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Remedial Action Work Plan

For:
One Water Street Blacksmith & Wheelwright Site
BCP No. C360235
White Plains, Westchester County, NY

Prepared for:

1 Water Street Acquisition LLC and
1 Water Street LLC

February 2026

SESI Project No:
14077

CERTIFICATION STATEMENT

I, Fuad Dahan, certify that I am currently a NYS registered professional engineer and that this Remedial Action Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and Green Remediation (DER-31).

NYS Professional Engineer #	Date	Signature

Remedial Action Work Plan

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LIST OF ACRONYMS

Acronym	Definition
AWQSGV	TOGS 1.1.1 Ambient Water Quality Standards and Guidance Values
AMSL	Above Mean Sea Level
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below ground surface
CVOC	Chlorinated Volatile Organic Compound
cy	Cubic yard
DER	Division of Environmental Remediation
DER-10	NYSDEC Technical Guidance for Site Investigation & Remediation
DUSR	Data Usability Summary Report
ELAP	Environmental Laboratory Accreditation Program
ESA	Environmental Site Assessment
ft bgs	feet below ground surface
MSL	Mean Sea Level
MW	Monitoring Well
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORP	Oxidation/Reduction Potential
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
PE	Professional Engineer
PFAS	Per and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PHC	Petroleum Hydrocarbon
PID	Photoionization Detector

Acronym	Definition
RAWP	Remedial Action Work Plan
RCRA	Resource Conservation and Recovery Act
RECs	Recognized Environmental Concerns
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
RRSCO	Restricted Residential Soil Cleanup Objective
RSCO	Residential Soil Cleanup Objective
SESI	SESI Consulting Engineers, DPC
SI	Focused Phase II Subsurface Investigation
SVOCs	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCL	Target Compound List
TCE	Trichloroethylene
TOGS	Technical and Operations Guidance Series
ug/m^3	micrograms per cubic meter
USCO	Unrestricted Soil Cleanup Objective
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

EXECUTIVE SUMMARY

SITE DESCRIPTION/PHYSICAL SETTING/SITE HISTORY

Site Description

1 Water Street L.L.C. entered into a Brownfield Cleanup Agreement (BCA) Index No. C360235-06-23 on October 2, 2023 with the New York State Department of Environmental Conservation (NYSDEC) to investigate and remediate the property known as the One Water Street Blacksmith & Wheelwright Site in the Brownfield Cleanup Program (BCP) identified as Site No. C360235 located at 1 Water Street, Westchester County, White Plains, New York (the "Site"). The BCA was amended on April 11, 2024 (Amendment No. 1), to remove a 0.059-acre portion of the Site that included a Consolidated Edison utility easement, reducing the Site from 1.237 acres to 1.178 acres. The BCA was further amended on February 14, 2025 (Amendment No. 2) to add 1 Water Street Acquisition LLC as a Volunteer in the BCP. 1 Water Street L.L.C. and 1 Water Street Acquisition LLC, are collectively referred to herein as the "Applicant."

Site History

Review of historical Sanborn maps identified the Site historical uses included single-family dwellings on the northern portion of the Site in 1889. From 1894 to 1900 there is also a wagon storage, sheds, a carport, and a dwelling on the southern portion of the Site. In 1905 a previously existing and unlabeled building in the central portion of the Site is labeled G.F. Coombs House Mover. In 1911, a blacksmith was depicted on the southwestern portion of the Site and an auto shed on the southeastern portion of the Site. In 1930, there were two (2) residential apartment buildings (Flats), the blacksmith building was razed, there was a structure on the southern portion of the Site labeled "Old Machines", and a new structure labeled BL SM Wheelwright appeared on the map. In 1950, most of the structures in the southern portion of the Site were razed, along with the former Wheelwright and machine storage. From 1987 to 2004, the Site is depicted with the former commercial office building. Most recently, the Site was improved with a four-story commercial office building that was reportedly built in the early 1980s and contained a footprint of approximately 11,500 square feet, which yielded a total floor area of approximately 46,000 square feet. The building was razed in 2021.

SUMMARY OF THE REMEDIAL INVESTIGATION

The Remedial Investigation (RI) has determined that soil underlaying the entire Site is impacted with volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and/or metals. The applicable standards criteria and guidance (SCGs) for Site soil are the 2025 updated NYSDEC SCOs. The overall depth of impacted soils extends to 18.0 ft bgs. VOC impacts exceeding the SCOs were identified to depths of 18.0 ft bgs across the Site. SVOC impacts exceeding the USCOs were identified to depths ranging from 2.0 to 15.0 ft bgs across the Site. Pesticide impacts exceeding the SCOs were identified to depths of 13.75 ft bgs across the Site. PCB impacts exceeding the SCOs were identified in shallow soils in one (1) area near the southeastern corner of the Site to depths of 3.5 ft bgs. Metal impacts exceeding the SCOs were identified to depths to 16.5 ft bgs across the Site. The estimated volume of soil exceeding the NYSDEC Unrestricted Use Soil Cleanup Objectives (USCOs) is approximately 34,000 cubic yards (51,000 tons).

The RI has also identified groundwater underlying the Site is impacted with VOCs, metals, and per- and polyfluoroalkyl substances (PFAS) above the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (AWQSGVs), which may pose a risk to human health. During the remedial investigation groundwater sampling in January 2025 groundwater was encountered between 13.68 and 19.67. Groundwater elevations ranged from 176.68 ft amsl (RI-MW1) on the northern portion of the Site to 176.68 ft amsl (RI-MW-4) on the southern portion of the Site and 169.67 ± amsl. The direction of groundwater flow has been calculated to flow to the southwest. The pathway of the contaminated groundwater to human receptors is limited to the ingestion of the groundwater or direct exposure through excavation work. Groundwater in this area of White Plains is not used for drinking. The impacted Site groundwater is not likely to have an ecological pathway.

Finally, the RI has determined the presence of petroleum hydrocarbon (PHC) VOCs and chlorinated VOCs (CVOCs) in soil vapor, which present the potential for soil vapor intrusion into proposed developments.

Green Remediation concepts and techniques were considered during the remediation investigation:

- Eliminated idling vehicles and equipment when possible; reducing emission of CO2, N2O, CH4, and other greenhouse gases contributing to climate change:
- Operation of particulate detectors to monitor and minimize dust export of contaminants:
- Operation of volatile organic compound (VOC) detectors to monitor and minimize VOC exposures: and
- Conducting sampling events planned simultaneously to maximize level of efforts while traveling to/from the Site (economy of scale implementing multiple sampling events).

QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

A human health assessment was conducted using data collected during the RI. SESI evaluated exposure pathways as follows:

- The exposure pathway can be through direct physical contact with the discharged products or contact with the impacted soils. However, the soil source will be removed through implementation of the Remedial Action Work Plan (RAWP).
- Metals exceedances of the SCOs in the Site soil that consist of contaminated fill from 1.0 to approximately 18.0 feet below grade pose a risk to human health. The exposure pathway to humans can be through direct dermal contact with the contaminated soils or incidental ingestion.
- The pathway into groundwater can be through direct physical contact with the discharged products or contact with the impacted soils. The soil source impacting groundwater will be removed through implementation of the RAWP.
- The PHC VOC and CVOC levels in the Site soil vapors were detected at concentrations that may cause a vapor intrusion risk. The exposure route for soil vapor is through the inhalation of the contaminated soil vapor that may intrude into the enclosed spaces of any planned Site development.

FISH AND WILDLIFE ASSESSMENT (FWIA)

The Site does not contain any ecologically sensitive resources and hence the contaminated soils are not expected to have any impacts on any ecological resources and will be removed during the soil removal Track 1 remedy.

SUMMARY OF THE REMEDY

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

- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Maximizing habitat value and creating habitat when possible;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development; and
- Additionally, to incorporate green remediation principles and techniques to the extent feasible in the future development at this site, any future on-site buildings shall be constructed, at a minimum, to meet the 2020 Energy Conservation Construction Code of New York (or most recent edition) to improve energy efficiency as an element of construction.

As part of the remedial program, to evaluate the remedy with respect to green and sustainable remediation principles, an environmental footprint analysis will be completed. The environmental footprint analysis will be completed using an accepted environmental footprint analysis calculator such as SEFA (Spreadsheets for Environmental Footprint Analysis, USEPA), SiteWise™ (available in the Sustainable Remediation Forum [SURF] library) or similar Department accepted tool. Water consumption, greenhouse gas emissions, renewable and non-renewable energy use, waste reduction and material use will be estimated, and goals for the project related to

these green and sustainable remediation metrics, as well as for minimizing community impacts, protecting habitats and natural and cultural resources, and promoting environmental justice, will be incorporated into the remedial program, as appropriate. The project will include detailed requirements to achieve the green and sustainable remediation goals. Further, progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the Final Engineering Report (FER), including a comparison to the goals established during the remedial program.

Additionally, the remedial program will include a climate change vulnerability assessment, to evaluate the impact of climate change on the project site and the proposed remedy. Potential vulnerabilities associated with extreme weather events (e.g., hurricanes, lightning, heat stress and drought), flooding, and sea level rise will be identified, and the remedial program will incorporate measures to minimize the impact of climate change on potential identified vulnerabilities.

1. Excavation of soil/fill exceeding Track 1 USCOs;

2. Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during any intrusive Site work;

3. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track 1 USCOs;

4. Appropriate off-Site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;

5. Import of materials to be used for backfill and cover in compliance with: (1) chemical limits and other specifications included NYCRR Sections 375-6.7(d) and 375-6.8 (b) and DER-10, (2) all Federal, State and local rules and regulations for handling and transport of material;

6. Post soil excavation groundwater monitoring well network to monitor the attainment of groundwater standards.

7. Installation of the elements of a sub-slab depressurization system (SSDS) underneath portions of the building foundation, if the sub-slab of the proposed building is not under

the water table during the seasonal low. A soil vapor intrusion evaluation will be conducted to determine if the soil vapor (SV) levels constitute a vapor intrusion (VI) risk. Prior to conducting a VI evaluation, a work plan will be submitted to NYSDEC and NYDOH for review and approval. The elements of the SSDS will be turned into engineering control (EC) as an active SSDS if the soil vapor evaluation determines that vapor mitigation is needed.

8. Installation of a 20-MIL sealing vapor barrier under the proposed building's foundation. The vapor barrier will be a construction element and not an EC if the Site achieves the planned Track 1 remedy.

9. If an unrestricted use remedy is not achieved at the time of certificate of completion issuance an Environmental Easement (EE) will be required to be recorded. The EE will remain effective until any required Engineering Controls (ECs) and Institutional Controls (ICs) are removed if an unconditional Track 1 remedy is accomplished within five (5) years. If the unconditional Track 1 remedy is not achieved in this timeframe as a result of any remaining on-Site conditions that do not meet the BCP Track 1 requirements, the EE will continue under a Track 2 remedy for any residual soil vapor contamination.

10. If required, publication of a Site Management Plan for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;

11. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

REMEDIAL ACTION WORK PLAN

1.0 INTRODUCTION

1 Water Street L.L.C. entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in October 2023, to investigate and remediate a 1.237-acre property located at 1 Water Street in White Plains, Westchester County, New York. 1 Water Street L.L.C. is a Participant in the Brownfield Cleanup Program. The BCA was amended on April 11, 2024 (Amendment No. 1), to remove a 0.059-acre portion of the Site that included a Consolidated Edison utility easement, reducing the Site from 1.237 acres to 1.178 acres. The BCA was further amended on February 14, 2025 (Amendment No. 2) to add 1 Water Street Acquisition LLC as a Volunteer in the BCP. 1 Water Street L.L.C. and 1 Water Street Acquisition LLC, are collectively referred to herein as the "Applicant."

Unrestricted use is proposed for the property. When completed, the Site will contain a multi-family apartment building with retail along Water Street and Ferris Avenue. Refer to the Brownfield Cleanup Program (BCP) application for additional details.

This Remedial Action Work Plan (RAWP) summarizes the nature and extent of contamination as determined from data gathered during the Remedial Investigation (RI), performed between January 2025 and August 2025. It provides an evaluation of a Track 1 cleanup and other applicable Remedial Action alternatives, their associated costs, and the recommended and preferred remedy. The remedy described in this document is consistent with the procedures defined in DER-10, DER-31, and complies with all applicable standards, criteria and guidance. The remedy described in this document also complies with all applicable Federal, State and local laws, regulations and requirements. A significant threat determination to human health and the environment has not yet been made. Upon determination, notice will be provided for public review. The RI for this Site did not identify fish and wildlife resources. A formal Remedial Design document will not be prepared.

1.1 SITE LOCATION AND DESCRIPTION

The Site is located in the County of Westchester, City of White Plains, New York and is identified as a portion of parcel 125.66.2-1.11 on the Westchester County Tax Map. A United States

Geological Survey (USGS) topographical quadrangle map (**RIR Figure 1.1, Appendix A**) shows the Site location. The Site is situated on an approximately 1.178-acre area bounded by [road, feature] to the north by a parking lot that was formerly associated with the Site building with residences beyond, to the south by Water Street with a New York Metropolitan Transit Authority bus terminal beyond, to the east by a public parking lot with a Cadillac auto dealer and auto repair shop beyond, and to the west by Ferris Avenue and a municipal service building with the White Plains Fire Department beyond **(RIR Figure 1.2, Appendix A)**. A boundary map is attached to the BCA as required by Environmental Conservation Law (ECL) Title 14 Section 27-1419. The 1.178-acre property is fully described in **Appendix B – Metes and Bounds Survey**. A global positioning system coordinate for the starting point is included.

1.2 CONTEMPLATED REDEVELOPMENT PLAN

The Remedial Action to be performed under the RAWP is intended to make the Site protective of human health and the environment consistent with the contemplated end use. The proposed redevelopment plan and end use is described here to provide the basis for this assessment. However, the Remedial Action contemplated under this RAWP may be implemented independent of the proposed redevelopment plan.

The planned redevelopment of the Site entails a 380-unit multifamily apartment project with 4,000 square feet of retail along its Water Street and Ferris Avenue frontages. The proposed construction is an 18-story building consisting of 14 stories of residential apartments over 4 levels of above-grade and 1.5 levels of below-grade parking, with a retail area running along Water Street to the intersection with Ferris Avenue.

1.3 DESCRIPTION OF SURROUNDING PROPERTY

A mix of land uses surround the Site. These include governmental and communication facilities, office and research buildings, multifamily housing, retail, personal services, food establishments, and institutional uses. Government and community facilities in the vicinity of the Site include the White Plains Police Department headquarters and White Plains Fire Department Station 4, the Westchester County governmental offices, the White Plains Public Library, as well as state and federal courthouses. Nearby, there are transportation hubs including the Metro-North Station and Westchester County Bee-Line Bus Terminal.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The Site was investigated in accordance with the scope of work presented in the Draft Remedial Investigation (RI) Work Plan dated November 2025. The investigation was conducted between January 2025 and August 2025. The RI was submitted to NYSDEC on November 10, 2025 and is currently being reviewed.

2.1 SUMMARY REMEDIAL INVESTIGATIONS PERFORMED

2.1.1 BORINGS, VAPOR PROBES, AND WELLS

Soil Borings

The RI consisted of advancing 20 soil borings and collection of 80 soil samples (**RIR Figure 4.1, Appendix A**). The borings were advanced utilizing direct-push drilling techniques. Borings were advanced to depths of approximately 20 ft bgs. Soil samples were collected utilizing a macro-core samplers. Samples for laboratory chemical analyses were collected based on field screening, which includes visual and olfactory observations and screening with photo-ionization detector (PID).

Monitoring Wells

To investigate groundwater at the Site, six (6) monitoring wells were installed and sampled (**RIR Figure 4.2, Appendix A**). The Monitoring wells were installed using direct-push drilling equipment and constructed utilizing 2-inch PVC pipe with 10-slot (0.010 inches) screen. Bentonite about 1 foot thick was then placed on top of the filter sand and the remaining annular space around the PVC riser was grouted with cement/bentonite mix. The wells were subsequently completed with protective steel manholes as flush mount

Soil Vapor

Six (6) temporary soil vapor probes were installed using direct push sampling equipment (**RIR Figure 4.3, Appendix A**). Soil vapor implants were installed using a direct push Geoprobe® to attain the desired depths. Porous, inert backfill packer sand was used to create a sampling column around each vapor point. The implants were fitted with inert Teflon® tubing to the surface. Soil vapor probes were sealed above the sampling zone with a bentonite slurry. Soil vapor probes were installed with an adequate surface seal to prevent outdoor air infiltration at each sampling location.

As a quality assurance/quality control check, a shroud and helium tracer gas was used at each vapor point prior to sampling. Prior to sampling, the soil vapor points were purged three (3) times the volume of the sample probe and tube. Soil vapor and ambient air samples were collected in accordance with the Guidance for Evaluating Soil Vapor Intrusion in the State of New York into certified 6-L Summa® canisters provided by the laboratory.

2.1.2 REMEDIAL INVESTIGATION SAMPLES COLLECTED

The RI consisted of collecting 80 soil samples from 20 soil borings, collecting six (6) groundwater samples from permanent monitoring wells, six (6) soil vapor samples, and two (2) ambient air samples.

2.1.3 CHEMICAL ANALYTICAL WORK PERFORMED

Soil and groundwater samples were analyzed for a combination of full target compound list (TCL) and target analyte list (TAL) analytes – which include volatile organic compounds (VOCs, USEPA Method 8260), metals (USEPA Methods 6010/7471), semi-volatile organic compounds (SVOCs, USEPA Method 8270), polychlorinated biphenyls (PCBs) and pesticides (USEPA Methods 8081/8082). In addition, samples were analyzed for per- and polyfluoroalkyl substances (PFAS, USEPA Method 1633A), and 1,4-dioxane (USEPA Method 8270). Duplicate samples were collected in general accordance with frequencies specified in DER-10. Soil vapor samples were analyzed for VOCs (USEPA Method TO-15). A summary of samples collected and their analysis is presented on **RIR Tables 4.1 in Appendix C**.

2.1.4. BEST MANAGEMENT PRACTICES

Best management practices (BMPs) implemented at the Site to reduce the environmental footprint of the RI include:

- Use minimally invasive drilling techniques such as direct-push or sonic technology whenever feasible to reduce drilling duration, avoid or minimize use of water, and prevent or reduce generation of cuttings and associated disposal of investigation derived waste.
- Deploy machinery that is suitably sized to increase efficiencies considerably.
- Use machines with repowered or newer engines that are more fuel efficient.
- Implement an engine idle reduction plan to avoid fuel consumption when machinery is not

actively engaged.

- Select service providers, product suppliers and analytical laboratories from the local area and consolidate the service and delivery schedules.
- Portable vapor/gas detection systems using photoionization or flame ionization for screening purposes.
- Choose groundwater monitoring equipment made of noncorrosive material.
- Compressed the number of days needed for a given round of sampling and use of mass transit to access the Site.

2.1.5 REMEDIAL INVESTIGATION SUMMARY

Below is a summary of RI findings.

Based on the field investigation, the overall depth of impacted soils extends to 18.0 ft bgs. VOC impacts exceeding the SCOs were identified to depths to18.0 ft bgs across the Site (see **RIR Figure 4.1 Appendix A**). SVOC impacts exceeding the USCOs were identified to 15.0 ft bgs across the Site. Pesticide impacts exceeding the SCOs were identified to 13.75 ft bgs across the Site. PCB impacts exceeding the SCOs were identified in shallow soils in one (1) area near the southeastern corner of the Site to depths of 3.5 ft bgs. Metal impacts exceeding the SCOs were identified to depths of 16.5 ft bgs across the Site. A summary of samples collected and their analysis is presented on **RIR Tables 5.1** (**Appendix C**).

The applicable standards criteria and guidance (SCGs) for the Site groundwater are the NYSDEC TOGS 1.1.1 AWQSGV. Samples collected from the Site's groundwater identified VOCs, metals, and per- and polyfluoroalkyl substances (PFAS) above the NYSDEC Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Guidance Values (AWQSGVs) (**Figures 4.2 Appendix A**). A summary of samples collected and their analysis is presented on **RIR Table 4.1 (Appendix C)**. During the remedial investigation groundwater sampling in January 2025 groundwater was encountered between 13.68 and 19.67 feet below ground surface (ft-bgs). Groundwater elevations ranged from 176.68 ft amsl (RI-MW1) on the northern portion of the Site to 176.68 ft amsl (RI-MW-4) on the southern portion of the Site and 169.67 ± amsl. The direction of groundwater flow has been calculated to flow to the southwest (**RIR Figure 4.4, Appendix A)**. This data is compared the applicable SCOs is provided in **RIR Tables 5.1, 5.5, and 5.7 in Appendix C.**

Finally, the RI has determined the presence of petroleum hydrocarbon (PHC) VOCs and chlorinated VOCs (CVOCs) in soil vapor, which present the potential for soil vapor intrusion into proposed developments (**RIR Figure 4.3 Appendix A**). A summary of samples collected and their analysis is presented on **RIR Table 5.7 (Appendix C)**.

2.2 SIGNIFICANT THREAT

A significant threat determination to human health and the environment has not yet been made. Upon determination, notice will be provided for public review.

2.3 SITE HISTORY

Review of historical Sanborn maps identified the Site historical uses included single-family dwellings on the northern portion of the Site in 1889. From 1894 to 1900 there is also a wagon storage, sheds, a carport, and a dwelling on the southern portion of the Site. In 1905 a previously existing and unlabeled building in the central portion of the Site is labeled G.F. Coombs House Mover. In 1911, a blacksmith was depicted on the southwestern portion of the Site and an auto shed on the southeastern portion of the Site. In 1930, there were two (2) residential apartment buildings (Flats), the blacksmith building was razed, there was a structure on the southern portion of the Site labeled “Old Machines”, and a new structure labeled BL SM Wheelwright appeared on the map. In 1950, most of the structures in the southern portion of the Site were razed, along with the former Wheelwright and machine storage. From 1987 to 2004, the Site is depicted with the former commercial office building. Most recently, the Site was improved with a four-story commercial office building that was reportedly built in the early 1980s and contained a footprint of approximately 11,500 square feet, which yielded a total floor area of approximately 46,000 square feet. The building was razed in 2021. All Sanborn Maps available for this Site were reviewed prior to preparation of the RAWP.

