. A leachate collection system and passive soil gas venting layer were also installed. The landfill closure was performed in general accordance with the Closure Plan and was approved by the NYSDEC.

A post-closure monitoring program, consisting of routine groundwater sampling, surface water sampling, and Site inspections in accordance with 6 NYCRR Part 360, is being implemented. The most recent inspection report available for review is dated October 12, 2022, and is discussed in **Section 2.7.9**.

2.7 Previous Environmental Investigations and Sampling

The Site was previously investigated as an inactive hazardous waste site in the late 1980s and early 1990s. This section presents a summary of previous environmental investigation and sampling information for the Site that was available to TRC.

2.7.1 *Engineering Investigations at Inactive Hazardous Waste Sites in the State of New York NYSDEC Phase I Investigation – Town of Saugerties Landfill Site # 356003 (EA Science and Technology, 1987)*

In June 1987, the NYSDEC retained EA Science and Technology of Middletown, New York (EA) to investigate the effect of several landfills on groundwater quality across the State, including the Site. A summary of the results of the EA investigation are provided below.

The Site was issued a solid waste disposal permit by New York State in March 1979 under which it was no longer permitted to accept hazardous industrial wastes or septic sludges. As part of the permit requirements, two groundwater monitoring wells (MW-N and MW-S) were installed.

In 1987, the Town of Saugerties entered into an Order of Consent to comply with NYSDEC mandates set forth in the 6 NYCRR Part 360 Regulations and close the landfill.

In June 1987, EA conducted a Phase I Environmental Site Assessment (ESA) and determined, based on prior reporting and a review of historical activities, that a Phase II ESA was warranted. EA's Phase II ESA Work Plan proposed collecting additional data through the completion of a geophysical study, the installation and sampling of six monitoring wells, and the collection and analysis of groundwater, surface water, and sediment samples. Based on prior reporting and a review of historical activities which indicated the possibility of hazardous waste disposal, the NYSDEC agreed that a Phase II ESA was warranted.

2.7.2 *Investigations at Inactive Hazardous Waste Sites in the State of New York - Phase II Investigation (Gibbs & Hill, Inc., March 1990)*

From July 1988 to February 1989, Gibbs & Hill (G&H) of New York, New York conducted Phase II ESA activities at the Site, which included the installation of four additional monitoring wells (MW-1 through MW-4).

Four groundwater samples, one duplicate groundwater sample, two surface water samples, and two sediment samples were collected and submitted for laboratory analysis of Target Compound List (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), pesticides, Polychlorinated Biphenyls (PCBs), and Target Analyte List (TAL) metals. Two leachate samples were proposed but not collected as leachate was not observed.

Groundwater sample results indicated that detectable concentrations of two VOCs were present in shallow groundwater. One of the VOCs was bis-2-ethylhexyl phthalate, a common laboratory artifact which was found in each sample, as well as the field and method blanks. The other VOC

was 1,1,1–trichloroethane (TCA), detected in MW-4 at a concentration of 6 µg/l which marginally exceeded the TOGS Class GA Value of 5 µg/l.

The metals iron and manganese were detected in the groundwater samples at concentrations above United States Environmental Protection Agency (USEPA) and NYSDEC drinking water standards. It was also noted that pesticides, PCBs, and SVOCs were not detected in the groundwater samples.

The surface water samples contained calcium, iron, lead, manganese, potassium, silver, sodium, vanadium, and zinc at concentrations above NYSDEC TOGS No 1.1.1 Addendum, Class A Standards and Guidance Values (Class A Values). The surface water samples did not contain detections of SVOCs or PCBs. The VOCs bis-2-ethylhexyl phthalate and TCA were detected at concentrations below the NYSDEC Class A Values. The pesticides 4,4' dichloro-diphenyl-trichloroethane (DDT) and aldrin were detected above NYSDEC Class A Values.

The sediment samples contained concentrations of TCA and cadmium above the soil standards referenced in this report (1988 NYCRR Part 360-4.4)

Based on the investigation results and prior reports (Phase 1 and Phase 2), the NYSDEC determined that a supplemental Phase II ESA was warranted.

2.7.3 Investigations at Inactive Hazardous Waste Sites in the State of New York – Supplemental Subsurface Investigation (Hazen & Sawyer, September 1993)

In June and July 1993, Hazen & Sawyer (H&S) of Upper Saddle River, New Jersey conducted supplemental Phase II ESA activities at the Site, which included the installation of three additional monitoring wells (MW-5, MW-6S, and MW-6D) and the repair/retrofitting of two existing monitoring wells (MW-N and MW-S). Following development of the new monitoring wells, two rounds of water-level measurements were obtained from the on-Site monitoring wells. Groundwater samples were collected from the nine wells and analyzed for TCL VOCs, TCL SVOCs, pesticides, PCBs, and TAL metals.

Results of the groundwater sampling indicated elevated concentrations of silver, cadmium, chromium, lead, and zinc in four monitoring wells (MW-1, MW-5, MW-6D, and MW-N). In addition, VOCs were detected in the groundwater samples at concentrations that exceeded the Class GA Values: 1,1-dichloroethane (MW-4); benzene (MW-3, MW-6D, and MW-S); toluene (MW-3 and 4); and chlorobenzene (MW-3 and MW-S). The VOC 1,1-dichloroethane was detected in MW-4 at a concentration of 0.00648 milligrams per liter (mg/L) as compared to the Class GA Value of 0.005 mg/L in use at the time. Benzene was detected at a maximum concentration of 0.0133 mg/L as compared to the Class GA Value of 0.0007 mg/L. Toluene was detected at a maximum

concentration of 0.0656 mg/L as compared to the Class GA Value of 0.005 mg/L. Chlorobenzene was detected at a maximum concentration of 0.0211 mg/L as compared to the Class GA Value of 0.005 mg/L.

Results of the private well sampling indicated elevated concentrations above the Class GA Values of iron, manganese, turbidity, and Total Dissolved Solids (TDS) in each of the samples the samples collected. In addition, concentrations of lead exceeded the Class GA Value in four of the eight private wells sampled. H&S' conclusion was that the detections were not necessarily attributable to the landfill.

As part of this investigation, hydraulic conductivity testing, and fracture trace analysis were also conducted. The analysis showed bedrock consists of Devonian age sandstone and shale which outcrops in several areas at the Site. The bedding planes on Site lie nearly horizontal, dipping slightly to the north. A comparison between groundwater elevations measured in shallow (25 to 50 feet bgs) and deep (60 to 90 feet bgs) bedrock indicates a downward vertical gradient in the vicinity of the landfill.

As a result of this investigation, the Site was de-listed and referred to the NYSDEC's Division of Solid Waste.

2.7.4 Landfill Closure Investigation Report - Town of Saugerties Landfill (Clough, Harbour, and Associates, May 1994)

Based on a review of previous work, the NYSDEC determined that the Site was not in compliance with applicable state and federal regulations. CHA was retained by the Town of Saugerties to provide engineering and hydrogeological services in support a Closure Investigation Report (CIR) for the Site to comply with 6 NYCRR Part 360 Regulations.

As part of this investigation, CHA investigated the Original Waste Disposal Area using test pits to evaluate whether hazardous wastes had been disposed of in that area. The test pits revealed that mixed solid waste and construction debris had been disposed of, and that the capping techniques appeared to be consistent with NYSDEC landfill closure regulations that were in effect at the time the Original Waste Disposal Area was closed. TRC's review of the test pit logs indicates that the extent of the waste was not delineated to the south and east.

Two groundwater monitoring wells (MW-1 and MW-N) were re-sampled, and three private residential wells were sampled. The two monitoring wells were analyzed for 6 NYCRR Part 360 baseline VOCs, total and dissolved metals, specific conductivity, and turbidity. The three residential wells were analyzed for the monitoring well parameters in addition to ammonia, TDS, and biological oxygen demand (BOD). Analytical results were generally similar to the results

presented in H&S's 1993 H&S Supplemental Subsurface Investigation Report, with iron, sodium, and calcium detected in private and monitoring well samples at concentrations exceeding the Class GA Values. No VOCs were detected in the monitoring well or residential well samples collected.

As part of this investigation, a landfill gas survey was conducted at the Closed Landfill. Results from sample locations on top of the landfill ranged from 10 to 46 percent methane; readings collected from beneath on-Site buildings showed less than 5 percent methane.

CHA recommended the installation of a cover system on the Closed Landfill to reduce infiltration of rainwater and surface water and thereby minimize groundwater contamination from the unlined landfill.

2.7.5 Post-Closure Environmental Monitoring & Maintenance Plan - Town of Saugerties Landfill (The Chazen Companies, Poughkeepsie, New York, July 2011)

This report documented the tasks necessary for monitoring groundwater, leachate, and explosive gas at the Site, conducting Site maintenance and periodic inspections, and preparing reports to document the work in accordance with 6 NYCRR Part 360 requirements. The report indicated that the following elements are required for monitoring:

- Annual sampling of three on-site groundwater monitoring wells
- Annual sampling of one on-site surface water location
- Annual sampling of three off-site, downgradient, potable residential groundwater wells
- Annual explosive gas sampling
- Annual sampling of on-site leachate
- Annual inspection of the landfill for defects in the cover and drainage structures, evidence of vectors, and other facility structure defects and operability.

2.7.6 Inactive Landfill Initiative – Field Activities Summary Report (Parsons Engineering, May 2019)

As part of the NYSDEC's ILI Program in October 2017, Parsons Engineering of Syracuse, New York (Parsons) sampled two monitoring wells (MW-1 and MW-S) and three residential wells for 6 NYCRR Part 360 leachate indicators, TAL metals, polycyclic aromatic hydrocarbons (PAHs), 1,4-D, PFAS, and VOCs. Analytical results for the three residential wells were not presented in the report.

The results indicated that VOCs, PAHs, 1,4-D, PFOA, and PFOS were not detected in samples collected from the monitoring wells. Metals, including barium, boron, calcium, iron, magnesium, manganese, potassium, sodium, and chloride, were detected in the sample collected from well MW-1.

2.7.7 NYSDEC Site Characterization Report – Saugerties Town Landfill Site 356003 (CDM Smith, October 2021)

As a result of the ILI, the NYSDEC re-opened the inactive hazardous waste site case and retained CDM Smith to perform a Site Characterization (SC) to evaluate the presence/absence of contamination and, if present, determine if the contamination was significantly impacting the environment and/or public health.

Field investigation activities were conducted between November 4, 2020 and March 21, 2021, and included the collection of samples for PFOS, PFOA, and 1,4-D from an existing non-potable supply well, each of the on-site groundwater monitoring wells, and the leachate sump. Surface water samples, with co-located sediment samples, were collected on-site around the landfill perimeter.

In addition, CDM Smith conducted a drone imaging survey with high resolution true color aerial camera and a thermal camera to identify thermal anomalies around landfill cap that could be potential indicators of groundwater or leachate seeps.

Groundwater sample results indicated the presence of detectable concentrations of PFOS in 8 of 10 wells, PFOA in 8 of 10 wells, and 1,4-D in 3 of 10 wells. The concentrations of PFAS ranged from 20 to 70 ng/L and exceeded the interim NYSDOH drinking water Secondary Maximum Contaminant Level (SMCL). Detected concentrations of PFOA ranged from 12 to 31 ng/L and detected concentrations of 1,4-D ranged from 3.7 to 8 µg/L. In addition, the metals iron (detected in eight wells), manganese (detected in seven wells), and sodium (detected in seven wells) were present above TOGS 1.1.1 Class GA Values. Arsenic was detected above the Class GA Value in the sample collected from well MW-6D and the pesticide dieldrin was detected above the Class GA Value in the sample collected from well MW-N.

PFAS was detected in the sample collected from the leachate sump at a concentration (21 ng/L) that exceeds the NYSDOH drinking water MCL (10 ng/L). CDM Smith noted that based on the reported lack of use of the sump, the sample collected from the leachate sump was not considered representative of continual leachate, but instead represented standing water that had collected within the sump.

Surface water sample results indicated the presence of PFOA concentrations above the NYSDOH MCL at three sampling locations, and a 1,4-D concentration above the NYSDOH MCL at one location. In addition, the metals iron, manganese, and sodium were detected at concentrations above NYSDEC TOGS Class A 1.1.1 criteria at several locations.

Sediment sample results indicated four samples contained PFOS concentrations above NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOs), and one sample contained a PFOA concentration above the UUSCO. In addition, one sample, collected from a location southwest of the sump, contained a 1,4-D concentration above the UUSCO.

The SC Report concluded that landfill leachate containing PFOS likely has and continues to migrate from the landfill mass downward through the unlined base and into shallow bedrock. The presence of PFOS in shallow groundwater, surface water, and sediment indicates PFOS is migrating through surficial processes as well. CDM Smith concluded that due to the high solubility of 1,4-D, it is likely that the 1,4-D present in surface water is the result of direct discharge into groundwater and not from sediment contaminated prior to the landfill being capped and closed. 1,4-D was only detected in groundwater at the southern boundary of the Site.

CDM Smith also concluded that the high-angle fractures described in previous investigations and the MW-6D boring log show these fractures may provide a near-vertical pathway for the downward migration of groundwater contamination.

The SC Report recommended additional hydrogeologic investigation as well as leachate production modeling to determine the nature and extent of 1,4-D and PFAS impacts to groundwater.

2.7.8 NYSDEC Site Characterization Report Addendum - Saugerties Town Landfill Site 356003 (CDM Smith, November 2022)

As a follow up to the SC, the NYSDEC requested that CDM Smith conduct additional investigation activities including: surface water, sediment, and seep sampling; installation of a downgradient bedrock monitoring well; packer testing and borehole geophysics of the new bedrock well; long-term groundwater monitoring; land surveying; analytical modeling of leachate production and infiltration; and PFAS mass flux calculation. The additional SC activities were completed by CDM Smith between July 19, 2021, and March 7, 2022.

Two surface water sampling locations were selected in the area south of the Closed Landfill and the results indicated the presence of PFOA in both samples at concentrations above the NYSDOH MCL. In addition, the metals iron, manganese, and sodium and the pesticides dieldrin and alpha BHC were detected at concentrations above the NYSDOH MCL and TOGS Class A Values.

Two sediment samples were collected from off-site areas south of the landfill (co-located with surface water samples). The laboratory results indicated that PFOS was detected at concentrations exceeding the NYSDEC UUSCO in one sampling location (SED-06), and PFOA was detected at a concentration exceeding the UUSCO at the other location (SED-05). In addition, the metal mercury and the pesticide P,P' DDE were detected at concentrations above UUSCOs.

A bedrock monitoring well (MW-7D) was installed to a depth of 101 feet bgs in the Sawood Lane cul-de-sac, located approximately 500 feet south from the Closed Landfill. On July 22, 2021, Earth Data Northeast (EDN) performed a standard suite of borehole geophysics to characterize the geology of the bedrock aquifer and identify transmissive features to guide monitoring well construction.

Based on the results of the borehole geophysics and with concurrence from the NYSDEC, CDM Smith chose three zones to conduct packer testing for further characterization: 60 to 73 feet bgs; 81 to 94 feet bgs; and a single packer test at 60 feet bgs to collect a sample of potentially cascading groundwater from above the static water level. 1,4-D was detected in the samples collected from each of the selected depth intervals. The detected concentrations of 1,4-D in samples collected from the 0 to 60 feet bgs and 60 to 73 feet bgs depth intervals were below the current Class GA Value (0.35 µg/L). The 1,4-D concentration (2.2 µg/L) in the sample collected from the 81 to 94 feet bgs depth interval exceeded the current Class GA Value (0.35 µg/L).

Hydraulic conductivity data shows there is limited connection between the shallow (25-50 feet bgs) and deep (60-90 feet bgs) water-bearing fractures. In addition, these data show regularly spaced cycles of sharply decreasing water levels that then recover over several hours, several times each day, which likely represents drawdown/recovery curves in response to the intermittent pumping of adjacent private residential wells. CDM Smith concluded that the mirrored response between MW-6X and MW-7D indicated a connection between the two wells which are 500 feet apart.

CDM Smith subcontracted a survey to include the nine existing groundwater monitoring wells, the newly installed MW-7D, and non-potable supply well PW-1. Two additional surface water and sediment samples were also collected and analyzed for PFAS, 1,4-D, VOCs, SVOCs, PCBs, pesticides, herbicides, metals, and cyanide. The groundwater sample collected from the newly installed off-site monitoring well MW-7D was only analyzed for PFAS and 1,4-D.

Passive flux meters were deployed at MW-6S, MW-6D, and MW-7D to measure groundwater Darcy flux and PFAS mass flux at the Site. The passive flux meter is a proprietary technology developed and constructed by EnviroFlux and consists of a mesh tube filled with absorbent

material and tracer alcohols. The passive flux meters were deployed in the monitoring wells 6-D and 7-D for 56 days and deployed in MW-6S for 48 days in which groundwater desorbs the tracer and sorbs contaminant mass. Therefore, the results represent an average contaminant mass over this period of time. In addition, pressure transducers were deployed in wells MW-6S, MW-6D, MW-6X, and MW-7D for a 1-month period to calculate time averaged hydraulic gradients and better characterize groundwater flow in the bedrock aquifers.

The passive flux meter results were compared with the fracture analysis conducted as part of historical investigations. The data indicated that the upper 25 to 50 feet of bedrock contains an interconnected fracture system, the density of which decreases with depth. Heat pulse flow meter data from the geophysical investigation showed significant downward water flow between the high angle fracture at 65 feet bgs and the sub horizontal fracture at 87 feet bgs in MW-7D.

2.7.9 Annual Post-Closure Monitoring and Maintenance Report for Landfills- Saugerties Town Landfill Site 356003 (LaBella Associates, Latham, New York, May 2023)

This annual monitoring report documented the results for required periodic inspections, Site maintenance conducted, and groundwater, leachate, and explosive gas monitoring at the Site. In summary, the report shows that Part 360 specific groundwater results and gas readings have been generally stable below criteria over time.

2.7.10 NYSDEC Phase I RI Field Activities Summary Report - Saugerties Town Landfill Site 356003 (TRC Engineers, March 2024)

TRC completed a Phase I RI Field Activities Summary Report dated March 11, 2024. The Phase I RI activities described in the report were completed by TRC between October and December 2023. The primary objectives of the Phase I RI were to:

- Assess the nature and extent of 1,4-D and PFAS migrating on- and off-Site in surface waters, seeps, and/or daylighting leachate by collecting surface soil, sediment, and surface water samples for laboratory analysis.
- Assess the nature and extent of 1,4-D and PFAS in on-Site groundwater via borehole geophysics and discreet packer testing at well TS-ASW to guide additional groundwater monitoring well construction to be completed under the Phase II RI.
- Complete Step 1 of the Fish and Wildlife Resources Impact Assessment (FWIA) in accordance with NYSDEC DER-10.
- Collection of groundwater samples from applicable monitoring wells for the Compound Specific Isotope Analysis (CSIA) of 1,4-D.
- Complete a land survey of Phase I RI sample locations.

The conclusions for each sampled media, as presented in the Report, is provided below. A map showing the location of all Phase I RI sample locations if provided on **Figure 4**. A full description of methods and results can be found in the *March 2024 Phase I RI Field Activities Summary Report*.

Surface Water

- 1,4-D was detected downstream of the landfill leachate collection sump in approximately the same area (WS-202 at 1.1 µg/L and WS-203 at 1.7 µg/L) where daylighting surface water and/or seepage was observed during TRC Site visits in May and October 2023.
- The highest PFOA and PFOS concentrations, exceeding Standards, Criteria, and Guidance (SCGs), were detected in surface water samples WS-201 (PFOA at 13 ng/L and PFOS at 27 ng/L) and WS-203 (PFOA at 22 ng/L and PFOS at 29 ng/L), which are located in the same area as the sump. The second highest PFOA and PFOS concentrations were detected in surface water sample WS-01 (PFOA at 9.5 ng/L and PFOS at 28 ng/L) which was collected in the stained area observed on October 5, 2023 in the northern portion of the landfill adjacent to the scrap metal storage area.

Sediment

- PFOS was detected in the sediment samples at concentrations above the applicable SCGs, where analyzed. The highest PFOS concentration (4.9 micrograms per kilogram [µg/kg]) was detected in sample SE-201, located near the leachate collection sump. PFOA was detected in three samples above SCOs (SE-205, SE-209, and SE-211). The highest concentration (2.5 µg/kg) was detected in sample SE-209, located directly downstream of the highest surface water sample concentrations.

Surface Soil

- Elevated PFAS concentrations (PFOS in particular) were detected in the shallow soil samples collected within and in the vicinity of the landfill at relatively consistent concentrations. PFOS was detected in the ten surface soil samples submitted for analysis, at concentrations ranging from 0.72 µg/kg (SS-107) to 3.7 µg/kg (SS-111). PFOS was detected at concentrations above the UUSCO (0.88 µg/kg) in nine samples.
- PFOA was detected in the 10 surface soil samples, at concentrations ranging from 0.082 µg/kg (SS-113) to 0.46 µg/kg (SS-109). PFOA was not detected at concentrations above the UUSCO in any of the surface soil samples.
- 1,4-D was not detected in surface soil samples.
- Lead, nickel, and zinc surface soil concentrations appear to be highest in the northern portion of the Site where disposal activities reportedly first occurred and included disposal of sludge and grinding swarf from Ferroxcube.

- Lead was detected in each of the 10 samples submitted for analysis. Detected concentrations of lead in 8 of the samples exceeded its UUSCO of 63 milligrams per kilogram (mg/kg) and ranged from 63.3 mg/kg (SS-111) to 139 mg/kg (SS-117).
- Nickel was detected in each of the 10 samples submitted for analysis. Detected concentrations of nickel in 6 of the samples exceeded its UUSCO of 30 mg/kg and ranged from 30.1 mg/kg at SS-113 to 71.3 mg/kg at SS-117.
- Zinc was detected in each of the 10 samples submitted for analysis. Detected concentrations of zinc in 2 of the samples exceeded its UUSCO of 109 mg/kg and ranged from 110 mg/kg at SS-101 to 133 mg/kg at SS-117.

TS-ASW Downhole Geophysics and Packer Testing

- As a result of the downhole geophysics, 5 potential water bearing fracture zones were identified and include: 120 to 125 feet below top of casing (TOC), 130 to 135 feet below TOC, 170 to 175 feet below TOC, 279 to 289 feet below TOC, and 325 to 331 feet below TOC.
- Of the five packer test groundwater samples collected, 1,4-D was detected above its NYSDEC GA Value of 0.35 µg/l at the fracture zones of 130 to 135 feet below TOC, 169 to 175 feet below TOC, and 326 to 331 feet below TOC depth intervals.
- PFOA was detected at concentrations of 7.5 and 8.3 ng/l (duplicate), above the NYSDEC Class GA Value of 6.7 ng/L, in groundwater samples collected from the 169 to 175 below TOC depth interval.
- PFOS was detected in 4 of the 5 samples collected at concentrations ranging from 1.6 ng/l (117 to 124 feet below TOC test interval) to 2.7 ng/l (326 to 331 feet below TOC test interval). No packer test samples exceeded the Class GA Value (2.7 ng/L).
- Total detected PFAS concentrations detected in groundwater ranged from 4.8 ng/L (TS-ASW 130-135) to 29.77 ng/L (TS-ASW 169-175).
- Analytical results indicate that 1,4-D and PFOA concentrations exceeding Class GA Values are present in groundwater bearing fractures at a depth of at least 331 feet below TOC in well TS-ASW.

3.0 General Information

3.1 Project Organization

TRC will implement the RI with oversight from the NYSDEC using qualified TRC personnel and NYSDEC-approved subcontractors. Contact information for designated representatives is provided below:

Contact information for the Town of Saugerties:

Fred Costello, Supervisor
Town of Saugerties
4 High Street
Saugerties, New York 12522
(845) 246-2800

Contact information for the Saugerties Town Landfill:

Doug Myer, Manager
Town of Saugerties Transfer Station
1765 Route 212
Saugerties, New York 12522
(845) 679-0514

Contact information for the NYSDEC:

Anthony Bollasina, P.G., Professional Geologist
New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau D, Section D
625 Broadway
Albany, New York 12233
(518) 402-2754
Anthony.Bollasina@dec.ny.gov

Contact information for the New York State Department of Health (NYSDOH):

Shaun Surani
New York State Department Health
Bureau of Environmental Exposure Investigation

Empire State Plaza – Corning Tower, Room 1787
Albany, New York 12237
(518) 402-7860
BEEI@health.ny.gov

Contact information for TRC:

David Glass, P.E., P.G., Principal in Charge
TRC Engineers, Inc.
1430 Broadway, 10th Floor
New York, New York 10018
(212) 221-7822
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James Magda, P.G., Program Manager
TRC Engineers, Inc
215 Greenfield Parkway, Suite 102
Liverpool, New York 13088
(315) 671-4049
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Justin King, Project Manager
TRC Engineers, Inc
3 Corporate Drive, Suite 202
Clifton Park, New York 12065
(518) 348-1190
JKing@trccompanies.com

NYSDEC-approved TRC subcontractors:

- Phase I and II RI Borehole Geophysics - Hager-Richter Geosciences, Inc.
- Phase I RI Packer Test Services – Cascade Drilling, L.P.
- Phase II RI Utility Locating Services - To be determined
- Phase II RI Tree Removal/Access Road Construction – To be determined
- Phase II RI Drilling and Packer Test Services - To be determined
- Phase II RI Investigation Derived Waste (IDW) Disposal Services - To be determined
- Phase I and II RI Land Surveying Services – Susan M. Anacker, PLS, PLLC
- Phase I and II RI Laboratory Analytical Services - Eurofins TestAmerica

- Phase I and II RI Laboratory Analytical Services (CSIA) - University of Waterloo

3.2 Notifications and Permits

3.2.1 NYSDEC

TRC will provide the NYSDEC 15 business days advance notice prior to the start of work pertaining to this Work Plan.