2.4 GEOLOGIC AND HYDROGEOLOGIC CONDITIONS

Based on geotechnical investigation and environmental investigations conducted by SESI between February 2018 and September 2022, and the Remedial Investigation conducted between January 2025 and August 2025 identified fill that was encountered below the surface materials in all of the borings to depths ranging from 5 to 9± ft bgs. The fill typically consists of

brown coarse to fine sand with varying amounts of silt and gravel, with concrete, brick, ash, cinders, asphalt, and wood. Beneath the existing fill are the natural soil deposits consisting primarily of a brown coarse/medium to fine sand with varying amounts of silt and gravel. Bedrock was encountered in the majority of the borings at depths ranging from 8 to 55± ft bgs. During the remedial investigation groundwater sampling in January 2025 groundwater was encountered between 13.68 and 19.67 ft bgs. Groundwater elevations ranged from 176.68 ft amsl (RI-MW1) on the northern portion of the Site to 176.68 ft amsl (RI-MW-4) on the southern portion of the Site and 169.67 ± amsl. The direction of groundwater flow has been calculated to flow to the southwest. A groundwater flow map is shown in **RIR Figure 4.4** (**Appendix A**).

2.5 CONTAMINATION CONDITIONS

2.5.1 CONCEPTUAL MODEL ON SITE CONTAMINATION

The applicable standards criteria and guidance (SCGs) for Site soil are the NYSDEC SCOs. The overall depth of impacted soils extends to 18.0 ft bgs. VOC impacts exceeding the SCOs were identified to depths to 18.0 ft bgs across the Site. SVOC impacts exceeding the USCOs were identified to depths of 15.0 ft bgs across the Site. Pesticide impacts exceeding the SCOs were identified to depths of 13.75 ft bgs across the Site. PCB impacts exceeding the SCOs were identified in shallow soils in one (1) area near the southeastern corner of the Site to depths of 3.5 ft bgs. Metal impacts exceeding the SCOs were identified to depths of 16.5 ft bgs across the Site.

The applicable SCGs for Site groundwater are the NYSDEC TOGS 1.1.1 AWQSGVs. The Site's groundwater has been impacted with VOCs, metals, and PFAS above the AWQSGVs Site-wide as a result of the historical land uses. The pathway of the contaminated groundwater to human receptors is limited to the ingestion of the groundwater or direct exposure through excavation work. Groundwater in this area of White Plains is not used for drinking. The impacted Site groundwater is not likely to have an ecological pathway.

The PHC VOCs and CVOCs detected in soil vapor may result in soil vapor intrusion into the future on-Site buildings. A vapor intrusion evaluation will be needed for this Site's proposed enclosed areas to determine the extent of vapor intrusion and the potential need for mitigation.

2.5.2 DESCRIPTION OF AREAS OF CONCERN

AOC-1: Historical land Uses: The Site soil and soil vapor have been contaminated by historical uses included single-family dwellings on the northern portion of the Site in 1889. From 1894 to 1900 there is also a wagon storage, sheds, a carport, and a dwelling on the southern portion of the Site. In 1905 a previously existing and unlabeled building in the central portion of the Site is labeled the G.F. Coombs House Mover facility that occupied the . In 1911, a blacksmith was depicted on the southwestern portion of the Site and an auto shed on the southeastern portion of the Site. In 1930, there were two (2) residential apartment buildings (Flats), the blacksmith building was razed, there was a structure on the southern portion of the Site labeled "Old Machines", and a new structure labeled BL SM Wheelwright appeared on the map. In 1950, most of the structures in the southern portion of the Site were razed, along with the former Wheelwright and machine storage. Impacts to soil and soil vapor have been identified Site-wide as a result of these historical land uses.

AOC-2: Contaminated Historic Fill: Contaminated historic fill material containing varying amount of brick, concrete, asphalt, and ash was identified at the Site during the SESI February 2018 geotechnical investigation. In addition, the environmental quality of the groundwater present at the Site was unknown and may be subject to environmental impacts based on the historical use of the Site.

2.5.3 IDENTIFICATION OF STANDARDS, CRITERIA AND GUIDANCE

The following standards, criteria, and guidance are typically applicable to Remedial Action projects in New York State, and will be consulted and adhered to as applicable:

- 6 NYCRR Part 364 - NYS Waste Transporter Permits
- 6 NYCRR Part 360 - NYS Solid Waste Management Requirements
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Subpart 374-2 - Standards for the Management of Used Oil
- 6 NYCRR Part 375 - Environmental Remediation Programs

- 6 NYCRR Part 376 - Land Disposal Restrictions
- 6 NYCRR Part 613 - Petroleum Bulk Storage
- 6 NYCRR Part 661 - Tidal Wetlands - Land Use Regulations
- 6 NYCRR Part 663 - Freshwater Wetlands - Permit Requirements
- 6 NYCRR Parts 700-706 – Classes and Standards of Quality and Purity
- 6 NYCRR Part 750 - State Pollutant Discharge Elimination System (SPDES) Permits
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- 40 CFR Part 144 - Underground Injection Control Program
- CP-43 - Commissioner Policy on Groundwater Monitoring Well Decommissioning (December 2009)
- CP-49 – Climate Change and DEC Action (2022)
- CP-51- Soil Cleanup Guidance (2010)
- CP-60 – Screening and Assessment of Contaminated Sediment (2014)
- DER-2 - Making Changes to Selected Remedies (April 2008)
- DER-4 – Management of Coal Tar Waste & Coal Tar Contaminated Soils from Manufactured Gas Plants (2001)
- DER-10 – Technical Guidance for Site Investigation and Remediation (2010)
- DER-13 – Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York (2006)
- DER-23 – Citizen Participation Handbook for Remedial Programs (2010)
- DER-31 – Green Remediation (2010)
- DER-32 – Brownfield Cleanup Program Applications and Agreements (2017)
- DER-33 – Guide to Drafting and Recording Institutional Controls (2010)

- TAGM 3028 - "Contained In" Criteria for Environmental Media: Soil Action Levels (August 1997)
- TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations (1998, Addenda 2000, 2004 and 2023)
- TOGS 1.3.8 - New Discharges to Publicly Owned Treatment Works (1994)
- TOGS 2.1.2 - Underground Injection/Recirculation (UIR) at Groundwater Remediation Sites (1990)
- New York State Standards and Specifications for Erosion and Sediment Control (2016)
- DAR-1 (formerly Air Guide 1) - Guidelines for the Control of Toxic Ambient Air Contaminants (1997)
- U.S. EPA OSWER Directive 9200.4-17 - Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (December 1997)
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006) with updates (SVI) Guidance)
- New York State Climate Act (2019)
- NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (2023).

2.6 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

2.6.1 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

This exposure assessment discusses potential migration routes by which contaminants in the environment may be able to reach human receptors in accordance with NYSDEC DER-10 sections 3.14(c)17, 3.3(c)4 and Appendix 3B. This discussion is based on current and

hypothetical future Site conditions at the investigation area.

An exposure assessment must evaluate five (5) elements that comprise an exposure pathway. A complete exposure pathway includes the following:

1. A description of the contaminant source. If the original source is unknown, then a description of the contaminated environmental medium at the point of exposure;
2. An explanation of the transport mechanism;
3. An identification of all potential exposure points;
4. A description of the exposure route at the contact point; and
5. A receptor population.

There are some exposure pathways related to the contamination if left unaddressed:

- The exposure pathway can be through direct physical contact with the discharged products or contact with the impacted soils. However, the soil source will be removed through implementation of the Remedial Action Work Plan (RAWP).
- Metals exceedances of the SCOs in the Site soil that consist of contaminated fill from 1.0 to approximately 16.5 feet below grade pose a risk to human health. The exposure pathway to humans can be through direct dermal contact with the contaminated soils or incidental ingestion.
- The pathway into groundwater can be through direct physical contact with the discharged products or contact with the impacted soils. The soil source impacting groundwater will be removed through implementation of the RAWP.
- The PHC VOC and CVOC levels in the Site soil vapors were detected at concentrations that may cause a vapor intrusion risk. The exposure route for soil vapor is through the inhalation of the contaminated soil vapor that may intrude into the enclosed spaces of any planned Site development.

2.6.2 ON-SITE ASSESSMENT

Soil

Potential routes of exposure to impacted soil include dermal contact, ingestion, and inhalation of soil particulates. At present, potential exposure points have been eliminated by restricting public access to the Site through fencing. During future construction activities, specifically, the

disturbance of soils during remedial construction, the potential for exposure to soils would increase for on-Site workers, utility workers, visitors, and trespassers.

VOCs, SVOC, PCBs, pesticides, PFAS, and metals exceedances of the SCOs in the Site soil from 1.0 to approximately 18.0 ft bgs pose a potential risk to human health if left unaddressed. The exposure pathway to humans can be through direct dermal contact with the contaminated soils or incidental ingestion without the implementation of the remedial action. However, these potential exposures to workers will be mitigated through the implementation of the Health and Safety Plan and use of personal protective equipment, and the soil source will be removed and/or capped under a cover system through the implementation of a future RAWP. Dust generation will be managed in accordance with the CAMP during excavation operations through the use of a water truck and truck wash at the point trucks exit the Site and monitored by air monitoring stations upgradient and downgradient of future excavation activities.

Groundwater

There are potential groundwater exposure pathways as well when considering the mapped groundwater flow directions. The groundwater flow directions located in both the overburden and bedrock sub-surfaces are depicted to be approximately southwest on **RIR Figure 4.4 (Appendix A)**.

The groundwater sampling has identified primarily metals and PFAS compounds exceeding the AWQSGVs. Potential groundwater exposure points include dermal contact and inhalation of vapors. However, the City of White Plains utilizes municipal treated water (not groundwater) for drinking purposes; therefore, ingestion of on-Site groundwater as a potential exposure point may be eliminated from further evaluation with adequate treatment. The City of White Plains water source is the New York City Reservoir System and is drawn from the Kensico Reservoir by Westchester County Water District No. 1, which is located approximately 3 miles north of the Site. Therefore, no groundwater from the area of the Site is utilized. In addition pursuant to Chapter 873, Article VII of the Westchester County local ordinance law the use of groundwater in Westchester County is prohibited.

Potential exposure through dermal contact and vapor inhalation could arise during future excavation, redevelopment, or utility repairs where workers, visitors, or trespassers may be exposed to on-Site groundwater. The Site currently has no aboveground buildings or structures;

therefore, a potential vapor inhalation exposure pathway does not currently exist.

During the Site remediation, dewatering will be implemented during the excavation work where groundwater is encountered in order to prevent direct contact with the groundwater. The water will be properly contained, treated and disposed off-Site either in the County of Westchester sewer system, the White Plains, storm water system, or shipped to an approved off-Site treatment facility. Further groundwater remediation will aim to mitigate potential groundwater and vapor concerns and try to reduce contamination to levels below the AWQSGVs or to asymptotic levels. If groundwater is discharged to the sanitary sewer, a groundwater remediation permit will be obtained for the Westchester County. If the groundwater is discharged to the stormwater system a permit will be obtained from the City of White Plains.

Surface Water and Sediment

Surface water and sediment is not present on the Site. Thus, this exposure pathway may be eliminated from further evaluation. However, construction water and or rainwater will be contained or managed appropriately so as to not to become a source of contamination to groundwater or surface water at the Site.

Soil Vapor

PHC VOCs and CVOCs are detected in soil vapor; therefore, there is potential exposure to future building occupants through vapors entering enclosed spaces in future structures and impacting indoor air quality. Currently, all potential human receptors are restricted from entering the Site by fencing. The Site currently has no aboveground buildings or structures; therefore, a potential exposure pathway does not currently exist. Following Site remediation and redevelopment, the planned excavation of the most contaminated source areas on the Site, combined with vapor mitigation measures, such as the installation of a sub-slab depressurization system will address this potential exposure pathway.

2.6.3 OFF-SITE ASSESSMENT

Soil

Potential routes of exposure to impacted soil include dermal contact, ingestion, and inhalation of soil particulates. Workers at off-Site properties are protected from these potential exposure routes by the covers systems on these properties.

Groundwater

No known monitoring, irrigation, or potable wells are located on properties adjacent to the Site. According to Chapter 873, Article VII of the Westchester County local ordinance law the use of groundwater in Westchester County is prohibited. Additionally, per a search of the immediate surrounding areas, there are no potential receptors immediately adjacent to the Site. The nearest water body is the Bronx River located approximately 600 feet to the west of the Site.

The greatest concentration of PFAS compounds were detected in monitoring well RI-MW-2 located on the northwestern portion of the Site. Due to the proximity of the monitoring well RI-MW-2 to the western property boundary, it is possible that groundwater contamination may have migrated on-Site from the upgradient White Plains Fire Department.

Soil Vapor

PHC VOCs and CVOCs detected in soil vapor samples can result in an SVI exposure pathway to off-Site buildings if not addressed. The remedial action workplan will propose a remedy that will address removal of all soil exceeding the SCOs and the treatment of groundwater, thereby eliminating any sources of VOCs on-Site that may be contributing to soil vapor concerns.

2.6.4 FISH & WILDLIFE REMEDIAL IMPACT ANALYSIS

The Site does not contain any ecologically sensitive resources and hence the contaminated soils are not expected to have any impacts on any ecological resources.

2.7 REMEDIAL ACTION OBJECTIVES

Based on the results of the Remedial Investigation, the following Remedial Action Objectives (RAOs) have been identified for this Site.

2.7.1 GROUNDWATER

RAOs for Public Health Protection

- Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.

- Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer, to the extent practicable, to pre-disposal/pre-release conditions.
- Remove the source of ground contamination.

2.7.2 SOIL

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of, or exposure to, contaminants volatilizing from contaminated soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota due to ingestion/direct contact with contaminated soil that would cause toxicity or bioaccumulation through the terrestrial food chain.

2.7.3 SOIL VAPOR

- Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at the Site.

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

3.1 EVALUATION OF REMEDIAL ALTERNATIVES

The objective of the remedy, a mixed use residential and commercial development that will cover the entire Site, is to achieve a cleanup that is the most protective of human health and the environment and that does not rely on long term Engineering or Institutional Controls (ECs or ICs). This objective will most likely be accomplished under a Track 1 remedy by removing all soils that exceed the USCOs with no engineering controls for the Site groundwater and soil vapor.

However, to the extent this most stringent remedy cannot be achieved before the certificate of completion (COC), the Volunteer will complete the remediation as a Track 2 clean-up as a fallback option. The monitoring and remediation, if needed, of groundwater and soil vapor monitoring will continue past COC in order to achieve a Track 1 clean-up within five years. The remedial alternatives are discussed below. The SEFA Remedial Alternatives Analysis and CVA are provided in **Appendix D.**

Track 1

A remedy pursuant to this Track must achieve compliance with the USCOs for soils set forth in 6 NYCRR § 375-6.8(a) with no long-term monitoring of groundwater or soil vapor. Achievement of Track 1 will be documented based on end point samples every 900 square feet at the bottom of the excavation. Side wall samples will be collected where possible, adhering to DER-10; however, sidewall sampling will not be possible on the perimeter of the Site based on the anticipated support of excavation (SOE) that will be constructed at the Site.

This alternative would involve the complete removal and/or remediation of the soil with exceedances of the USCOs, which were encountered as deep as 18 ft-bgs. A feasible remedial technology that may be used to implement this alternative involves the excavation of the contaminated soil and transportation to an approved off-site facility for disposal. The estimated excavation volume is approximately 34,000 cubic yards (CY) (51,000 tons) of contaminated material.

Groundwater will be sampled post soil removal. If the groundwater levels are below the AWQS or at levels that do not require remediation or long-term monitoring, then the Site groundwater would achieve a Track 1.

VOCs in soil vapor were detected during the RI. The proposed remedy includes the removal of all soil exceeding the USCOs which could be the source of the soil vapor since groundwater did not contain any VOCs exceedances. Since the proposed building will include one level of aerated parking garage, a soil vapor intrusion issue is not anticipated. However, the remedy will include the installation of the piping elements of an SSDS underneath the buildings if the sub slab of each of the proposed building is not totally submerged under the water table including during the seasonal low, and a vapor barrier. The vapor barrier will be a construction element and not an EC unless the Site does not achieve the planned Track 1 remedy. The design for the SSDS

piping, assuming it is feasible to install based on the water table levels, will be developed, and will be submitted for NYSDEC and NYSDOH approvals. If it is determined that an SSDS or portions of an SSDS would be below the water table, then no SSDS will be installed in such areas if approved by NYSDEC and NYSDOH.

Track 2

Cleanups pursuant to this track may consider the intended future use in determining the appropriate cleanup levels for soil. This track requires the Volunteer implement a cleanup that achieves SCOs from tables in 6 NYCRR § 375-6.8(b), which is consistent with the intended Site use for the top 15 feet of soil (or bedrock if less than 15 feet). Under a Track 2 remedy, the remedial program may include the use of long-term institutional or engineering controls to address contamination related to other media including but not limited to groundwater and soil vapor. The Site remediation pursuant to Track 2 would still involve excavation and disposal of the contaminated soils to 18 feet to meet the UUSCOs and Protection of Groundwater Soil Cleanup Objectives (PGWSCOs).

Because the soils on the Site will be excavated down to around 19 feet, it is anticipated the soils will achieve UUSCOs. However, if this is not possible, a Track 2 remedy will be an alternative remediation for the Site soils.

The same precautionary measure for Site soil vapor (i.e. SSDS piping and vapor barrier) and IC in the form of an easement that will require soil vapor evaluation sampling will be implemented for a Track 2 remedy in the event that only Track 2 can be achieved on all or portions of the Site. A SMP and EE as institutional controls will be put in place to ensure that all of the institutional and engineering controls are maintained until no longer required by NYSDEC and NYSDOH.

Following soil remediation, dissolved contamination in groundwater will be monitored via the RI monitoring well network. The groundwater remedial investigation identified slight exceedances of VOCs and metals of the AWQS, and PFOA/PFOS that were identified above the NYSDEC groundwater TOGS AWQSGV guidance values but at levels that are typically being found as background on most BCP sites. Given the low levels of groundwater exceedances, no groundwater remedy is anticipated. It is expected that the groundwater will meet the AWQS or reach asymptotic levels in less than five (5) years after the implementation of excavation, which

will result in the removal of contamination sources for purposes of eventually achieving an unconditional Track 1 remedy without active treatment of groundwater. A round of groundwater sampling will be conducted post the soil excavation.

A soil vapor intrusion evaluation will also be completed in each building. If the evaluation determines that vapor mitigation is required, then assuming the SSDS could be installed, the SSDS will be turned active and its operation and monitoring will be described in the SMP. If vapor mitigation is required and the active SSDS turns into an EC, the vapor intrusion monitoring will include the collection of samples from the sub-slab of the proposed buildings and the indoor air in accordance with the NYSDOH "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (October 2006/Amended February 2024) with updates (SVI Guidance). When the soil vapor levels drop to below the "no further action" sub-slab vapor concentrations, a work plan to shut it off will be provided to the NYSDEC and NYSDOH approval. If the work plan is approved, the SSDS will be shut down and not be considered an EC anymore and the condition on the Track 1 remedy will be removed. If soil vapors continue to exceed the matrix values that require mitigation or monitoring after 5 years, then the SSDS will become a permanent EC and the remedy will remain a Track 2 remedy as described below. A site management plan (SMP) and EE as institutional controls will be put in place for the groundwater monitoring and SVI evaluation.

No Action Alternative

No action does not involve implementation of any active remedial activities or monitoring, and therefore, there are no costs associated with this alternative. The no action alternative would leave existing sources of contamination in soil and groundwater and soil vapor. The no action alternative is thus unacceptable and has not been compared to the factors below.

Protection of human health and the environment

Although all tracks will provide adequate protection of human health and the environment, Track 1 would be more protective than the other cleanup tracks because it would remove all soil contamination to meet the State's most stringent SCOs and should expedite the elimination of soil vapor intrusion sources. Moreover, because a Track 1 remedy requires no long term ongoing institutional or engineering controls to manage contamination indefinitely into the future (other than possibly some short term soil vapor mitigation measures), the cleanup does not anticipate

relying on human intervention or mechanical equipment to remain effective in protecting human health and the environment. A Track 2 remedy would also be protective of human health and the environment if the proper long-term engineering and institutional controls are put in place and managed in an SMP.

Compliance with standards, criteria, and guidelines (SCGs):

All cleanup tracks will achieve applicable cleanup standards. A Track 1 cleanup achieves a more stringent set of standards than a Track 2 cleanup.

Short-term effectiveness and impacts:

Generally, Track 1 provides the best short term effectiveness because it promptly removes the most contaminant mass from the Site. Track 2 also accomplishes this, but to a lesser extent. Tracks 1 and 2 are somewhat less favorable in terms of short-term impacts primarily because mass removal of the contaminated soils generates more truck trips. Excavation may result in a greater potential for migration of impacts from the open excavation (e.g. wind erosion, storm water intrusion, etc.), however, an air monitoring program and erosion and sediment controls will be implemented to minimize and control any potential migration.

Long-term effectiveness and Performance:

Because Tracks 1 and 2 would involve removal of the greatest amount of contaminated soil, these remedies will provide the most long-term effectiveness. As already discussed above, a Track 1 cleanup will allow the Site to be used for any purpose without restriction and without reliance on the long-term employment ICs or ECs (which can fail and require on-going monitoring and maintenance to remain effective over the long-term). A restricted residential Track 2 clean-up allows the Site to be used for almost all possible uses in an urban setting but requires ECs and ICs to ensure there is no exposure to residual contamination.