3.2.2 Property Owner(s)

The NYSDEC will provide property owner(s) 5 to 10 business days notice of the commencement of subsurface intrusive activities on their respective parcels.

3.2.3 Town of Saugerties

TRC understands that no Town of Saugerties permits are required for the implementation of work pertaining to this Work Plan; however, TRC and/or NYSDEC will provide the Town with 10 days notice prior to the start of work in Town Right of Way (ROW) or public properties.

3.2.4 Ulster County

Based on a review of Ulster County requirements and discussions with the NYSDEC, no County notices or permits are required for implementation of this Work Plan.

3.2.5 New York State

The NYSDEC will provide necessary inter-agency notices that are required and/or appropriate prior to the start of work pertaining to this Work Plan.

3.2.6 Federal

Based on a review of Federal requirements, no notices or permits are required for implementation of this Work Plan.

3.3 Governing Documents

3.3.1 General

The RI activities discussed in this Work Plan will be conducted in accordance with the September 12, 2023, NYSDEC DER WA Approval Letter for Standby Engineering Services Contract No. D009812 for a Remedial Investigation/Feasibility Study.

Investigation activities, including sample collection and laboratory analysis, will be completed in accordance with the Standby Engineering Services Contract, DER-10, and other pertinent generic governing documents included in Standby Engineering Services Contract No. D009812, namely TRC's generic Health and Safety Plan (HASP), Community Air Monitoring Plan (CAMP), Field Activities Plan (FAP), and Quality Assurance Project Plan (QAPP).

3.3.2 Site-Specific Health and Safety Plan

A Site-Specific Health and Safety Plan (SSHASP) has been prepared for the activities to be performed under this Work Plan based on the generic HASP and SSHASP template for Standby Engineering Services Contract No. D009812. The SSHASP is provided in **Appendix A**.

3.3.3 Community Air Monitoring Plan

A CAMP will be implemented (as appropriate) during ground intrusive activities in accordance with the NYSDOH generic CAMP. The CAMP will include real-time monitoring for VOCs and particulates (i.e., dust) at one upwind and one downwind perimeter location on a continuous basis during intrusive activities. The CAMP will be implemented by the TRC scientist/engineer overseeing investigation activities. CAMP summaries will be provided to the NYSDOH and NYSDEC on a weekly basis, at a minimum, and any exceedances of action levels and corrective measures will be reported to the Departments immediately (within 24 hours).

A Site-Specific Community Air Monitoring Plan (SSCAMP) has been prepared for the intrusive activities to be performed under this Work Plan. The SSCAMP is provided in **Appendix B**.

3.3.4 EQuIS EDDs and Data Usability Summary Reports

The laboratory analyses summarized in **Tables 1** and **2** will be performed by the laboratories identified in **Section 3.1**.

Quality control samples consisting of one field duplicate and one matrix spike/matrix spike duplicate (MS/MSD) sample will be collected in accordance with TRC's Generic QAPP (i.e., at a frequency of one MS/MSD sample per 20 matrix samples). Equipment blanks will be collected in accordance with TRC's Generic QAPP utilizing water provided and certified by the subcontract laboratory as to not contain PFAS. Where applicable and appropriate, the laboratories will provide NYSDEC Analytical Services Protocol (ASP) Category B data deliverable packages, and Data Usability Summary Reports (DUSRs) will be prepared by TRC or a TRC subcontractor. Electronic Data Deliverables (EDDs) in EQuIS format will be submitted to the NYSDEC and the results will be presented in the Remedial Investigation Report.

4.0 Phase I Remedial Investigation Activities (Complete)

From October 2023 to December 2023, TRC completed the following Site activities as part of the Phase I RI: surface water and sediment sampling, surface soil sampling, borehole geophysics and packer testing of TS-ASW, groundwater sampling and CSIA of 1,4-D analysis of applicable Site monitoring wells, professional land survey, and Step I of the FWIA. The Phase I RI sample locations can be found on **Figure 4**, and the results are described in detail in the *March 2024 Phase I RI Field Activities Summary Report*.

The subcontractors selected to perform the activities outlined below are identified above in **Section 3.1**.

4.1 Surface Water and Sediment Sampling

To determine if Site related 1,4-D contamination have migrated off-Site by way of runoff from surface waters, seeps, and/or daylighting leachate, TRC collected surface water and sediment samples at multiple locations surrounding the landfill. During the May 2, 2023 Site visit, numerous surface waters and/or seeps were identified flowing away from the landfill cap. It was noted that for several days prior to the Site visit, heavy precipitation was prevalent throughout the area. To reduce the likelihood of collecting precipitation induced surface water and instead to collect concentrated landfill seep, leachate, and/or surface water, the sampling was performed in drier conditions in fall 2023. The completed sampling included the below.

4.1.1 Surface Water Sampling

- At 15 locations, surface water either ponding within 50 feet of or flowing away from the landfill cap was sampled**.**
- All surface water samples were submitted for laboratory analysis of 1,4-D.
- Approximately 50 percent of the surface water samples (8 locations) were additionally analyzed for PFAS and TCL VOCs + 10 Tentatively Identified Compounds (TICs) (TCL VOCs+10) by USEPA Methods Draft 1633 and 8260D, respectively. Surface water samples submitted for PFAS and TCL VOCs+10 were biased toward the landfill and/or sensitive receptors (i.e., residence), physical appearance and point of origin (i.e., bedrock seep).

4.1.2 Sediment Sampling

- Co-located with the seven surface water sample locations, TRC collected sediment/soil samples via a decontaminated stainless-steel hand trowel or disposable high-density polyethylene (HDPE) sampling device.

- The sediment/soil samples were screened for evidence of contamination (via photo-ionization detector (PID) and visual observation) and characterized using the Unified Soil Classification System (USCS) and/or Modified Burmister system
- Sediment/soil samples were biased toward surface water samples selected for additional analyses and submitted for analysis of 1,4-D, PFAS, and TCL VOCs+10 by USEPA Methods 8270 Low Level, Draft 1633, and 8260D, respectively. .

4.2 Surface Soil Sampling

To determine if potential contaminated runoff or seeps from the landfill have impacted surface soils, TRC collected 18 surface soil samples as described below.

- Thirteen surface soil samples were collected within 25 feet of the landfill cap and/or accessible areas topographically downgradient of the landfill. Five surface soil samples were collected in accessible areas within the original waste disposal area, located north of the current landfill cap.
- Surface soil samples were collected at a depth of 0 to 2 inches below the encountered vegetation or engineered surface cover (i.e., gravel, road base, etc.).
- The soil samples were screened for evidence of contamination (visual, olfactory, and via PID) and characterized using the USCS and/or Modified Burmister system.
- All surface soil samples were submitted for laboratory analysis of 1,4-D by USEPA Method 8270 Low Level.
- Approximately 50 percent of the surface soil samples (9 locations) were additionally submitted for analysis for PFAS, TCL VOCs+10, TCL SVOCs plus 20 TICs (TCL SVOCs+20), TCL Pesticides, PCBs, and TAL Metals by USEPA Methods Draft 1633, 8260D, 8270E, 8081B/8082A, and 6010D/7470A, respectively

4.3 TS-ASW Borehole Geophysics

With the objective of identifying fracture zones that are contributing 1,4-D contamination to TS-ASW (open hole from approximately 120 to 500 feet below ground surface (bgs)), a downhole geophysical survey was performed on November 9, 2023. The geophysical tools used to log the well included borehole caliper, fluid temperature and resistivity, acoustic televiewer, and heat pulse flow meter (HPFM) under ambient flow conditions.

It should be noted that prior to borehole geophysics and following discreet packer testing (**Section 4.4**), the downhole pump within TS-ASW was pulled and re-installed by Huber Enterprises, Inc. of Catskill, New York.

4.4 TS-ASW Discreet Packer Testing

Packer sampling of the existing 500-foot-deep, open borehole of bedrock supply well TS-ASW was completed between December 6 and December 12, 2023, by Cascade Drilling, L.P. of Mineola, NY. Each test interval was isolated using a double packer system separated by an approximately 10-foot section of slotted steel pipe with intervals customized based on the distribution of fractures at each interval. After inflating the packers, the groundwater in the isolated test interval was purged using a Waterra pump with PFAS-free High-Density Polyethylene (HDPE) tubing. The field procedures required well purging until field indicator parameters (i.e., pH, conductivity, temperature, dissolved oxygen (DO), oxygen reduction potential (ORP), and turbidity) achieved stabilization or the interval was purged dry. During the testing, each test interval was purged dry before field indicator parameters stabilized. Samples were collected using the Waterra pump with HDPE tubing after the interval recharged.

Samples were subsequently collected and submitted for laboratory analysis to Eurofins for analysis of 1,4-D by USEPA Method 8270 SIM, PFAS by USEPA Draft Method 1633, Boron by USEPA Method 200.7, Nitrate by USEPA Method 353.2, and Total Suspended Solids via USEPA Method 3510C. The following intervals were subject to sampling:

- 117 to 124 feet below TOC;
- 130 to 135 feet below TOC;
- 169 to 175 feet below TOC; and
- 326 to 331 feet below TOC.

No sample was obtained from the 279 to 289 feet below TOC interval due to insufficient recharge. The packer assembly and downhole equipment were decontaminated in accordance with the field activities plan in between intervals.

4.5 Groundwater Sampling of Selected Monitoring Wells

On November 28 and 29, 2023, groundwater samples were collected from five monitoring wells (MW-S, MW-6S, MW-6D, MW-6X, and MW-7D) to determine applicability of CSIA of 1,4-D. The groundwater samples were collected utilizing standard low-flow sampling techniques. Following stabilization of field indicator parameters, samples were collected in laboratory supplied bottles, placed on ice, and submitted to Eurofins for analysis of 1,4-D.

4.6 Compound Specific Isotope Analysis of 1,4-Dioxane

The results of the packer testing and groundwater sampling tasks outlined above were reviewed and assessed for applicability of CSIA sampling of 1,4-D. CSIA sampling of applicable monitoring wells will aid in identifying/differentiating potential source areas of the Site.

The groundwater samples collected from the monitoring wells and well TS-ASW that had detected concentrations of 1,4-D greater than 0.5 µg/l were submitted for CSIA analysis. As a result, eight samples were collected for CSIA as outlined below:

- MW-6D
- MW-S
- MW-6X
- MW-6S
- MW-7D
- TS-ASW (169-175 feet below TOC packer interval)
- TS-ASW (130-135 feet below TOC packer interval)
- TS-ASW (326-331 feet below TOC packer interval)

The samples were submitted to the University of Waterloo, under contract to TRC, for CSIA analysis of 1,4-D, specifically $\delta^{13}C$ (carbon) and $\delta^{2}H$ (hydrogen) analytes. Results of the Phase I RI CSIA of 1,4-D analysis will be presented and discussed in the Remedial Investigation Report (**Section 6.0**).

4.7 Land Survey

On November 20, 2023, a professional land survey was completed and consisted of the following:

- Location and elevation of the existing borehole for supply well TS-ASW including elevations of adjacent ground surface and top of protective casing elevations;
- Location and elevation of the leachate collection system sump (top of water level), cleanouts (top), and the leachate aboveground storage tank; and
- Locations and elevations of surface water, sediment, and surface soil samples.

4.8 Fish and Wildlife Resources Impact Assessment – Step 1

TRC completed a Fish and Wildlife Impact Assessment (FWIA) for the Site on October 10, 2023, in accordance with NYSDEC DER-10 and the NYSDEC Guidance Document, *Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites*. The activity included components associated with Step 1 of the FWIA process, including wetland and waterbody delineations, ecological cover-type classification and mapping, evaluation of habitat quality, and identification of Site-specific and contaminant-specific sediment, soil, and water screening criteria.

5.0 Phase II Remedial Investigation Activities

The following Scope of Work (SOW) describes the additional remedial investigation activities, with the objective of further defining the nature and extent of potential on-Site contamination, off-Site contamination south, east and west of the Site, and preparation of a Remedial Action Report.

In May 1994, CHA investigated the Original Waste Limit Disposal Area using test pits to evaluate whether hazardous wastes had been disposed of in that area. Based on TRC's review of the test pits, waste delineation is potentially incomplete to the south and east. The on-site investigation includes soil borings along the perimeter of the Original Waste Limit Disposal Area to further define waste limits.

On May 2, 2023 and April 18, 2024, TRC personnel conducted a Site visit/inspections to examine the physical features, topography, utilities, proposed soil boring and monitoring well locations (see **Figure 5**), and access to the Site and surrounding properties. The subcontractors selected to perform the activities outlined below are identified above in **Section 3.1**.

5.1 Soil Boring and Open Hole Bedrock Monitoring Well Installations

5.1.1 Utility Clearance

Under this subtask, the proposed soil boring and monitoring well locations will be verified in the field with the selected driller. A private utility locating survey will be conducted, in addition to the public utility mark outs, to clear proposed boring and monitoring well locations. The utility locating surveyor will survey the area within an approximately 20-foot radius around each proposed investigation location. Subsurface utilities/structures/anomalies will be identified on the ground surface with spray paint and/or pin flags.

TRC will discuss soil boring or monitoring well repositioning required by identified subsurface utilities/structures/anomalies with the NYSDEC PM prior to installation. It is anticipated that offsets of 20 feet or less will not require prior notification/approval.

5.1.2 Clearing, Grading and Access Road Construction

Concurrent with utility locating activities, a determination will be made as to the extent of clearing, grading, and/or road construction needed to allow access to each proposed bedrock well location with the required drilling equipment.

5.1.3 Soil Boring and Bedrock Monitoring Well Installation and Development

Installation of up to six new bedrock monitoring wells (three located on-site and three located off-site) each to a depth of 400 feet bgs have been proposed, as shown on **Figure 5**. The on-Site

monitoring wells are shown with dark green symbols and off-Site wells are shown with purple symbols. Activities anticipated to be completed during the soil boring and bedrock monitoring well installations are further described below.

Direct Push Soil Borings

Continuous soil sampling will be completed at up to 11 boring locations to a depth of 5 feet below the encountered water table (expected to be within 5 to 10 feet bgs) or refusal, whichever is encountered first. Subsurface soil samples will be collected via a macrocore sampling system and small diameter poly-vinyl chloride (PVC) sleeves. Five of these borings will be advanced in the northern portion of the Site (shown in light green on **Figure 5**) to further delineate the extent of the Original Waste Limit Disposal Area, and the remaining six borings (shown in light red on **Figure 5**) will be used to characterize soil at the proposed monitoring well locations.

One soil sample, collected from directly above the bedrock surface, will be submitted for laboratory analysis of 1,4-D by USEPA Method 8270D Low Level and PFAS by USEPA Method Draft 1633. The samples will be field screened by qualified TRC field staff visually and with a PID for organic vapors. If field screening indicates the potential for contaminated soil, a second sample will be collected from the corresponding depth interval.

If waste is encountered, each borehole will be grouted using a cement/bentonite grout from the refusal depth to ground surface after completion. If waste or other visual evidence of gross contamination is not encountered, recovered soils will be placed back into the borehole.

Open Hole Bedrock Monitoring Wells

The boreholes for the monitoring wells will initially be advanced through the overburden to bedrock using 8.25-inch inner diameter (ID) hollow stem augers (HSAs).

Following the advancement of HSAs at each location, a nominal 8-inch diameter pilot hole will be advanced using air rotary or cable tool methods to approximately 5 feet into competent bedrock. A 6-inch diameter steel casing will then be installed and grouted into place prior to further advancement to limit potential for vertical leakage. Following a minimum 48-hour curing period, a 5.75-inch diameter borehole will be further advanced below the casing using air-rotary or cable tool drilling methods to a terminal depth of 400 feet bgs for each bedrock well.

Following installation, each monitoring well will be developed utilizing surging and pumping and/or air lifting techniques, as appropriate. Groundwater quality parameters (i.e., pH, temperature, salinity, conductivity, turbidity, ORP, and DO) will be monitored prior to, during (at an approximate frequency of once per well volume purged), and at the conclusion of development. Development

will be considered complete when either turbidity is below 50 nephelometric turbidity units (NTUs), the well purges dry, or 10 well volumes have been removed, whichever occurs first.

Following development, each borehole will then be evaluated via downhole geophysics and packer testing utilizing the same methods, sampling protocol, and subcontractor selected for work as described below in **Section 5.2**.

5.2 Borehole Geophysics and Packer Testing

Borehole geophysics and packer testing subcontractors will be retained to identify fracture zones that may be acting as conduits for PFAS and 1,4-D contamination migrating from the Site.

The methods used to perform the geophysical survey of each open hole bedrock monitoring well will include caliper, fluid temperature and conductivity, optical and acoustic televiewer, natural gamma, and/or heat-pulse flow meter under ambient and stress/pumping conditions. Geophysical logging will be viewed in real time to identify potential water-bearing fracture zones and select packer test intervals.

After selection of the packer test intervals and with concurrence from the NYSDEC, the selected packer testing subcontractor will perform packer tests at up to five zones in each borehole utilizing the following procedures:

- Packer tests will be initiated at the lowest fracture zone to be tested and proceed upward through the borehole.
- A straddle packer assembly, pump and tubing, and instrumentation will be used to monitor changes in head and indicators of yield and packer tightness during pumping. After successfully inflating and setting the packers at each test interval, the subcontractor will initiate pumping of the test interval at a flow rate specified by TRC to permit monitoring water quality using a water quality meter and a flow cell. A flow rate will be determined based on fracture yield.
- At each packer interval, field sampling parameters (i.e., pH, temperature, salinity, conductivity, oxidation-reduction potential, dissolved oxygen and turbidity) will be recorded at frequent intervals during pumping.
- After field sampling parameters have stabilized, a groundwater sample will be collected via pump and tubing for laboratory analysis. One sample will be collected from each packer interval and submitted for analysis of:
    - 1,4-D by USEPA Method 8270 SIM;
    - PFAS by USEPA Draft Method 1633;

- Boron by USEPA Method 200.7;
- Nitrate by USEPA Method 353.2;
- Total Suspended Solids via USEPA Method 3510C; and
- CSIA for 1,4-D (to be held in refrigeration pending review of the 1,4-D results).

- To facilitate CSIA for 1,4-D (refer to **Section 5.7**), the total 1,4-D analysis will be performed on an expedited (5 day) turnaround time (TAT), if possible.
- Purge water generated during packer testing activities will be discharged to a frac tank that will be brought to the Site.
- After completion of geophysics and packer testing, a blank FLUTe liner will be installed in each open borehole to prevent vertical contaminant migration. To limit the length of time each bedrock monitoring well remains an open borehole, the drilling and geophysical/packer testing tasks will be completed as soon as possible after drilling and concurrently within the same mobilization.

5.3 Bedrock Monitoring Well Completion

After review of the packer testing analytical results and in consultation with the NYSDEC, TRC will select proposed well screen intervals for each bedrock monitoring well. Alternatively, if review of the geophysical and packer test results indicates a need for multi-level monitoring well systems, TRC will review available technologies and seek concurrence from the NYSDEC as appropriate.

Following installation, each monitoring well will be developed utilizing surging and pumping and/or air lifting techniques, as appropriate. Groundwater quality parameters (i.e., pH, temperature, salinity, conductivity, turbidity, ORP, and DO) will be monitored prior to, during (at an approximate frequency of once per well volume purged), and at the conclusion of development. Development will be considered complete when either turbidity is below 50 nephelometric turbidity units (NTUs), the well purges dry, or 10 well volumes have been removed, whichever occurs first.

5.4 Investigation Derived Waste Management

IDW is anticipated to include the following: decontamination fluids, well development and purge water, soil and rock drill cuttings, and used PPE and sampling equipment/supplies. Wash and rinse water used for equipment decontamination, development water, and purge water will be containerized in a closed top frac tank (minimum 20,000-gallon capacity). Drill cuttings and other solids will be containerized in 20 cubic yard roll-off containers.

Waste characterization sampling and analysis will be performed prior to off-site disposal in accordance with Subcontractor recommendations and facility requirements.

5.5 Groundwater Sampling

After a minimum of 2 weeks following well development activities, water-level measurements of the existing and newly installed monitoring wells will be completed utilizing a PFAS-free water-level meter. In addition, monitoring wells will be screened with a PID and gauged for total well depth.

Groundwater samples will be collected from the existing and newly installed wells (anticipated total of 16 samples) using low-flow sampling techniques and submitted for laboratory analysis of 1,4-D, PFAS, boron, nitrate, and total suspended solids by USEPA Methods 8270 SIM, Draft 1633, 200.7, 353.2, and 3510C, respectively.

In addition, groundwater samples will be collected for the analysis of CSIA for 1,4-D. All CSIA samples will be held in refrigeration pending the results of the total 1,4-D results. To facilitate CSIA for 1,4-D (refer to **Section 5.7**), the 1,4-D analyses will be performed on an expedited (5 day) TAT, if possible.

5.6 Hydraulic Conductivity/Groundwater Monitoring

After the conclusion of groundwater sampling activities, up to two rising/falling head slug tests will be performed on each newly installed bedrock monitoring well to estimate hydraulic conductivity.

Following slug testing, pressure transducers will be deployed in each newly installed bedrock monitoring well for data collection over an approximate 1-month period. Collected water-level data will be used to evaluate the effect of local demand on groundwater flow, in addition to determining groundwater flow directions during static periods (i.e., approximate period between 2 AM and 4 AM).

5.7 Compound Specific Isotope Analysis of 1,4-Dioxane

The results of the groundwater sampling task described above in **Sections 5.2** and **5.5** will be reviewed and assessed for applicability of CSIA sampling of 1,4-D. CSIA sampling of the newly installed bedrock monitoring wells will aid in identifying/differentiating potential source areas.

It is anticipated that all packer test samples and newly installed bedrock monitoring wells groundwater samples with 1,4-D concentrations greater than 0.5 µg/l will be submitted for CSIA.

5.8 Land Survey

The land survey will include the locations and elevations (ground surface, top of well casing, top of PVC well riser, and top of protective cover, as applicable) of the 6 newly installed off-Site

monitoring wells, 11 soil borings, and other features of interest to TRC. The ground surface and measuring point on each PVC well riser will be permanently marked by the professional land surveyor. A survey report, documenting the coordinates/elevations of the newly installed monitoring wells, will be signed and sealed by a Professional Land Surveyor (PLS) licensed to practice in the State of New York, and provided in the RI Report.

6.0 Remedial Investigation Report

The Phase I RI Field Activities Data Summary Report will be modified to include the results of the additional Phase II RI and prepare a comprehensive Remedial Investigation Report. The Remedial Investigation Report will be prepared in accordance with the applicable provisions of NYSDEC DER-10 and include the following:

- Background information for the Site;
- Characteristics of the area investigated, including physical features, topography, geology, and hydrogeology;
- Description of field investigation activities performed;
- Investigation, testing/screening, and sampling results including a comparison to SCGs (as applicable);
- Figures showing the Site location, Site features, sample locations, geology, groundwater surface elevations, contaminant distribution, etc.;
- DUSR results;
- Evaluation of Phase II RI data (field, laboratory, geophysics, packer testing, etc.);
- Presentation and evaluation of CSIA of 1,4-D analytical data.
- Identification of known and/or potential contaminant migration pathways and contaminant receptors;
- Update of the Conceptual Site Model;
- Conclusions regarding the significance of RI findings including recommendations for additional investigation activities, continued monitoring, or completion of a Feasibility Study;
- Project GSR metrics; and
- Supporting documentation (e.g., field forms, photographs, data usability summary reports, etc.) as appendices.

7.0 Schedule

Presented below is a tentative project schedule for implementation of each of the tasks described above. The schedule will be updated periodically and summarized in the regular monthly project progress reports during project implementation.