Reduction of toxicity, mobility, or volume of contaminated material:

Tracks 1 and Track 2 will reduce toxicity and mobility.

Constructability:

Tracks 1 and 2, are all implementable given the location and the planned use for the Site. The Site is located in the middle of an urban area, and, therefore disposal of the contaminated soils

and truck access will not be a problem. Any short-term impacts will be avoided through implementation of the CAMP and HASP, which will employ truck washing and odor and dust control measures. Therefore, Track 1 or 2 are readily constructable remedies for this Site.

Cost effectiveness:

The preferred alternative should provide optimal suitability of the eight accompanying evaluation factors with minimal remedial cost. The contaminated fill and soil layer extends from the surface to a maximum depth of 18 ft bgs. However, this mass removal results in long term savings by eliminating (or, in Track 2, significantly reducing) the need for indefinite cap monitoring and maintenance. In addition, a Track 1 or 2 remedy should eliminate any on-Site soil source that maybe contributing to soil vapor issues at the Site. Therefore, a Track 1 or 2 remedy for the Site is cost effective.

Community Acceptance:

A citizen participation plan program has been and will continue to be incorporated into all remedial alternatives, per NYSDEC Brownfield Program law and regulations. The Site development will include mixed-use multi-family/retail project with structured parking. The planned redevelopment of the Site consists of multi-story residential apartment building with ground floor retail and a basement level parking garage. The community should accept any of the remedies, however, the Track 1 or 2 remedy is likely preferable to the community since it will eliminate more of the contamination.

Land use:

All cleanup tracks would achieve remediation for the planned residential and commercial use of the Site. While remediation and redevelopment of the Site will create short term construction impacts, the creation of a new housing project will provide significant community benefits in a high poverty/ high unemployment disadvantaged community.

Zoning: All of the proposed remedies under each track will facilitate the Site to be utilized for a proposed mixed commercial-residential development, which is consistent with applicable zoning laws, local Master Plan, and anticipated future use of the Site.

Applicable comprehensive community master plans or land use plans: Implementation of all Tracks (with institutional controls) cleanup will facilitate the proposed commercial-residential development, which is consistent with current local land use plan.

Surrounding property uses: Any cleanup approach is not expected to significantly impact land use of the surrounding properties as the truck traffic and access will be on public roads. There will be short term impacts from the remediation and construction project but these will result in long-term benefits of converting contaminated property into housing and commercial uses.

Citizen Participation: Citizen Participation during implementation of a remedial program will proceed in accordance with the Citizen Participation Plan included as Appendix F of this RIWP and as noted above will have minimal community impact. Any short-term impacts will be addressed by the CAMP and HASP.

Environmental justice concerns: There are no known environmental justice concerns associated with this project.

Land use designations: A Track 1 remedy will not restrict any current or future land use designations. A restricted residential Track 2 will have very minimal restrictions on the future land use of the property.

Population growth patterns: Any of the proposed remedies will not impact reasonably anticipated population growth patterns in the area other than to better accommodate growth by providing for new downtown, transit-oriented housing.

Accessibility to existing infrastructure: Access to existing infrastructure is present in the surrounding area. Some on-site utility infrastructure will likely have to be demolished and removed as part of the remediation. However, new infrastructure will be installed subsequent to the remediation as part of the redevelopment.

Proximity to natural resources: The closest surface water body is the Kensico Reservoir, approximately 2.7 miles to the northeast. Storm water drainage patterns are generally consistent with the surrounding topography and primarily flow to the south.

Geography and geology of the Site: See Section 2.4 above.

Current Institutional Controls: There are no current institutional controls associated with the Site.

3.2 SELECTION OF THE PREFERRED REMEDY

The remedial alternatives analysis determined that a Track 1 (if achievable) or Track 2 remedy will be the preferred remedy for the Site.

3.2.1 ZONING

The Site is currently located in the CB-4 (Core-Business 2) zoning district. The CB-4 (Core Business-4) zoning district in White Plains is designated for a mix of commercial uses, including retail and service businesses, aimed at enhancing the urban environment.

3.3 SUMMARY OF SELECTED REMEDIAL ACTIONS

1. Excavation of soil/fill exceeding Track 1 USCOs;
2. Screening for indications of contamination (by visual means, odor, and monitoring with PID) of all excavated soil during any intrusive Site work;
3. Collection and analysis of end-point samples to evaluate the performance of the remedy with respect to attainment of Track 1 USCOs;
4. Appropriate off-Site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal;
5. Import of materials to be used for backfill and cover in compliance with: (1) chemical limits and other specifications included NYCRR Sections 375-6.7(d) and 375-6.8 (b) and DER-10, (2) all Federal, State and local rules and regulations for handling and transport of material;
6. Post soil excavation groundwater monitoring well network to monitor the attainment of groundwater standards.
7. Installation of the elements of a sub-slab depressurization system (SSDS) underneath portions of the building foundation, if the sub-slab of the proposed building is not under the water table during the seasonal low. A soil vapor intrusion evaluation will be conducted

to determine if the soil vapor (SV) levels constitute a vapor intrusion (VI) risk. Prior to conducting a VI evaluation, a work plan will be submitted to NYSDEC and NYDOH for review and approval. The elements of the SSDS will be turned into engineering control (EC) as an active SSDS if the soil vapor evaluation determines that vapor mitigation is needed.

8. Installation of a 20-MIL sealing vapor barrier under the proposed building's foundation. The vapor barrier will be a construction element and not an EC unless the Site does not achieve the planned Track 1 remedy.
9. if an unrestricted use remedy is not achieved at the time of certificate of completion issuance an Environmental Easements will be required to be recorded. The EE will remain effective until any required Engineering Controls (ECs) and Institutional Controls (ICs) are removed if an unconditional Track 1 remedy is accomplished within five (5) years. If the unconditional Track 1 remedy is not achieved in this timeframe as a result of any remaining on-Site conditions that do not meet the BCP Track 1 requirements, the EE will continue under a Track 2 remedy for any residual soil vapor contamination.
10. Publication of a Site Management Plan for long term management of residual contamination as required by the Environmental Easement, including plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting;
11. All responsibilities associated with the Remedial Action, including permitting requirements and pretreatment requirements, will be addressed in accordance with all applicable Federal, State and local rules and regulations.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP and the NYSDEC-issued Decision Document. All deviations from the RAWP and/or Decision Document will be promptly reported to NYSDEC for approval and fully explained in the FER.

4.0 REMEDIAL ACTION PROGRAM

4.1 GOVERNING DOCUMENTS

4.1.1 STANDARDS, CRITERIA AND GUIDANCE (SCGS)

The following standards, criteria, and guidance are typically applicable to Remedial Action projects in New York State, and will be consulted and adhered to as applicable:

- 6 NYCRR Part 364 - NYS Waste Transporter Permits
- 6 NYCRR Part 360 - NYS Solid Waste Management Requirements
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities
- 6 NYCRR Subpart 374-2 - Standards for the Management of Used Oil
- 6 NYCRR Part 375 - Environmental Remediation Programs
- 6 NYCRR Part 376 - Land Disposal Restrictions
- 6 NYCRR Part 613 - Petroleum Bulk Storage
- 6 NYCRR Part 661 - Tidal Wetlands - Land Use Regulations
- 6 NYCRR Part 663 - Freshwater Wetlands - Permit Requirements
- 6 NYCRR Parts 700-706 – Classes and Standards of Quality and Purity
- 6 NYCRR Part 750 - State Pollutant Discharge Elimination System (SPDES) Permits
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- 40 CFR Part 144 - Underground Injection Control Program
- CP-43 - Commissioner Policy on Groundwater Monitoring Well Decommissioning (December 2009)
- CP-49 – Climate Change and DEC Action (2022)

- CP-51- Soil Cleanup Guidance (2010)
- CP-60 – Screening and Assessment of Contaminated Sediment (2014)
- DER-2 - Making Changes to Selected Remedies (April 2008)
- DER-4 – Management of Coal Tar Waste & Coal Tar Contaminated Soils from Manufactured Gas Plants (2001)
- DER-10 – Technical Guidance for Site Investigation and Remediation (2010)
- DER-13 – Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York (2006)
- DER-23 – Citizen Participation Handbook for Remedial Programs (2010)
- DER-31 – Green Remediation (2010)
- DER-32 – Brownfield Cleanup Program Applications and Agreements (2017)
- DER-33 – Guide to Drafting and Recording Institutional Controls (2010)
- TAGM 3028 - "Contained In" Criteria for Environmental Media: Soil Action Levels (August 1997)
- TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations (1998, Addenda 2000, 2004 and 2023)
- TOGS 1.3.8 - New Discharges to Publicly Owned Treatment Works (1994)
- TOGS 2.1.2 - Underground Injection/Recirculation (UIR) at Groundwater Remediation Sites (1990)
- New York State Standards and Specifications for Erosion and Sediment Control (2016)
- DAR-1 (formerly Air Guide 1) - Guidelines for the Control of Toxic Ambient Air Contaminants (1997)
- U.S. EPA OSWER Directive 9200.4-17 - Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (December 1997)

- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (2006/Amended February 2024)
- New York State Climate Act (2019)
- NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (2023).

4.1.1.1 Green and Sustainable Remediation and Climate Resiliency

During the course of the remedial action field activities, SESI will consider NYSDEC DER-31 "Green Remediation" implementation objectives. DER-31: Green Remediation provides the framework for DER's approach to remediating sites in the context of the larger environment, a concept known as "Green Remediation". Green Remediation (or greener cleanups) can be defined as "the practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprint of cleanup actions." It is intended to be a holistic approach which improves the overall sustainability of remedial cleanups by promoting the use of more sustainable practices and technologies. Such practices and technologies are less disruptive to the environment, generate less waste, increase reuse and recycling, and emit fewer pollutants, including greenhouse gases (GHGs), to the atmosphere. The approach also recognizes the potential for positive economic and social benefits of site reuse and supports coordination of site reuse and remediation to affect the most beneficial and sustainable reuse of the site. Please note that final end use is dictated by local zoning codes. NYSDEC's role is to ensure that the remedy is protective for the intended end use. Green Remediation concepts and techniques considered during the remedial activities will include:

- Require a Green Remediation Implementation Plan submittal from the selected Contractor to detail procedures and tracking of these items;
- During construction activities and associated landscape alteration activities, green building strategies such as those outlined in the USGBC LEED should be considered;
- LEED includes guidelines and recommendations for new construction, and existing building operations and management that fall under six categories important for reducing the environmental impact of facilities of all types:

- Sustainable sites
- Water efficiency
- Energy and atmosphere
- Materials and resources
- Indoor environmental quality
- Innovation in operations

Other approaches or considerations may be approved by NYSDEC on a case-by-case basis.

- Prohibiting idling vehicles and equipment when possible to reduce emission of CO2, N2O, CH4, and other greenhouse gases contributing to climate change;
- Considering the environmental impacts of treatment technologies and remedy stewardship over the long term when choosing a site remedy;
- Reducing direct and indirect greenhouse gases and other emissions;
- Increasing energy efficiency and minimizing use of non-renewable energy;
- Conserving and efficiently managing resources and materials;
- Reducing waste, increasing recycling and increasing reuse of materials which would otherwise be considered a waste;
- Fostering green and healthy communities and working landscapes which balance ecological, economic and social goals;
- Integrating the remedy with the end use where possible and encouraging green and sustainable re-development;
- Implementing the use of particulate detectors to monitor and minimize dust export of contaminants;
- Implementing the use of VOC detectors to monitor and minimize VOC exposures; and
- Coordinating sampling events to maximize on-site efforts while minimizing travel to/from the Site (economy of scale implementing multiple sampling events) and use of mass transit to access the project site.
- Integrating the remedy with the Site's end use for a green and sustainable redevelopment (i.e. Track 1 soil excavation).

4.1.2 SITE SPECIFIC HEALTH & SAFETY PLAN (HASP)

All remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA.

The Applicant and associated parties preparing the remedial documents submitted to the State and those performing the construction work, are completely responsible for the preparation of an appropriate Health and Safety Plan and for the appropriate performance of work according to that plan and applicable laws.

The Health and Safety Plan (HASP) and requirements defined in this Remedial Action Work Plan pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion. The HASP is included as **Appendix E**.

Confined space entry will comply with all OSHA requirements to address the potential risk posed by combustible and toxic gasses.

4.1.3 QUALITY ASSURANCE PROJECT PLAN (QAPP)

A copy of SESI QAPP is included as **Appendix F**. All field sampling procedures and analytical methods will be implemented in accordance with this QAPP.

4.1.4 SOIL/MATERIALS MANAGEMENT PLAN (SOMP)

The SoMP is included as Section 5.4 and includes detailed plans for managing all soils/materials that are disturbed at the Site, including excavation, handling, storage, transport, and disposal. It also includes all of the controls that will be applied to these efforts to assure effective, nuisance-free performance in compliance with all applicable Federal, State, and local laws and regulations.

4.1.5 EROSION AND SEDIMENT CONTROL PLAN (ESCP)

A soil erosion and sediment control plan will be prepared prior to the start of remedial work. .The erosion and sediment controls will be in conformance with requirements presented in the New York State Standards and Specifications for Erosion and Sediment Control.

4.1.6 COMMUNITY AIR MONITORING PLAN (CAMP)

A Community Air Monitoring Plan for the RAWP at the Site will be implemented in accordance with the requirements of DER-10 Appendix 1A. The objective of the CAMP is to provide a measure of protection for the downwind community from potential airborne contaminant releases that may arise during all ground intrusive activities, and potentially contaminated soil and material handling and staging. In addition, the CAMP is intended to ensure that dust and contaminants are not leaving the work zone.

The CAMP stations will be active and monitored during all ground intrusive activities and soil handling activities at the Site. The CAMP data will be submitted to NYSDEC and NYSDOH on a weekly basis, at a minimum, while ground intrusive and soil handling are taking place. In addition, the NYSDEC and NYSDOH will be notified as soon as possible and within one (1) business day of monitoring results which exceed the action levels, including the duration and actions taken in response to exceedances.

Details of the air monitoring program including perimeter air monitoring objectives, proposed CAMP stations, methods, and actions levels are detailed in the CAMP that is provided in **Appendix G**.

4.1.7 CONTRACTORS SITE OPERATIONS PLAN (SOP)

The Remedial Engineer has reviewed all plans and submittals for this remedial project (including those listed above and contractor and sub-contractor document submittals) and confirms that they comply with this RAWP. The Remedial Engineer is responsible to ensure that all later document submittals for this remedial project, including contractor and sub-contractor document submittals, comply with this RAWP. All remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

4.1.8 CITIZEN PARTICIPATION PLAN

A certification of mailing will be sent by the Applicant to the NYSDEC project manager following the distribution of all Fact Sheets and notices that includes: (1) certification that the Fact Sheets were mailed, (2) the date they were mailed; (3) a copy of the Fact Sheet, (4) a list of recipients

(contact list); and (5) a statement that the repository was inspected and that it contained all of applicable project documents.

No changes will be made to approved Fact Sheets authorized for release by NYSDEC without written consent of the NYSDEC. No other information, such as brochures and flyers, will be included with the Fact Sheet mailing.

The approved Citizen Participation Plan for this project is attached in **Appendix H**.

Document repositories have been established at the following locations and contain all applicable project documents:

PUBLIC LIBRARY	
Galina Chernykh Harrison Public Library, West Harrison Branch, Director 2 Madison Street West Harrison, NY 10604 (914) 948-2092 https://www.harrisonpl.org/west-harrison-branch	HOURS: Sunday,.....Closed Monday, ...Closed Tuesday, ...10:00am-5:00pm Wednesday, ...10:00am-7:00pm Thursday, ...10:00am-5:00pm Friday,.....10:00am-5:00pm Saturday,..... 10:00am-5:00pm

In addition, an electronic repository can be accessed via DECInfo Locator at the following link: Index of /data/DecDocs/C360235.

4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION

4.2.1 PROJECT ORGANIZATION

Table 4.1 below provides a list of key project personnel anticipated for this remedial action.

Table 4.1 Key Project Personnel

Role	Name	Email Address	Telephone No.
Volunteer Contact	Kavneet Sethi	kavsethi@greenpropertyllc.com	(516 319-3700
Project Principal	Fuad Dahan, P.E., PhD;	fd@sesi.org	973-808-9050 x249
Project Manager	TBD		TBD
Principal Engineer	Fuad Dahan, P.E., PhD;	fd@sesi.org	973-808-9050 x249
Field Team Leader	TBD		TBD
Quality Assurance Officer	TBD		TBD
Field Personnel	TBD		TBD
Analytical Laboratory	TBD		TBD
Data Validator	TBD		TBD
NYSDEC Project Manager	Oliver Wolfe	Oliver.Wolfe@dec.ny.gov	(518) 402-9732
NYSDOH Project Manager	Sarita Wagh	BEEI@health.ny.gov	(518) 402-7860
Citizens Participation Specialist	Stephanie Mossey		(845) 256-3154

4.2.2 REMEDIAL ENGINEER

The Remedial Engineer for this project will be Fuad Dahan. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the One Water Street Blacksmith & Wheelwright Site (NYSDEC BCA Index No. C360235-06-23 Site No. C360235). The Remedial Engineer will certify in the Final Engineering Report that the remedial activities were observed by qualified environmental professionals under [his/her] supervision and that the remediation requirements set forth in the Remedial Action Work Plan and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this RAWP.

The Remedial Engineer will coordinate the work of other contractors and subcontractors involved in all aspects of remedial construction, including soil excavation, stockpiling, characterization, removal and disposal, air monitoring, emergency spill response services, import of back fill material, and management of waste transport and disposal. The Remedial Engineer will be responsible for all appropriate communication with NYSDEC and NYSDOH.

The Remedial Engineer will review all pre-remedial plans submitted by contractors for compliance with this RAWP and will certify compliance in the Final Engineering Report.

The Remedial Engineer will provide the certifications listed in Section 10.1 in the FER.

4.2.3 REMEDIAL ACTION CONSTRUCTION SCHEDULE

The anticipate remedial action schedule is provided on table 4.2 below. This schedule will be updated as needed.

Table 4.2: Remedial Action Schedule

Task	Date
Draft RIR Submitted to NYSDEC	November 10, 2025
Submit Draft RAWP to DEC	12/12/2025
Start 45 Day Comment period	2/1/2026
File building permits for change of use	2/15/2026
End of Comment period	3/15/2026
RAWP Approval and Decision Document	5/1/2026
Construction - RA	May-September, 2026
Submit EE (if required)	May 2026
Submit SMP	8/1/2026
Submit FER	October 2026
COC	End of 2026

4.2.4 WORK HOURS

The hours for operation of remedial construction will conform to the City of White Plains Department of Buildings (DOB) construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Applicant of any variances issued by DOB. NYSDEC reserves the right to deny alternate remedial construction hours.

4.2.5 SITE SECURITY

The Site will be secured with fences and locked gates when remediation is about to commence. The fence will be eight foot high fabric lined chain link construction. The gate will be locked during non-construction hours.

4.2.6 TRAFFIC CONTROL

Traffic control shall be the responsibility of the Volunteer and its Contractors. Traffic control must comply with all local, state, and federal regulations including but not limited to the City of White Plains Department of Transportation, New York City Department of Transportation (NYSDOT) and the Manual on Uniform Traffic Control Devices (MUTCD).

4.2.7 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during on-Site remedial excavation or development related construction, sampling will be performed on product, sediment and surrounding soils, etc. in accordance with DER-10. Chemical analytical work will be for full scan parameters (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides, PCBs and PFAS). Analyses will not be otherwise limited without NYSDEC approval.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and periodic electronic media reports.

4.2.8 WORKER TRAINING AND MONITORING

The required worker training and monitoring are presented in the HASP located in **Appendix E**.

4.2.9 AGENCY APPROVALS

The Applicant has addressed all SEQRA requirements for this Site. All permits or government approvals required for remedial construction have been, or will be, obtained prior to the start of remedial construction.

The planned end use for the Site is in conformance with the current zoning for the property as determined by the City of White Plains. A Certificate of Completion will not be issued for the project unless conformance with zoning designation is demonstrated.

All planned remedial or construction work in regulated wetlands and adjacent areas will be specifically approved by the NYSDEC Division of Natural Resources to ensure that it meets the requirements for substantive compliance with those regulations prior to the start of construction.

Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

4.2.10 PRE-CONSTRUCTION MEETING WITH NYSDEC

A pre-construction meeting will be held with NYSDEC at least one week prior to the mobilization of major remedial construction activities.

4.2.11 EMERGENCY CONTACT INFORMATION

An emergency contact sheet with names and phone numbers is included in Table 4.3. That document will define the specific project contacts for use by NYSDEC and NYSDOH in the case of a day or night emergency.

TABLE 4.3
Emergency and Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480 (3-day notice required for utility markout)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362
Fuad Dahan – Remedial Engineer (SESI Consulting Engineers)	(973) 808-9050
Director of Construction - TBD	TBD

4.3 SITE PREPARATION

4.3.1 MOBILIZATION

Mobilization tasks will include:

- Construction of temporary facilities and utilities;
- Set-up of construction equipment and facilities;
- Construction of fencing and barriers;

- Construction of erosion control measures; and
- Construction of decontamination and materials staging areas.

4.3.2 MONITORING WELL / VAPOR PROBE DECOMMISSIONING

Existing groundwater monitoring wells will either be protected during remediation and development for use in post-remedial monitoring or will be properly decommissioned in accordance with NYSDEC Commissioners Policy CP-43. The only exception to this is if the full length of the well is to be excavated during remediation.

Similarly, existing soil vapor probes will be properly decommissioned unless they are to be fully removed during remediation or used for post-remedial monitoring.

4.3.3 EROSION AND SEDIMENTATION CONTROLS

Erosion and sediment control measures are outlined in Section 5.4.

4.3.4 STABILIZED CONSTRUCTION ENTRANCE(S)

A tracking pad sloped towards the interior of the Site will be required for any vehicles going off-site that have come in contact with on-site soils. The decontamination area construction and operational requirements are provided in the HASP. All vehicle tires must be washed before exiting the Site.

4.3.5 UTILITY MARKER AND EASEMENTS LAYOUT

The Applicant and its contractors are solely responsible for the identification of utilities that might be affected by work under the RAWP and implementation of all required, appropriate, or necessary health and safety measures during performance of work under this RAWP. The Applicant and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Applicant and its contractors must obtain any local, State or Federal permits or approvals pertinent to such work that may be required to perform work under this RAWP. Approval of this RAWP by NYSDEC does not constitute satisfaction of these requirements.

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. It has been determined that no risk or impediment to the planned work under this Remedial Action Work Plan is posed by utilities or easements on the Site.

4.3.6 SHEETING AND SHORING

Appropriate management of structural stability of on-Site or off-Site structures during on-Site activities include excavation is the sole responsibility of the Applicant and its contractors. The Applicant and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Applicant and its contractors must obtain any local, State or Federal permits or approvals that may be required to perform work under this RAWP. Further, the Applicant and its contractors are solely responsible for the implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved RAWP.

4.3.7 EQUIPMENT AND MATERIAL STAGING

Equipment and material staging areas are expected to be relocated throughout the Site during remedial construction.

4.3.8 DECONTAMINATION AREA

Decontamination activities will include the removal of contaminated soil, debris and other miscellaneous materials from construction equipment and tools utilizing physical/mechanical agitation (brushing/scraping with hand tools) of soil may be utilized to minimize wastewater generation. When necessary the removal of contaminated soil, debris and other miscellaneous materials from construction equipment and tools will be accomplished using clean water supplied from the Site.

4.3.9 SITE FENCING

A construction safety fence will be installed around the entire perimeter of the Site. Access through gates will be provided at various points as required by the Volunteer and its contractors. These gates will be locked during non-construction hours.

4.3.10 DEMOBILIZATION

- Restoration of areas that may have been disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management area[s], and access area);
- Removal of temporary access areas (whether on-Site or off-Site) and restoration of disturbed access areas to pre-remediation conditions;
- Removal of sediment and erosion control measures and disposal of materials in accordance with acceptable rules and regulations;
- Equipment decontamination;
- General refuse disposal.

4.4 REPORTING

All daily and monthly Reports will be included in the Final Engineering Report.

4.4.1 DAILY REPORTS

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers by noon of each day following the reporting period and will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP finding, including excursions;
- Photographs of site activities;
- An explanation of notable Site conditions.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RAWP or other sensitive or time critical information. However, such conditions must also be included in the daily reports.

Emergency conditions and changes to the RAWP will be addressed directly to NYSDEC Project Manager via personal communication.

Daily Reports will include a description of daily activities keyed to an alpha-numeric map for the Site that identifies work areas. These reports will include a summary of CAMP results, odor and dust excursions and corrective actions, and all complaints received from the public.

The NYSDEC assigned project number will appear on all reports.

4.4.2 MONTHLY REPORTS

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers by the 10th day of each month following the reporting period and will include:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (e.g., tons/cubic yards of material exported and imported, etc.);
- Description of approved activity modifications, including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; and,
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.
- Tracking of GSR metrics determined during the design process should be included in monthly reports.

4.4.3 OTHER REPORTING

Photographs will be taken of all remedial activities and submitted to NYSDEC in digital (JPEG) format. Photos will illustrate all remedial program elements and will be of acceptable quality. Representative photos of the Site prior to any Remedial Actions will be provided. Representative photos will be provided of each contaminant source, source area and Site structures before,

during and after remediation. Photos will be included in the daily reports as needed, and a comprehensive collection of photos will be included in the FER.

Progress with respect to green and sustainable remediation metrics will be tracked during implementation of the remedial action and reported in the FER, including a comparison to the goals established during the remedial program. Regular updates to the metrics used (SEFA, SiteWise™ or otherwise approved method) should be included.

The Climate Screening process and results will be documented in the form of a completed checklist and brief letter report. If the Climate Screening results indicate that a CVA is necessary, a complete CVA Report will be developed. The CVA Report will be included as an Appendix or Attachment in relevant documents and/or submitted as a standalone report.

Job-site record keeping for all remedial work will be appropriately documented. These records will be maintained on-Site at all times during the project and be available for inspection by NYSDEC and NYSDOH staff.

4.4.4 COMPLAINT MANAGEMENT PLAN

A public information board will be constructed at the perimeter of the Site. This information board will contain the phone number of the Volunteer where complaints may be directed. General information notices to the public will also be posted on this board for their benefit.

4.4.5 DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

If there are any deviations from the RAWP, the following steps will be taken:

- Reasons for deviating from the approved RAWP will be identified and communicated directly to the NYSDEC Project Manager;
- All deviations will be communicated verbally and in writing (by letter or email) to the NYSDEC Project Manager;
- The deviations will be implemented based on verbal or written approval of the NYSDEC Project Manager. All verbal approvals will be followed-up in writing.
- The effect of the deviations on the overall remedy will be described/addressed in the FER.

5.0 REMEDIAL ACTION: MATERIAL REMOVAL FROM SITE

Removal of all contaminated soil under the Remedial Action for the Site will be implemented in accordance with the Site-specific QAPP (**Appendix F**). Soil exceeding the Track 1 USCOs extends to a depth of 18 ft-bgs based on the RI and prior investigations performed. A plan depicting the locations where the Track 1 remedial excavation activities will be carried out to planned depths of 19 ft-bgs is included as **Figure 5.1,** and on **Figure 5.2** for a Track 2 remedy. The depth was determined based on the deepest exceedance of the Track 1 USCO documented during the RI plus two feet and the need to achieve the Track 1 remedy. The estimated excavation volume is approximately 34,000 cubic yards (cy) (51,000 tons) for the planned Track 1 remedial excavation or approximately 28,500 CYs (42,750 tons) for Track 2 alternative if Track 1 cannot be achieved. The target remedial excavation elevations are depicted on **Figure 5.1 and 5.2**. The approximate elevations are used to define the depth of cleanup because the Site is not level this accounts for the elevation variances across the Site.

Institutional and engineering controls may be implemented to address contamination in soil vapor for a conditional Track 1 remedy. Institutional and engineering controls (environmental easement, SSDS, etc.) may be required if the Site does not achieve a Track 1 remedy. Groundwater remediation is not anticipated and will be monitored and are anticipated to reach asymptotic levels. Any minor residual contamination in the groundwater should naturally attenuate with time and is not anticipated to be a pathway for human health exposure since groundwater use is prohibited for drinking water purposes.

The soil vapor pathway will be addressed with precautionary elements of the SSDS piping (if the piping is not below the seasonal low groundwater table) and a vapor barrier. The vapor barrier will be a construction element and not an EC unless the Site does not achieve the planned Track 1 remedy. The SSDS could be made active as described herein pending future soil vapor sampling results. The design for the proposed buildings has not been completed as of the time of writing this RAWP. Once the building envelope is completed with air handling systems in place, the soil vapor intrusion evaluation will be performed pursuant to the SMP. A workplan will be submitted to the NYSDEC and NYSDOH prior to the SVI evaluation.

5.1 SOIL CLEANUP OBJECTIVES

- The Soil Cleanup Objectives for this Site are the Track 1 USCOs.
- Soil and materials management on-Site and off-Site will be conducted in accordance with the Soil/Materials Management Plan as described below.
- A spider map that shows all soil samples that exceed the SCOs proposed for this Remedial Action is shown in **RIR Figure 4.1 (Appendix B**).
- UST closures will, at a minimum, conform to criteria defined in DER-10.

5.2 REMEDIAL PERFORMANCE EVALUATION (POST EXCAVATION END-POINT SAMPLING)

For all excavations, post-excavation soil samples will be collected in accordance with Section 5.4 of DER-10 for laboratory analysis of TCL + 30/TAL compounds including VOCs by EPA Method 8260C, SVOCs by EPA Method 8270D, pesticides by EPA Method 8081B, PCBs by EPA Method 8082A, TAL metals by EPA Methods 6010C, 7471B, and 9012, 1,4-dioxane by EPA Method 8720, and for PFAS in accordance with the latest EPA Method 1633A.

5.2.1 END-POINT SAMPLING FREQUENCY

All Site soils will be removed down to some depths up 19.5 ft-bgs within the final SOE boundary as required to achieve the Track 1 remediation. Endpoint verification sampling will be implemented every 900 square feet (SF) at this depth, verified, and documented by field personnel. The proposed end-point sample locations and sample depths are depicted on **Figure 5.1** for Track 1 and **Figure 5.2** for Track 2. Although not depicted on **Figures 5.1** and **5.2**, sidewall samples will be collected within the Site where adjacent grids are excavated to different depths (greater than 2 feet variance between grids). In cases where a subject grid is appreciably lower in depth than adjacent grids, the subject grid shall be excavated to appropriate lower depths to avoid excavating grids in a silo fashion. Such grids shall receive end point sampling at such lower depths. Sidewall samples will not be collected along the exterior property boundary per DER-10 requirements because of the SOE that will be placed along the Site boundaries. Documentation will be presented in the FER. To the extent that any of the end-point sample results do not achieve Track 1 USCOs, excavation of additional of soil will be performed every two feet until the Track 1

USCOs are achieved to the extent feasible or until bedrock. Alternatively, the team may decide to revert to a Track 2 remedy to avoid over excavation.

5.2.2 GROUNDWATER SAMPLING FREQUENCY

The remedy will include mass source removal during the remedial excavation. Groundwater sampling will be conducted after the soil remedial activities for the full suite TCL/TAL:+30, PFAS and 1,4-dioxane in order to verify that the remedy is effective. The goal of the remedy is to achieve the AWQSGV standards or to reach asymptotic levels. The proposed post remediation groundwater sample locations are depicted on **Figure 5.3**. A typical well construction diagram is provided in **Appendix I**.

5.2.3 VI MITIGATION AND EVALUATION SAMPLING

Precautionary installation of the elements of a sub-slab depressurization system (SSDS) underneath portions of the building foundation if the sub-slab of the proposed building is not under the water table including during the seasonal low, and a soil vapor barrier, will be implemented. An SSDS Remedial Design Document including the proposed communication testing locations, will be submitted to NYSDEC and NYSDOH for review prior to system implementation. The venting layer consists of six to eight inches of sand or crushed stone with a network of perforated pipes that act as transmission conduits for the contaminated soil gas. The perforated pipes are vented to the outside with risers. The system will be designed as passive with the possibility of switching it to active if active venting is needed to meet the VI indoor air objectives. The vapor barrier will be a construction element and not an EC unless the Site does not achieve the planned Track 1 remedy.

The sealing methodology will consist of a vapor barrier comprised of 20-mils thickness of high or low-density polyethylene (H or LDPE) or an approved equal. The vapor barrier will be installed on top of the venting layer just below the slab to provide the required sealing layer as stated in the NYSDOH SVI Guidance. All the utility penetrations into the slab will also be sealed. Permanent soil vapor sampling ports will be built into the vapor barrier to prevent future sampling penetrations. The final sampling point locations will be submitted to NYSDEC and NYSDOH for approval.

The soil vapor evaluation will be described in the SMP. The SMP will be amended if SSDS operation and monitoring is required. Following installation of the SSDS elements, a soil vapor intrusion evaluation, in accordance with the NYSDOH SVI Guidance, will be conducted to determine if the SSDS needs to be made active, and thereafter if an active system is required, to determine the ongoing long-term presence or mitigation of SVI. If within the five-year period, the VOC concentrations in the sub slab and indoor air drop to levels below the mitigate threshold requirements, with NYSDEC and NYSDOH approval, the SSDS will cease to be an engineering control.

A soil vapor intrusion evaluation will be conducted after the lowest level is fully enclosed and with an operable HVAC system on the lowest level to assess the potential for soil vapor intrusion to affect indoor air quality. The elements of the SSDS will be turned into engineering control (EC) as an active SSDS if the soil vapor evaluation determines that vapor mitigation is needed. The proposed vapor sampling point locations are depicted on **Figure 5.4**.

5.2.4 METHODOLOGY

Soil samples will be collected in accordance with the QAPP using disposable gloves/trowels or dedicated, decontaminated stainless steel spoons. Groundwater samples will be collected in accordance with the QAPP using the low-flow purging and sampling method and associated decontamination and quality control procedures. Soil vapor samples will be collected in accordance with the NYSDOH SVI Guidance for Evaluating Sub-Slab vapor Intrusion.

5.2.5 REPORTING OF RESULTS

The samples will be submitted to a NYSDOH Environmental Laboratory Accreditation Program (ELAP) certified laboratory. The results will be reported in accordance with NYSDEC requirements for Category B data deliverables (as outlined in DER-10). In addition, all data collected during the remedial action will be submitted in the NYSDEC approved Electronic Data Deliverable format using the NYSDEC's Environmental Information Management System database software application EQuIS™.

5.2.6 QA/QC

Collection of quality assurance/quality control (QA/QC) samples to evaluate potential cross-contamination from sampling equipment and during shipment of samples and repeatability of laboratory analytical practices will be in accordance with the QAPP included as **Appendix F**. Field blanks, trip blanks and duplicate samples associated with daily sampling activities will be collected as a part of the QA/QC practices.

5.2.7 DUSR AND EDDS

To ensure that the field sampling and laboratory analytical practices are acceptable, the data associated with all the samples will be validated by a third party (in accordance with requirements of DER-10). The validation approach and results will be presented in a DUSR to be included in the FER.

5.2.8 REPORTING OF END-POINT DATA IN FER

The FER will include a table of final soil and groundwater sample data with highlights or a summary of exceedances of the Track 1 USCOs and AWQSGV.

The FER will include a table of end point data with highlights or a summary of exceedances of SCOs. A spider map showing all SCO exceedances will also be presented in the FER.

Chemical labs used for all end-point sample results and contingency sampling will be NYSDOH ELAP certified.

End point sampling, including bottom and side-wall sampling, will be performed in accordance with DER-10 sample frequency requirements. Side-wall samples will be collected a minimum of every 30 linear feet. Bottom samples will be collected at a rate of one for every 900 square feet from the base of the remedial excavation. The FER will provide a tabular and map summary of all end-point sample results and exceedances of SCOs.

5.3 ESTIMATED MATERIAL REMOVAL QUANTITIES

Based on the RI, the depth of contaminated fill/ soil ranges from grade to 18 ft-bgs. The entire Site within the SOE will be excavated to remove all soil exceedances in order to achieve a Track

1 remedy. The estimated quantity of soil/fill to be removed from the Site is 34,000 cubic yards (51,000 tons) for a Track 1 remedy.

5.4 SOIL/MATERIALS MANAGEMENT PLAN

Material will be required to be excavated during remediation activities. Any required fill will consist of imported clean fill that meets the requirements per 6 NYCRR § 375-6.8(d) and the requirements for emerging contaminants sampling per the April 2023 DEC Guidance Document.

5.4.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional or experienced field geologist under the direction of the Remedial Engineer during all remedial and development excavations into known or potentially contaminated material. Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during the remedy and during development phase, such as excavations for foundations and utility work, prior to issuance of the COC.

All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. This information will be provided on maps in the FER.

Screening will be performed by qualified environmental professionals. Resumes will be provided for all personnel responsible for field screening (e.g., those representing the Remedial Engineer) of invasive work for unknown contaminant sources during remediation and development work.

5.4.2 STOCKPILE METHODS

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. At a minimum, a storm event should be considered a rainfall of three inches or greater in 12 hours. Judgement should be used to evaluate water infiltration, nearby waterbodies where runoff is likely, and engineering controls that may be affected.

Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Soil stockpiles will be continuously encircled with silt fences. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Water will be available on-site at suitable supply and pressure for use in dust control.

5.4.3 MATERIALS EXCAVATION AND LOAD OUT

The Remedial Engineer or a qualified environmental professional under his/her supervision will oversee all invasive work and the excavation and load-out of all excavated material.

The Applicant and its contractors are solely responsible for safe execution of all invasive and other work performed under this Plan.

The presence of utilities and easements on the Site has been investigated by the Remedial Engineer. It has been determined that no risk or impediment to the planned work under this Remedial Action Work Plan is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and all other applicable transportation requirements).

Vehicles leaving the Site will not be overloaded. The Remedial Engineer's representative will make reasonable efforts to ensure that vehicles are not loaded beyond their NYSDOT weight rating and that all material is secured beneath the truck bed cover.

A truck wash will be operated on-Site. The Remedial Engineer will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the remedial construction is complete.

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-Site sediment tracking.

The Remedial Engineer will be responsible for ensuring that all egress points for truck and equipment transport from the Site will be clean of dirt and other materials derived from the Site during Site remediation and development. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site -derived materials.

The Applicant and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe performance of all invasive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings).

The Remedial Engineer will ensure that Site development activities will not interfere with, or otherwise impair or compromise, remedial activities proposed in this Remedial Action Work Plan. Each hotspot and structure to be remediated (USTs, vaults and associated piping, transformers, etc.) will be removed and end-point remedial performance sampling completed before excavations related to Site development commence proximal to the hotspot or structure. Development-related grading cuts and fills will not be performed without NYSDEC approval and will not interfere with, or otherwise impair or compromise, the performance of remediation required by this plan.

Mechanical processing of historical fill and contaminated soil on-Site is prohibited.

All primary contaminant sources (including but not limited to tanks and hotspots) identified during Site Characterization, Remedial Investigation, and Remedial Action will be surveyed by a surveyor licensed to practice in the State of New York. The survey information will be shown on maps to be reported in the FER.

5.4.4 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Truck transport routes will be provided to NYSDEC prior to the start of remediation. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes.

Proposed in-bound and out-bound truck routes to the Site will take into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off- Site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport; [(g) community input where necessary.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed on-Site in order to minimize off-Site disturbance. Off-Site queuing will be prohibited.

Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas or mesh truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks will be washed prior to leaving the Site. Truck wash waters will be collected and disposed of off-Site in an appropriate manner.

5.4.5 MATERIALS DISPOSAL OFF-SITE

The disposal locations will be provided to NYSDEC prior to the start of work. Disposal location established at a later date will be reported to the NYSDEC Project Manager.

The total quantity of material expected to be disposed off-Site is 34,000 cubic yards for the planned Track 1 remedy.

All soil/fill/solid waste excavated and removed from the Site will be treated as contaminated and regulated material and will be disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from this Site is proposed for unregulated

disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to NYSDEC's Project Manager. Unregulated off-Site management of materials from this Site is prohibited without formal NYSDEC approval.

Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360.15 Registration Facility).

The following documentation will be obtained and reported by the Remedial Engineer for each disposal location used in this project to fully demonstrate and document that the disposal of material derived from the Site conforms with all applicable laws: (1) a letter from the Remedial Engineer or BCP Applicant to the receiving facility describing the material to be disposed and requesting formal written acceptance of the material. This letter will state that material to be disposed is contaminated material generated at an environmental remediation Site in New York State. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported (including Site Characterization data); and (2) a letter from all receiving facilities stating it is in receipt of the correspondence (above) and is approved to accept the material. These documents will be included in the FER.

Non-hazardous historic fill and contaminated soils taken off-Site will be handled, at minimum, as a Municipal Solid Waste per 6NYCRR Part 360.2. The Remedial Engineer is responsible for assuring material is properly characterized and determining the appropriate disposal methods based on the characterization results.

Historical fill and contaminated soils from the Site are prohibited from being disposed at Part 360.15 Registration Facilities (also known as Soil Recycling Facilities).

Soils that are contaminated but non-hazardous and are being removed from the Site are considered by the NYSDEC Division of Materials Management (DMM) to be Construction and Demolition (C/D) materials with contamination not typical of virgin soils. These soils may be sent to a permitted Part 360 landfill. They may be sent to a permitted C/D processing facility without permit modifications only upon prior notification of NYSDEC DMM. This material is prohibited from being sent or redirected to a Part 360-15 Registration Facility. In this case, as dictated by DMM,

special procedures will include, at a minimum, a letter to the C/D facility that provides a detailed explanation that the material is derived from a DER remediation Site, that the soil material is contaminated and that it must not be redirected to on-Site or off-Site Soil Recycling Facilities. The letter will provide the project identity and the name and phone number of the Remedial Engineer. The letter will include as an attachment a summary of all chemical data for the material being transported.

The FER will include an accounting of the destination of all material removed from the Site during this Remedial Action, including excavated soil, contaminated soil, historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the FER.

Bill of Lading system or equivalent will be used for off-Site movement of non-hazardous wastes and contaminated soils. This information will be reported in the FER.

Hazardous wastes derived from on-Site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with all applicable local, State and Federal regulations.

Waste characterization sampling will be performed exclusively for the purposes of off-Site soil disposal in a manner suitable to receiving facilities and in conformance with applicable federal, state and local laws rules and regulations and facility-specific permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC associated with waste characterization activities will be reported in the FER. All data available for soil/material to be disposed at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt. Waste characterization data will be used solely for complying with requirements for off-site disposal. Waste Characterization sampling cannot be utilized for:

- Delineating the extent of contamination required for remediation at a Site.
- Replacing or substituting data collected as part of Site Characterization and/or Remedial Investigation.

- Replacing or substituting confirmation or documentation sampling as described in NYSDEC DER-10, Section 5.4.
- To modify remedial decisions as formalized in a NYSDEC approved Decision Document or Record of Decision.