Task Description	Completed or Estimated Completion Date
Phase I Remedial Investigation (Complete)	
Step 1 Fish and Wildlife Impact Assessment	October 2023
Surface Soil Sampling	November 2023
Groundwater Sampling of Selected Monitoring Wells	
Land Survey	
TS-ASW Borehole Geophysics	
TS-ASW Discreet Packer Testing	December 2023
Phase I RI Field Activities Summary Report	March 2024
Phase II Remedial Investigation	
Scope of Work Development and Subcontractor Procurement	May-August 2024
Direct Push Soil Borings	September-November 2024
Bedrock Monitoring Well Installation	
Borehole Geophysics and Packer Testing	
Bedrock Monitoring Well Completion	
IDW Disposal	
Groundwater Sampling	October-December 2024
Hydraulic Conductivity / Groundwater Monitoring	
Land Survey	
Remedial Investigation Report	*April 2025*

TABLES

Table 1
New York State Department of Environmental Conservation
Saugerties Town Landfill – Site No. 356003
WA No. D009812-33
Phase I RI Sampling and Analysis Plan

Task	Sample Type	Sample Matrix	Number of Samples for Analysis	PFAS - 40 Compounds (USEPA Draft Method 1633)	1,4-Dioxane (USEPA Methods 8270 SIM or 8270E LL)	CSIA of 1,4-Dioxane (University of Waterloo Proprietary Method)[2]	TCL VOC + 10 TICS (USEPA Method 8260)	TCL SVOCs, TCL Pesticides, TAL Metals, PCBs[1]
PHASE I REMEDIAL INVESTIGATION SAMPLING AND ANALYSES								
Surface Water Sampling	Water	Water	15	X[3]	X		X[3]	
	Blind Duplicate	Water	1					
	MS/MSD	Water	2					
	Trip Blank	Water	1					
Sediment Sampling	Sediment	Soil	7	X	X		X	
	Blind Duplicate	Soil	1					
	MS/MSD	Soil	2					
Surface Soil Sampling	Surface Soil	Soil	18	X[3]	X		X[3]	X[3]
	Blind Duplicate	Soil	1					
	MS/MSD	Soil	2					
Packer Test Sampling	Groundwater	Groundwater	4	X	X			
	Blind Duplicate	Groundwater	1					
	MS/MSD	Groundwater	2					
Groundwater Sampling	Groundwater	Groundwater	5			X[3]		

Notes:
1 - TCL SVOCs by USEPA Method 8270; Pesticides and PCBs by USEPA Method 8082; TAL Metals by USEPA Method 6010
2 - Monitoring wells containing concentrations of 1,4-dioxane greater than 0.5 micrograms per liter (ug/L) will be sampled for CSIA of 1,4-dioxane, specifically δ13C (carbon) and δ2H (hydrogen) analytes. As the University laboratory is not Environmental Laboratory Approval Program (ELAP) certified, nor is there a USEPA Method for CSIA, QA/QC samples will not be collected, and analytical results will not be validated.

3 - Number of samples submitted collected are location specific. See the *March 2024 Phase I RI Field Activities Field Report* for additional details.

CSIA : Compound Specific Isotope Analysis
MS/MSD : Matrix Spike/Matrix Spike Duplicate
PFAS : Per- and Polyfluoroalkyl Substances
PCBs : Polychlorinated Biphenyls
SIM : Selective Ion Monitoring
SVOCs : Semi-Volatile Organic Compounds
TAL : Target Analyte List
TCL : Target Compound List
TICs : Tentatively Identified Compounds
USEPA : United States Environmental Protection Agency
VOCs : Volatile Organic Compounds

Table 2
New York State Department of Environmental Conservation
Saugerties Town Landfill – Site No. 356003
WA No. D009812-33
Phase II RI Sampling and Analysis Plan

Task	Sample Type	Sample Matrix	Number of Samples for Analysis	PFAS - 40 Compounds (USEPA Draft Method 1633)	1,4-Dioxane (USEPA Methods 8270 SIM or 8270E LL)	CSIA of 1,4-Dioxane (University of Waterloo Proprietary Method)[2]	Waste Characterization Parameters[3]
PHASE II REMEDIAL INVESTIGATION SAMPLING AND ANALYSES							
Soil Boring / Bedrock Monitoring Well Installations	Soil[1]	Soil[1]	22	X	X		
	Blind Duplicate	Soil[1]	2				
	MS/MSD	Soil[1]	4				
	Equipment Blank	Water	2				
	Trip Blank	Water	2				
Packer Testing / Groundwater Sampling	Groundwater	Groundwater	46	X	X		
	Blind Duplicate	Groundwater	3				
	MS/MSD	Groundwater	4				
	Equipment Blank	Water	2				
	Trip Blank	Water	2				
CSIA of 1,4-Dioxane	Groundwater	Groundwater	Note 2			X	
Investigation-Derived Waste Disposal	IDW	Liquid IDW	Note 4	X	X		X
	IDW	Solid IDW	Note 4				

Notes:

[1] - Soil samples will be screened using a PID, inspected for indications of contamination (e.g., staining, odors, etc.). In the event elevated PID readings are encountered and/or there is visible staining, soil samples will be collected for laboratory analysis and analyzed for TCL VOC+10 TICs, PFAS, and 1,4-dioxane. It is assumed for purposes of this summary that two samples per borehole will be subject to laboratory analyses.

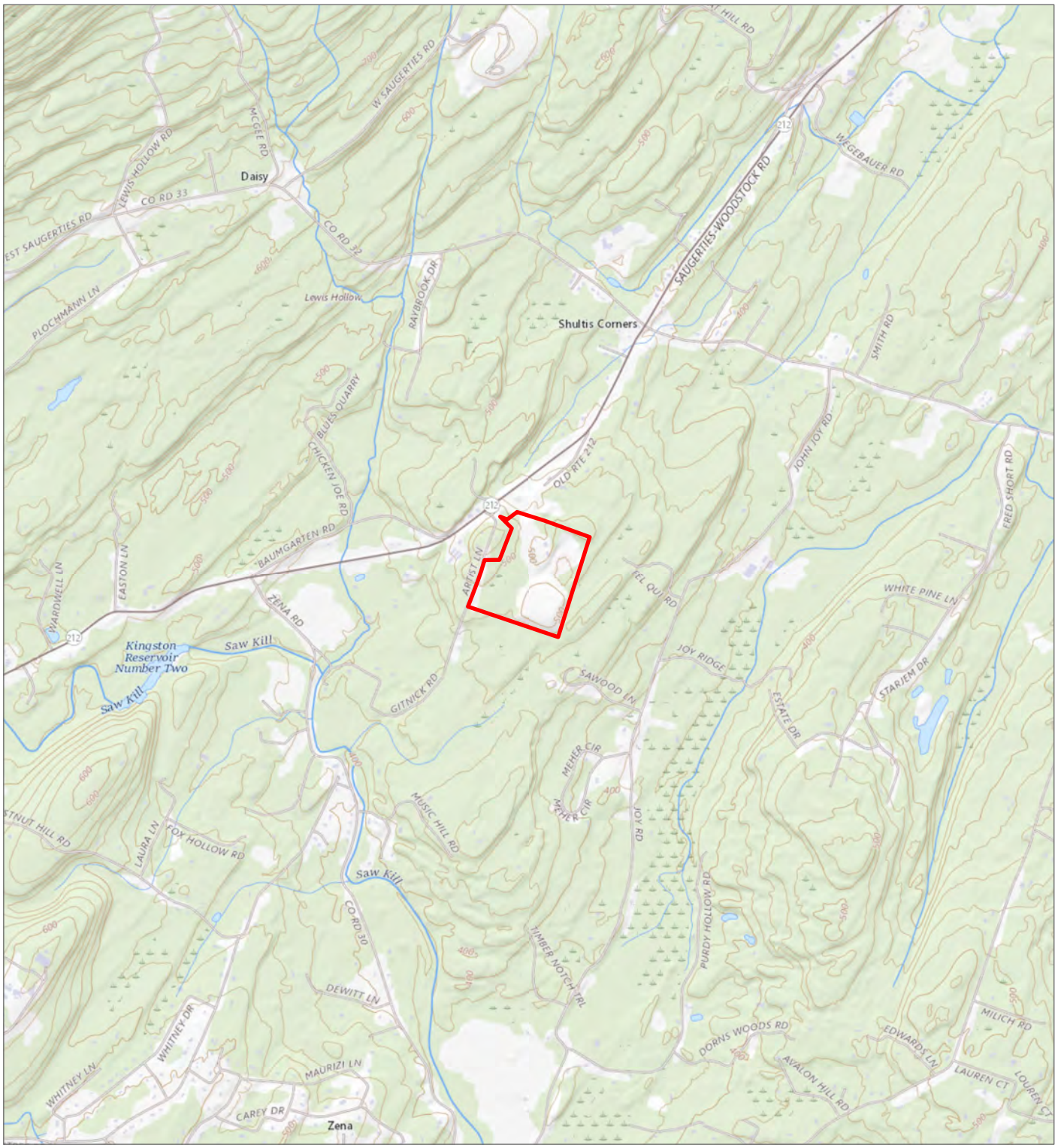
[2] - Samples containing concentrations of 1,4-dioxane greater than 0.5 micrograms per liter (ug/L) will be submitted for CSIA of 1,4-dioxane, specifically δ13C (carbon) and δ2H (hydrogen) analytes. As the University laboratory is not Environmental Laboratory Approval Program (ELAP) certified, nor is there a USEPA Method for CSIA, QA/QC samples will not be collected, and analytical results will not be validated.

[3] - Waste characterization parameters include: TCL VOCs, TCL SVOCs, TCL pesticides, TAL metals, PCBs, TPH DRO/GRO, ignitability, corrosivity, and reactivity. In addition, solid IDW will be analyzed for the full list of Resource Conservation and Recovery Act (RCRA) toxicity constituents by toxicity characteristic leaching procedure (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver), cyanide, and paint filter.

[4] - The number of liquid and solid IDW characterization samples will be determined based on final accumulated volumes, as well as the requirements of the receiving disposal facility.

CSIA : Compound Specific Isotope Analysis
IDW : Investigation-Derived Waste
MS/MSD : Matrix Spike/Matrix Spike Duplicate
PFAS : Per- and Polyfluoroalkyl Substances
PID : Photo-Ionization Detector
PCBs : Polychlorinated Biphenyls
QA/QC : Quality Assurance/Quality Control
SVOCs : Semi-Volatile Organic Compounds
TAL : Target Analyte List
TCL : Target Compound List
TICs : Tentatively Identified Compounds
TPH DRO/GRO : Total Petroleum Hydrocarbons Diesel Range Organics/ Gasoline Range Organics
USEPA : United States Environmental Protection Agency
VOCs : Volatile Organic Compounds

FIGURES



LEGEND

SITE LOCATION

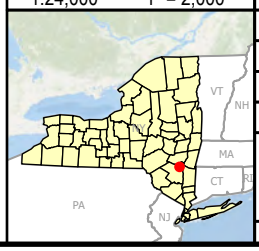
BASE MAP: USGS TOPOGRAPHIC MAP SERVICE
DATA SOURCES: TRC

N

0 1,000 2,000

FEET

1:24,000 1" = 2,000'



PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SAUGERTIES TOWN LANDFILL - NYSDEC SITE NO. 356003
1765 ROUTE 212
SAUGERTIES, ULSTER COUNTY, NEW YORK

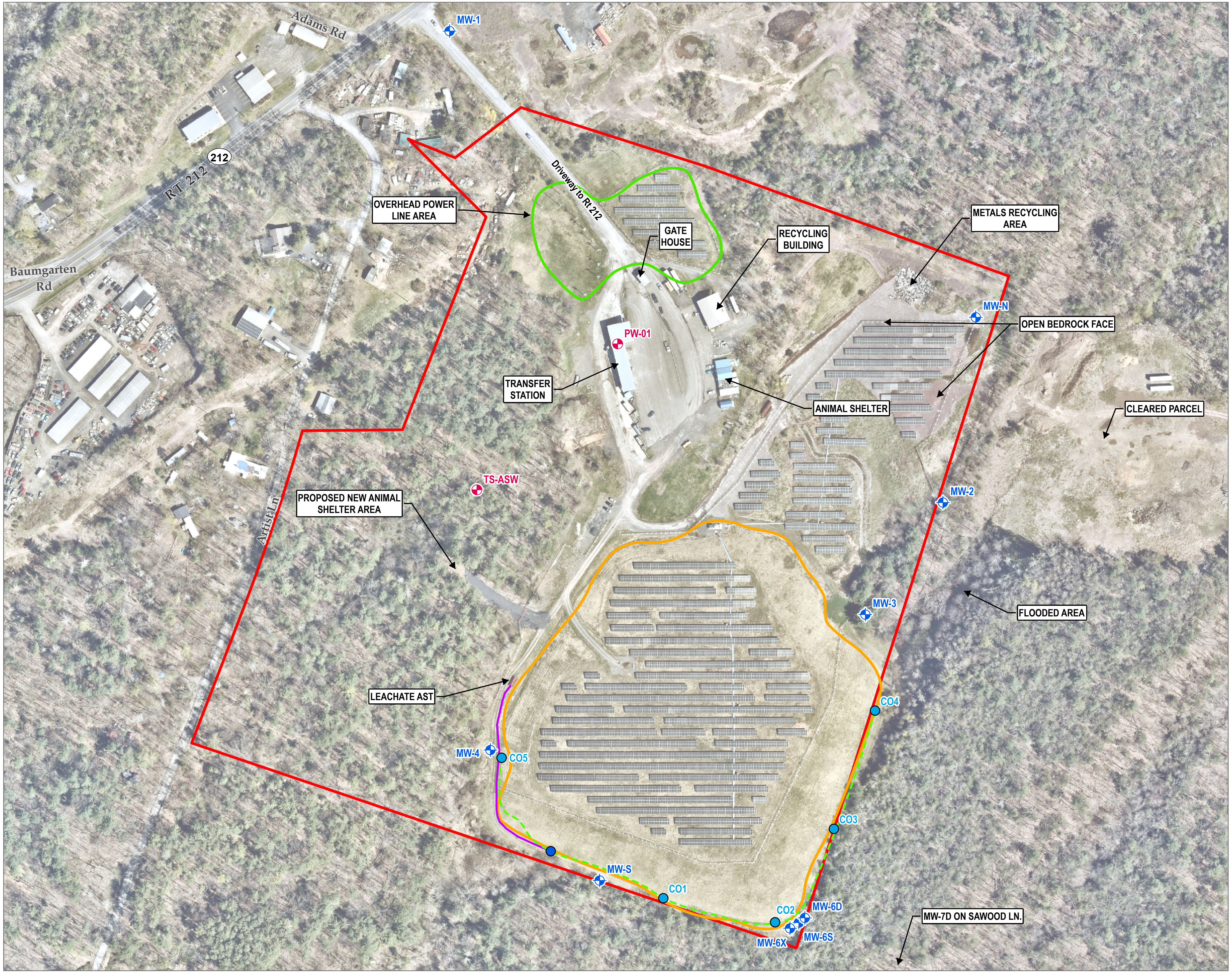
TITLE:

SITE LOCATION MAP

DRAWN BY:	L. LILL	PROJ. NO.:	556071.0000.0000
CHECKED BY:	T. SHANLEY		
APPROVED BY:	J. KING		**FIGURE 1**
DATE:	FEBRUARY 2024		

TRC
3 CORPORATE DRIVE
SUITE 202
CLIFTON PARK, NY 12065
PHONE: 518.348.1190

FILE: WAFIGS



LEGEND

- TAX PARCEL BOUNDARY
- ORIGINAL WASTE LIMIT DISPOSAL AREA (WASTEWATER TREATMENT SLUDGE AND FERROX CUBE SLUDGE)
- CLOSED LANDFILL LIMITS
- 6-INCH HDPE PERFORATED COLLECTION LINE
- 2-INCH DIA. HDPE FORCE MAIN
- MONITORING WELL
- NON-POTABLE WELL
- LEACHATE COLLECTION SUMP
- LEACHATE COLLECTION LINE CLEANOUT

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND BOUNDARIES ARE APPROXIMATE.

2. MONITORING WELL LOCATIONS ARE FROM A SURVEY DATED JANUARY 15, 2022.

3. ORIGINAL DISPOSAL AREA LOCATION IS APPROXIMATE. ESTIMATED BOUNDARIES ARE FROM THE 1994 LANDFILL CLOSURE PLAN, TOPOGRAPHIC BASEMAP (DRAWING G-2).

4. GPS LAND SURVEY OF ALL MONITORING WELLS, ALL LEACHATE COLLECTION LINE CLEANOUTS, AND TS-ASW WAS COMPLETED BY SUSAN M. ANACKER PLS, PLLC ON NOVEMBER 20, 2023.

BASE MAP: NEARMAP IMAGERY DATED APRIL 20, 2022
DATA SOURCES: TRC, ULSTER COUNTY TAX PARCELS, NYGIS

N

1:2,400

1" = 200'

0 100 200 FEET

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SAUGERTIES TOWN LANDFILL - NYSDEC SITE NO. 356003
1765 ROUTE 212
SAUGERTIES, ULSTER COUNTY, NEW YORK

TITLE:

SITE LAYOUT MAP

DRAWN BY:	L. LILL	PROJ. NO.:	556071.0000.0000
CHECKED BY:	P. RODMAN	**FIGURE 2**	
APPROVED BY:	J. KING		
DATE:	JULY 2024		

TRC

3 CORPORATE DRIVE
SUITE 202
CLIFTON PARK, NY 12065
PHONE: 518.348.1190

FILE: WAfigs.aprx

LEGEND (SYMBOLS NOT TO SCALE):

- SITE BOUNDARY
- PARCEL BOUNDARY
- 480' — LAND SURFACE ELEVATION CONTOUR (IN FEET)
- SURFACE WATER FLOW DIRECTION

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND BOUNDARIES ARE APPROXIMATE.
2. AERIAL IMAGE PROVIDED BY NEARMAP DATED APRIL 20, 2022.
3. SURVEY INFORMATION REFERENCED HORIZONTALLY TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), PROJECTED ON THE NYS PLANE COORDINATE SYSTEM (EAST ZONE) (NY83-EF).
4. VERTICAL DATUM PROVIDED IN THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

N (TRUE NORTH)

0 200 400 FT.

SCALE: 1" = 200'
SHEET SIZE 11" BY 17"

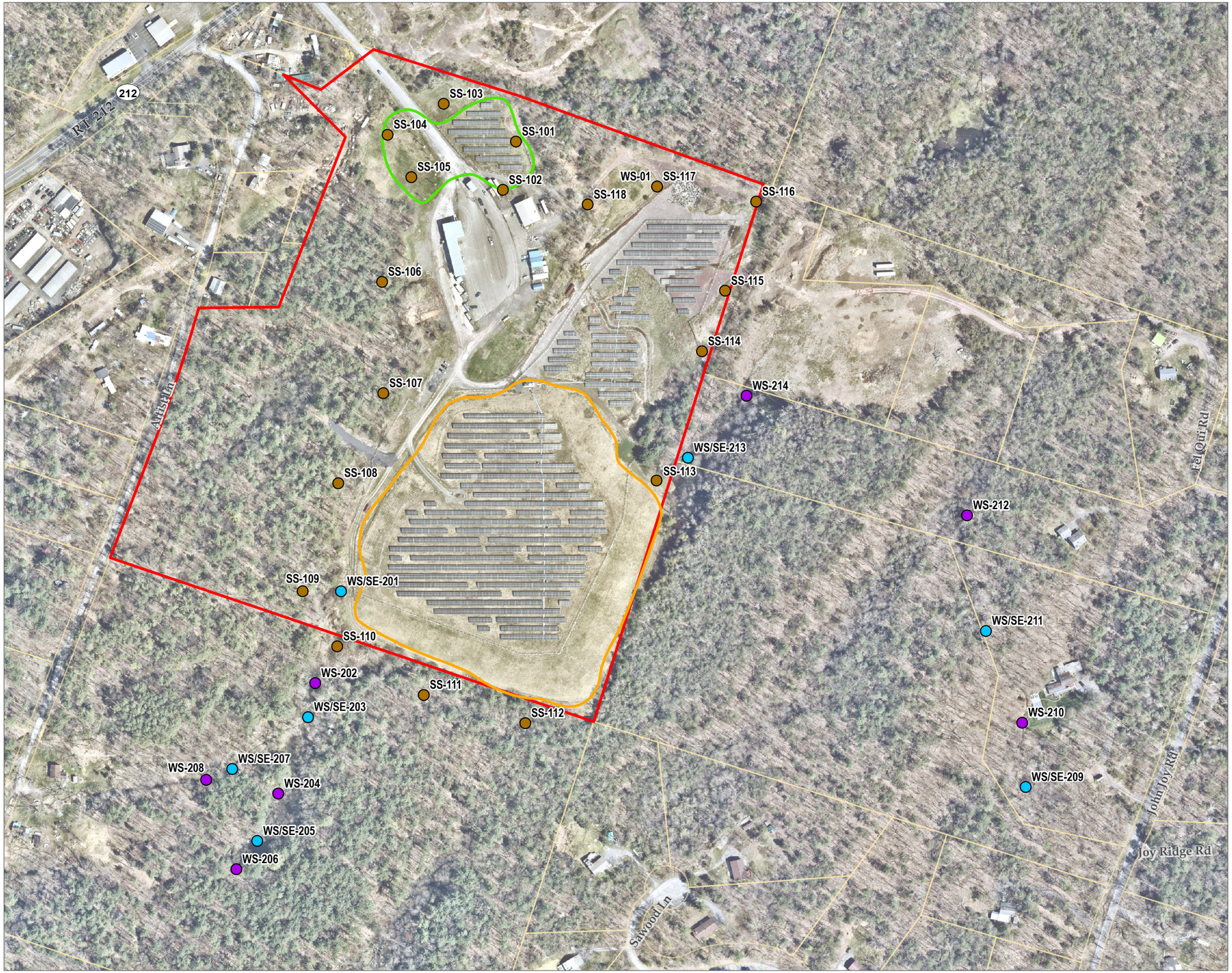
PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SAUGERTIES TOWN LANDFILL - SITE NO. 356003
1765 ROUTE 212
SAUGERTIES, ULSTER COUNTY, NEW YORK

TITLE:
LAND SURFACE ELEVATION CONTOUR MAP

DRAWN BY:	H. DELGADO	PROJ NO.:	556071.0000.0000
CHECKED BY:	P. RODMAN		
APPROVED BY:	J. KING		**FIGURE 3**
DATE:	FEBRUARY 2024		

TRC
3 Corporate Drive, Suite 202
Clifton Park, NY 12065
Phone: 518.348.1190
www.TRCcompanies.com

FILE NO.: Fig 3 - Land Surface Elev. Contour Map (STLF)_RI.dwg



LEGEND

- TAX PARCEL BOUNDARY
- ULSTER COUNTY TAX PARCELS
- ORIGINAL DISPOSAL AREA (WASTEWATER TREATMENT SLUDGE AND FERROX CUBE SLUDGE)
- CLOSED LANDFILL WASTE LIMITS
- SURFACE WATER/SEDIMENT SAMPLE LOCATION
- SURFACE WATER SAMPLE LOCATION
- SURFACE SOIL SAMPLE LOCATION

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND BOUNDARIES ARE APPROXIMATE.
2. SURVEY COMPLETED ON NOVEMBER 20, 2023 BY SUSAN M. ANACKER, PLS.
3. SAMPLES WERE COLLECTED FROM NOVEMBER 14 TO 16, 2023. WS-01 WAS COLLECTED ON OCTOBER 5, 2023.

BASE MAP: NEARMAP IMAGERY DATED APRIL 20, 2022
DATA SOURCES: TRC, NYGIS

N

1:3,000
1" = 250'
0 125 250
FEET

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SAUGERTIES TOWN LANDFILL - NYSDEC SITE NO. 356003
1765 ROUTE 212
SAUGERTIES, ULSTER COUNTY, NEW YORK

TITLE:
PHASE I RI
SURFACE WATER, SEDIMENT, AND SURFACE SOIL LOCATION MAP - OCTOBER AND NOVEMBER 2023

DRAWN BY:	L. LILL	PROJ. NO.:	556071.0000.0000
CHECKED BY:	P. RODMAN		
APPROVED BY:	J. KING		FIGURE 4
DATE:	MAY 2024		

TRC
3 CORPORATE DRIVE
SUITE 202
CLIFTON PARK, NY 12065
PHONE: 518.348.1190

FILE: Phase1_Data_Report.aprx

Coordinate System: NAD 1983 StatePlane New York East FIPS 3101 Feet; Map Rotation: 0
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LEGEND

- TAX PARCEL BOUNDARY
- ULSTER COUNTY TAX PARCELS
- CLOSED LANDFILL LIMITS
- ORIGINAL WASTE LIMIT DISPOSAL AREA (WASTEWATER TREATMENT SLUDGE AND FERROX CUBE SLUDGE)
- MONITORING WELL
- NON-POTABLE WELL
- PROPOSED ONSITE BEDROCK MONITORING WELL
- PROPOSED OFFSITE BEDROCK MONITORING WELL
- PROPOSED SOIL BORING FOR SOIL CHARACTERIZATION
- PROPOSED SOIL BORING TO DEFINE ORIGINAL WASTE LIMIT DISPOSAL AREA

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND BOUNDARIES ARE APPROXIMATE.
2. MONITORING WELL LOCATIONS ARE FROM A SURVEY DATED JANUARY 15, 2022.
3. ORIGINAL DISPOSAL AREA LOCATION IS APPROXIMATE. BOUNDARIES ARE FROM THE JUNE 1987 PHASE I ENVIRONMENTAL SITE ASSESSMENT AND HISTORICAL AERIAL IMAGES.