5.4.6 MATERIALS REUSE ON-SITE

If On-Site material is suitable for reuse, the proposed materials for reuse on-Site will be sampled for full suite analytical parameters including PFAS and 1,4-dioxane. The sampling frequency will be in accordance with DER-10 Table 5.4(e)10 unless prior approval is obtained from the NYSDEC project manager for modification of the sampling frequency. The analytical results of soil/fill material testing must meet the Site use criteria presented in NYSDEC DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil for all constituents listed, and the NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances [April 2023] guidance values. Approvals for modifications to the analytical parameters must be obtained from the NYSDEC project manager prior to the sampling event.

A “Request to Import/Reuse Fill Material” form will be filed with the NYSDEC project manager for review and approval prior to material reuse on the site. Acceptable demolition material proposed for reuse on-Site, if any, will be sampled for asbestos.

Concrete crushing or processing on-Site is prohibited, unless NYSDEC has specifically approved on-site processing and reuse of acceptable demolition material.

Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing of the Site is prohibited for reuse on-Site.

Contaminated on-Site material, including historic fill and contaminated soil, removed for grading or other purposes will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines. This will be expressed in the Site Management Plan (SMP).

5.4.7 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Liquids discharged into the White Plains sewer system will be addressed through approval by Westchester County Department of Environmental Facilities.

5.4.8 BACKFILL FROM OFF-SITE SOURCES

Backfilling may be needed in certain of areas on the Site. The imported material, if needed, will be sampled in accordance with DER-10 Section 5.4 (e) Table 5.4 (e)10. The samples will be analyzed for target compound list (TCL) volatile organic compounds (VOCs), TCL Semi-Volatile Organic Compounds (SVOCs), pesticides, PCBs, and TAL metals, including cyanide. The soil may be used as cover material provided that all parameters meet the USCOs, per the NYSDEC regulatory requirements. In addition, composite samples will be collected for emerging contaminants in accordance with the NYSDEC Sampling, Analysis, and Assessment of Per-and-Polyfluoroalkyl Substances (April 2023).

All materials proposed for import onto the Site will be approved by the Remedial Engineer and will be in compliance with provisions in this RAWP prior to receipt at the Site.

Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site. Solid waste will not be imported onto the Site.

The FER will include the following certification by the Remedial Engineer: “I certify that all import of soils from off-Site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the Remedial Action Work Plan”.

All imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. These NYSDEC approved backfill or cover soil quality objectives are the lower of the protection of groundwater or the protection of public health soil cleanup objectives for unrestricted use as set forth in Table 375-6.8(b) of 6 NYCRR Part 375. Non-compliant soils will not be imported onto

the Site without prior approval by NYSDEC. Nothing in the approved RAWP or its approval by NYSDEC should be construed as an approval for this purpose.

Soils that meet 'general fill' requirements under 6 NYCRR Part 360.13, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this RAWP should be construed as an approval for this purpose.

A "Request to Import/Reuse Fill Material" form will be filed with the NYSDEC project manager for review and approval prior to import to the site.

5.4.9 STORMWATER POLLUTION PREVENTION

An erosion and sediment control plan will be prepared prior to the start of ground intrusive activities.

Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.

All undercutting or erosion of the silt fence toe anchor shall be repaired immediately with appropriate backfill materials.

Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.

Erosion and sediment control measures identified in the RAWP shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters.

Silt fencing or hay bales will be installed around the entire perimeter of the remedial construction area.

5.4.10 CONTINGENCY PLAN

If underground tanks or other previously unidentified contaminant sources are found during on-Site remedial excavation or development related construction, sampling will be performed on product, sediment and surrounding soils, etc. in accordance with DER-10. Chemical analytical work will be for full scan parameters (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides, PCBs and PFAS). Analyses will not be otherwise limited without NYSDEC approval. Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and periodic electronic media reports.

5.4.10.1 EXTREME STORM PREPAREDNESS AND RESPONSE CONTINGENCY PLAN

Damage from flooding or storm surge can include dislocation of soil and stockpiled materials, dislocation of site structures and construction materials and equipment, and dislocation of support of excavation structures. Damage from wind during an extreme storm event can create unsafe or unstable structures, damage safety structures and cause downed power lines creating dangerous site conditions and loss of power. In the event of emergency conditions caused by an extreme storm event, the Applicant will undertake the following steps for site preparedness prior to the event and response after the event.

Storm Preparedness

Preparations in advance of an extreme storm event will include the following: containerized hazardous materials and fuels will be removed from the property; loose materials will be secured to prevent dislocation and blowing by wind or water; heavy equipment such as excavators and generators will be removed from excavated areas, trenches and depressions on the property to high ground or removed from the property; an inventory of the property with photographs will be performed to establish conditions for the site and equipment prior to the event; stockpile covers for soil and fill will be secured by adding weights such as sandbags for added security and worn or ripped stockpile covers will be replaced with competent covers; stockpiled hazardous wastes

will be removed from the property; stormwater management systems will be inspected and fortified, including, as necessary: clean and reposition silt fences, hay bales; clean storm sewer filters and traps; and secure and protect pumps and hosing.

Storm Response

At the conclusion of an extreme storm event, as soon as it is safe to access the property, a complete inspection of the property will be performed. A site inspection report will be submitted to NYSDEC at the completion of site inspection and after the site security is assessed. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. Damage from storm conditions that result in acute public safety threats, such as downed power lines or imminent collapse of buildings, structures or equipment will be reported to public safety authorities via appropriate means such as calling 911.

Petroleum spills will be reported to NYSDEC within 2 hours of identification and consistent with State regulations. Public safety structures, such as construction security fences will be repaired promptly to eliminate public safety threats. Debris will be collected and removed.

Dewatering will be performed in compliance with existing laws and regulations and consistent with emergency notifications, if any, from proper authorities. Eroded areas of soil including unsafe slopes will be stabilized and fortified. Dislocated materials will be collected and appropriately managed. Support of excavation structure will be inspected and fortified as necessary. Impacted stockpiles will be contained and damaged stockpile covers will be replaced. Stormwater control systems and structures will be inspected and maintained as necessary.

If soil or fill materials are discharged off site to adjacent properties, property owners and NYSDEC will be notified, and corrective measure plan designed to remove and clean dislocated material will be submitted to NYSDEC and implemented following approval by NYSDEC and granting of site access by the property owner. Impacted offsite areas may require characterization based on site conditions, at the discretion of NYSDEC.

If onsite petroleum spills are identified, a qualified environmental professional will determine the nature and extent of the spill and report to NYSDEC's spill hotline at (800) 457-7362 within

statutory defined timelines. If the source of the spill is ongoing and can be identified, it should be stopped if this can be done safely. Potential hazards will be addressed immediately, consistent with guidance issued by NYSDEC.

Storm Response Reporting

A site inspection report will be submitted to NYSDEC at the completion of site inspection. An inspection report will be used for this purpose. Site conditions will be compared to the inventory of site conditions and material performed prior to the storm event and significant differences will be noted. The site inspection report will be sent to the NYSDEC project manager and will include the site name, address, tax block and lot, site primary and alternate contact name and phone number.

Damage and soil release assessment will include: whether the project had stockpiles; whether stockpiles were damaged; photographs of damage and notice of plan for repair; report of whether soil from the site was dislocated and whether any of the soil left the site; estimates of the volume of soil that left the site, nature of impact, and photographs; description of erosion damage; description of equipment damage; description of damage to the remedial program or the construction program, such as damage to the support of excavation; presence of onsite or offsite exposure pathways caused by the storm; presence of petroleum or other spills and status of spill reporting to NYSDEC; description of corrective actions; schedule for corrective actions.

This report should be completed and submitted to NYSDEC project manager with photographs within 24 hours of the time of safe entry to the property after the storm event.

5.4.11 COMMUNITY AIR MONITORING PLAN

A CAMP will be implemented during RAWP remedial actions in the field at the Site in accordance with the requirements of DER-10 Appendix 1A. The objective of the CAMP is to provide a measure of protection for the downwind community from potential airborne contaminant releases that may arise during all ground intrusive activities, and potentially contaminated soil and material handling and staging. In addition, the CAMP is intended to ensure that dust and contaminants are not leaving the work zone. Details of the air monitoring program including perimeter air monitoring objectives, methods, and actions levels are detailed in the CAMP is provided in **Appendix G**.

Exceedances observed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers and included in the Daily Report.

5.4.12 ODOR, DUST AND NUISANCE CONTROL PLAN

The FER will include the following certification by the Remedial Engineer: "I certify that all invasive work during the remediation and all invasive development work were conducted in accordance with dust and odor suppression methodology defined in the Remedial Action Work Plan."

5.4.12.1 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors off-Site. Specific odor control methods to be used on a routine basis will include spraying of water to control dust that may cause odors and modifying work practices or applying deodorizing or masking agents. If nuisance odors are identified, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of all other complaints about the project. Implementation of all odor controls, including the halt of work, will be the responsibility of the Applicant's Remedial Engineer, who is responsible for certifying the FER.

All necessary means will be employed to prevent on- and off-Site nuisances. At a minimum, procedures will include: (a) limiting the area of open excavations; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils; [add other elements as appropriate]. If odors develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-Site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

Where odor nuisances have developed during remedial work and cannot be corrected, or where the release of nuisance odors cannot otherwise be avoided due to on-Site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

5.4.12.2 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-Site work will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-Site water truck or hookup to the fire hydrant for road wetting. The water source will be capable of spraying water directly onto off-road areas including excavations and stockpiles for use in dust control.
- Clearing and grubbing of larger sites will be done in stages to limit the area of exposed, unvegetated soils vulnerable to dust production.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-Site roads will be limited in total area to minimize the area required for water spraying.

5.4.12.3 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during Site clearing and Site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work and will conform, at a minimum, to NYCDEP noise control standards.

6.0 RESIDUAL CONTAMINATION TO REMAIN ON-SITE

If after all soil exceeding the USCOs have been removed, residual contaminated soil [groundwater/soil vapor] exist beneath the Site, Engineering and Institutional Controls (ECs and ICs) may be required to protect human health and the environment. These ECs and ICs are described hereafter. Long-term management of EC/ICs and of residual contamination will be executed under a Site specific Site Management Plan (SMP) that will be developed and included in the FER.

ECs will be implemented to protect public health and the environment by appropriately managing residual contamination.

The FER will report residual contamination on the Site in tabular and map form. This will include presentation of exceedances of both Track 1 and Track 2.

7.0 CRITERIA FOR COMPLETION OF REMEDIATION

7.1 SUB-SLAB DEPRESSURIZATION SYSTEM (SSDS)

Precautionary installation of the elements of a sub-slab depressurization system (SSDS) underneath portions of the building foundation, if the sub-slab of the proposed building is not under the water table during the seasonal low and a soil vapor barrier, will be implemented. The vapor barrier will be a construction element and not an EC unless the Site does not achieve the planned Track 1 remedy. A soil vapor intrusion evaluation will be conducted to determine if the SV levels constitute a VI risk. The elements of the SSDS will be turned into engineering control (EC) as an active SSDS if the soil vapor evaluation determines that vapor mitigation is needed.

If the SSD system becomes an active EC, it will not be discontinued without written approval by NYSDEC and NYSDOH. A proposal to discontinue the active SSD system may be submitted by the property owner based on confirmatory data that justifies such request. Systems will remain in place and operational until permission to discontinue use is granted in writing by NYSDEC and NYSDOH.

7.2 GROUNDWATER MONITORING

Groundwater monitoring activities to assess the performance of the remedy, or natural attenuation following the removal of contaminant sources, will continue, as determined by NYSDOH and NYSDEC, until residual groundwater concentrations are found to be below NYSDEC standards or have become asymptotic over an extended period. Monitoring will continue until permission to discontinue is granted in writing by NYSDEC and NYSDOH. Monitoring activities will be outlined in the Monitoring Plan of the SMP. It is anticipated that, following remediation, a minimum of eight quarterly monitoring events will be performed.

8.0 INSTITUTIONAL CONTROLS

In the event that the remedy does not achieve Track 1 unrestricted use, institutional controls in the form of an environmental easement will be imposed.

8.1 ENVIRONMENTAL EASEMENT

An Environmental Easement, as defined in Article 71 Title 36 of the Environmental Conservation Law, is required when residual contamination is left on-Site after the Remedial Action is complete. As part of this remedy, an Environmental Easement approved by NYSDEC will be filed and recorded with the Westchester County Office of the City Register. The Environmental Easement will be submitted as part of the Final Engineering Report.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with Westchester County before the Certificate of Completion can be issued by NYSDEC. A series of Institutional Controls are required under this remedy to implement, maintain and monitor these Engineering Control systems, prevent future exposure to residual contamination by controlling disturbances of the subsurface soil and restricting the use of the Site to restricted residential use only. These Institutional Controls are requirements or restrictions placed on the Site that are listed in, and required by, the Environmental Easement. Institutional Controls can, generally, be subdivided between controls that support Engineering Controls, and those that place general restrictions on Site usage or other requirements. Institutional Controls in both of these groups are closely integrated with the SMP, which provides all of the methods and procedures to be followed to comply with this remedy.

The Institutional Controls that support Engineering Controls are:

- Compliance with the Environmental Easement by the Grantee and the Grantee's successors and adherence of all elements of the SMP is required;
- All Engineering Controls must be operated and maintained as specified in this SMP;
- A soil vapor mitigation system consisting of [a sub-slab depressurization system under all building structures] must be inspected, certified, operated and maintained as required by the SMP;
- All Engineering Controls on the Controlled Property must be inspected and certified at a frequency and in a manner defined in the SMP;
- Groundwater, soil vapor, and other environmental or public health monitoring must be performed as defined in the SMP;

- Data and information pertinent to Site Management for the Controlled Property must be reported at the frequency and in a manner defined in the SMP;
- On-Site environmental monitoring devices, including but not limited to, [groundwater monitor wells and soil vapor probes], must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP;
- Engineering Controls may not be discontinued without an amendment or extinguishment of the Environmental Easement.

Adherence to these Institutional Controls for the Site is mandated by the Environmental Easement and will be implemented under the SMP (discussed in the next section). The Controlled Property (Site) will also have a series of Institutional Controls in the form of Site restrictions and requirements. The Site restrictions that apply to the Controlled Property are:

- Vegetable gardens and farming on the Controlled Property are prohibited;
- Use of groundwater underlying the Controlled Property is prohibited without treatment rendering it safe for intended purpose;
- All future activities on the Controlled Property that will disturb residual contaminated material are prohibited unless they are conducted in accordance with the soil management provisions in the SMP;
- The Controlled Property may be used for restricted residential use only, provided the long-term Engineering and Institutional Controls included in the SMP are employed;
- The Controlled Property may not be used for a higher level of use, such as unrestricted use without an amendment or extinguishment of this Environmental Easement;
- Grantor agrees to submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) controls employed at the Controlled Property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such Controlled Property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted

annually, or an alternate period of time that NYSDEC may allow. This statement must be certified by an expert that the NYSDEC finds acceptable.

8.2 SITE MANAGEMENT PLAN

Site Management is the last phase of remediation and begins with the approval of the FER and issuance of the Certificate of Completion (COC) for the Remedial Action. The SMP is submitted as part of the FER but will be written in a manner that allows its removal and use as a complete and independent document. Site Management continues in perpetuity or until released in writing by NYSDEC. The property owner is responsible to ensure that all Site Management responsibilities defined in the Environmental Easement and the SMP are performed.

The SMP should include methods to incorporate and track GSR. Measures should be taken to maintain a cost-effective, protective remedy that remains conscientious of the Site's environmental footprint. At a minimum, the following should be assessed: waste generation, energy usage, emissions, and water usage.

The SMP is intended to provide a detailed description of the procedures required to manage residual contamination left in place at the Site following completion of the Remedial Action in accordance with the BCA with the NYSDEC. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development and implementation of monitoring systems and a Monitoring Plan; (3) development of a plan to operate and maintain any treatment, collection, containment, or recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual); (4) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (5) defining criteria for termination of treatment system operation.

To address these needs, this SMP will include four plans: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site Monitoring; (3) an Operation and Maintenance Plan for implementation of remedial collection, containment, treatment, and recovery systems; and (4) a Site Management Reporting Plan for submittal of data, information, recommendations, and certifications to NYSDEC. The SMP will be prepared in accordance with the requirements in NYSDEC DER-10

Technical Guidance for Site Investigation and Remediation and the guidelines provided by NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. The certification period will be annually. The SMP will be based on the certifying period relative to the date of issuance of the COC. The first submission will be due16 months after the issuance of the COC, and annually (or at another frequency as approved by NYSDEC) thereafter.

The SMP in the FER will include a monitoring plan for groundwater at the down-gradient Site perimeter to evaluate Site-wide performance of the remedy. Appropriately placed groundwater monitor wells will also be installed immediately down-gradient of all source remediation areas for the purpose of evaluation of the effectiveness of the remedy that is implemented.

No exclusions for handling of residual contaminated soils will be provided in the SMP. All handling of residual contaminated material will be subject to provisions contained in the SMP.

9.0 FINAL ENGINEERING REPORT

A Final Engineering Report (FER) will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP. The FER provides the documentation that the remedial work required under this RAWP has been completed and has been performed in compliance with this plan. The FER will provide a comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed map(s) of all sources. The Final Engineering Report will include as-built drawings for all constructed elements, calculation and manufacturer documentation for treatment systems, certifications, manifests, bills of lading as well as the complete SMP. The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP and associated design documents. The FER will provide a tabular summary of all performance evaluation sampling results and all material characterization results and other sampling, and chemical analysis performed as part of the Remedial Action. The FER will provide test results demonstrating that all mitigation and remedial systems are functioning properly. The FER will be prepared in conformance with DER-10.

Where determined to be necessary by NYSDEC, a Financial Assurance Plan will be required to ensure the sufficiency of revenue to perform long-term operations, maintenance and monitoring tasks defined in the Site Management Plan and Environmental Easement. This determination will be made by NYSDEC in the context of the FER review.

The FER will include written and photographic documentation of all remedial work performed under this remedy.

The FER will include an itemized tabular description of actual costs incurred during all aspects of the Remedial Action.

The FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. Residual contamination includes all contamination that exceeds the Track 1 Unrestricted Use SCO in 6NYCRR Part 375-6. A table that shows exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action and a map that shows the location and summarizes exceedances from Track 1 Unrestricted SCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER.

The FER will provide a thorough summary of all residual contamination that exceeds the SCOs defined for the Site in the RAWP and must provide an explanation for why the material was not removed as part of the Remedial Action. A table that shows residual contamination in excess of Site SCOs and a map that shows residual contamination in excess of Site SCOs will be included in the FER.

The FER will include an accounting of the destination of all material removed from the Site, including excavated contaminated soil, historic fill, solid waste, hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of all material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of all material imported onto the Site.

The FER must include a discussion of the green remediation practices/technologies employed throughout the remedial program. A final footprint analysis using a DER accepted model, and any tracking methods used through the construction including restoration activities. Before approval

of a FER and issuance of a COC, all project reports must be submitted in digital form on electronic media (PDF).

9.1 CERTIFICATIONS

The following certification will appear in front of the Executive Summary of the Final Engineering Report. The FER will be prepared, stamped and the following certification signed by an individual licensed or otherwise authorized in accordance with article 145 of the education law to practice the profession of engineering. The certification will include the following statements:

I, Fuad Dahan, am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Action Work Plan was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Action Work Plan.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Action Work Plan and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established for the remedy.

I certify that all use restrictions, Institutional Controls, Engineering Controls, and/or any operation and maintenance requirements applicable to the Site are contained in an environmental easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Fuad Dahan, of SESI Consulting Engineers, am certifying as Owner's Designated Site Representative for the site.