BASE MAP: NEARMAP IMAGERY DATED APRIL 20, 2022
DATA SOURCES: TRC, ULSTER COUNTY TAX PARCELS

N

1:3,600
1" = 300'
0 150 300 FEET

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SAUGERTIES TOWN LANDFILL - NYSDEC SITE NO. 356003
1765 ROUTE 212
SAUGERTIES, ULSTER COUNTY, NEW YORK

TITLE:
REMEDIAL INVESTIGATION
PROPOSED SOIL BORING AND BEDROCK MONITORING WELL MAP

DRAWN BY:	L. LILL	PROJ. NO.:	556071.0000.0000
CHECKED BY:	P. RODMAN		FIGURE 5
APPROVED BY:	J. KING		
DATE:	JULY 2024		

TRC
3 CORPORATE DRIVE
SUITE 202
CLIFTON PARK, NY 12065
PHONE: 518.348.1190

FILE: WAfigs.aprx

Coordinate System: NAD 1983 StatePlane New York East FIPS 3101 Feet: Map Rotation: 0
Saved By: LLILL on 7/24/2024, 10:25:50 AM File Path: T:\1_PROJECTS\NYSDEC\356003\6_Saugerties Town LF\2-4\APRX\WAfigs\WAfigs.aprx Layout Name: Figure 5 - Proposed Soil Boring and Bedrock Monitoring Well Map

APPENDIX A

SITE SPECIFIC HEALTH AND SAFETY PLAN

SITE-SPECIFIC HEALTH AND SAFETY PLAN

Saugerties Town Landfill
1765 Route 212, Saugerties, NY 12477
NYSDEC Site No. 356003
Work Assignment No. D09812-33

Prepared for:
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233

Prepared by:
TRC Engineers, Inc.
3 Corporate Drive, Suite 202
Clifton Park, New York 12065

TRC Project No.: 556071.0000.0000

July 2024

Table of Contents

List of Tables

List of Appendices

1. Site/Project Contact Information

Table 1 – Site/Project Contact Information			
Site Information			
Site Name	**Site No.**	**Address**	
Saugerties Town Landfill	NYSDEC Site No. 356003	1765 Route 212, Saugerties, NY 12477	
Client Contact			
Name	**Organization**	**Title**	**Primary Phone No.**
Mr. Anthony Bollasina	NYSDEC	Professional Geologist	(518) 402-2754
TRC Personnel and Project Role			
Name	**Role**	**Email**	**Primary Phone No.**
Michael Glenn	Health and Safety Officer (HSO)	mglenn@trccompanies.com	(949) 697-7418 (cell)
David Sullivan	Assistant HSO	dsullivan@trccompanies.com	(978) 758-2809 (cell)
James Magda	Contract Manager	jmagda@trccompanies.com	(315) 415-4315 (cell)
Justin King	Project Manager	jking@trccompanies.com	(518) 860-7656 (cell)
Pat Rodman	Associate Project Manager	prodman@trccompanies.com	(518)-937-3213 (cell)
Jonathan Bone	Office Safety Coordinator (OSC)	jbone@trccompanies.com	(315) 436-0853 (cell)
Andrew Fishman	On-Site HSO/Field Staff	afishman@trccompanies.com	(518) 478-5210 (cell)
Rich DePolo	Field Staff	rdepolo@trccompanies.com	(518) 348-1194 (cell)
Subcontractor Information			
Company Name	**Service**	**Primary Contact**	**Primary Phone No.**
Eurofins	Laboratory Analytical Services	N/A	N/A
Emergency Assistance			
Service	**Name**	**Emergency No.**	**Primary Phone No**
Ambulance	Saugerties EMS	911	(518) 743-9566
Early Incident Intervention	WorkCare	1-888-449-7787	Not applicable
Fire	Saugerties Fire Department	911	(845) 246-9701
Hospital	Northern Dutchess Hospital	911	(845) 876-3001
Police	Kingston police Department	911	(845) 331-1671
Poison Control Center	Upstate New York Poison Center	911	(800) 222-1222
Spill	CHEMTREC	Not applicable	1-800-424-9300 (TRC No. CCN 671126)
Spill (Federal)	National Response Center	1-800-424-8802	Not applicable
Spill (State)	New York State Spill Hotline	1-800-457-7362	Not applicable

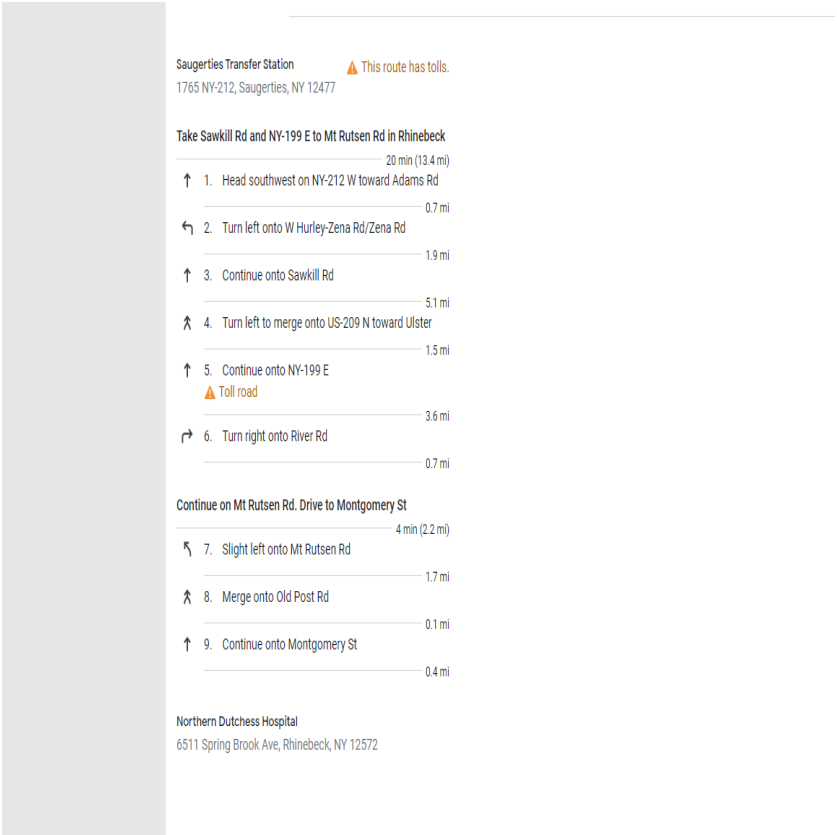
2. Medical Facility Identification and Directions

Nearest Hospital: Northern Dutchess Hospital

Hospital Address: 6511 Spring Brook Ave, Rhinebeck, NY 12572

Hospital Telephone Number: (845) 876-3001

Directions to Hospital (see Map below):



Saugerties Transfer Station — ⚠ This route has tolls.
1765 NY-212, Saugerties, NY 12477

Take Sawkill Rd and NY-199 E to Mt Rutsen Rd in Rhinebeck
20 min (13.4 mi)

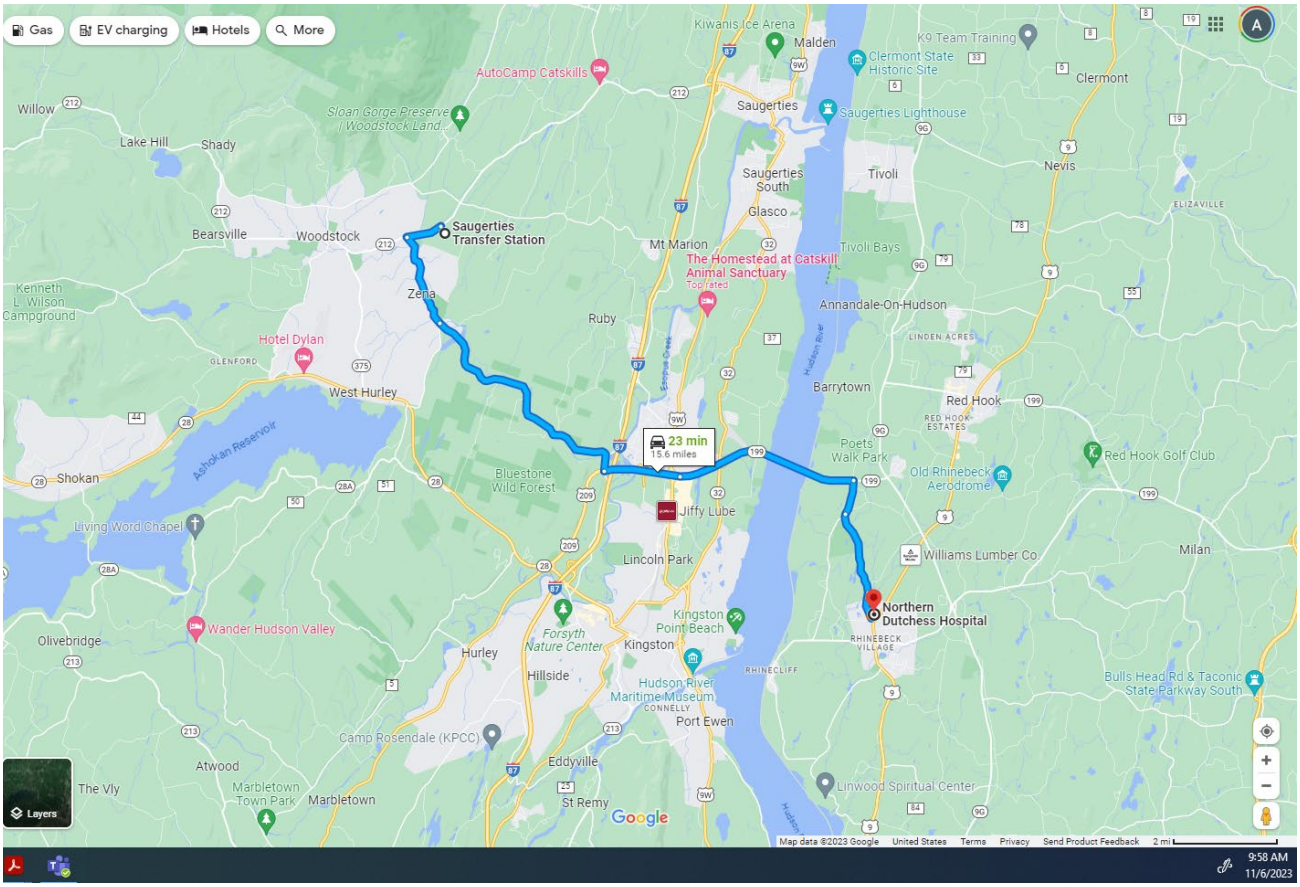
1. Head southwest on NY-212 W toward Adams Rd
0.7 mi
2. Turn left onto W Hurley-Zena Rd/Zena Rd
1.9 mi
3. Continue onto Sawkill Rd
5.1 mi
4. Turn left to merge onto US-209 N toward Ulster
1.5 mi
5. Continue onto NY-199 E
⚠ Toll road
3.6 mi
6. Turn right onto River Rd
0.7 mi

Continue on Mt Rutsen Rd. Drive to Montgomery St
4 min (2.2 mi)

7. Slight left onto Mt Rutsen Rd
1.7 mi
8. Merge onto Old Post Rd
0.1 mi
9. Continue onto Montgomery St
0.4 mi

Northern Dutchess Hospital
6511 Spring Brook Ave, Rhinebeck, NY 12572

Map to Hospital:



3. Utility Clearance

The proposed soil boring and monitoring well locations will be verified in the field with the selected driller. At this time, a private utility locating survey will be conducted, in addition to the public utility mark outs, to clear proposed boring and monitoring well locations. The utility locating surveyor will survey the area within an approximately 20-foot radius around each proposed investigation location. Subsurface utilities/structures/anomalies will be identified on the ground surface with spray paint and/or pin flags.

TRC will discuss soil boring or monitoring well repositioning required by identified subsurface utilities/structures/anomalies with the NYSDEC PM prior to installation. It is anticipated that offsets of 20 feet or less will not require prior notification/approval.

4. Scope of Work Summary

The specific scope of work to be completed from the approved Work Assignment (WA No. 22) includes the following:

- NYSDEC will coordinate and arrange access with on- and off-Site property owners.
- A Community Air Monitoring Plan (CAMP) will be implemented (as necessary) during ground intrusive activities in accordance with the NYSDOH generic CAMP and generic and site-specific HASPs. The CAMP will include real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at one upwind and one downwind perimeter location during ground intrusive activities. The CAMP will be implemented by the TRC scientist/engineer overseeing investigation activities. CAMP summaries will be provided to the NYSDOH and NYSDEC on a weekly basis, at a minimum, and any exceedances of action levels and corrective measures will be reported to the Departments immediately (within 24 hours).
- Investigation activities, including sample collection and analysis, will be completed in accordance with the Standby Engineering Services Contract, 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 Environmental Remediation Programs, NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation (NYSDEC DER-10), Guidelines for Sampling and Analysis of Per- and Polyfluoroalkyl Substances (PFAS) under NYSDEC's Part 375 Programs (NYSDEC PFAS Guidance), the HASPs, CAMP, and Field Activities Plan (FAP) and Quality Assurance Project Plan (QAPP) for the Standby Engineering Services Contract.
- Unless noted otherwise, environmental samples collected as part of Tasks 2 and 3 will be submitted to a TRC standby laboratory approved for use on the Standby Engineering Services Contract for analysis of 1,4-D and PFAS (40 compound list). 1,4-D will be analyzed by United States Environmental Protection Agency (USEPA) Methods 8270 Selective Ion Monitoring (SIM) or 8270E Low Level (solid) and 8270 SIM (aqueous). PFAS will be analyzed by Draft USEPA Method 1633 (solid and aqueous).
- In addition to the sampling further described below, quality control samples consisting of one field duplicate and one matrix spike/matrix spike duplicate (MS/MSD) sample will be collected in accordance with the QAPP (i.e., at a frequency of one per 20 sample matrix). Additionally, equipment blanks will be collected for analysis of PFAS in accordance with the QAPP (i.e., at a frequency of one per piece of non-dedicated sampling equipment per day). The laboratory will provide NYSDEC Analytical Services Protocol (ASP) Category B data deliverable packages for environmental sample analyses and Category A data deliverable packages for waste characterization parameters. Data Usability Summary Reports (DUSRs) for the analytical results, except for waste characterization analyses, will be prepared. The DUSR will provide an evaluation of analytical data with the primary objective of determining whether or not the data, as presented, satisfies the project specific criteria for data quality and use. Electronic Data Deliverables (EDDs) in EQuIS format will be submitted to the NYSDEC and the results will be presented in the Phase I

RI Data Summary Report (Task 2) and RIR (Task 3).

- Used personal protective equipment (PPE) and disposable sampling equipment and supplies will be bagged as regular refuse and disposed of as solid waste, unless grossly contaminated. Grossly contaminated PPE/equipment/supplies will be drummed and disposed of as IDW.
- Where applicable at each environmental sample location, TRC will collect location data via a handheld global positioning system (GPS) unit for incorporation into geographic information system (GIS) mapping. In addition, environmental sample locations will be staked/flagged for future survey by a New York State licensed land surveyor.
- A Potential Environmental Justice Area (PEJA) map will be prepared based on NYSDEC's publicly available GIS resources. The map will include Site location information, Site boundary, and proximity to PEJAs. The map will be included in the RIR and/or FS, and mapping results will be considered during development and screening of remedial alternatives, as appropriate.
- TRC will identify and, where feasible and appropriate, implement green remediation and climate change guidance as described in NYSDEC DER-31 - Green Remediation (DER-31) and CP-49 - Climate Change and DEC Action (CP-49), including, but not limited to: using local staff and subcontractors, grouping field tasks, minimizing mobilizations, using alternate sampling techniques, minimizing waste generation, using renewable energy, optimizing remedial alternatives, and tracking and reporting green and sustainable remediation metrics.

5. Hazard Assessment

This Site Specific Health and Safety Plan (SSHASP) assumes that an ongoing hazard assessment process with the HSO (or his/her designee), Project Manager, OSC and field staff (including the On-Site HSO) will take place regularly (via meetings/teleconferences), supplemented by as needed communication on project safety needs, to ensure the project work is conducted at a high level of technical excellence both safely and efficiently. Where the on-going hazard assessment indicates the presence of hazards, tasks, or other activities that are not adequately covered by the HASP and supporting documentation and/or staff training levels, supplemental planning will be conducted and documented in a revised or higher-level HASP document and appropriately trained personnel assigned.

5.1 Chemical Hazards

The following contaminants are known and/or suspected to be present at the site:

- PFAS
- 1, 4 Dioxane

TRC also anticipates the presence of the following chemicals in laboratory bottles used as sample preservatives: Sodium Hydroxide, Nitric Acid and Hydrochloric Acid. In addition, TRC anticipates the use

of methyl alcohol (methanol) during decontamination procedures. Safety Data Sheets (SDS) for preservatives and decontamination products are provided in **Attachment A**. Sample bottles containing hazardous preservatives will be handled with care. Sample bottles will be checked for leaks and lids tightened. Cut resistant and chemical resistant gloves and safety glasses will be worn at all times when handling sample bottles (see Section 5.2 for information concerning edges and material handling).

Isobutylene may be used for brief periods each work day to calibrate a photoionization detector (PID). One hundred parts per million (ppm) isobutylene will be primarily contained in a Tedlar® bag. Any gas that is released to the air will quickly disperse and will not pose a threat to on-site workers. No further monitoring is required for isobutylene

5.2 Physical Hazards

Physical hazards that may be encountered at the site are outlined below. If hazards are identified by the ongoing hazard assessment process, which are not address by this HASP, work shall be stopped and the HSO (or his/her designee), Project Manager, OSC or On-Site OSC, as appropriate, shall be contacted to determine if additional safety procedures and programs should be employed at the site.

Dust – When conducting any ground disturbing activities, be cognizant that the dust has potential to contain hazardous chemicals and should not be inhaled. Whenever possible dust reduction by wetting shall be used. If dust is billowing, wetting the area, letting the dust settle, working from an upwind direction, and/or respirator with P100 cartridges (with proper fit test, training and medical monitoring) is recommended to reduce exposure.

Edges/Material Handling – Cut resistant gloves are required to be worn at all times while performing tasks that have the potential for hand injuries. A glove selection guideline is presented in **Attachment B**.

TRC has a policy of using guarded blades for cutting tasks, fixed blade open knives are not to be used for work under this scope of work unless a variance is approved by the ECR Safety Manager.

Hand Tools – Use only the appropriate tool for the task at hand. Use the tool(s) as designed, described, and intended by the manufacturer. Hand tools will meet the manufacturer's safety standards. Hand tools will not be altered in any way. Makeshift tools will not be used. At a minimum, hand and eye protection will be used when working with hand tools (see glove selection guide provided herein). Wrenches, including adjustable, pipe, end and socket wrenches, will not be used when jaws are sprung to the point that slippage occurs. Impact tools such as drift pins, wedges and chisels, will be kept free of mushroom heads. Wooden handles will be free of splinters or cracks and secured tightly to the tool. At all times use appropriate hand protection when utilizing hand tools.

Heavy Equipment/Drill Rigs – Use caution around drill rigs, construction equipment, and open excavations.

Ensure the equipment operator is aware of the location of on-site personnel at all times to avoid potential injuries (e.g., maintain eye contact with the equipment operator). A spotter should be used to direct the movement of heavy equipment. A swing zone should be established with cones behind any excavators to prevent injury during movement of equipment. Exercise caution and wear protective equipment as noted herein around the equipment to guard against crushing and pinching hazards. On-site personnel will maintain a distance (approximately 10 feet) from mechanical hazards associated with heavy equipment. All field team members working near or with equipment with emergency shut-off switches should be aware of the locations and situations when these switches should be used.

Hostile Individual(s) – Most personnel who are encountered during work will not be hostile, however if a hostile individual is encountered you should not confront them. You should back away and go to your vehicle or other safe location where you can isolate yourself from the hostile person(s). Once safe, if you are continuing to be harassed you should contact the local police for assistance. Contact the Project Manager or OSC once the situation is safe and under control.

Hunters/Firing Range, etc. – Be aware of surrounding activities that may involve hunting, firearms, etc. that may not be in your immediate area, but could be create an unsafe work environment.

Manual Lifting – Improper lifting can lead to a variety of injuries including back strains, muscle pulls and joint damage. It is important for all personnel to understand proper lifting techniques and to utilize safe lifting procedures when handling materials. Generally, no one person should lift more than 50 pounds without assistance. Mechanical means should be used whenever possible.

Noise – Hearing protection must be worn when noise levels exceed 85 dBA in the work area. If you need to raise your voice to be heard at the work site, then hearing protection should be worn. Hearing protection will be worn near drill rigs.

Power Tools – All power tools will be inspected regularly (at least on a daily basis) and used in accordance with the manufacturer's instructions and its capabilities. Electrical tools will not be used in flammable areas, unless they are approved for that purpose. Portable electric tools will be used only with a GFCI. Proper hand, eye and hearing protection will be used when working with power tools and all appropriate safety guards must be in place. Personnel will be trained in the proper use of the specific tool. Any defective power tools will be immediately tagged and removed from service. Tools will be stored properly after use.

Pressurized Fluids/Gases – All compressed gases are hazardous due to the high pressures inside the cylinders. Even at a relatively low pressure, gas can flow rapidly from an open or leaking cylinder. Damaged cylinders can become projectiles resulting in severe injury and property damage. An unsecured or uncapped cylinder can become a cause of a major accident. Cylinders shall be secured when not in use, in transport, and as much as possible when in use.

Slips, Trips and Falls – Be aware of uneven ground and buried debris (e.g., metal, plastic, etc.) to avoid potential slip/trip/fall hazards, and use caution near open excavations. Maintain good housekeeping practices to minimize physical hazards.

Traffic Hazards – Driving to and from the site each day is considered a physical hazard. Directions and travel time to the site should be determined in advance (a.k.a. Journey Management Planning) and adequate time should be allocated to drive safely. The use of cellular phones is prohibited, and distracted driving should be avoided. Seatbelts shall be worn at all times while the vehicle is moving. Use caution around traffic flow. Ensure proper traffic control (e.g., signs, traffic cones, barriers, etc.) are in place prior to and throughout the work day where work takes place in or near traffic. Work personnel must wear ANSI-rated class 3 reflective traffic vests at all times. A site-specific traffic management plan describing procedures to be employed, including barriers, signage, etc., will be used for each drilling location.

Weather – Heat and cold stress are a potential concern for on-site workers. Take breaks as needed to cool down, replenish fluids and/or warm up. Please refer to **Appendix C** for the signs, symptoms and precautions for cold and heat stress. Work may occur during a time of year when thunderstorms are possible/likely. If thunder or lightning is noted by onsite personnel, work will cease until the storm passes (thunder and/or lightning ceases and is not observed over at least a 30-minute period). Personnel will seek shelter in buildings or vehicles.

Working Over/Near Water – All workers working over/near water will be required to wear a Type I, II, or III Personal Floatation Device (PFD). When continuous fall protection is used (without exception) to prevent employees from falling into the water, the drowning hazard has effectively been removed. Therefore, PFDs are not required when utilizing continuous fall protection.

5.3 Biological Hazards

Biological Waste – This includes feces, urine, needles/sharps and other materials which may contain biological matter from humans or animals. This material should be avoided and not handled in any way. If biological waste impedes the planned scope of work the Project Manager or OSC should be contacted to discuss appropriate actions.

Blood-Borne Pathogens – Injuries received in the field may require assistance from a field team member with appropriate first aid/first responder training to perform first aid. Contact with blood and certain body fluids can contain pathogens that may be transmitted by contact with an open wound by the caregiver. The following precautions should be used when giving first aid:

- Use nitrile gloves to avoid contact with blood/fluids. Spent bandages and gloves used to perform

first aid should be placed in a plastic bag and properly disposed.

- Blood/fluid should be cleaned from surfaces that may be contacted by other individuals.
- Use an appropriate barrier if required to perform rescue breathing.

Ticks - Ticks generally favor areas of high grass and dense vegetation so to the extent possible, these areas should be avoided. It is advisable when entering these areas to tuck pants into socks and to wear a light colored long sleeve shirt to help spot ticks before they bite. DEET-based insect repellents may be worn to repel ticks but hands should be washed thoroughly after use and DEET should not be sprayed directly onto the skin surface. Self-checks should be made frequently and at least at the end of the field day for ticks when working in or near vegetated areas.

If discovered, the tick should be removed with a pair of tweezers and saved in a sealed plastic bag. Sometimes, tick bites occur but the tick may not stay attached, followed by a rash developing in the area within a few days of the bite**. If bitten by a tick or a bulls-eye like rash develops, it is advisable to consult WorkCare**.

Spiders – Spiders typically seek cover in dark protected areas. Common areas where spiders may be encountered are heavy vegetation and trees. Spiders also are found in basements and enclosed spaces such as sheds, protective well covers, etc. Spider bites may cause swelling, pain and respiratory problems. Avoid dense vegetation, and use caution when sampling in dark poorly illuminated locations. If bitten, wash the area and use ice on the bite area to reduce swelling. If respiratory stress, significant pain or swelling is noted, or discoloration around the bite area occurs, seek immediate medical attention.

Stinging Insects – Like spiders, wasps and yellow jackets often nest in dense vegetation and in the ground, or in protective casings on monitoring wells and shielded gate locks. A sting from these insects can cause pain, swelling, and respiratory problems that may be life-threatening to certain individuals. If stung, remove stinger (if present) using tweezers, or similar, and wash the area and use ice on the sting area to reduce swelling. If respiratory stress, significant pain or swelling is noted, or discoloration around the sting area occurs, seek immediate medical attention.

Dogs and Wild Animals – Dogs often are not leashed and may be unfriendly. Bites from dogs and wild animals can cause infections or transmit disease. In general, it is best to not approach dogs even if they appear to be friendly, and wild animals should never be approached. If bitten, the area should be washed with soap and water. If the bite resulted in puncturing or tearing of the skin, the wound should be covered with a sterile dressing and medical attention should be sought immediately. A description of the dog should be noted and if possible, the dog's owner.

Plants – There are many types of plants which can cause irritation or allergic type reactions. Examples of some encountered on TRC sites include the following:

Poison Ivy – the trademarks of this plant are its solid green, pointed leaves that hang from the stem in groups of three. It grows as both a vine and a shrub. The look of poison ivy can change with the seasons. It produces yellow-green flowers in the spring and its green leaves can change to yellow and red in autumn.

Wild Parsnip/Giant Hogweed – Both plants are part of the carrot family and can grow up to 15 feet tall. They look similar to giant Queen Anne's lace with bristly stalks. Contact with the sap from the plant can cause phytophotodermatits or irritation (sometimes severe) when skin is exposed to sunlight.

<u>*Pandemic Preparedness*</u> – A "pandemic" refers to an epidemic that has spread over several countries or continents, usually impacting a large number of people. A pandemic has the potential to significantly impact routine services. A pandemic disease presents a serious health risk and could prevent TRC from performing project-related tasks. The risk to employee health and the business will vary based on the geographic area of the pandemic and the potential severity of the disease. Pandemic risk assessments will be performed by the TRC Corporate Safety team who will provide direction to field personnel.

TRC will follow health and travel precautions issued by the respective authorities. Employees should stay at home when sick or otherwise experience symptoms that are consistent with the pandemic disease. When at a project site, infection control measures should be enacted, which are essential components of pandemic management and a component of public health measures. These essential measures include:

- Practice frequent hand washing. According to the CDC, washing hands with soap and water is the best way to get rid of germs in most situations. If soap and water are not readily available, you can use an alcohol-based hand sanitizer that contains at least 60 percent alcohol. You can tell if the sanitizer contains at least 60 percent alcohol by looking at the product label.
- Obtain immunizations recommended by healthcare providers to help avoid disease.
- Practice social distancing to increase the space between employee work areas and decreasing the possibility of contact by limiting large or close contact gatherings and avoid shaking hands.

- Frequently disinfect all areas that are likely to have frequent hand contact (like doorknobs, faucets, handrails, etc.).

5.4 Radiological Hazards

No radiological hazards are expected at the site. If any new condition is encountered during this activity, the HASP will be adjusted accordingly.

6. Personal Protection Monitoring

Personal Protection Monitoring Equipment and Use Recommendations: The following table outlines monitoring equipment needs and rationale. Note that an upgrade to a higher level of respiratory protection (C or higher) will warrant revision or addendum to this HASP and consultation with the TRC Corporate Safety team before work recommences.

Table 2: Monitoring Equipment Use Recommendations

Instrument	Use Code	Action Levels	Notes/Rationale
PID	C	5 ppmv*	Recommended for VOC screening to monitor airborne VOC concentrations in breathing zone levels. If PID readings are sustained above 5 ppmv in the breathing zone for at least 5 minutes, move to an upwind location for 15 minutes. After 15 minutes, measure again. If PID readings are still above 5 ppmv in the breathing zone, contact the Project Manager or OSC to evaluate suitable response actions. Any upgrade in respiratory protection will be coordinated with the TRC Corporate Safety team. Withdraw from area if PID readings exceed 50 ppmv.
TSI Dustrak™ (or equivalent)	C	> 150 µg/m3; 15 minute average**	Used where contaminants could adhere to fugitive dust, and where fugitive dust migration could potentially serve as a significant exposure pathway. Half-faced APR for particulates to be used intermittently/temporarily where dust control measures cannot maintain dust levels below action level. Use is optional for dust levels below the action level. Use of a half-face APR for dust does not require CIH approval where dust action level excursions are limited in duration, and where dust control measures will be implemented until below the action level. However, personnel must be medically qualified, fit tested for half-face APR use, and trained in the use of the APR.
O^2/LEL	C	19.5%	Recommended for landfill, lagoon, excavation, sewer, and anaerobic degradation site work. Required for confined space work.
H_2S Meter	C	1 ppm	Recommended for landfill, lagoon, excavation, sewer, and anaerobic degradation site work. Required for confined space work.
CO	C	25 ppm	½ of the PEL (PEL = 50 ppm)
CGI	C	10% LEL	Recommended safe level to prevent explosive conditions.
MINIRAM (or equivalent)	O		Supplement operation of Dustrak™ stations for work near sensitive receptors.
Radiation meters	N/A		Not known or anticipated to be a Contaminant of Concern.

Table 2: Monitoring Equipment Use Recommendations			
Instrument	**Use Code**	**Action Levels**	**Notes/Rationale**

Notes:
* Site/project specific action levels for VOCs may be established in consultation with the OSC.
** Above background upwind levels

PID – Photoionization detector	LEL – Lower Explosive Limit	O_2 – Oxygen
H_2S – Hydrogen Sulfide	CO – Carbon Monoxide	ppm – Parts per Million
CGI – Combustible Gas Indicator	VOC – Volatile organic compound	ppmv – Parts per Million Volume
APR – Air Purifying Respirator	CIH – Certified Industrial Hygienist	PEL – Permissible Exposure Limit
µg/m3 – micrograms per cubic meter		

Use Codes: R – Required, C – Condition specific, O – Optional, N/A – Not applicable

Personal Protection Monitoring Procedures: When necessary, the OHSO will measure organic vapor concentrations in the breathing zone using a PID. Fugitive dust emissions are not anticipated to be a concern. When required, air monitoring for dust will be performed using a combination of real-time dust monitoring upwind and downwind of the work area, and at a point near the closest receptor.

Personal Protection Exposure Limits: The following table summarizes anticipated concentrations and accepted exposure limits of chemicals potentially present within the work site.

Table 3: Summary of Exposure Limits – Known or Suspected Site Impacts		
Chemical of Concern	**Detected Concentration**	**OSHA PEL/ACGIH TLV**
Volatile Organic Compounds (VOCs)	Unknown	200 ppm (OSHA PEL for PCE) 200 ppm (OSHA PEL for TCE) 200 ppm (OSHA PEL for DCE)
Semi-volatile Organic Compounds (SVOCs)	Unknown	0.2 mg/m^3 (OSHA PEL for PAHs)
Polychlorinated Biphenyls (PCBs)	Unknown	1,000 $\mu g/m^3$ (OSHA PEL for PCBs containing 42% chlorine) 500 $\mu g/m^3$ (OSHA PEL for PCBs containing 54% chlorine)
Metals	Unknown	50 $\mu g/m^3$ (OSHA PEL for lead) 10 $\mu g/m^3$ (OSHA PEL for arsenic) 0.2 mg/m^3 (OSHA PEL for cadmium) 0.5 mg/m^3 (OSHA PEL for chromium) 0.2 mg/m^3 (OSHA PEL for selenium) 0.01 mg/m^3 (OSHA PEL for silver) 0.5 mg/m^3 (OSHA PEL for barium) 1.0 mg/m^3 (OSHA PEL for mercury)
PFAS (PFOS and PFOA)	Unknown	0.01 mg/m^3 (ACGIH TLV-TWA for skin notation)

Table 3: Summary of Exposure Limits – Known or Suspected Site Impacts		
Chemical of Concern	**Detected Concentration**	**OSHA PEL/ACGIH TLV**

Notes: Exposure and hazard data obtained from the NIOSH Pocket Guide to Chemical Hazards unless otherwise noted.

ppm – parts per million
OSHA – Occupational Safety and Health Administration
PCE – Tetrachloroethene
DCE – Dichloroethene
µg/m3 – micrograms per cubic meter
TLV – Threshold Limit Value
PEL – Permissible Exposure Limit
TCE – Trichloroethelene
PAHs – Polycyclic aromatic hydrocarbons

Table 4: Preservatives and Decontamination Products		
Chemical of Concern	**On-Site Usage and Potential Exposures**	**Control Method**
Hydrochloric Acid (HCl)	Less than 20 ml quantities used for sample preservation. Air phase exposure is expected to be minimal and incidental to sample containerization.	5 ppm (OSHA PEL)
Methyl Alcohol (methanol; MeOH)	Less than 20 ml quantities used for sample preservation. Air phase exposure is expected to be minimal and incidental to sample containerization.	200 ppm (OSHA PEL)
Nitric Acid (HNO_3)	Less than 20 ml quantities used for sample preservation. Air phase exposure is expected to be minimal and incidental to sample containerization.	5 mg/m3 (OSHA PEL)
Isobutylene	100 ppm gas for use during calibration of PID instruments.	No specific exposure limits for isobutylene (simple asphyxiant). Maintain oxygen levels above 19.5%. Before attaching regulator to cylinder, verify that the regulator is off. Before opening regulator, make sure that tubing connecting regulator to monitoring device/ Tedlar® bag is secure. To use a Tedlar® bag, put bag control valve in an open position and close after filling.

Table 4: Preservatives and Decontamination Products		
Chemical of Concern	**On-Site Usage and Potential Exposures**	**Control Method**
		Before disconnecting gas from the instrument and/or Tedlar® bag, verify the regulator is closed. Empty bag of contents after calibration in a downwind position and/or to avoid inadvertent inhalation.

Notes:

ppm – parts per million
ml – milliliters
PID – Photoionization Detector
OSHA – Occupational Safety and Health Administration
PEL – Permissible Exposure Limit

7. Personal Protective Equipment

TRC personnel will use Level D PPE as noted/modified below:

Table 5: Level D Personal Protective Equipment

Item	Rationale/Notes
Hardhat	American National Standards Institute/International Safety Equipment Association (ANSI/ISEA) Z89.1-2009 rated hard hats will be worn by personnel at all times when overhead hazards are present, including electrical.
Hearing protection	Hearing protection will be worn by all personnel exposed to at least 85 dB of sound during the workday. A good rule of thumb to use in determining whether background noise is 85 dB or higher is if you must shout to be understood by somebody about one arm-length away, that background noise is hazardous.
Safety boots (steel or composite toe and shank)	Electrical Hazard (EH) rated safety-toe safety boots will be worn by all personnel during project work described in this HASP.
Eye protection (safety glasses)	ANSI rated eye protection (Z87 or Z87+) is required to be worn at all times when onsite or when personnel are exposed to flying debris, chemical vapors or particulates. Chemical splash goggles will be worn for protection against chemical gases, vapors or particulates. Safety glasses will be worn for protection against flying objects.
Safety vest	ANSI Class 2 safety vest is required at all times when onsite. Utilize in areas in or near vehicular traffic of any kind on or off property.
Chemical Protective Clothing (CPC) and Gloves	CPC and gloves will be inspected according to TRC's Personal Protective Equipment Program. CPC will be chosen with assistance from the OSC according to the chemical hazards present. Gloves are to be changed between samples to avoid cross-contamination.
Cut resistant work gloves	As indicated herein, use Cut and Abrasion Resistance Level 2 to Level 4 gloves when necessary for hand protection during field tasks. See **Appendix B** for a Glove Selection Guide. ***Leather work gloves are expressly prohibited.***
Electrical Safety	8 cal/cm^2 Flame Resistant (FR) clothing
Face Coverings	Protect personnel from receiving or transmitting COVID-19.
Personal Floatation Device (PFD)	Type I, II, or III PFD is required to be worn at all times when working over/near water.

A basic first aid kit will be readily available on-site in the event of an emergency.

Fire extinguishers should be present within 50 feet of wherever more than 5 gallons of flammable or

combustible liquids or 5 pounds of flammable gas are being used at the site, including operational equipment. All personnel working on or around the equipment should know the location of and how to operate the fire extinguisher. Ensure the fire extinguisher is in working order by checking the manufacture and/or most recent inspection dates.

8. Personnel and Equipment Decontamination Plan

At minimum, personnel and equipment decontamination will include the following:

Equipment Decontamination: There is a possibility that site media contacted during work activities contain compounds described in **Table 3**. All equipment that comes in contact with media needs to be decontaminated before it is removed from the job site. To properly decontaminate equipment that comes in contact with media, the following procedure should be followed:

- Brush accumulated material off equipment that has come in contact with impacted media. The material shall be returned to the location from which it came or disposed of properly;
- Wipe parts of the equipment that came in contact with the media down with cloth, rags or heavy-duty paper towel damp with non-phosphate concentrated laboratory-grade soap (i.e. Alconox© or Liquinox©);
- Follow up with a wipe from a separate cloth, rags or heavy duty paper towel damp with potable water; and
- PPE and cloth, rags or heavy duty paper towels can be disposed of in the regular waste stream.
- If equipment becomes grossly impacted with site media, equipment shall be steam cleaned over a decontamination pad.

Personnel Decontamination: In general, contamination of personnel shall be prevented through the use of PPE. At minimum, nitrile gloves shall be worn during contact with impacted material or chemical in addition to other Level D PPE.

9. Required Personnel Training

TRC field personnel will have the training outlined below before on-site work activities:

Table 6: Project Training Requirements

(* required for all sites; but minimum recommended)
Check "A" if training required for everyone, and check "T" if training required for specific task or per notations.

A	T	Subject	Reference	
			29 CFR 1910	29 CFR 1926 or Other
☒	☐	HAZWOPER 40 hour*	1910.120	1926.65
☒	☐	3-Day HAZWOPER Supervised On-site*	1910.120	1926.65
☒	☐	8-Hour HAZWOPER Refresher*	1910.120	1926.65
☐	☒	8-Hour Supervisor HAZWOPER*	1910.120	1926.65
☐	☒	First Aid, CPR*,1	1910.151	1926.23,.50
☒	☐	Hazard Communication (HAZCOM)	1910.1200	1926.59
☐	☒	DOT/IATA Shipping Training	1910.1201	49 CFR 172.704
☐	☐			
☐	☐			
☐	☐			
Client-specific training:_____ ☐ Not Applicable ☐ Specify				
Client-specific training:_____ ☐ Not Applicable ☐ Specify				
Client-specific training:_____ ☐ Not Applicable ☐ Specify				

Note:
1 Per the TRC Health and Safety Policy and Procedure Manual, each TRC project will have at least one certified CPR/first aid trained person on site at all times. All Project Managers and anyone acting as the on-site Health and Safety Officer must be current in First Aid/CPR.

Project training requirements beyond those provided in the above table will require a HASP revision/upgrade or concurrence of the TRC Safety Director or ECR Safety Manager.

10. Medical Monitoring

Medical monitoring will apply routinely to all employees who are or may be exposed to hazardous substances or health hazards at or above the established permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year (40 CFR 1910.120[f][2][i]). Said TRC field personnel will have the medical surveillance outlined in the table below prior to commencing on-site work activities.

Table 7: Medical Surveillance Required			
*Baseline is minimum recommended.			
	29 CFR 1910	**29 CFR 1926 or Other**	**Notes**
☒ HAZWOPER Physical - Baseline*	1910.120	1926.65	
☒ HAZWOPER Physical – Annual	1910.120	1926.65	
☐ HAZWOPER Physical - Biennial*	1910.120	1926.65	
Client-specific drug testing[1]	☐ Not Applicable ☐ Specify		
Client-specific medical monitoring[1]	☐ Not Applicable ☐ Specify		
Site-specific medical monitoring:	☐ Not Applicable ☐ Specify		
Note: [1] Client required drug testing or medical monitoring should be coordinated through the Project Manager.			

TRC has a Drug and Alcohol-Free Workplace Policy (TRC Academy Course #900013753). TRC may require employees or subcontractors to be tested upon reasonable suspicion, following accidents or incidents during work activities, or during travel to or from a project site. Client policies may be stricter in regard to procedures following an accident. Project Managers must be aware of these and inform employees and subcontractors of any additional requirements.

11. General Safety Requirements

The general safety rules listed below apply to all TRC personnel present at the site.

- A tailgate health and safety meeting will be held with all field team members each day prior to the start of work, the start of a new shift, upon changing of work conditions or job task duties, or when new field team members arrive onsite.
- Adhere to all requirements of this HASP.
- Wear protective clothing appropriate for the designated level of protection and decontaminate before entering clean areas when applicable.
- Use safety equipment in accordance with OSHA guidance and labeling instructions.
- Maintain safety equipment in good condition and proper working order and make sure that the equipment is calibrated prior to use.
- Immediately report unsafe acts or conditions to the Project Manager and OSC.
- Eating, drinking, and smoking are prohibited on site, except in designated areas.
- Maintaining a position upwind from intrusive activities is encouraged.
- The emergency shutoff switch should be demonstrated to be working prior to initiating drilling.
- An adequately stocked first-aid kit will be maintained at the work site.

12. Tailgate Safety Meetings

- A tailgate safety meeting will be conducted daily prior to commencement of the work day, the start of a new shift, upon changing of work conditions or job task duties, or when new field team members arrive onsite (see checklist provided in **Appendix D**).
- Topics covered by the tailgate safety meeting will include, but not be limited to, scope of work and who will conduct each task, potential hazards, weather forecast, PPE, emergency procedures and the route to the medical facility, site conditions and features, and, communication guidelines related to stakeholder engagement and visitors.
- Safety meetings must also be held to address modifications to this HASP and any addenda prepared to supplement the HASP.
- Subcontractors and personnel present at the tailgate safety meeting shall be required to sign an acknowledgement form after each meeting.

13. Emergency/Contingency Plan

Before commencing any on-site operations, the TRC OHSO will advise all personnel of potential emergencies. Personnel will be advised on their roles in the event of an emergency, and the steps to take for a timely and controlled response.

Communication networks/chain of command – All on-site personnel will communicate any accident, injury or near miss to the TRC OHSO who will provide instruction on how to proceed further.

First Aid / Safety Equipment – First aid equipment should be readily available in the event of an emergency. First aid equipment should include a well-stocked first aid kit, fire extinguisher and emergency eye wash.

Evacuation Plans and Refuge Area – All personnel should safely remove themselves from danger in the event of an emergency and safely access the refuge area. The refuge area should be in an upwind location a safe distance from the work zone. The refuge area will be determined during the daily safety briefing.

Notifications of Fire, Police and Emergency Facilities – In the event of an emergency that cannot be controlled by on-site personnel, the appropriate emergency contact shall be notified. All personnel shall remove themselves from the area of danger and wait for the arrival of help in the predetermined refuge area.

Non-Emergency Medical Assistance – If an injury does occur and it is not life threatening, then the employee or employee's supervisor/project manager should contact WorkCare as soon as possible, but within the first hour after an injury. WorkCare information is proved in **Appendix E**. This information will help assist the injured employee by connecting them with instant access to a medically qualified professional in order to provide guidance on appropriate first aid measures and medications.

14. Stop Work

TRC personnel are all empowered, responsible, authorized and obliged to stop work at any time we feel that our safety or the safety of others is, or could be, compromised. When a stop work occurs the Project Manager and/or OSC should be contacted to discuss the reason for the stop work and the corrective action(s) needed to resume work safely. Work on an activity shall not continue until the unsafe condition has been corrected.

15. Safe Catches

A "Safe Catch" is a potential hazard or incident that has not resulted in any personal injury. Unsafe working conditions, unsafe employee behaviors, improper use of equipment or use of malfunctioning equipment have the potential to cause work related injuries. It is everyone's responsibility to report and/or correct these potential incidents immediately. Please complete the form provided in **Appendix F** as a means to report these "Safe Catch" situations and submit to your local OSC Representative and Mike Glenn, National Safety Director.

16. Observations

Note that the Project Manager and/or OSC may notify field staff that their site activities may be the subject of Safety Observation, an integral part of the continuous improvement safety culture promoted at TRC. If subject to an observation, please note the following:

- The Observation will tend to focus on the highest risk activity (as a general example, drilling in a public right-of-way).
- Follow-up observations may need to occur on previous observations, depending on prior data collected.
- The observer's preparation before visiting the site will be a review of the HASP, JSAs, client-specific requirements, etc., and a review of the work scope with the Project Manager to ensure the context of the work is well understood in advance.
- Review items may include PPE, body use and positioning, work environment, operating procedures, and tools and equipment.
- The observation should last between 30 and 60 minutes.

Both positive and negative observations are candidates for documentation and later discussion. The overarching goals are to identify and correct questionable practices and to identify and promote good, safe and efficient practices. It is a data gathering process that will allow TRC safety specialists to identify root causes for safety issues in both categories to better inform policy decisions.

17. Incident Reporting

In case of an incident, TRC personnel must report the incident immediately to their project manager/supervisor and/or OSC as well as the client's representative and follow the TRC Incident Response and Reporting Process (see **Appendix G -** In Case of Emergency and Incident Reporting). Required Incident Notification or Auto Incident Report forms must be completed within 24 hours following the incident. If neither is available, the incident shall be reported to the TRC Safety Director. Incident/injury/exposure information must be recorded per TRC policy and will be the basis of any incident investigations.

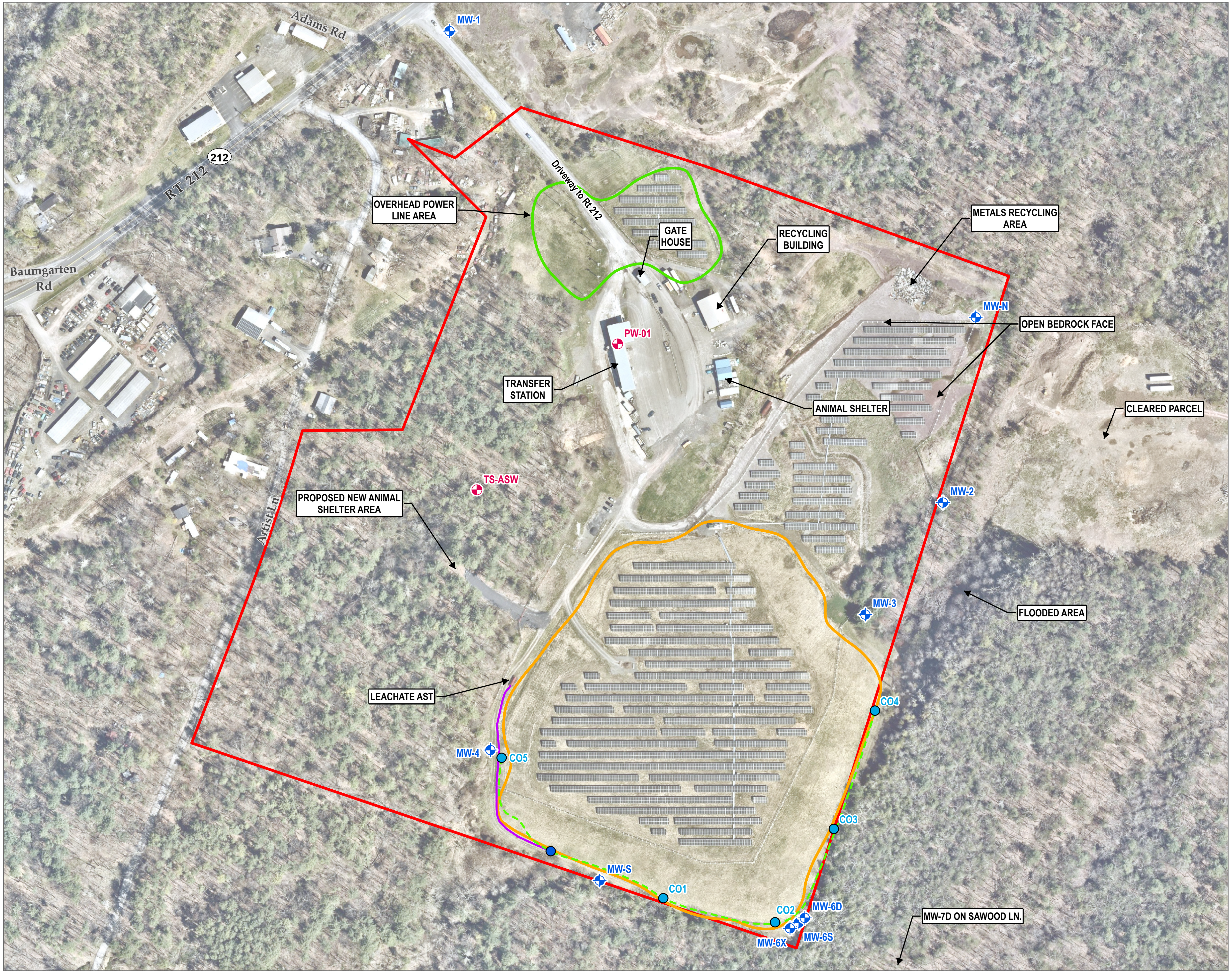
18. Job Safety Analysis

It is anticipated that the standard operating procedures (SOPs) detailed in the Generic Field Activities Plan (FAP) will be utilized for all work practices. If site specific activities require additional or alternate procedures, TRC will assess the task hazards and controls using separate job safety analysis forms (JSAs). Prior to use in the field, JSAs will be reviewed and approved by the TRC Project Manager and OSC. JSA forms can be found in **Appendix H**.