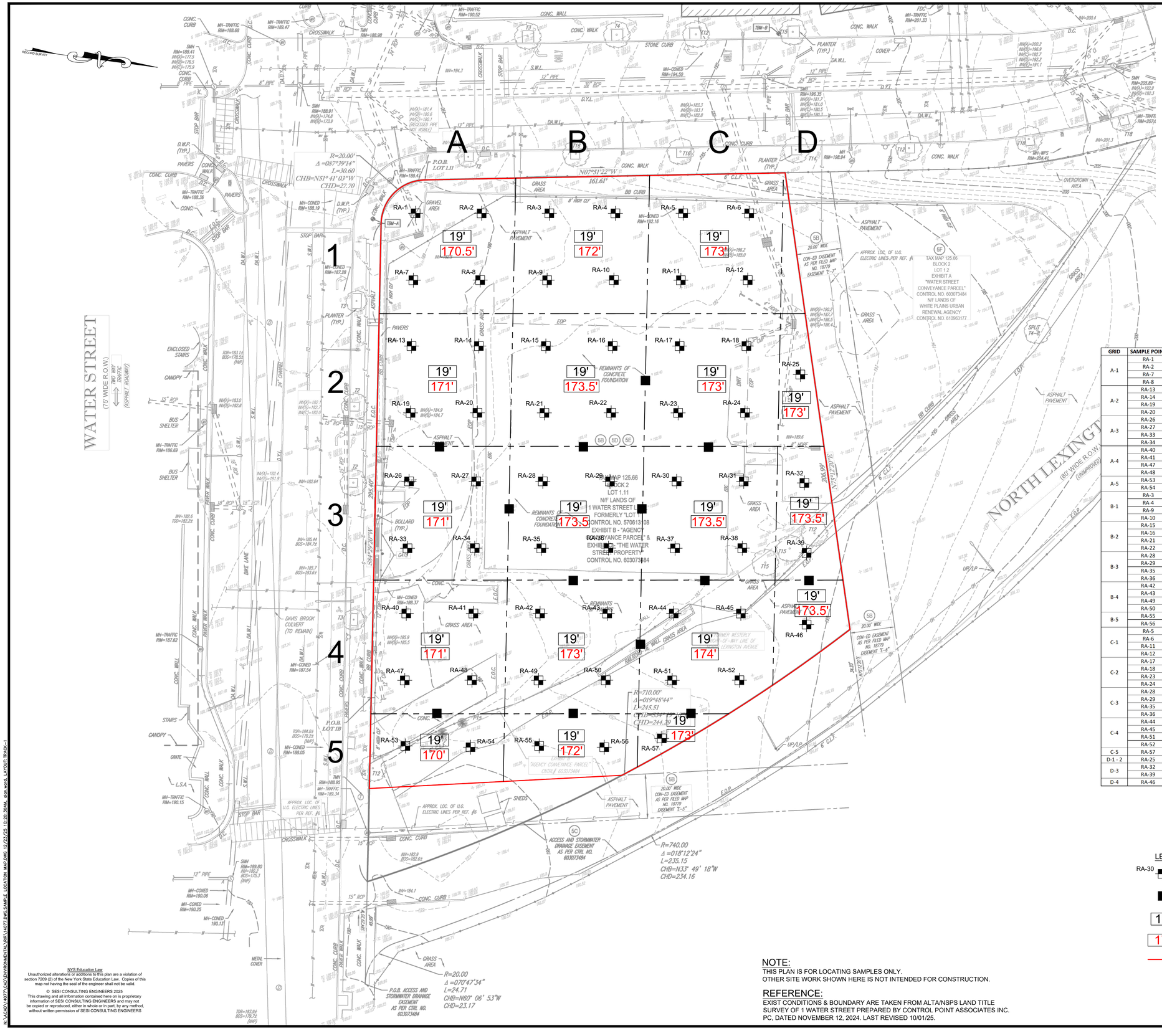
It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

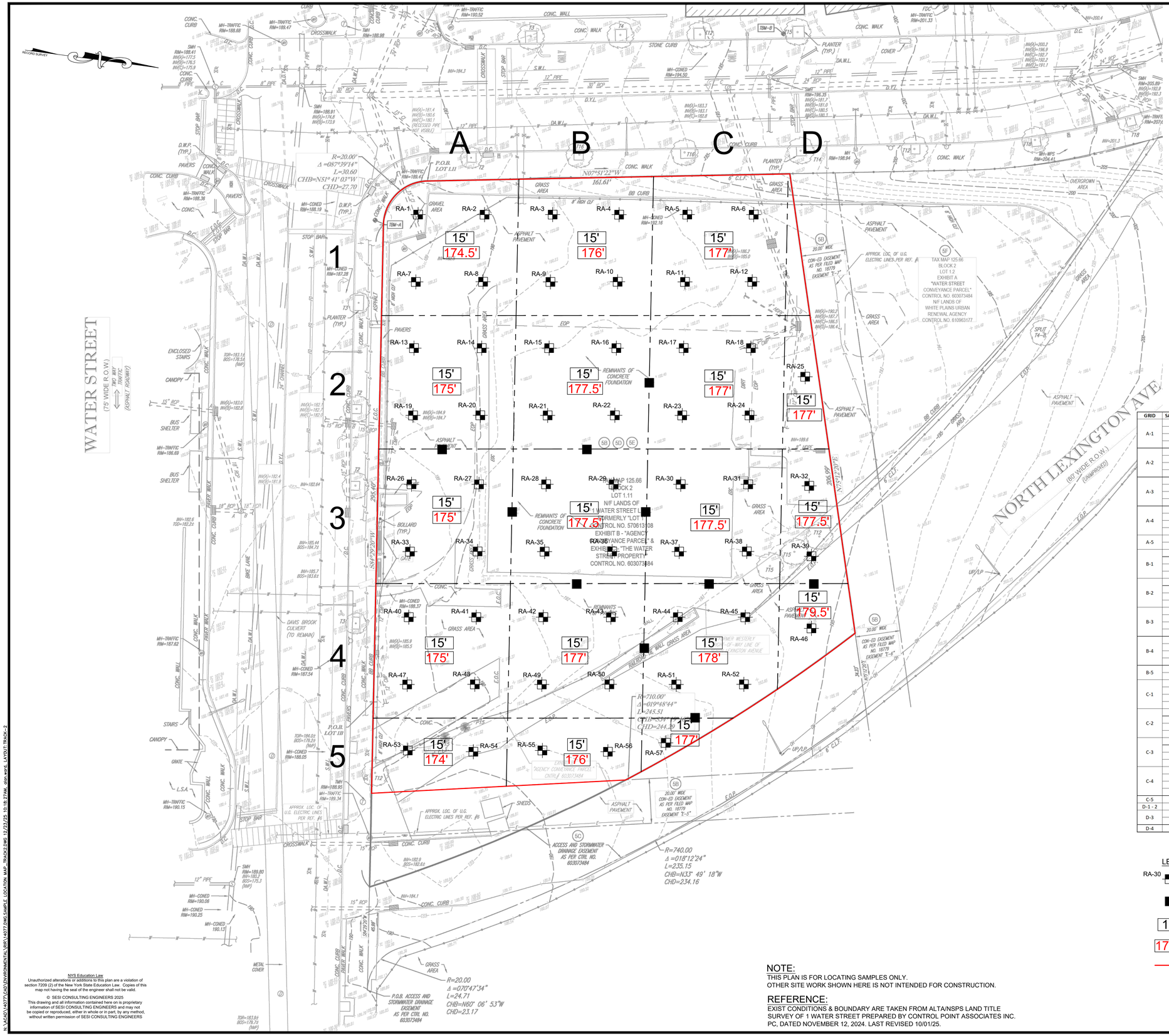
10.0 SCHEDULE

Table 10.1: Project Schedule

Task	Date
Draft RIR Submitted to NYSDEC	November 10, 2025
Submit Draft RAWP to DEC	12/12/2025
Start of SOE with change of use	2/1/2026
Start 45 Day Comment period	2/1/2026
End of Comment period	3/15/2026
RAWP Approval and Decision Document	5/1/2026
Construction - Remedial Action	May-September, 2026
Submit EE (if required)	May 2026
Submit SMP	8/1/2026
Submit FER	October 2026
COC	End of 2026

Figures


A
B
C
D
1
2
3
4
5
WATER STREET
(75' WIDE R.O.W)
TWO WAY TRAFFIC
(ASPHALT ROADWAY)
NORTH LEXINGTON AVENUE
(80' WIDE R.O.W.)
(UNIMPROVED)
RA-1
RA-2
RA-3
RA-4
RA-5
RA-6
RA-7
RA-8
RA-9
RA-10
RA-11
RA-12
RA-13
RA-14
RA-15
RA-16
RA-17
RA-18
RA-19
RA-20
RA-21
RA-22
RA-23
RA-24
RA-25
RA-26
RA-27
RA-28
RA-29
RA-30
RA-31
RA-32
RA-33
RA-34
RA-35
RA-36
RA-37
RA-38
RA-39
RA-40
RA-41
RA-42
RA-43
RA-44
RA-45
RA-46
RA-47
RA-48
RA-49
RA-50
RA-51
RA-52
RA-53
RA-54
RA-55
RA-56
RA-57
19' 170.5'
19' 172'
19' 173'
19' 171'
19' 173.5'
19' 173'
19' 173'
19' 171'
19' 173.5'
19' 173.5'
19' 173.5'
19' 173.5'
19' 171'
19' 173'
19' 174'
19' 170'
19' 172'
19' 173'
TBM-A
TBM-B
P.O.B. LOT I.11
P.O.B. LOT I.B
R=20.00'
Δ =087°39'14"
L=30.60
CHB=N51° 41' 03"W
CHD=27.70
N07°51'22"W
161.61'
N71°22'10"W
206.69'
N74°22'10"W
295.40'
S64°22'10"E
295.40'
S71°22'10"E
206.69'
S07°51'22"E
161.61'
TAX MAP 125.66
BLOCK 2
LOT 1.11
N/F LANDS OF
1 WATER STREET LLC
FORMERLY "LOT 1"
CONTROL NO. 570613 08
EXHIBIT B - "AGENCY
CONVEYANCE PARCEL" &
EXHIBIT C "THE WATER
STREET PROPERTY"
CONTROL NO. 603073484
TAX MAP 125.66
BLOCK 2
LOT 1.2
EXHIBIT A
"WATER STREET
CONVEYANCE PARCEL"
CONTROL NO. 603073484
N/F LANDS OF
WHITE PLAINS URBAN
RENEWAL AGENCY
CONTROL NO. 610963177
REMNANTS OF CONCRETE FOUNDATION
CON-ED EASEMENT AS PER FILED MAP NO. 18779 EASEMENT 'E-7'
20.00' WIDE CON-ED EASEMENT AS PER FILED MAP NO. 18779 EASEMENT 'E-5'
APPROX. LOC. OF U.G. ELECTRIC LINES PER REF. #6
ACCESS AND STORMWATER DRAINAGE EASEMENT AS PER CTRL NO. 603073484
P.O.B. ACCESS AND STORMWATER DRAINAGE EASEMENT AS PER CTRL NO. 603073484
R=740.00
Δ =018°12'24"
L=235.15
CHB=N33° 49' 18"W
CHD=234.16
R=710.00'
Δ=019°48'44"
L=245.51
CHB=N34° 53' 10"W
CHD=244.29
R=20.00
Δ =070°47'34"
L=24.71
CHB=N60° 06' 53"W
CHD=23.17
RAILROAD WALL
RAILROAD R.O.W.
GRASS AREA
ASPHALT PAVEMENT
CONC. WALK
CONC. CURB
BB CURB
6" HIGH CLF
6' CLF
STONE CURB
PLANTER (TYP.)
GRAVEL AREA
OVERGROWN AREA
DAYLIGHTING
CROSSWALK
STOP BAR
BUS SHELTER
ENCLOSED STAIRS
CANOPY
PAVERS
BOLLARD (TYP.)
DAVIS BROOK CULVERT (TO REMAIN)
SHEDS
GRATE
L.S.A.
METAL COVER
MH-TRAFFIC RIM=188.68
MH-TRAFFIC RIM=188.47
MH-TRAFFIC RIM=190.52
MH-TRAFFIC RIM=201.33
MH-CONED RIM=194.50
MH-CONED RIM=192.18
MH-CONED RIM=187.28
MH-CONED RIM=188.19
MH-CONED RIM=188.37
MH-CONED RIM=187.54
MH-CONED RIM=188.05
MH-CONED RIM=180.06
MH-CONED RIM=190.25
MH-CONED 190.15
MH-TRAFFIC RIM=188.36
MH-TRAFFIC RIM=187.62
MH-TRAFFIC RIM=186.69
MH-TRAFFIC RIM=190.15
MH-TRAFFIC RIM=188.47
MH-TRAFFIC RIM=198.94
MH-WPS RIM=204.41
SMH RIM=188.41
SMH RIM=188.91
SMH RIM=196.35
SMH RIM=205.89
SMH RIM=189.80
SMH RIM=189.05
SMH RIM=207.6
MH-TRAFFIC RIM=189.34
MH-TRAFFIC RIM=207.6
SPUT
12" PIPE
15" RCP
18" RCP
24" RCP
30" RCP
24" CMP
8" PIPE
D.W.L.P. (TYP.)
D.W.L.
D.Y.L.
S.W.L.
EOP
EOG
UP/LP
OHW
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10
T11
T12
T13
T14
T15
T16
T17
T18
TBR=183.16
BOS=178.56
(INP)
TOR=184.01
BOS=179.23
(INP)
TOR=183.91
BOS=179.73
(INP)
TOR=183.61
BOS=179.11
(INP)
IN(A)=182.4
IN(B)=181.9
IN(A)=183.0
IN(B)=182.8
IN(A)=184.9
IN(B)=184.7
IN(A)=181.4
IN(B)=180.6
IN(C)=180.1
(RECEIVING PIPE
NOT VISIBLE)
IN(A)=183.3
IN(B)=183.1
IN(C)=182.8
IN(A)=186.2
IN(B)=185.0
IN(A)=190.3
IN(B)=187.7
IN(C)=186.5
IN(D)=186.4
IN=189.6
8" MAIN
IN=182.6
TOR=182.2
IN=185.4
BOS=184.74
IN=185.7
BOS=183.61
IN=182.64
IN=184.3
IN=200.4
IN(A)=200.2
IN(B)=196.9
IN(C)=195.7
IN(D)=192.2
IN(E)=191.1
IN(A)=202.9
IN(B)=202.3
IN(C)=192.3
IN(D)=192.3
IN=201.3
IN=205.1
IN=182.9
BOS=182.61
IN=184.1
IN=185.9
IN=185.5
IN=189.2
IN=188.98
IN=188.91
IN(A)=174.8
IN(B)=173.9
IN=188.36
IN=188.47
IN=189.41
IN=188.38
IN=187.28
IN=188.19
IN=188.37
IN=187.54
IN=188.05
IN=189.05
IN=189.34
IN=189.80
IN=189.2
BOS=179.3
(INP)
IN=189.6
IN=189.7
IN=189.8
IN=189.9
IN=190.0
IN=190.1
IN=190.2
IN=190.3
IN=190.4
IN=190.5
IN=190.6
IN=190.7
IN=190.8
IN=190.9
IN=191.0
IN=191.1
IN=191.2
IN=191.3
IN=191.4
IN=191.5
IN=191.6
IN=191.7
IN=191.8
IN=191.9
IN=192.0
IN=192.1
IN=192.2
IN=192.3
IN=192.4
IN=192.5
IN=192.6
IN=192.7
IN=192.8
IN=192.9
IN=193.0
IN=193.1
IN=193.2
IN=193.3
IN=193.4
IN=193.5



GRID	SAMPLE POINT	GRADE ELEV (FT AMSL)	CUT THICKNESS (FT)	TARGET ELEV (FT-AMSL)
A-1	RA-1	189.5	15	174.5
	RA-2	189.5	15	174.5
	RA-7	189.5	15	174.5
	RA-8	189.5	15	174.5
A-2	RA-13	190	15	175
	RA-14	190	15	175
	RA-19	190	15	175
	RA-20	190	15	175
A-3	RA-26	190	15	175
	RA-27	190	15	175
	RA-33	190	15	175
	RA-34	190	15	175
A-4	RA-40	190	15	175
	RA-41	190	15	175
	RA-47	190	15	175
	RA-48	190	15	175
A-5	RA-53	189	15	174
	RA-54	189	15	174
B-1	RA-3	191	15	176
	RA-4	191	15	176
	RA-9	191	15	176
	RA-10	191	15	176
B-2	RA-15	192.5	15	177.5
	RA-16	192.5	15	177.5
	RA-21	192.5	15	177.5
	RA-22	192.5	15	177.5
B-3	RA-28	192.5	15	177.5
	RA-29	192.5	15	177.5
	RA-35	192.5	15	177.5
	RA-36	192.5	15	177.5
B-4	RA-42	192	15	177
	RA-43	192	15	177
	RA-49	192	15	177
	RA-50	192	15	177
B-5	RA-55	191	15	176
	RA-56	191	15	176
C-1	RA-5	192	15	177
	RA-6	192	15	177
	RA-11	192	15	177
	RA-12	192	15	177
C-2	RA-17	192	15	177
	RA-18	192	15	177
	RA-23	192	15	177
	RA-24	192	15	177
C-3	RA-28	192.5	15	177.5
	RA-29	192.5	15	177.5
	RA-35	192.5	15	177.5
	RA-36	192.5	15	177.5
C-4	RA-44	193	15	178
	RA-45	193	15	178
	RA-51	193	15	178
	RA-52	193	15	178
C-5	RA-57	192	15	177
D-1 - 2	RA-25	192	15	177
D-3	RA-32	192.5	15	177.5
	RA-39	192.5	15	177.5
D-4	RA-46	194.5	15	179.5

LEGEND:

- RA-30 - END POINT SAMPLE LOCATION
- ■ - PROPOSED SIDE-WALL SAMPLE LOCATION
- 15' - PROPOSED THICKNESS CUT
- 177.5' - PROPOSED REMEDIAL EXCAVTION ELEVATION
- ——— - BCP BOUNDARY

Scale: 1"= 20'

0 10 20 40 60 80

NOTE:
THIS PLAN IS FOR LOCATING SAMPLES ONLY.
OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.

REFERENCE:
EXIST CONDITIONS & BOUNDARY ARE TAKEN FROM ALTA/NSPS LAND TITLE SURVEY OF 1 WATER STREET PREPARED BY CONTROL POINT ASSOCIATES INC. PC, DATED NOVEMBER 12, 2024. LAST REVISED 10/01/25.

KEY MAP

rev	date	description

SESI CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 ROUTE 46E, 3RD FLOOR, PARSIPPANY, NJ 07054 PH: 973.808.9050

project:
ONE WATER STREET BLACKSMITH & WHEELWRIGHT SITE (BCP C360235)
1 WATER STREET
WHITE PLAINS, NY 10601

title:
TRACK 2 REMEDIAL EXCAVATION PLAN & END-POINT SAMPLE PLAN

dwg by: AW
chk by: SG
scale: AS NOTED
date: 12/16/2025

job no. 14077
drawing no.
FIG 5.2
1 of 1

NYS Education Law
Unauthorized alterations or additions to this plan are a violation of section 7209 (2) of the New York State Education Law. Copies of this map not having the seal of the engineer shall not be valid.

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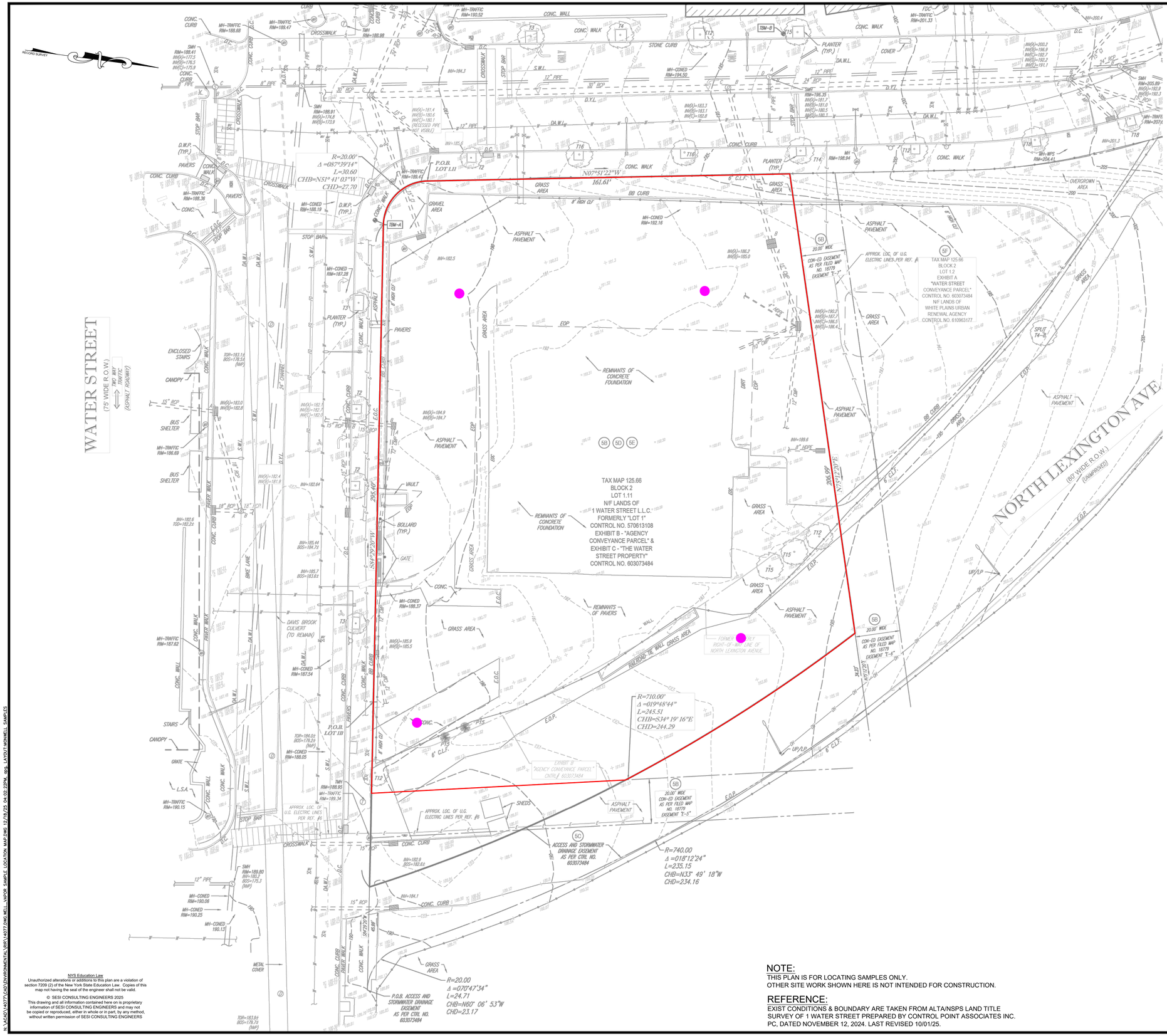
N:\VOL1\14077\CAD\ENVIRONMENTAL\WR\14077ENG SAMPLE LOCATION MAP_TRACK2.DWG 12/23/25 10:18:27AM dan.ward LAYOUT: TRACK-2



N:\VCAD\14077\CAD\ENVIRONMENTAL\ISR\14077.DWG WELL_VAPOR SAMPLE LOCATION MAP.DWG 12/18/25 04:02:22PM dgp LAYOUT:MONELL SAMPLES

NYS Education Law
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REFERENCE:
EXIST CONDITIONS & BOUNDARY ARE TAKEN FROM ALTA/NSPS LAND TITLE SURVEY OF 1 WATER STREET PREPARED BY CONTROL POINT ASSOCIATES INC. PC, DATED NOVEMBER 12, 2024. LAST REVISED 10/01/25.

LEGEND:

- PROPOSED GROUNDWATER MONITORING WELL NETWORK

Scale: 1"= 20'
0 10 20 40 60 80

KEY MAP

rev	date	description

SESI CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 ROUTE 46E, 3RD FLOOR, PARSIPPANY, NJ 07054 PH: 973.808.9050

project:
ONE WATER STREET BLACKSMITH & WHEELWRIGHT SITE (BCP C360235)
1 WATER STREET
WHITE PLAINS, NY 10601

title:
PROPOSED GROUNDWATER MONITORING WELL NETWORK

dwg by: APG
chk by: SG
scale: AS NOTED
date: 12/18/2025

job no. 14077
drawing no.
FIG 5.3
1 of 1

RECORD SURVEY

WATER STREET
(75' WIDE R.O.W.)
⟺ TWO WAY TRAFFIC (ASPHALT ROADWAY)

NORTH LEXINGTON AVE
(80' WIDE R.O.W.)
(UNIMPROVED)

TAX MAP 125.66
BLOCK 2
LOT 1.11
NF LANDS OF
1 WATER STREET L.L.C.
FORMERLY "LOT 1"
CONTROL NO. 570613108
EXHIBIT B - "AGENCY CONVEYANCE PARCEL" &
EXHIBIT C - "THE WATER STREET PROPERTY"
CONTROL NO. 603073484

TAX MAP 125.66
BLOCK 2
LOT 1.2
EXHIBIT A
"WATER STREET CONVEYANCE PARCEL"
CONTROL NO. 603073484
NF LANDS OF
WHITE PLAINS URBAN RENEWAL AGENCY
CONTROL NO. 610963177

R=20.00'
Δ =087°39'14"
L=30.60
CHB=N51° 41' 03"W
CHD=27.70

P.O.B. LOT 1.11

N07°51'22"W 161.61'

P.O.B. LOT 1B

S07°51'22"E 256.40'

N71°22'27"E 266.69'

R=710.00'
Δ =019°48'44"
L=245.51
CHB=S34° 19' 16"E
CHD=244.29

R=740.00
Δ =018°12'24"
L=235.15
CHB=N33° 49' 18"W
CHD=234.16

R=20.00
Δ =070°47'34"
L=24.71
CHB=N60° 06' 53"W
CHD=23.17

P.O.B. ACCESS AND STORMWATER DRAINAGE EASEMENT AS PER CTRL NO. 603073484

ACCESS AND STORMWATER DRAINAGE EASEMENT AS PER CTRL NO. 603073484

EXHIBIT B "AGENCY CONVEYANCE PARCEL" CNTRL# 603073484

FORMER WESTERLY RIGHT-OF-WAY LINE OF NORTH LEXINGTON AVENUE

RAILROAD TIE WALL GRASS AREA

20.00' WIDE CON-ED EASEMENT AS PER FILED MAP NO. 18779 EASEMENT 'E-7'

APPROX. LOC. OF U.G. ELECTRIC LINES PER REF. #8

APPROX. LOC. OF U.G. ELECTRIC LINES PER REF.

REMNANTS OF CONCRETE FOUNDATION

REMNANTS OF PAVERS

DAVIS BROOK CULVERT (TO REMAIN)

METAL COVER

NOTE:
THIS PLAN IS FOR LOCATING SAMPLES ONLY.
OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.

REFERENCE:
EXIST CONDITIONS & BOUNDARY ARE TAKEN FROM ALTA/NSPS LAND TITLE SURVEY OF 1 WATER STREET PREPARED BY CONTROL POINT ASSOCIATES INC. PC, DATED NOVEMBER 12, 2024. LAST REVISED 10/01/25.

LEGEND:

- PROPOSED SVI EVALUATION SAMPLING POINT

Scale: 1"= 20'
0 10 20 40 60 80

NYS Education Law
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N:\VCAD\14077\CAD\ENVIRONMENTAL\ISR\14077.DWG WELL_VAPOR SAMPLE LOCATION MAP.DWG 12/18/25 04:03:09PM dgp LAYOUT: VAPOR SAMPLES

KEY MAP

rev	date	description

SESI CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 ROUTE 46E, 3RD FLOOR, PARSIPPANY, NJ 07054 PH: 973.808.9050

project:
ONE WATER STREET BLACKSMITH & WHEELWRIGHT SITE (BCP C360235)
1 WATER STREET
WHITE PLAINS, NY 10601

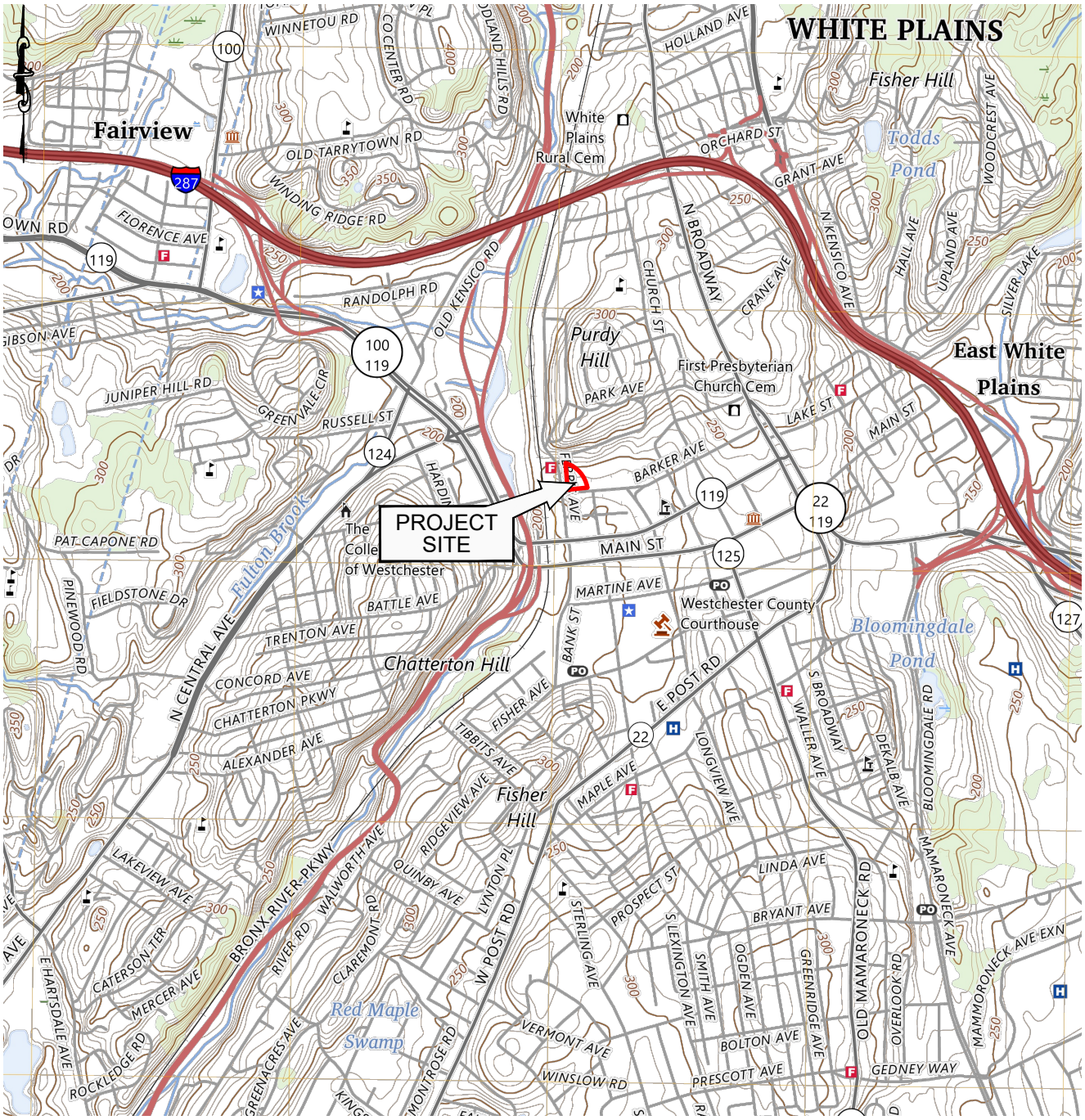
title:
PROPOSED SVI EVALUATION SAMPLING POINTS

dwg by: APG
chk by: SG
scale: AS NOTED
date: 12/18/2025

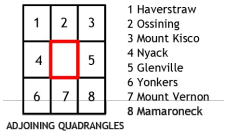
job no. 14077
drawing no.
FIG 5.4
1 of 1

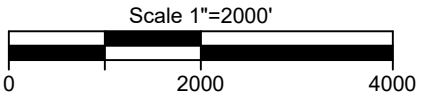
Appendix A:

Remedial Investigation Figures



REFERENCE:
INFORMATION TAKEN FROM WHITE PLAINS, NY QUADRANGLE, 2023 7.5 MINUTE SERIES,





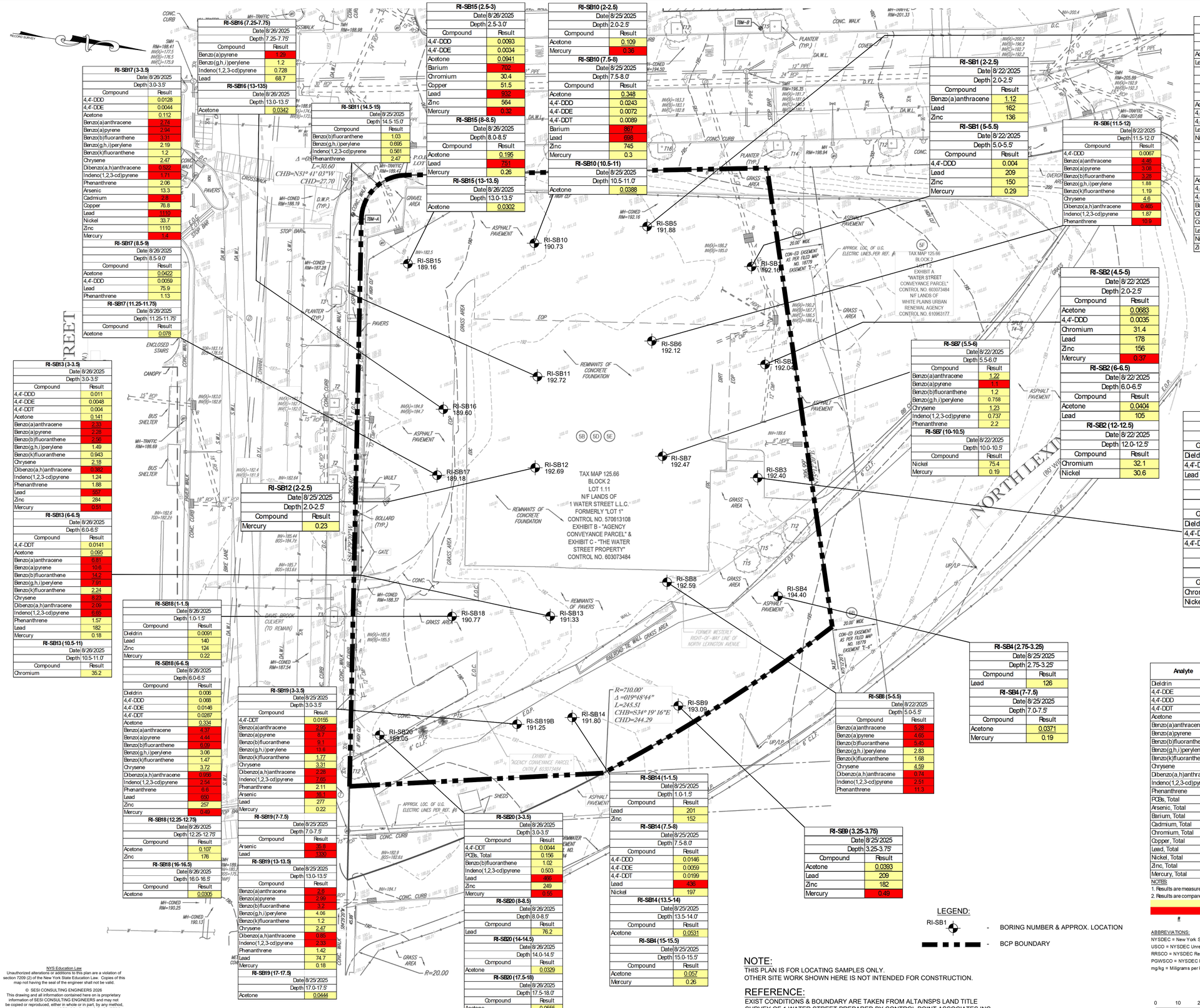
PROPOSED DEVELOPMENT
1 WATER STREET
WHITE PLAINS, NY 10601

SITE LOCATION MAP

SESI CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 ROUTE 46E, 3RD FLOOR, PARSIPPANY, NJ 07054 PH: 973.808.9050

FIG-1.1
DRAWN BY: EC
CHECKED BY: SC
SCALE: AS NOTED
DATE: 10/06/25
JOB NO.: 14077

N:\ACAD\14077\CAD\GEOTECH\LOCATION PLANS\14077.DWG.SITE LOCATION MAP.DWG 10/06/25 09:47:17AM, pinnacle, LAYOUT:FIG-1.1



RI-SB17 (3-3.5)

Date	8/26/2025
Depth	3.0-3.5'
Compound	Result
4,4'-DDD	0.0128
4,4'-DDE	0.0044
Acetone	0.112
Benzo(a)anthracene	2.74
Benzo(a)pyrene	2.94
Benzo(b)fluoranthene	3.51
Benzo(g,h,i)perylene	2.19
Benzo(k)fluoranthene	1.2
Chrysene	2.47
Dibenzo(a,h)anthracene	0.522
Indeno(1,2,3-cd)pyrene	1.71
Phenanthrene	2.06
Arsenic	13.3
Cadmium	2.6
Copper	76.8
Lead	1110
Nickel	33.7
Zinc	1110
Mercury	1.4

RI-SB17 (8.5-9)

Date	8/26/2025
Depth	8.5-9.0'
Compound	Result
Acetone	0.0422
4,4'-DDD	0.0059
Lead	75.9
Phenanthrene	1.13

RI-SB17 (11.25-11.75)

Date	8/26/2025
Depth	11.25-11.75'
Compound	Result
Acetone	0.078

RI-SB16 (7.25-7.75)

Date	8/26/2025
Depth	7.25-7.75'
Compound	Result
Benzo(a)pyrene	1.29
Benzo(g,h,i)perylene	1.2
Indeno(1,2,3-cd)pyrene	0.728
Lead	68.7

RI-SB16 (13-135)

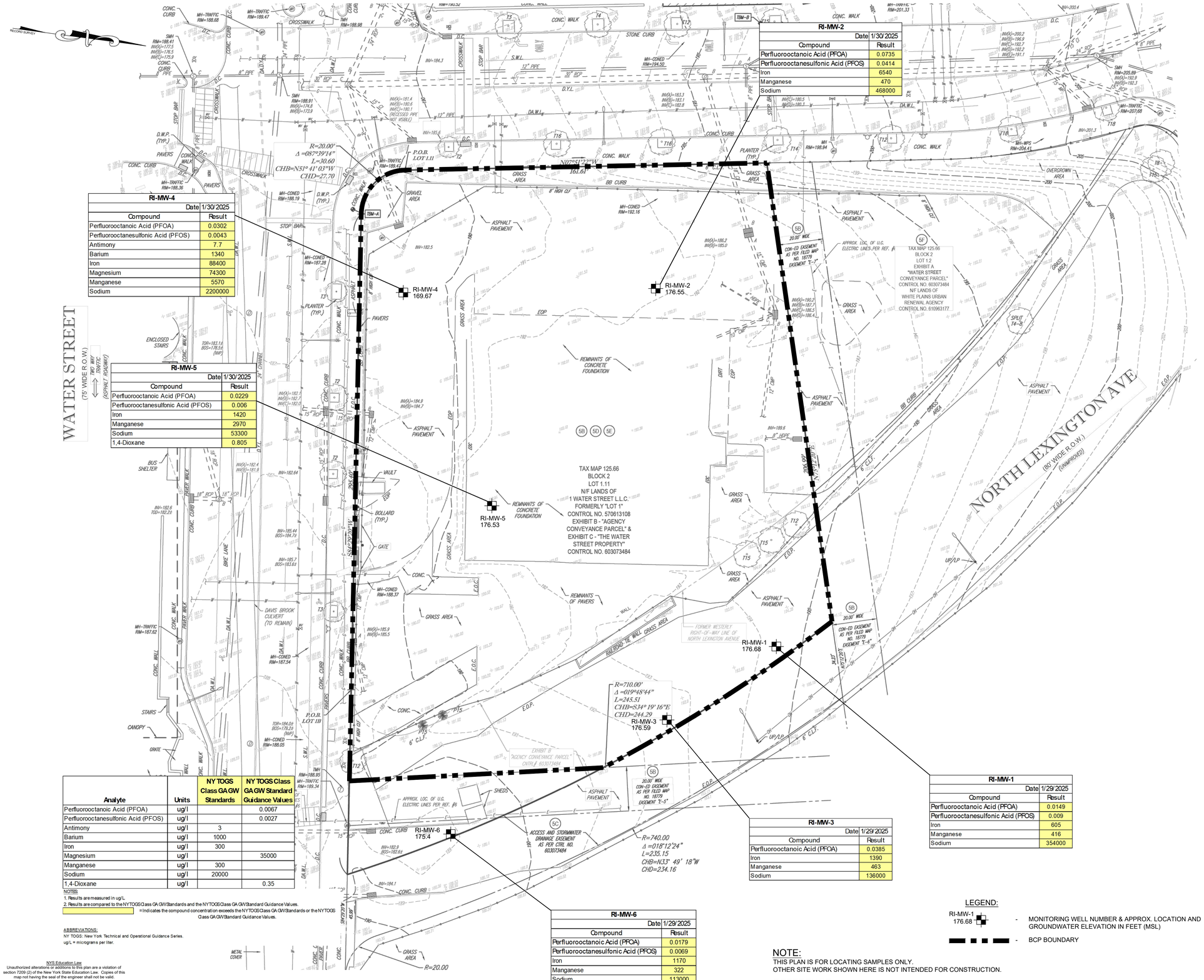
Date	8/26/2025
Depth	13.0-13.5'
Compound	Result
Acetone	0.0342

RI-SB11 (14.5-15)

Date	8/25/2025
Depth	14.5-15.0'
Compound	Result
Benzo(b)fluoranthene	1.03
Benzo(g,h,i)perylene	0.695
Indeno(1,2,3-cd)pyrene	0.561
Phenanthrene	2.47

RI-SB15 (2.5-3)

Date	8/26/2025
Depth	2



RI-MW-1

Compound	Date 1/29/2025 Result
Perfluorooctanoic Acid (PFOA)	0.0149
Perfluorooctanesulfonic Acid (PFOS)	0.009
Iron	605
Manganese	416
Sodium	354000

RI-MW-2

Compound	Date 1/30/2025 Result
Perfluorooctanoic Acid (PFOA)	0.0735
Perfluorooctanesulfonic Acid (PFOS)	0.0414
Iron	6540
Manganese	470
Sodium	468000

RI-MW-3

Compound	Date 1/29/2025 Result
Perfluorooctanoic Acid (PFOA)	0.0385
Iron	1390
Manganese	463
Sodium	136000

RI-MW-4

Compound	Date 1/30/2025 Result
Perfluorooctanoic Acid (PFOA)	0.0302
Perfluorooctanesulfonic Acid (PFOS)	0.0043
Antimony	7.7
Barium	1340
Iron	88400
Magnesium	74300
Manganese	5570
Sodium	2200000

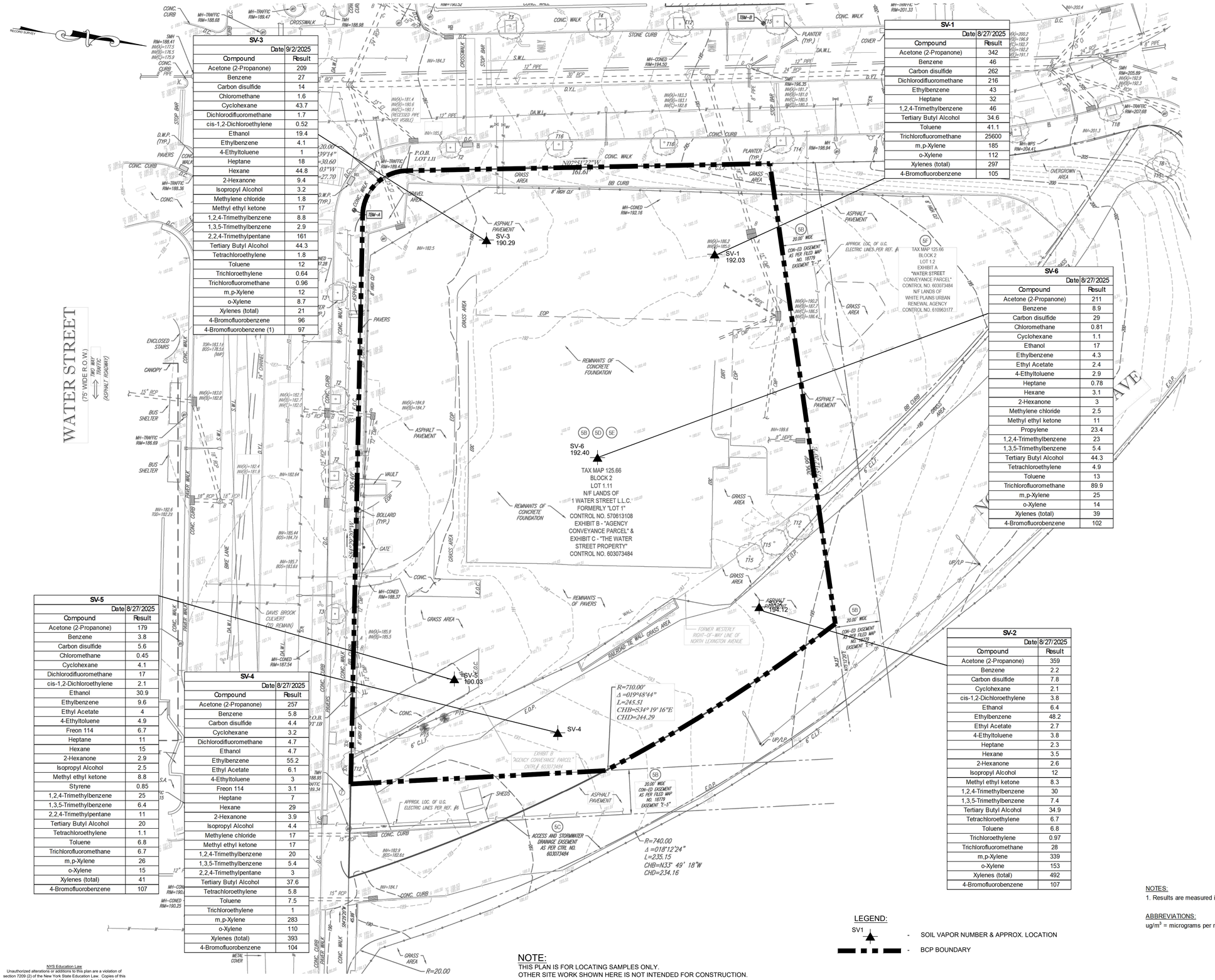
RI-MW-5

Compound	Date 1/30/2025 Result
Perfluorooctanoic Acid (PFOA)	0.0229
Perfluorooctanesulfonic Acid (PFOS)	0.006
Iron	1420
Manganese	2970
Sodium	53300
1,4-Dioxane	0.805

RI-MW-6

Compound	Date 1/29/2025 Result
Perfluorooctanoic Acid (PFOA)	0.0179
Perfluorooctanesulfonic Acid (PFOS)	0.0069
Iron	1170
Manganese	322
Sodium	113000

Analyte	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values
Perfluorooctanoic Acid (PFOA)	ug/l		0.0067
Perfluorooctanesulfonic Acid (PFOS)	ug/l		0.0027
Antimony	ug/l	3	
Barium	ug/l	1000	
Iron	ug/l	300	
Magnesium	ug/l		35000
Mangan



LEGEND:

SV1 - SOIL VAPOR NUMBER & APPROX. LOCATION

- BCP BOUNDARY

NOTES:
1. Results are measured in ug/m^3.