19. Acknowledgement

All TRC personnel operating under this HASP must read the HASP and sign the acknowledgment page in **Appendix I**.

Figure 1
Site Layout



LEGEND

- TAX PARCEL BOUNDARY
- ORIGINAL WASTE LIMIT DISPOSAL AREA (WASTEWATER TREATMENT SLUDGE AND FERROX CUBE SLUDGE)
- CLOSED LANDFILL LIMITS
- 6-INCH HDPE PERFORATED COLLECTION LINE
- 2-INCH DIA. HDPE FORCE MAIN
- MONITORING WELL
- NON-POTABLE WELL
- LEACHATE COLLECTION SUMP
- LEACHATE COLLECTION LINE CLEANOUT

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND BOUNDARIES ARE APPROXIMATE.

2. MONITORING WELL LOCATIONS ARE FROM A SURVEY DATED JANUARY 15, 2022.

3. ORIGINAL DISPOSAL AREA LOCATION IS APPROXIMATE. ESTIMATED BOUNDARIES ARE FROM THE 1994 LANDFILL CLOSURE PLAN, TOPOGRAPHIC BASEMAP (DRAWING G-2).

4. GPS LAND SURVEY OF ALL MONITORING WELLS, ALL LEACHATE COLLECTION LINE CLEANOUTS, AND TS-ASW WAS COMPLETED BY SUSAN M. ANACKER PLS, PLLC ON NOVEMBER 20, 2023.

BASE MAP: NEARMAP IMAGERY DATED APRIL 20, 2022
DATA SOURCES: TRC, ULSTER COUNTY TAX PARCELS, NYGIS

N

1:2,400
1" = 200'
0 100 200 FEET

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SAUGERTIES TOWN LANDFILL - NYSDEC SITE NO. 356003
1765 ROUTE 212
SAUGERTIES, ULSTER COUNTY, NEW YORK

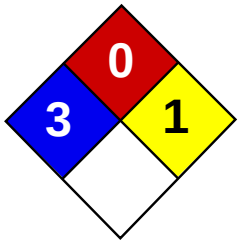
TITLE:
SITE LAYOUT MAP

DRAWN BY:	L. LILL	PROJ. NO.:	556071.0000.0000
CHECKED BY:	P. RODMAN	FIGURE 1	
APPROVED BY:	J. KING		
DATE:	JULY 2024		

TRC
3 CORPORATE DRIVE
SUITE 202
CLIFTON PARK, NY 12065
PHONE: 518.348.1190

FILE: WAfigs.aprx

Attachment A
Safety Data Sheets



Material Safety Data Sheet
Hydrochloric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Hydrochloric acid

Catalog Codes: SLH1462, SLH3154

CAS#: Mixture.

RTECS: MW4025000

TSCA: TSCA 8(b) inventory: Hydrochloric acid

CI#: Not applicable.

Synonym: Hydrochloric Acid; Muriatic Acid

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

Toxicological Data on Ingredients: Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth. Repeated or prolonged exposure to the substance can produce target

organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of metals

Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Non combustible. Calcium carbide reacts with hydrogen chloride gas with incandescence. Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine. Rubidium acetylene carbides burns with slightly warm hydrochloric acid. Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved. Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammble gas. Cesium acetylene carbide burns hydrogen chloride gas. Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute. Reacts with most metals to produce flammable Hydrodgen gas.

Special Remarks on Explosion Hazards:

Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate. Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

Section 6: Accidental Release Measures

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. Poisonous liquid. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. 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 the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
CEIL: 5 (ppm) from OSHA (PEL) [United States] CEIL: 7 (mg/m3) from OSHA (PEL) [United States] CEIL: 5 from NIOSH CEIL: 7 (mg/m3) from NIOSH TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)] TWA: 2 STEL: 8 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Pungent. Irritating (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.

Color: Colorless to light yellow.

pH (1% soln/water): Acidic.

Boiling Point:
108.58 C @ 760 mm Hg (for 20.22% HCl in water) 83 C @ 760 mm Hg (for 31% HCl in water) 50.5 C (for 37% HCl in water)

Melting Point:
-62.25°C (-80°F) (20.69% HCl in water) -46.2 C (31.24% HCl in water) -25.4 C (39.17% HCl in water)

Critical Temperature: Not available.

Specific Gravity:
1.1- 1.19 (Water = 1) 1.10 (20%and 22% HCl solutions) 1.12 (24% HCl solution) 1.15 (29.57% HCl solution) 1.16 (32% HCl solution) 1.19 (37% and 38%HCl solutions)

Vapor Pressure: 16 kPa (@ 20°C) average

Vapor Density: 1.267 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.25 to 10 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility: Soluble in cold water, hot water, diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, water

Incompatibility with various substances:
Highly reactive with metals. Reactive with oxidizing agents, organic materials, alkalis, water.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316). Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Reacts with water especially when water is added to the product. Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C. Sodium reacts very violently with gaseous hydrogen chloride. Calcium phosphide and hydrochloric acid undergo very energetic reaction. It reacts with oxidizers releasing chlorine gas. Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates. Reacts with most metals to produce flammable Hydrogen gas. Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure) Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid. Adsorption of Hydrochloric Acid onto silicon dioxide results in exothmeric reaction. Hydrogen chloride causes aldehydes and epoxides to violently polymerize. Hydrogen chloride or Hydrochloric Acid in contact with the folloiwng can cause explosion or ignition on contact or

Special Remarks on Corrosivity:

Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinium, tantalum, silver, and certain alloys are exceptions). It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys. No corrosivity data on zinc, steel. Severe Corrosive effect on brass and bronze

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
Acute oral toxicity (LD50): 900 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse]. Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid]. May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, . Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Doses (LDL/LCL) LDL [Man] -Route: Oral; 2857 ug/kg LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (fetoxicity). May affect genetic material.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: Corrosive. Causes severe skin irritation and burns. Eyes: Corrosive. Causes severe eye irritation/conjuntivitis, burns, corneal necrosis. Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and larryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well has headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure, occur, particularly if exposure is prolonged. May affect the liver. Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomitting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophogeal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis). Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel. Chronic Potential Health Effects: dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Hydrochloric acid, solution UNNA: 1789 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Hydrochloric acid Illinois toxic substances disclosure to employee act: Hydrochloric acid Illinois chemical safety act: Hydrochloric acid New York release reporting list: Hydrochloric acid Rhode Island RTK hazardous substances: Hydrochloric acid Pennsylvania RTK: Hydrochloric acid Minnesota: Hydrochloric acid Massachusetts RTK: Hydrochloric acid Massachusetts spill list: Hydrochloric acid New Jersey: Hydrochloric acid New Jersey spill list: Hydrochloric acid Louisiana RTK reporting list: Hydrochloric acid Louisiana spill reporting: Hydrochloric acid California Director's List of Hazardous Substances: Hydrochloric acid TSCA 8(b) inventory: Hydrochloric acid TSCA 4(a) proposed test rules: Hydrochloric acid SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid SARA 313 toxic chemical notification and release reporting: Hydrochloric acid CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-2A: Material causing other toxic effects (VERY TOXIC). CLASS E: Corrosive liquid.

DSCL (EEC):
R34- Causes burns. R37- Irritating to respiratory system. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 1

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Face shield.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

Created: 10/09/2005 05:45 PM

Last Updated: 06/09/2012 12:00 PM

GASCO

MATERIAL SAFETY DATA SHEET - CALIBRATION CHECK GAS

PRODUCT NAME: ISOBUTYLENE (1 PPM – 0.9%) IN AIR

MSDS NO: 248 **Version:3** **Date: August, 2010**

1. Chemical Product and Company Identification

Gasco Affiliates, LLC
320 Scarlett Blvd.
Oldsmar, FL 34677

TELEPHONE NUMBER: (800) 910-0051 **24-HOUR EMERGENCY NUMBER: 1-800-424-9300**
FAX NUMBER: (866) 755-8920
E-MAIL: info@gascogas.com

PRODUCT NAME: ISOBUTYLENE (1 PPM – 0.9%) IN AIR
CHEMICAL NAME: Isobutylene in air
COMMON NAMES/ SYNONYMS: None
TDG (Canada) CLASSIFICATION: 2.2
WHIMIS CLASSIFICATION: A

2. COMPOSITION/ INFORMATION ON INGREDIENTS

INGREDIENT	%VOLUME	PEL-OSHA	TLV-ACGIH	LD_{50} or LC_{50} Route/Species
Isobutylene FORMULA: C_4H_8	0.0001-0.9	N/A	N/A	N/A
Air FORMULA: Mixture	99.0 to 99.9999	N/A	N/A	N/A

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Release of this product may produce oxygen-deficient atmospheres (especially in confined spaces or other poorly ventilated environments); individuals in such atmospheres may be asphyxiated. Isobutylene may cause drowsiness and other central nervous system effects in high concentrations; however, due to the low concentration of this gas mixture, this is unlikely to occur.

ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
No	No	No	Yes	No

HEALTH EFFECTS:

Exposure Limits	Irritant	Sensitization	Reproductive Hazard	Mutagen
Yes	No	No	No	No

Carcinogenicity: --NTP: No IARC: No OSHA: No

EYE EFFECTS:
N/A.

SKIN EFFECTS:
N/A.

PRODUCT NAME: ISOBUTYLENE (1 PPM – 0.9%) IN AIR

INGESTION EFFECTS:
Ingestion unlikely. Gas at room temperature.

INHALATION EFFECTS:
Due to the small size of this cylinder, no unusual health effects from over-exposure are anticipated under normal routine use.

NFPA HAZARD CODES		HMIS HAZARD CODES		RATING SYSTEM
Health:	1	Health:	1	0= No Hazard
Flammability:	0	Flammability:	0	1= Slight Hazard
Reactivity:	0	Reactivity:	0	2= Moderate Hazard
				3= Serious Hazard
				4= Severe Hazard

4. FIRST AID MEASURES

EYES:
N/A

SKIN:
N/A

INGESTION:
Not required

INHALATION:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASED OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED THE SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. If breathing has stopped administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

5. FIRE-FIGHTING MEASURES

These containers hold gas under pressure, with no liquid phase. If involved in a major fire, they should be sprayed with water to avoid pressure increases, otherwise pressures will rise and ultimately they may distort or burst to release the contents. The gases will not add significantly to the fire, but containers or fragments may be projected considerable distances - thereby hampering fire fighting efforts.

6. ACCIDENTAL RELEASE MEASURES

In terms of weight, these containers hold very little contents, such that any accidental release by puncturing etc. will be of no practical concern.

7. HANDLING AND STORAGE

Suck back of water into the container must be prevented. Do not allow backfeed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Use only in well-ventilated areas. Do not heat cylinder by any means to increase rate of product from the cylinder. Do not allow the temperature where cylinders are stored to exceed 130^{o}F (54^{o}C).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Use adequate ventilation for extended use of gas.

PRODUCT NAME: ISOBUTYLENE (1 PPM – 0.9%) IN AIR

9. PHYSICAL AND CHEMICAL PROPERTIES

PARAMETER:	VALUE:
Physical state	: Gas
Evaporation point	: N/A
pH	: N/A
Odor and appearance	: Colorless, odorless gas

10. STABILITY AND REACTIVITY

Stable under normal conditions. Expected shelf life 48 months.

11. TOXICOLOGICAL INFORMATION

No toxicological damage caused by this product.

12. ECOLOGICAL INFORMATION

No ecological damage caused by this product.

13. DISPOSAL INFORMATION

Do not discharge into any place where its accumulation could be dangerous. Used containers are acceptable for disposal in the normal waste stream as long as the cylinder is empty and valve removed or cylinder wall is punctured; but GASCO encourages the consumer to return cylinders.

14. TRANSPORT INFORMATION

	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Compressed Gas N.O.S. (Isobutylene in Air)	Compressed Gas N.O.S. (Isobutylene in Air)
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	UN1956	UN1956
SHIPPING LABEL:	NONFLAMMABLE GAS	NONFLAMMABLE GAS

15. REGULATORY INFORMATION

Isobutylene is listed under the accident prevention provisions of section 112(r) of the Clean Air Act (CAA) with a threshold quantity (TQ) of 10,000 pounds.

16. OTHER INFORMATION

This MSDS has been prepared in accordance with the Chemicals (Hazard Information and Packaging for Supply (Amendment) Regulation 1996. The information is based on the best knowledge of GASCO, and its advisors and is given in good faith, but we cannot guarantee its accuracy, reliability or completeness and therefore disclaim any liability for loss or damage arising out of use of this data. Since conditions of use are outside the control of the Company and its advisors we disclaim any liability for loss or damage when the product is used for other purposes than it is intended.

MSDS/S010/248/ August, 2010

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 10.18.2017 **Revision**: 10.18.2017

Trade Name: Alconox

1 Identification of the substance/mixture and of the supplier

1.1 Product identifier

Trade Name: Alconox
Synonyms:
Product number: 1104-1, 1104, 1125, 1150, 1101, 1103, 1112-1, 1112

1.2 Application of the substance / the mixture : Cleaning material/Detergent

1.3 Details of the supplier of the Safety Data Sheet

Manufacturer
Alconox, Inc.
30 Glenn Street
White Plains, NY 10603
1-914-948-4040

Supplier

Emergency telephone number:
ChemTel Inc
North America: 1-800-255-3924
International: 01-813-248-0585

2 Hazards identification

2.1 Classification of the substance or mixture:

In compliance with EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments.

Hazard-determining components of labeling:
Tetrasodium Pyrophosphate
Sodium tripolyphosphate
Sodium Alkylbenzene Sulfonate

2.2 Label elements:

Skin irritation, category 2.
Eye irritation, category 2A.

Hazard pictograms:

Signal word: Warning

Hazard statements:
H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 10.18.2017 **Revision**: 10.18.2017

Trade Name: Alconox

Additional information: None.

Hazard description

Hazards Not Otherwise Classified (HNOC): None

Information concerning particular hazards for humans and environment:

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Classification system:

The classification is according to EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments, and extended by company and literature data. The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

3 Composition/information on ingredients

3.1 Chemical characterization : None

3.2 Description : None

3.3 Hazardous components (percentages by weight)

Identification	Chemical Name	Classification	Wt. %
CAS number: 7758-29-4	Sodium tripolyphosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	12-28
CAS number: 68081-81-2	Sodium Alkylbenzene Sulfonate	Acute Tox. 4; H303 Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	8-22
CAS number: 7722-88-5	Tetrasodium Pyrophosphate	Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	2-16

3.4 Additional Information : None.

4 First aid measures

4.1 Description of first aid measures

General information: None.

After inhalation:

Maintain an unobstructed airway.

Loosen clothing as necessary and position individual in a comfortable position.

After skin contact:

Wash affected area with soap and water.

Seek medical attention if symptoms develop or persist.

After eye contact:

Rinse/flush exposed eye(s) gently using water for 15-20 minutes.

Remove contact lens(es) if able to do so during rinsing.

Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly.

Seek medical attention if irritation, discomfort, or vomiting persists.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 10.18.2017 **Revision**: 10.18.2017

Trade Name: Alconox

4.2 Most important symptoms and effects, both acute and delayed

None

4.3 Indication of any immediate medical attention and special treatment needed:

No additional information.

5 Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:

Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition.

For safety reasons unsuitable extinguishing agents : None

5.2 Special hazards arising from the substance or mixture :

Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

Protective equipment:

Wear protective eye wear, gloves and clothing.
Refer to Section 8.

5.4 Additional information :

Avoid inhaling gases, fumes, dust, mist, vapor and aerosols.
Avoid contact with skin, eyes and clothing.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures :

Ensure adequate ventilation.
Ensure air handling systems are operational.

6.2 Environmental precautions :

Should not be released into the environment.
Prevent from reaching drains, sewer or waterway.

6.3 Methods and material for containment and cleaning up :

Wear protective eye wear, gloves and clothing.

6.4 Reference to other sections : None

7 Handling and storage

7.1 Precautions for safe handling :

Avoid breathing mist or vapor.
Do not eat, drink, smoke or use personal products when handling chemical substances.

7.2 Conditions for safe storage, including any incompatibilities :

Store in a cool, well-ventilated area.

7.3 Specific end use(s):

No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 10.18.2017 **Revision**: 10.18.2017

Trade Name: Alconox

8 Exposure controls/personal protection

8.1 Control parameters :

a) 7722-88-5, Tetrasodium Pyrophosphate, OSHA TWA 5 mg/m3

b) Dusts, non-specific OEL, Irish Code of Practice

(i) Total inhalable 10 mg/m3 (8hr)

(ii) Respirible 4mg/m3 (8hr)

(iii) Tetrasodium Pyrophosphate, OSHA TWA 5 mg/m3, (8hr)

8.2 Exposure controls

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling.

Respiratory protection:

Not needed under normal use conditions.

Protection of skin:

Select glove material impermeable and resistant to the substance or preparation. Protective gloves recommended to comply with EN 374. Take note of break through times, permeability, and special workplace conditions, such as mechanical strain, duration of contact, etc. Protective gloves should be replaced at the first sign of wear.

Eye protection:

Safety goggles or glasses, or appropriate eye protection. Recommended to comply with ANSI Z87.1 and/or EN 166.

General hygienic measures:

Wash hands before breaks and at the end of work.

Avoid contact with skin, eyes and clothing.

9 Physical and chemical properties

Appearance (physical state, color):	White and cream colored flakes - powder	**Explosion limit lower:** **Explosion limit upper:**	Not determined or not available. Not determined or not available.
Odor:	Not determined or not available.	**Vapor pressure at 20°C:**	Not determined or not available.
Odor threshold:	Not determined or not available.	**Vapor density:**	Not determined or not available.
pH-value:	9.5 (aqueous solution)	**Relative density:**	Not determined or not available.
Melting/Freezing point:	Not determined or not available.	**Solubilities:**	Not determined or not available.
Boiling point/Boiling range:	Not determined or not available.	**Partition coefficient (n-octanol/water):**	Not determined or not available.
Flash point (closed cup):	Not determined or not available.	**Auto/Self-ignition temperature:**	Not determined or not available.
Evaporation rate:	Not determined or not available.	**Decompositio n**	Not determined or not available.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 10.18.2017 **Revision**: 10.18.2017

Trade Name: Alconox

Flammability (solid, gaseous):	Not determined or not available.	**Viscosity**:	a. Kinematic: Not determined or not available. b. Dynamic: Not determined or not available.
Density at 20°C:	Not determined or not available.		

10 Stability and reactivity

10.1 Reactivity : None

10.2 Chemical stability : None

10.3 Possibility hazardous reactions : None

10.4 Conditions to avoid : None

10.5 Incompatible materials : None

10.6 Hazardous decomposition products : None

11 Toxicological information

11.1 Information on toxicological effects :

Acute Toxicity:

Oral:

: LD50 > 5000 mg/kg oral rat - Product .

Chronic Toxicity: No additional information.

Skin corrosion/irritation:

Sodium Alkylbenzene Sulfonate: Causes skin irritation. .

Serious eye damage/irritation:

Sodium Alkylbenzene Sulfonate: Causes serious eye irritation .

Tetrasodium Pyrophosphate: Rabbit - Risk of serious damage to eyes .

Respiratory or skin sensitization: No additional information.

Carcinogenicity: No additional information.

IARC (International Agency for Research on Cancer): None of the ingredients are listed.

NTP (National Toxicology Program): None of the ingredients are listed.

Germ cell mutagenicity: No additional information.

Reproductive toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

12 Ecological information

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 10.18.2017 **Revision**: 10.18.2017

Trade Name: Alconox

12.1 Toxicity:

Sodium Alkylbenzene Sulfonate: Fish, LC50 1.67 mg/l, 96 hours.
Sodium Alkylbenzene Sulfonate: Aquatic invertebrates, EC50 Daphnia 2.4 mg/l, 48 hours. Sodium Alkylbenzene Sulfonate: Aquatic Plants, EC50 Algae 29 mg/l, 96 hours.
Tetrasodium Pyrophosphate: Fish, LC50 - other fish - 1,380 mg/l - 96 h.
Tetrasodium Pyrophosphate: Aquatic invertebrates, EC50 - Daphnia magna (Water flea) - 391 mg/l - 48 h.

12.2 Persistence and degradability: No additional information.

12.3 Bioaccumulative potential: No additional information.

12.4 Mobility in soil: No additional information.

General notes: No additional information.

12.5 Results of PBT and vPvB assessment:

PBT: No additional information.

vPvB: No additional information.

12.6 Other adverse effects: No additional information.

13 Disposal considerations

13.1 Waste treatment methods (consult local, regional and national authorities for proper disposal)

Relevant Information:

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities. (US 40CFR262.11).

14 Transport information

14.1 UN Number: ADR, ADN, DOT, IMDG, IATA	None
14.2 UN Proper shipping name: ADR, ADN, DOT, IMDG, IATA	None
14.3 Transport hazard classes: ADR, ADN, DOT, IMDG, IATA	**Class:** None **Label:** None **LTD.QTY:** None

US DOT

Limited Quantity Exception: None

Bulk:
RQ (if applicable): None
Proper shipping Name: None
Hazard Class: None
Packing Group: None
Marine Pollutant (if applicable): No additional information.

Non Bulk:
RQ (if applicable): None
Proper shipping Name: None
Hazard Class: None
Packing Group: None
Marine Pollutant (if applicable): No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 10.18.2017 **Revision**: 10.18.2017

Trade Name: Alconox

Comments: None	**Comments:** None
14.4 Packing group: ADR, ADN, DOT, IMDG, IATA	None
14.5 Environmental hazards :	None
14.6 Special precautions for user:	None
Danger code (Kemler):	None
EMS number:	None
Segregation groups:	None
14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.	
14.8 Transport/Additional information:	
Transport category:	None
Tunnel restriction code:	None
UN "Model Regulation":	None

15 Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture.

North American

SARA

Section 313 (specific toxic chemical listings): None of the ingredients are listed.
Section 302 (extremely hazardous substances): None of the ingredients are listed.

CERCLA (Comprehensive Environmental Response, Clean up and Liability Act) Reportable

Spill Quantity: None of the ingredients are listed.

TSCA (Toxic Substances Control Act):

Inventory: All ingredients are listed.
Rules and Orders: Not applicable.

Proposition 65 (California):

Chemicals known to cause cancer: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males: None of the ingredients are listed.

Chemicals known to cause developmental toxicity: None of the ingredients are listed.

Canadian

Canadian Domestic Substances List (DSL):
All ingredients are listed.

EU

REACH Article 57 (SVHC): None of the ingredients are listed.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 10.18.2017 **Revision**: 10.18.2017

Trade Name: Alconox

Germany MAK: Not classified.
EC 648/2004 – This is an industrial detergent. Contains >30% phosphate, 15-30% anionic surfactant, <5% EDTA salts
EC 551/2009 – This is not a laundry or dishwasher detergent
EC 907/2006 – Contains no enzymes, optical brighteners, perfumes, allergenic fragrances, or preservative agents

Asia Pacific

Australia

Australian Inventory of Chemical Substances (AICS): All ingredients are listed.

China

Inventory of Existing Chemical Substances in China (IECSC): All ingredients are listed.

Japan

Inventory of Existing and New Chemical Substances (ENCS): All ingredients are listed.

Korea

Existing Chemicals List (ECL): All ingredients are listed.

New Zealand

New Zealand Inventory of Chemicals (NZOIC): All ingredients are listed.

Philippines

Philippine Inventory of Chemicals and Chemical Substances (PICCS): All ingredients are listed.

Taiwan

Taiwan Chemical Substance Inventory (TSCI): All ingredients are listed.

16 Other information

Abbreviations and Acronyms: None

Summary of Phrases

Hazard statements:
H315 Causes skin irritation.
H319 Causes serious eye irritation.

NFPA: 1-0-0
HMIS: 1-0-0

Precautionary statements:
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P321 Specific treatment (see supplemental first aid instructions on this label).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P501 Dispose of contents and container as instructed in Section 13.

Manufacturer Statement:

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

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 05/17/2017 **Revision** : 05/17/2017

Trade Name: Liquinox

1 Identification of the substance/mixture and of the supplier

1.1 Product identifier

Trade Name: Liquinox
Synonyms:
Product number: 1232-1, 1232, 1201-1, 1201, 1205, 1215, 1255

1.2 Application of the substance / the mixture : Cleaning material/Detergent

1.3 Details of the supplier of the Safety Data Sheet

Manufacturer **Supplier**
Alconox, Inc.
30 Glenn Street
White Plains, NY 10603
1-914-948-4040

Emergency telephone number:
ChemTel Inc
North America: 1-800-255-3924
International: 01-813-248-0585

2 Hazards identification

2.1 Classification of the substance or mixture:

In compliance with EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments.

Hazard-determining components of labeling:
Alcohol ethoxylate
Sodium alkylbenzene sulfonate
Sodium xylenesulphonate
Lauramine oxide

2.2 Label elements:

Eye irritation, category 2A.
Skin irritation, category 2.

Hazard pictograms:

Signal word: Warning

Hazard statements:
H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P501 Dispose of contents and container as instructed in Section 13.

Additional information: None.

Hazard description

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 05/17/2017 **Revision** : 05/17/2017

Trade Name: Liquinox

Hazards Not Otherwise Classified (HNOC): None

Information concerning particular hazards for humans and environment:

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Classification system:

The classification is according to EC regulation No. 1272/2008, 29CFR1910/1200 and GHS Rev. 3 and amendments, and extended by company and literature data. The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

3 Composition/information on ingredients

3.1 Chemical characterization : None

3.2 Description : None

3.3 Hazardous components (percentages by weight)

Identification	Chemical Name	Classification	Wt. %
CAS number: 68081-81-2	Sodium Alkylbenzene Sulfonate	Acute Tox. 4; H303 Skin Irrit. 2 ; H315 Eye Irrit. 2; H319	10-25
CAS number: 1300-72-7	Sodium Xylenesulphonate	Eye Irrit. 2; H319	2.5-10
CAS number: 84133-50-6	Alcohol Ethoxylate	Skin Irrit. 2 ; H315 Eye Dam. 1; H318	2.5-10
CAS number: 1643-20-5	Lauramine oxide	Skin Irrit. 2 ; H315 Eye Dam. 1; H318	1-2

3.4 Additional Information: None.

4 First aid measures

4.1 Description of first aid measures

General information: None.

After inhalation:

Maintain an unobstructed airway.

Loosen clothing as necessary and position individual in a comfortable position.

After skin contact:

Wash affected area with soap and water.

Seek medical attention if symptoms develop or persist.

After eye contact:

Rinse/flush exposed eye(s) gently using water for 15-20 minutes.

Remove contact lens(es) if able to do so during rinsing.

Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly.

Seek medical attention if irritation, discomfort, or vomiting persists.

4.2 Most important symptoms and effects, both acute and delayed

None

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 05/17/2017 **Revision** : 05/17/2017

Trade Name: Liquinox

4.3 Indication of any immediate medical attention and special treatment needed:

No additional information.

5 Firefighting measures

5.1 Extinguishing media

Suitable extinguishing agents:

Use appropriate fire suppression agents for adjacent combustible materials or sources of ignition.

For safety reasons unsuitable extinguishing agents : None

5.2 Special hazards arising from the substance or mixture :

Thermal decomposition can lead to release of irritating gases and vapors.

5.3 Advice for firefighters

Protective equipment:

Wear protective eye wear, gloves and clothing.
Refer to Section 8.

5.4 Additional information :

Avoid inhaling gases, fumes, dust, mist, vapor and aerosols.
Avoid contact with skin, eyes and clothing.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures :

Ensure adequate ventilation.
Ensure air handling systems are operational.

6.2 Environmental precautions :

Should not be released into the environment.
Prevent from reaching drains, sewer or waterway.

6.3 Methods and material for containment and cleaning up :

Wear protective eye wear, gloves and clothing.

6.4 Reference to other sections : None

7 Handling and storage

7.1 Precautions for safe handling :

Avoid breathing mist or vapor.
Do not eat, drink, smoke or use personal products when handling chemical substances.
Conditions for safe storage, including any incompatibilities:
Store closed upright and in a cool dry place, should be 15 - 30 deg C or 60 - 90 deg F.

7.2 Specific end use(s):

No additional information.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 05/17/2017 **Revision** : 05/17/2017

Trade Name: Liquinox

8 Exposure controls/personal protection

8.1 Control parameters :

No applicable occupational exposure limits

8.2 Exposure controls

Appropriate engineering controls:

Emergency eye wash fountains and safety showers should be available in the immediate vicinity of use or handling.

Respiratory protection:

Not needed under normal conditions.

Protection of skin:

Select glove material impermeable and resistant to the substance.

Eye protection:

Safety goggles or glasses, or appropriate eye protection.

General hygienic measures:

Wash hands before breaks and at the end of work.
Avoid contact with skin, eyes and clothing.

9 Physical and chemical properties

Appearance (physical state, color):	Pale yellow liquid	**Explosion limit lower:** **Explosion limit upper:**	Not determined or not available. Not determined or not available.
Odor:	Not determined or not available.	**Vapor pressure at 20°C:**	Not determined or not available.
Odor threshold:	Not determined or not available.	**Vapor density:**	Not determined or not available.
pH-value:	8.5 as is	**Relative density:**	Not determined or not available.
Melting/Freezing point:	Not determined or not available.	**Solubilities:**	Not determined or not available.
Boiling point/Boiling range:	Not determined or not available.	**Partition coefficient (n-octanol/water):**	Not determined or not available.
Flash point (closed cup):	Not determined or not available.	**Auto/Self-ignition temperature:**	Not determined or not available.

Evaporation rate:	Not determined or not available.	**Decomposition temperature:**	Not determined or not available.
Flammability (solid, gaseous):	Not determined or not available.	**Viscosity:**	a. Kinematic: Not determined or not available. b. Dynamic: Not determined or not available.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 05/17/2017 **Revision** : 05/17/2017

Trade Name: Liquinox	
Density at 20°C:	Not determined or not available.

10 Stability and reactivity

10.1 Reactivity : None

10.2 Chemical stability : None

10.3 Possibility hazardous reactions : None

10.4 Conditions to avoid : None

10.5 Incompatible materials : None

10.6 Hazardous decomposition products : None

11 Toxicological information

11.1 Information on toxicological effects :

Acute Toxicity:

Oral:

: LD50 >5000 mg per kg Rat, Oral) - product .

Chronic Toxicity: No additional information.

Skin corrosion/irritation:

Alcohol Ethoxylate: May cause mild to moderate skin irritation.

Sodium Alkylbenzene Sulfonate: Causes skin irritation.

Lauramine oxide: Causes skin irritation.

Serious eye damage/irritation:

Sodium Alkylbenzene Sulfonate: Causes serious eye irritation.

Alcohol Ethoxylate: Causes moderate to severe eye irritation and conjunctivitis.

Sodium xylenesulphonate: Rabbit: irritating to eyes.

Lauramine oxide: Causes serious eye damage.

Respiratory or skin sensitization: No additional information.

Carcinogenicity: No additional information.

IARC (International Agency for Research on Cancer): None of the ingredients are listed.

NTP (National Toxicology Program): None of the ingredients are listed.

Germ cell mutagenicity: No additional information.

Reproductive toxicity: No additional information.

STOT-single and repeated exposure: No additional information.

Additional toxicological information: No additional information.

12 Ecological information

12.1 Toxicity:

Sodium Alkylbenzene Sulfonate: Fish, LC50 1.67 mg/l, 96 hours.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 05/17/2017 **Revision** : 05/17/2017

Trade Name: Liquinox

Sodium Alkylbenzene Sulfonate: Aquatic invertebrates, EC50 Daphnia 2.4 mg/l, 48 hours.
Sodium Alkylbenzene Sulfonate: Aquatic Plants, EC50 Algae 29 mg/l, 96 hours.
Lauramine oxide: Fish, LC0 24.3 mg/l, 96h [Killifish (Cyprinodontidae)]
Lauramine oxide: Aquatic invertebrates, (LC50): 3.6 mg/l 96 hours [Daphnia (Daphnia)].
Lauramine oxide: Aquatic plants, EC50 Algae 0.31 mg/l 72 hours [Algae]
Alcohol Ethoxylate: Aquatic invertebrates, (LC50): 4.01 mg/l 48 hours [Daphnia (daphnia)].

12.2 Persistence and degradability: No additional information.

12.3 Bioaccumulative potential: No additional information.

12.4 Mobility in soil: No additional information.

General notes: No additional information.

12.5 Results of PBT and vPvB assessment:

PBT: No additional information.

vPvB: No additional information.

12.6 Other adverse effects: No additional information.

13 Disposal considerations

13.1 Waste treatment methods (consult local, regional and national authorities for proper disposal)

Relevant Information:

It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities. (US 40CFR262.11).

14 Transport information

14.1 UN Number: None
ADR, ADN, DOT, IMDG, IATA

14.2 UN Proper shipping name: None
ADR, ADN, DOT, IMDG, IATA

14.3 Transport hazard classes:
ADR, ADN, DOT, IMDG, IATA

Class: None
Label: None
LTD. QTY: None

US DOT
Limited Quantity Exception: None

Bulk:
RQ (if applicable): None
Proper shipping Name: None
Hazard Class: None
Packing Group: None
Marine Pollutant (if applicable): No additional information.
Comments: None

Non Bulk:
RQ (if applicable): None
Proper shipping Name: None
Hazard Class: None
Packing Group: None
Marine Pollutant (if applicable): No additional information.
Comments: None

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 05/17/2017 **Revision** : 05/17/2017

Trade Name: Liquinox

14.4 Packing group: ADR, ADN, DOT, IMDG, IATA	None
14.5 Environmental hazards :	None
14.6 Special precautions for user:	None
Danger code (Kemler):	None
EMS number:	None
Segregation groups:	None

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

14.8 Transport/Additional information:

Transport category:	None
Tunnel restriction code:	None
UN "Model Regulation":	None

15 Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture.

North American

SARA

Section 313 (specific toxic chemical listings): None of the ingredients are listed.
Section 302 (extremely hazardous substances): None of the ingredients are listed.

CERCLA (Comprehensive Environmental Response, Clean up and Liability Act) Reportable

Spill Quantity: None of the ingredients are listed.

TSCA (Toxic Substances Control Act):

Inventory: All ingredients are listed.
Rules and Orders: Not applicable.

Proposition 65 (California):

Chemicals known to cause cancer: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females: None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males: None of the ingredients are listed.

Chemicals known to cause developmental toxicity: None of the ingredients are listed.

Canadian

Canadian Domestic Substances List (DSL):
All ingredients are listed.

EU

REACH Article 57 (SVHC): None of the ingredients are listed.

Germany MAK: Not classified.

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), 29CFR1910/1200 and GHS Rev. 3

Effective date: 05/17/2017 **Revision** : 05/17/2017

Trade Name: Liquinox

Asia Pacific

Australia

Australian Inventory of Chemical Substances (AICS): All ingredients are listed.

China

Inventory of Existing Chemical Substances in China (IECSC): All ingredients are listed.

Japan

Inventory of Existing and New Chemical Substances (ENCS): All ingredients are listed.

Korea

Existing Chemicals List (ECL): All ingredients are listed.

New Zealand

New Zealand Inventory of Chemicals (NZOIC): All ingredients are listed.

Philippines

Philippine Inventory of Chemicals and Chemical Substances (PICCS): All ingredients are listed.

Taiwan

Taiwan Chemical Substance Inventory (TSCI): All ingredients are listed.

16 Other information

Abbreviations and Acronyms: None

Summary of Phrases

Hazard statements:

H315 Causes skin irritation.
H319 Causes serious eye irritation.

Precautionary statements:

P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352 If on skin: Wash with soap and water.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P332+P313 If skin irritation occurs: Get medical advice/attention.
P501 Dispose of contents and container as instructed in Section 13.

Manufacturer Statement:

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.

NFPA: 1-0-0

HMIS: 1-0-0

Attachment B
Glove Selection Guideline

APPENDIX B: GLOVE SELECTION GUIDELINE

HAZARD	EXAMPLE TASKS	ANSI CUT/ABRASION RATING*	REPRESENTATIVE GLOVE
Impact Hazards, Med/Heavy Duty Puncture Cut	Drilling/direct push activities. Construction. Heavy materials handling. Power tools. Air knifing. Excavation.	ANSI Cut and Abrasion Resistance **Level 5** **EN 388 4521**	Hexarmor®Chrome Hexarmor® GGT5 Hexarmor® L5 Hexarmor® SteelLeather III Ironclad® Kong Glove
Med/Heavy Duty Puncture Cut Oil/Solvent Resistant	Tasks where materials are treated with oil or solvents.	ANSI Cut and Abrasion Resistance **Level 3 - 4** **EN 388 4522**	Ansell Alpha-Tec ® Memphis® Ultra Tech Nitrile Cut & Splash Best® Neoprene 6780 Hexarmor™ TenX Threesixty
Medium Duty Cut/Puncture Gloves with Oily Surface Grip	Light materials handling, wet service	ANSI Cut and Abrasion Resistance **Level 3** **EN 388 44xx**	Best®Zorb-It Ultimate HV 4567 Ansell® Cut Protective Glove 97-505 Ansell HyFlex® 11-511 Ansell HyFlex® 11-624
Med/Heavy Duty Cut/Puncture	Light Materials Handling. System O&M. Use of Hand Tools. Hand Augering. Heavy Equipment Operator.	ANSI Cut and Abrasion Resistance **Level 2** **EN 388 33xx**	Perfect Fit® PF570 Hexarmor® Level Six 9010/9012 Ironclad® Cut Resistant Glove Ansell HyFlex® 11-511 Ansell HyFlex® 11-624 Ansell® Cut Protective Glove 97-505
Light Duty Cut/Puncture Abrasion Only	Handling soil and Groundwater Samples. Opening spoons. Well construction.	ANSI Cut and Abrasion Resistance **Level 2 - 4** **EN 388 21xx**	Memphis® Ninja Max N9676GL Memphis® UltraTech Dyneema 9676 Memphis® Ninja Ice (Cold Weather) Ansell HyFlex® 11-511 Ansell® Cut Protective Glove 97-505 Ansell® Powerflex 80-813 Ironclad™ Workforce
Light Duty Glove Cut/Abrasion (used under nitrile gloves)	Groundwater Sampling.	ANSI Cut and Abrasion Resistance **Level 2** **EN 388 21xx**	Ansell HyFlex® 11-500 Ansell HyFlex® 11-624 Ansell GoldKnit
* Reference to ANSI and EN 388 glove testing standards. Listed gloves meet the standards in the table, but are not the only gloves that meet the standard.			
This selection chart is not intended to address all chemical hazards. Gloves used for chemical protection shall provide cut/puncture resistance, or be used in tandem with cut/puncture protection. Nitrile gloves used for environmental sampling must be used in tandem with a cut/puncture resistant glove.			
Gloves available in high visibility colors have shown to be effective and are preferred.			

Attachment C
Heat and Cold Stress

COLD STRESS

Ambient air temperatures during site activities may create cold stress for on-site workers. Procedures for recognizing and avoiding cold stress must be followed. Cold stress can range from frostbite to hypothermia. The signs and symptoms of cold stress are listed below.

Frostbite is defined as the actual freezing of one or more layers of skin. In severe cases, organs and structures below the skin can become frozen. Usually, body areas exposed to the most cold, and least body warmth, are affected first. These areas include fingers, toes, ears, and the tip of your nose. Frostbite is characterized by pain and loss of dexterity in the affected limb. The tissue initially appears reddened, but may progress to white, blue, or black.

> **FIRST AID:** Bring the affected employee indoors and call the local emergency clinic. Rewarming of frostbitten parts is best left to a medical doctor in a controlled setting.

Hypothermia is the condition that occurs when the body's natural warming mechanisms (muscle activity and shivering) cannot counteract the loss of body heat to the environment. The onset of hypothermia is greatly hastened by being wet. Hypothermia is marked by severe, uncontrollable shivering. The patient will show signs of excessive fatigue, drowsiness, irritability, or euphoria. As hypothermia progresses, the patient will begin to lose consciousness, blood pressure will drop, shivering will cease, and the patient may slip into a coma and possibly die.

> **FIRST AID:** If these symptoms occur, remove the patient to a warm, dry place. If clothing is wet, remove and replace with dry clothing. Keep the patient warm, but not overheated. The patient should be gradually rewarmed to prevent shock. If the patient is conscious and alert, warm liquids should be provided. Coffee and other caffeinated liquids should be avoided because of diuretic and circulatory effects. Notify the emergency clinic if conditions worsen, the patient loses consciousness, or the patient has an altered mental status. Have the patient transported to an emergency facility.

General Precautions The reduction of adverse health effects from cold exposure can be achieved by adopting the following work practices.

- Provide adequate insulating clothing to maintain core temperature at 98.6° F if work is to be performed in air temperatures below 40° F. Wind chill cooling rates and the cooling power of air are critical factors. The higher the wind speed and the lower the air temperature in the work area, the greater the insulation value of the protective clothing should be.
- If the air temperature is 32° F or less, hands should be protected by mittens/gloves.
- If only light work is involved and if the clothing on the worker may become wet on the job site, the outer layer of clothing should be impermeable to water. With more severe work under such conditions, the outer layer should be water repellent, and the outer layer should be changed as it becomes wet. The outer garments should include provisions for easy ventilation in order to prevent wetting of the inner layer by sweat.
- If available clothing does not give adequate protection to prevent cold injury, work should be modified or suspended until adequate clothing is available, or until weather conditions improve.
- For prolonged work, heated shelters should be available. Workers should be encouraged to use these at regular intervals, with the frequency depending on the severity of the environmental exposure. When entering the shelter, the outer layer of clothing should be removed and the remainder of the clothing

loosened to permit heat evaporation, or a change of work clothing should be provided.

- Warm, sweet drinks, such as hot cocoa or soup, should be available at the work site to provide caloric intake and fluid volume. The intake of coffee should be limited because of diuretic and circulatory effects.
- The weight and bulk of cold-weather gear should be included in estimating the required work performance and weights to be lifted in the field.

Workers should be instructed in safety and health procedures regarding cold work environments as part of the pre-work safety meeting. The training program should include instruction in preventing, recognizing, and treating cold stress conditions.

Wind Chill Chart

Wind (mph) \ Temperature (°F)	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	29	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes, 10 minutes, 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph) *Effective 11/01/01*

HEAT STRESS

There is a potential for heat stress from the use of protective clothing and climate conditions. One or more of the following procedures may be employed to alleviate potential heat stress problems in the event that site conditions warrant the use of personal protective equipment (PPE), or ambient temperatures exceed 85° F. Heat stress training must be emphasized during the daily safety meetings, and adequate supplies of potable water must be provided to workers each day.

General Precautions Provide plenty of liquids. To replace body fluids (water and electrolytes) lost because of sweating, use a 0.1 percent saltwater solution, more heavily salted foods, or commercial drink mixes. The commercial mixes may be preferable for those employees on a low sodium diet. Employees on low sodium diets, or other special diets, are advised to contact their personal physician for recommendations regarding appropriate electrolyte replacement fluids/beverages.

In extremely hot weather, conduct operations in early morning or evening and rotate shifts of workers wearing impervious clothing. Install mobile showers and/or hose-down facilities to reduce body temperature and cool protective clothing.

Ensure that adequate shelter is available for breaks to protect personnel against heat, which can decrease physical efficiency and increase the probability of accidents.

Acclimatization for workers not accustomed to working in elevated temperature environments will be considered and implemented as appropriate in accordance with American Conference of Governmental and Industrial Hygienists (ACGIH) Guidelines.

Heat Stress Monitoring

For monitoring the body's recuperative ability toward excess heat, one or more of the following techniques should be used as a screening mechanism. Monitoring of personnel wearing impervious clothing should commence when the ambient temperature is 70° F or above. Frequency of monitoring should increase as the ambient temperature increases or as slow recovery rates are indicated. When temperatures exceed 80° F, regardless of the use of Personal Protective Equipment (PPE), workers will be monitored for heat stress after every work period.

Good hygienic standards must be maintained by the employee to aid in the prevention of heat stress illnesses. At a minimum, frequent changes of clothing and daily showering should occur with clothing being allowed to dry during rest periods. Persons who notice skin problems should immediately inform their supervisor.

Heart rate (HR) should be measured by the radial pulse for 30 seconds as early as possible in the resting period. The HR at the beginning of the rest period should not exceed 110 beats/minute. If the HR is higher, the next work period should be shortened by 25 percent. The HR is then measured again, once each minute for 2 minutes (a total of three measurements), after the initial rest period measurement. The HR should decrease by ten beats per minute between each measurement (a total reduction of 20 beats). If the HR does not decrease, the work period should be reduced by an additional 25 percent.

Body temperature can be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature (OT) at the beginning of the rest period should not exceed 99°F. If it is greater than 99°F, the next work period should be shortened by 25 percent. The OT should be measured again at the end of the rest period to make sure that it has dropped below 99° F.

Effects of Heat Street

If the body's physiological processes fail to maintain a normal body temperature because of excessive heat loading, a number of physical reactions can occur. The severity of these reactions ranges from mild (such as fatigue, irritability, anxiety, and decreased concentration, dexterity, or movement) to severe (fatal).

Heat-related illnesses include:

Heat rash (also known as prickly heat rash) is caused by continuous exposure to heat and humid air and aggravated by chafing clothes. Heat rash decreases the ability to tolerate heat as well as being a nuisance. Signs are not limited to, but may include, a red prickly rash.

FIRST AID: Employees exhibiting signs of heat rash will be directed to shower and change into clean, dry clothing.

Heat cramps are caused by profuse perspiration with inadequate fluid intake and electrolyte replacement (especially salts). Signs are muscle spasms and pain in the extremities and abdomen, and may occur several hours after work has stopped.

FIRST AID: Employees showing signs of heat cramps will be directed to lie in a cool, shady area, and drink cool fluids. If symptoms persist or worsen, the employee will be transported to an emergency facility.

Heat exhaustion is caused by increased stress on various organs to meet increased demands to cool the body. Signs are shallow breathing; pale, cool, moist skin; profuse sweating; dizziness and lassitude.

FIRST AID: Employees with signs of heat exhaustion will be brought to a cool, shady location and given fluids. After recovering, the employee will be dismissed for the day. If employee is unconscious, or conditions persist, the employee will be transported to a hospital.

Heat stroke is the most severe form of heat stress. The body must be cooled immediately to prevent severe injury and/or death. Signs and symptoms are red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; and/or coma.

FIRST AID: HEAT STROKE IS A MEDICAL EMERGENCY. Employees will be brought to a cool area, aggressively treated by removing constricting clothes and applying wet towels or ice packs, and transported without delay to an emergency facility.

Attachment D
Tailgate Meeting/Checklist

Daily Pre-Job Safety Briefing

Project Name: _____ Project Number: _____

Work Location: _____ Date: _____

Tasks Performed: _____ Time: _____ AM PM

Client Name: _____ Submitted By: _____

Weather: _____

Refuge Area: _____

First Aid/CPR Persons: _____

Potential Hazards: _____

For Emergencies Dial 911 **For Non-Emergencies Dial WorkCare (888) 449-7787**

Personal Protective Equipment Required

	Yes	*No*	*Specify*
Clothing	☐	☐	_____
FR, reflective vest, chemical, other (specify)			
Eye/Face	☐	☐	_____
Safety glasses, goggles, face shield, other (specify)			
Respirator	☐	☐	_____
1/2 face, full face, other (specify)			
Foot Protection	☐	☐	_____
Safety toe, EH rated, rubber boots, other (specify)			
Hand Protection	☐	☐	_____
Kevlar, chemical, EH, other (specify)			
Head Protection	☐	☐	_____
hard hat, electrical hazard, other (specify)			
Fall Protection	☐	☐	_____
body harness, lifelines, barricades, other (specify)			
Hearing Protection	☐	☐	_____
Other:			_____

Procedures/Programs Required	*Yes*	*No*
Confined Space	☐	☐
Hot Work	☐	☐
Signs/Barricades	☐	☐
LOTO/Energy Control	☐	☐
Scaffolds/Aerial Lifts	☐	☐
_____	☐	☐
_____	☐	☐
_____	☐	☐
_____	☐	☐
Employee Certification/Training Required		
HAZWOPWER	☐	☐
Asbestos Awareness	☐	☐
Asbestos Inspector	☐	☐
XRF Trained	☐	☐
_____	☐	☐
_____	☐	☐
_____	☐	☐

Additional Considerations

Work Procedures: ☐ Dig Safe
☐ Working clearances ☐ _____
☐ _____

People: ☐ Worker fatigue ☐ Other site activities
☐ Public safety ☐ Pedestrian control ☐ Experience
☐ Traffic control ☐ Other utilities
☐ _____

Tools/Equipment: ☐ Eye wash ☐ First Aid Kit
☐ Inspection of tools/equipment
☐ Specialized tools/equipment
☐ Correct tool/equipment for the job
☐ _____

Special Precautions: ☐ Environmental
☐ Condition of structures ☐ Weather conditions
☐ Lighting conditions ☐ Terrain ☐ Water bodies
☐ Adjacent structures
☐ _____

If Conditions CHANGE…Stop Work, Review and Revise the Plan!!

Daily Pre-Job Safety Briefing

Hazards Associated with the Job

☐ Hazardous Chemicals	☐ Heavy Equipment	☐ Slip/Trip and Falls	☐ Work in Active Rail ROW	☐ Confined space
☐ Biological Waste	☐ Hostile Individual(s)	☐ Traffic Hazards	☐ Work in Active Substation	☐ Hot Work
☐ Asbestos	☐ Ladder	☐ Trenches Excavations	☐ Animals/Insects	☐ Radioactive Materials
☐ Dust	☐ Lighting	☐ Utilities	☐ Plants	☐ Boom/Scissor Lift
☐ Edges/Material Handling	☐ Manual Lifting	☐ Water/Boat Safety	☐ _____	☐ _____
☐ Electricity	☐ Pressurized Fluids/Gases	☐ Weather (hot/cold)	☐ _____	☐ _____

List all hazards associated with this task	**Signature of Crew Members Present**	
	Print Name	Sign Name
Barriers to eliminate/control above hazards?		
Supervisor Signature:		

Post Task Safety Analysis

Did any injuries or incidents occur today? If yes, explain.

☐ Yes ☐ No

Was the injury or incident reported the safety department?

☐ Yes ☐ No ☐ N/A

What problems did you have with today's work assignment?

What can we do tomorrow to improve performance?

Attachment E
WorkCare Program Information

EARLY INCIDENT INTERVENTION®

Immediate Access to Medical Advice for Work Related Incidents

(888) 449-7787

INTRODUCTION

WorkCare, Inc. (WorkCare) and TRC have partnered together to promote Incident Intervention®, a resource designed to support company safety goals/targets—while reducing runaway-costs associated with workplace injuries and illnesses.

PURPOSE

Early Incident Intervention provides TRC employees with **IMMEDIATE** telephonic access to WorkCare clinicians at the time of a presumed, non-emergency workplace injury or illness. Clinicians provide expert guidance on the evaluation of symptoms, appropriate first aid, and the need for additional medical evaluation or treatment.

When utilizing this service within the first hour of an incident, known as the "Golden Hour," licensed medical staff can guide the case so that medical evaluation and treatment are rendered appropriately.

> ***"…helps the worker traverse the unpredictable terrain of work-related injuries and illness."***

PRINCIPLES OF EARLY INCIDENT INTERVENTION

- Utilizes principles of the "Golden Hour."
- Provides workers immediate clinician support at the time of an incident.
- Focuses on providing the right care, at the right time in the proper setting.

BENEFITS FOR EMPLOYEES

- Instant access to a medically qualified professional for evaluation of symptoms and possible outcomes.
- Professional guidance on appropriate first aid measures and medications.
- Professional advice regarding the need for additional medical evaluation or treatment.

BENEFITS FOR TRC

- Point of contact for emergency and non-emergency medical clinicians.
- Triages the incident to determine risk and urgency, delivering interventions that are consistent with medical guidelines for the specified injury and illness.
- Maintains communication with clinicians to ensure accurate and timely reporting.

Attachment F
Safe Catch Form

Safe Catch Report

A “Safe Catch” is a potential hazard or incident that has not resulted in any personal injury. Unsafe working conditions, unsafe employee behaviors, improper use of equipment or use of malfunctioning equipment have the potential to cause work related injuries. It is everyone’s responsibility to report and/or correct these potential incidents immediately. Please complete this form as a means to report these “Good Catch” situations and submit to your local OSC Representative and Mike Glenn, SVP/National Safety Director.

Complete ALL field entries:

Employee Name:		Date:	
Location:		Office:	
Project Number:		Practice:	

Conditions

Please check all appropriate conditions:

☐ Unsafe Act	☐ Unsafe Condition	☐ Unsafe Equipment	☐ Unsafe Use of Equipment

Description of Incident or Potential Hazard:

Task Performed at Time of Incident:

Causes (Primary and Contributing):

Corrective Action(s) Taken (remove the hazard, replace, repair, or retrain):

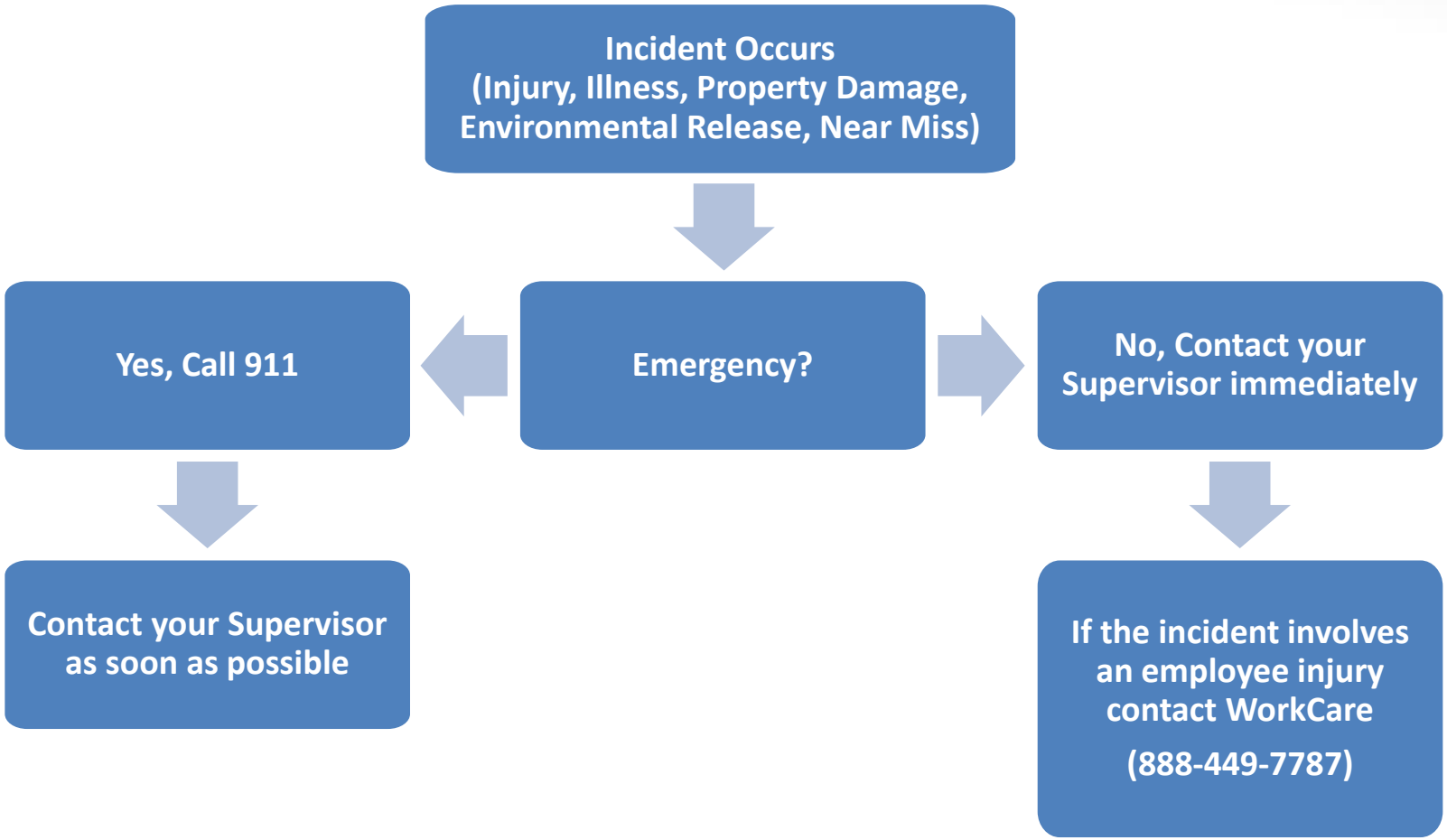
Employee Signature:		Date Completed:	

Our Mission: To reduce the frequency of incidents by applying local lessons learned globally.

If you have any questions about this report or would like additional information, please reference Compliance Program CP019 TRC Incident Response and Lessons Learned Program, located on TRCNET or contact Mike Glenn, SVP/National Safety Director at mglenn@trcsolutions.com.

Attachment G
In Case of Emergency and Incident Reporting

Incident Response Flow Chart - Employees



In Case of Injury at Work

1. If emergency care **is** needed, or if you are in a motor vehicle incident, call 9-1-1.

2. If emergency care **is not** needed, notify your supervisor **prior** to the initial contact with **WorkCare (888.449.7787).**

3. Supervisor must notify a Corporate Health and Safety Team Member.

Submit the appropriate form(s): TRC Incident Notification Report or TRC Auto Incident Report **within 24 hours** to Mike Glenn, VP, National Safety Director.

TRC
Results you can rely on

Attachment H
Job Safety Analysis Forms

Job Safety Analysis Template

COMPANY/ PROJECT NAME or ID/ LOCATION (City, State)	DATE PREPARED FOR HASP:	☐ NEW ☐ REVISED
TRC		
JSA WORK ACTIVITY (Description):	List of Contractor(s) and key work activity:	

SITE SPECIFIC JSA AUTHOR	POSITION / TITLE	DEPT	SIGNATURE

TRC HEALTH AND SAFETY MANAGEMENT	POSITION / TITLE	APPROVAL DATE

PERSONAL PROTECTION EQUIPMENT (PPE) QUICK SUMMARY
Required PPE (indicate with "R") vs. Must Have Available On-site (indicate "A")

___ REFLECTIVE VEST ____HARD HAT _____GLOVES: **ANSI Cut Level ____ Kevlar** ____SAFETY GLASSES _____GOGGLES _____FACE SHIELD	____ HEARING PROTECTION ___SAFETY SHOES: Protective Toe ____ 5pt.HARNESS / LANYARD PPE CLOTHING: ____Coveralls ___Tyvek Suit ____Nomex ___Other (specify):	RESPIRATORY PROTECTION: ☐ NA ____½ face Air Purifying Respirator (APR) ____Particulate Mask: ☐ PM100 ☐ PM95 ____ Cartridge: ☐ P100-Multigas ☐ _____ _____Full face ARP; specify cartridge type: ____ Air Supplied Respirator ____SCBA ____Air-line	Additional PPE: .

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.

[1] JOB TASKS	[2] POTENTIAL HAZARDS	[3] HAZARD CONTROLS (beyond wearing "Required" PPE)
1)	a.	
	b.	

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day. Focus on each new task, procedures, and skill sets to be used.		
[1] JOB TASKS	**[2] POTENTIAL HAZARDS**	**[3] HAZARD CONTROLS (beyond wearing "Required" PPE)**
2)		
3)		

Always perform a Safety Assessment (Hazard Hunt): 1) prior to starting work; 2) when changing tasks; and 3) throughout the day.

[1] JOB TASKS	[2] POTENTIAL HAZARDS	[3] HAZARD CONTROLS (beyond wearing "Required" PPE)
3)		
4)		

	LOCATION(S) WHERE HAZARD IS TO BE EXPECTED	[3] HAZARD CONTROLS (beyond wearing "Required" PPE)
1.	a.	a.
2.	a.	a.
3.	a.	a.

Field Notes:

LIMITATION: As part of TRC's EHS Policy, a JSA is provided by TRC for its employees. The purpose of a JSA is NOT to identify all hazards associated with a task, but to identify key potential hazards to get TRC and other onsite personnel thinking about other potential safety hazards and mitigating actions for unsafe conditions and behavior during various works. TRC recognizes that JSA's may not cover every conceivable step or hazard that emerges during a job, so we've provided a "Field Change" section below to amend a JSA if required. The JSA does not supersede or replace any local, state or federal permit, regulation, statute or other entities policies and procedures but is simply a tool for enhancing the execution of safe work at a jobsite under TRC's supervision. Similarly, all subcontractors are required to provide their own JSA(s) for their specialty prior to performing any work for TRC or its customers in accordance with TRC's EHS Policy; however, any unsafe condition or hazard not covered in any JSA is ultimately the direct responsibility of the person or entity performing the work.

Attachment I
Acknowledgement

PERSONAL ACKNOWLEDGEMENT

A component of the HASP, designed to provide personnel safety during work activities described herein, requires that you receive training as described in the HASP prior to working at this site. Additionally, you are required to read and understand the HASP. When you have fulfilled these requirements, please sign and date this personal acknowledgement:

Name (Printed)	Signature	Date
Name (Printed)	Signature	Date
Name (Printed)	Signature	Date
Name (Printed)	Signature	Date
Name (Printed)	Signature	Date
Name (Printed)	Signature	Date
Name (Printed)	Signature	Date
Name (Printed)	Signature	Date
Name (Printed)	Signature	Date
Name (Printed)	Signature	Date

APPENDIX B

SITE SPECIFIC COMMUNITY AIR MONITORING PLAN

SITE-SPECIFIC COMMUNITY AIR MONITORING PLAN

Saugerties Town Landfill
1765 Route 212, Saugerties, NY 12477
NYSDEC Site No. 356003

Work Assignment No. D09812-33

Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233

Prepared by:

TRC Engineers, Inc.
3 Corporate Drive, Suite 202
Clifton Park, New York 12065

TRC Project No.: 556071.0000.0000

July 2024

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List of Appendices

1. Introduction

This Site-Specific Community Air Monitoring Plan (SSCAMP) is developed for utilization during ground intrusive work activities during the Remedial Investigation at the Saugerties Town Landfill site, NYSDEC Site No. 356003, located at 1765 Route 212, in the Town of Saugerties, Ulster County, New York (referred to as the "Site").

TRC Engineers, Inc. (TRC) developed this SSCAMP to describe the procedures for real-time air monitoring for volatile organic compounds (VOCs) and particulate levels which will be continuously monitored and observed during ground intrusive activities. This CAMP was developed based on the requirements of New York State Department of Health (NYSDOH) Generic CAMP, Appendix 1A and Fugitive Dust and Particulate Monitoring, Appendix 1B, of NYSDEC DER-10, included here as **Appendix A**.

2. Purpose

The CAMP requires real-time monitoring for VOCs and particulates (i.e., dust) at the downwind perimeter of the work area at the Site. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of ground intrusive work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities do not spread contamination off-site through the air.

3. Air Monitoring Protocol

All instrumentation and equipment will be calibrated daily and maintained in proper operating condition in accordance with the manufacturer's specifications. Each calibration event, any equipment and instrument malfunctions, unusual conditions, air monitoring station locations, and any exceedances of action levels and countermeasures implemented will be documented in the daily field logs or a dedicated log book.

3.1 CAMP Station Location

A total of two CAMP stations will be used to monitor VOCs and particulate for the duration of the PDI whenever ground-intrusive work is being performed. These stations will be placed upwind (identified at SAUG-UW) and downwind (identified as SAUG-DW) at a distance between 20 to 40 feet of each work area, as determined appropriate for the subject intrusive location and setting. CAMP stations will be placed between work activities at the Site and potential receptors, where applicable and to the extent practical. This will allow for CAMP stations to be moved to accommodate the work areas while ensuring that a CAMP station is placed between any work area and each potential receptor. CAMP station locations will

be recorded at the end of each day.

A map showing the proposed soil boring and monitoring wells subject to SSCAMP activities is provided on **Figure 1**.

3.2 VOC Monitoring, Response Levels, and Corrective Actions

VOCs will be monitored at both locations on a continuous basis. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present (i.e., photoionization detector MiniRae 2000 or equivalent). The equipment will be calibrated daily and will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the Site exceed 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the work area persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the work area or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
- All 15-minute readings will be recorded and will be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

3.3 Particulate Monitoring, Response Levels, and Corrective Actions

Particulate concentrations will be monitored at both locations on a continuous basis. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level (i.e., TSI DustTrak Model 8520 or equivalent). The equipment will be equipped with telemetry to notify TRC field personal via email and SMS text messages to indicate exceedance of the action level. In addition, fugitive dust migration will be visually

assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (µg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, work activities must be shutdown until dust suppression techniques can be employed. Work may resume with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 µg/m3 above the upwind level and provided that no visible dust is migrating from the work area. Note dust complaints from any owner of an adjacent or nearby property will be managed by the Contractor in a manner equivalent to an exceedance of an action level in the SSCAMP.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 µg/m3 above the upwind level, work will be stopped and a reevaluation of activities will be initiated. Work will be able to be resumed provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 µg/m3 of the upwind level and in preventing visible dust migration.

3.4 Work Within 20 Feet of Potential Exposed Individuals or Occupied Structures

While not planned, if work areas fall within 20 feet of potentially exposed populations or occupied structures, the existing continuous monitoring locations for VOCs and particulates will be relocated to reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. Background reading in the occupied spaces will be collected prior to commencement of the planned work to establish baseline readings within the occupied spaces.

If total VOC concentrations at the wall of the occupied structure closest to the work area or next to intake vents exceed 2 ppm above background for a sustained period of over one hour, intrusive work will be stopped until VOC concentrations at the wall return to background.

If total particulate concentrations at the wall of the occupied structure closest to the work area or next to intake vents exceed 150 µg/m3 work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 µg/m3 or less at the monitoring point.

The use of engineering controls such as adding water for dust suppression, vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices will be considered in situations of elevated VOCs and particulates as described above to prevent exposures related to the work activities and to control dust.

4. Reporting

Any exceedance of a SSCAMP threshold or action level will be reported to the NYSDEC and NYSDOH immediately and additionally via email within 24 hours of the time it is recorded. The notification will

include the instrument readings; location of the monitoring station where the exceedance was recorded; readings at upwind locations; date, time, and duration of elevated readings (i.e., number of 15-minute time-weighted exceedances); activities being performed at the time of the exceedances; and descriptions of countermeasures implemented to control the exceedance and prevent future occurrences.

All readings will be recorded and provided to the NYSDEC and NYSDOH on a weekly basis and upon request.

Figures
Proposed Soil Boring/Monitoring Well Location Maps

LEGEND

- TAX PARCEL BOUNDARY
- ULSTER COUNTY TAX PARCELS
- CLOSED LANDFILL LIMITS
- ORIGINAL WASTE LIMIT DISPOSAL AREA (WASTEWATER TREATMENT SLUDGE AND FERROX CUBE SLUDGE)
- MONITORING WELL
- NON-POTABLE WELL
- PROPOSED ONSITE BEDROCK MONITORING WELL
- PROPOSED OFFSITE BEDROCK MONITORING WELL
- PROPOSED SOIL BORING FOR SOIL CHARACTERIZATION
- PROPOSED SOIL BORING TO DEFINE ORIGINAL WASTE LIMIT DISPOSAL AREA

NOTES:

1. LOCATIONS AND DIMENSIONS OF PHYSICAL FEATURES AND BOUNDARIES ARE APPROXIMATE.
2. MONITORING WELL LOCATIONS ARE FROM A SURVEY DATED JANUARY 15, 2022.
3. ORIGINAL DISPOSAL AREA LOCATION IS APPROXIMATE. BOUNDARIES ARE FROM THE JUNE 1987 PHASE I ENVIRONMENTAL SITE ASSESSMENT AND HISTORICAL AERIAL IMAGES.

BASE MAP: NEARMAP IMAGERY DATED APRIL 20, 2022
DATA SOURCES: TRC, ULSTER COUNTY TAX PARCELS

N

1:3,600
1" = 300'
0 150 300 FEET

PROJECT:
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SAUGERTIES TOWN LANDFILL - NYSDEC SITE NO. 356003
1765 ROUTE 212
SAUGERTIES, ULSTER COUNTY, NEW YORK

TITLE:
REMEDIAL INVESTIGATION
PROPOSED SOIL BORING AND BEDROCK MONITORING WELL MAP

DRAWN BY:	L. LILL	PROJ. NO.:	556071.0000.0000
CHECKED BY:	P. RODMAN		FIGURE 5
APPROVED BY:	J. KING		
DATE:	JULY 2024		

TRC
3 CORPORATE DRIVE
SUITE 202
CLIFTON PARK, NY 12065
PHONE: 518.348.1190

FILE: WAfigs.aprx

Coordinate System: NAD 1983 StatePlane New York East FIPS 3101 Feet: Map Rotation: 0
Saved By: LLILL on 7/24/2024, 10:25:50 AM File Path: T:\1_PROJECTS\NYSDEC\356003\6_Saugerties Town LF\2-4\APRX\WAfigs\WAfigs.aprx Layout Name: Figure 5 - Proposed Soil Boring and Bedrock Monitoring Well Map

Attachment 1
NYSDEC DER-10: NYSDOH Generic CAMP, Appendices 1A and 1B

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical- specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate DEC/NYSDOH staff.

Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions, particularly if wind direction changes. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

1. If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

1. If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

3. All readings must be recorded and be available for State (DEC and NYSDOH) and County Health personnel to review.

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

A program for suppressing fugitive dust and particulate matter monitoring at hazardous waste sites is a responsibility on the remedial party performing the work. These procedures must be incorporated into appropriate intrusive work plans. The following fugitive dust suppression and particulate monitoring program should be employed at sites during construction and other intrusive activities which warrant its use:

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

this short-term interval will provide a real-time assessment of on-site air quality to assure both health and safety. If particulate levels are detected in excess of 150 ug/m3, the upwind background level must be confirmed immediately. If the working site particulate measurement is greater than 100 ug/m3 above the background level, additional dust suppression techniques must be implemented to reduce the generation of fugitive dust and corrective action taken to protect site personnel and reduce the potential for contaminant migration. Corrective measures may include increasing the level of personal protection for on-site personnel and implementing additional dust suppression techniques (see paragraph 7). Should the action level of 150 ug/m3 continue to be exceeded work must stop and DER must be notified as provided in the site design or remedial work plan. The notification shall include a description of the control measures implemented to prevent further exceedances.

6. It must be recognized that the generation of dust from waste or contaminated soil that migrates off-site, has the potential for transporting contaminants off-site. There may be situations when dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Since this situation has the potential to allow for the migration of contaminants off-site, it is unacceptable. While it is not practical to quantify total suspended particulates on a real-time basis, it is appropriate to rely on visual observation. If dust is observed leaving the working site, additional dust suppression techniques must be employed. Activities that have a high dusting potential--such as solidification and treatment involving materials like kiln dust and lime--will require the need for special measures to be considered.

7. The following techniques have been shown to be effective for the controlling of the generation and migration of dust during construction activities:

(a) Applying water on haul roads;
(b) Wetting equipment and excavation faces;
(c) Spraying water on buckets during excavation and dumping;
(d) Hauling materials in properly tarped or watertight containers;
(e) Restricting vehicle speeds to 10 mph;
(f) Covering excavated areas and material after excavation activity ceases; and
(g) Reducing the excavation size and/or number of excavations.

Experience has shown that the chance of exceeding the 150ug/m3 action level is remote when the above-mentioned techniques are used. When techniques involving water application are used, care must be taken not to use excess water, which can result in unacceptably wet conditions. Using atomizing sprays will prevent overly wet conditions, conserve water, and provide an effective means of suppressing the fugitive dust.

8. The evaluation of weather conditions is necessary for proper fugitive dust control. When extreme wind conditions make dust control ineffective, as a last resort remedial actions may need to be suspended. There may be situations that require fugitive dust suppression and particulate monitoring requirements with action levels more stringent than those provided above. Under some circumstances, the contaminant concentration and/or toxicity may require additional monitoring to protect site personnel and the public. Additional integrated sampling and chemical analysis of the dust may also be in order. This must be evaluated when a health and safety plan is developed and when appropriate suppression and monitoring requirements are established for protection of health and the environment.