ABBREVIATIONS:
ug/m^3 = micrograms per meter cubed

NOTE:
THIS PLAN IS FOR LOCATING SAMPLES ONLY.
OTHER SITE WORK SHOWN HERE IS NOT INTENDED FOR CONSTRUCTION.

REFERENCE:
EXIST CONDITIONS & BOUNDARY ARE TAKEN FROM ALTA/NSPS LAND TITLE SURVEY OF 1 WATER STREET PREPARED BY CONTROL POINT ASSOCIATES INC. PC, DATED NOVEMBER 12, 2024. LAST REVISED 10/01/25.

Scale: 1"= 20'
0 10 20 40 60 80

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GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
999 ROUTE 46E, 3RD FLOOR, PARSIPPANY, NJ 07054 PH: 973.808.9050

KEY MAP

rev	date	description

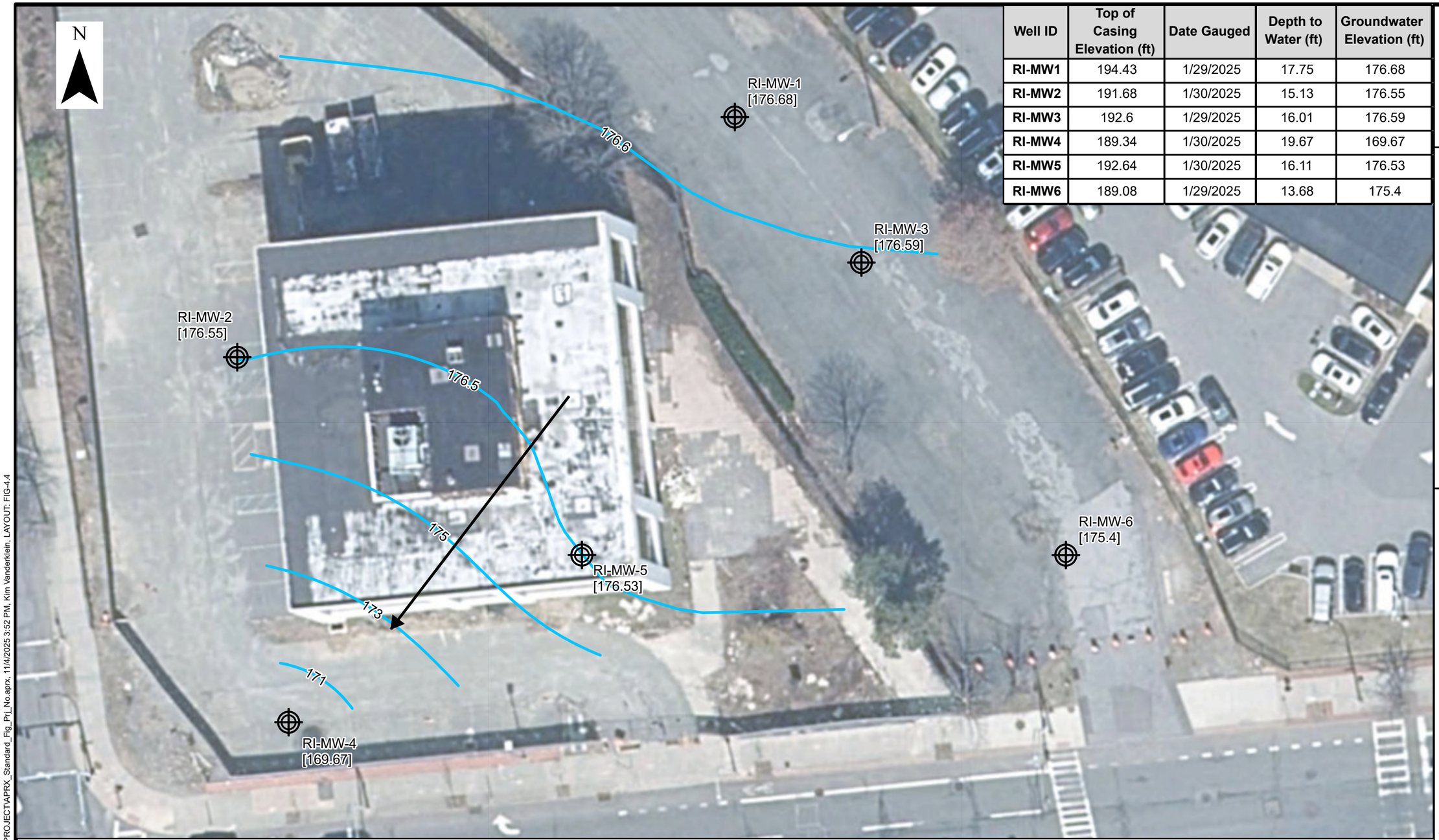
project:
PROPOSED DEVELOPMENT
1 WATER STREET
WHITE PLAINS, NY 10601

title:
SOIL GAS SAMPLE LOCATIONS AND RESULTS PLAN

dwg by: EC
chk by: SC
scale: AS NOTED
date: 02/04/2026

job no. 14077
drawing no. FIG-4.3
1 of 1

N:\CAD\14077\CAD\ENVIRONMENTAL\V01\14077-DWG SAMPLE LOCATION MAP_RESTORED_2025\218_1058.STWG 02/04/26 11:47:55AM, dan.wenz, LAYOUT-SOIL GAS RESULTS (2-2026)



Well ID	Top of Casing Elevation (ft)	Date Gauged	Depth to Water (ft)	Groundwater Elevation (ft)
RI-MW1	194.43	1/29/2025	17.75	176.68
RI-MW2	191.68	1/30/2025	15.13	176.55
RI-MW3	192.6	1/29/2025	16.01	176.59
RI-MW4	189.34	1/30/2025	19.67	169.67
RI-MW5	192.64	1/30/2025	16.11	176.53
RI-MW6	189.08	1/29/2025	13.68	175.4

dwg by: KBV
chk by: SC
scale: AS NOTED
date: 11/4/2025

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GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 ROUTE 46E, 3RD FLOOR, PARSIPPANY, NJ 07054 PH: 973.808.9050

project:
1 WATER STREET
WHITE PLAINS, NY 10601

title:
GROUNDWATER CONTOUR FLOW

job no.: 14077
drawing no:
FIG-4.4

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NOTE:
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REFERENCE:
PARCELS: NYS OFFICE OF INFORMATION TECHNOLOGYSERVICES - GIS PROGRAM OFFICE, NYS DEPT OF TAXATION AND FINANCE'S OFFICE OF REAL PROPERTY TAX SERVICES; AERIAL IMAGERY: NEW YORK STATE, MICROSOFT, VANTOR

LEGEND:

RI-MW1 — MONITORING WELL NO. AND APPROX. LOCATION

SITE LOCATION

INFERRED GROUNDWATER CONTOURS

INFERRED GROUNDWATER CONTOURS

[194.43] - GROUNDWATER ELEVATION AT MONITORING WELL

GROUNDWATER FLOW DIRECTION

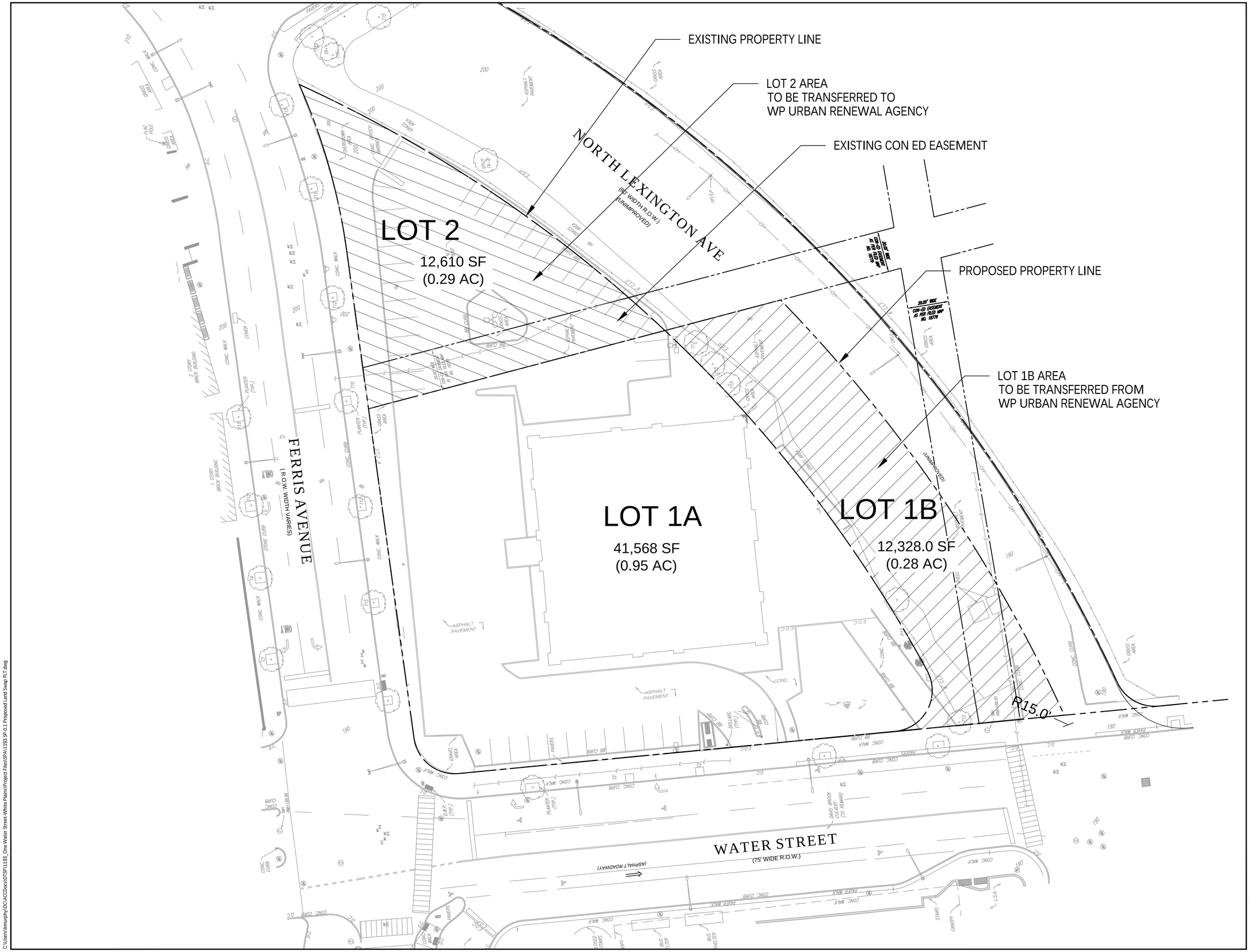
SCALE: 1" = 30'

0 15 30 60 FEET

Y:\GIS\Project_Numbers\14077\APRX_PRO.JECT\APRX_Standard_Fig_Prj_No.aprx, 11/4/2025 3:52 PM, Kim Vanderklein, LAYOUT: FIG-4.4

Appendix B:

Metes and Bounds Survey



PROJECT

ONE WATER STREET

City of White Plains
Westchester County, New York

Landscape Arch.
Lynden Studio
Web: www.lynden-studio.com
Tel: (201) 948-5306

Surveyor
Control Point Associates, Inc. PC
14 Penn Plaza
225 West 34th Street
New York, NY 10122

Architect
Lessard Design, Inc. PC
8521 Leesburg Pike, Suite 700
Vienna, VA 22182

Owner/Applicant
One Water Street Acquisition L.L.C.
613 Washington Boulvard, Suite 1243
Jersey City, NJ 07310

NO.	REVISION	DATE
1	ISSUED TO THE CITY OF WHITE PLAINS	4/21/2025
2	ISSUED TO THE CITY OF WHITE PLAINS	5/16/2025

DTS | PROVIDENT
Intelligent Land Use
Civil Engineers, Landscape Architect and Planner
DTS Provident Design Engineering, LLP
One North Broadway White Plains, NY 10601
P: 914.428.0010
F: 914.428.0017

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Certificate of Authorization #0017846

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NOT FOR CONSTRUCTION

TITLE:

PROPOSED 1 WATER STREET PROJECT SITE

Seal

STATE OF NEW YORK · PETER J. GREGORY · No. 071228 · LICENSED PROFESSIONAL ENGINEER
EXPIRES 4/30/2028

Scale:	AS NOTED
Date:	4/1/2025
Drawn By:	KMM
Checked By:	PJG
Project No.:	1193
Sheet No.:	2 of 14
Dwg. No.:	SP-0.1

C:\Users\kmurphy\OCAC\Docs\DTSP\11193_One Water Street-White Plains\Project Files\SP\A11193 SP-0.1 Proposed Land Swap Pt.T.dwg

Appendix C:

Remedial Investigation Summary Tables

Table 4.1
Sampling Summary Table

Soil Samples					
Soil Samples	**Type**	**Terminal Depth (ft)**	**Sampling Interval**	**Date**	**Target Analyses**
RI-SB1	Soil Boring	20	2.0 - 2.5'	8/22/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			5.0 - 5.5'		
			11.0 - 11.5'		
			15.5 - 16.0'		
RI-SB2	Soil Boring	20	4.5 - 5.0'	8/22/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			6.0 - 6.5'		
			12.0 - 12.5'		
			18.0 - 18.5'		
RI-SB3	Soil Boring	20	1.5 - 2.0'	8/22/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			6.0 - 6.5'		
			10.0 - 10.5'		
			16.0 - 16.5'		
RI-SB4	Soil Boring	20	2.75 - 3.25'	8/25/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			7.0 - 7.5'		
			10.0 - 10.5'		
			18.0 - 18.5'		
RI-SB5	Soil Boring	20	3.0 - 3.5'	8/22/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			8.0 - 8.5'		
			13.25 - 13.75'		
			15.0 - 15.5'		
RI-SB6	Soil Boring	20	2.0 - 2.5'	8/22/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			7.5 - 8.0'		
			11.5 - 12.0'		
			17.5 - 18.0'		
RI-SB7	Soil Boring	20	2.0 -2.5'	8/22/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			5.5 - 6.0'		
			10.0 - 10.5'		
			17.0 - 17.5'		
RI-SB8	Soil Boring	20	3.5 - 4.0'	8/22/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			5.0 - 5.5'		
			10.5 - 11.0'		
			17.0 - 17.5'		
RI-SB9	Soil Boring	20	3.25 - 3.75'	8/25/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			5.0 - 5.5'		
			10.0 - 10.5'		
			17.0 - 17.5'		
RI-SB10	Soil Boring	20	2.0 - 2.5'	8/25/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			7.5 - 8.0'		
			10.5 - 11.0'		
			15.5 - 16.0'		
RI-SB11	Soil Boring	20	2.0 - 2.5'	8/25/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			8.0 - 8.5'		
			14.5 - 15.0'		

Table 4.1
Sampling Summary Table

Soil Samples					
Soil Samples	**Type**	**Terminal Depth (ft)**	**Sampling Interval**	**Date**	**Target Analyses**
			18.0 - 18.5'		
RI-SB12	Soil Boring	20	2.0 - 2.5'	8/25/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			6.5 - 7.0'		
			11.0 - 11.5'		
			18.5 - 19.0'		
RI-SB13	Soil Boring	20	3.0 - 3.5'	8/26/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			6.0 - 6.5'		
			10.5 - 11.0'		
			18.5 - 19.0'		
RI-SB14	Soil Boring	20	1.0 - 1.5'	8/25/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			7.5 - 8.0'		
			13.5 - 14.0'		
			15.0 - 15.5'		
RI-SB15	Soil Boring	20	2.5 - 3.0'	8/26/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			8.0 - 8.5'		
			13.0 - 13.5'		
			17.0 - 17.5'		
RI-SB16	Soil Boring	20	3.5 - 4.0'	8/26/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			7.25 - 7.75'		
			13.0 - 13.5'		
			18.0 - 18.5'		
RI-SB17	Soil Boring	20	3.0 - 3.5'	8/26/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			8.5 - 9.0'		
			11.25 - 11.75'		
			17.0 - 17.5'		
RI-SB18	Soil Boring	20	1.0 - 1.5'	8/26/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			6.0 - 6.5'		
			12.25 - 12.75'		
			16.0 - 16.5'		
RI-SB19	Soil Boring	20	3.0 - 3.5'	8/25/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			7.0 - 7.5'		
			13.0 - 13.5'		
			17.0 - 17.5'		
RI-SB20	Soil Boring	20	3.0 - 3.5'	8/26/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
			8.0 - 8.5'		
			14.0 - 14.5'		
			17.5 - 18.0'		
Groundwater Samples					
Location Name	**Terminal Depth (ft)**	**Screen Interval (ft)**	**Depth to Water (ft)**	**Date**	**Target Analyses**
RI-MW-1	23	13.0 - 23.0	17.75	1/29/2025	TCL/TAL+30, 1,4-Dioxane, PFAS

Table 4.1
Sampling Summary Table

Soil Samples					
Soil Samples	**Type**	**Terminal Depth (ft)**	**Sampling Interval**	**Date**	**Target Analyses**
RI-MW-2	21	11.0 - 21.0	15.13	1/30/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
RI-MW-3	21	11.0 - 21.0	16.01	1/29/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
RI-MW-4	20	10.0 - 20.0	19.67	1/30/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
RI-MW-5	22	12.0 - 22.0	16.11'	1/30/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
RI-MW-6	20	10.0 - 20.0	13.68'	1/29/2025	TCL/TAL+30, 1,4-Dioxane, PFAS
Soil Vapor Samples					
Location Name	**Type**	**Maximum Depth (ft)**	**Smple Depth (ft)**	**Date**	**Target Analyses**
RI-SV1	Soil Vapor		7.0'		TO-15
RI-SV2	Soil Vapor		7.0'		TO-15
RI-SV3	Soil Vapor		7.0'		TO-15
RI-SV4	Soil Vapor		7.0'		TO-15
RI-SV5	Soil Vapor		7.0'		TO-15

Table 4.1
Sampling Summary Table

Soil Samples					
Soil Samples	**Type**	**Terminal Depth (ft)**	**Sampling Interval**	**Date**	**Target Analyses**
RI-SV6	Soil Vapor		7.0'		TO-15

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 1 (2-2.5)		RI-SB 1 (5-5.5)		RI-SB 1 (11-11.5)		RI-SB 1 (15.5-16)		RI-SB 2 (4.5-5)		RI-SB 2 (6-6.5)		RI-SB 2 (12-12.5)		RI-SB 2 (18-18.5)		RI-SB 3 (1.5-2)		RI-SB 3 (6-6.5)		RI-SB 3 (10-10.5)		RI-SB 3 (16-16.5)	
Lab Sample ID:						JE17599-1		JE17599-2		JE17599-3		JE17599-4		JE17599-5		JE17599-6		JE17599-7		JE17599-8		JE17599-9		JE17599-10		JE17599-11		JE17599-12	
Date Sampled:						8/22/2025 10:05 AM		8/22/2025 10:06 AM		8/22/2025 10:07 AM		8/22/2025 10:08 AM		8/22/2025 10:45 AM		8/22/2025 10:46 AM		8/22/2025 10:47 AM		8/22/2025 10:48 AM		8/22/2025 11:30 AM		8/22/2025 11:31 AM		8/22/2025 11:32 AM		8/22/2025 11:33 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005	0.000086	U	0.000085	U	0.000091	U	0.0001	U	0.000083	U	0.000088	U	0.000094	U	0.0001	U	0.0011		0.00046 [e]	J	0.000081	U	0.0001	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02	0.00031 [e]	J	0.00029 [e]	J	0.000054	U	0.000059	U	0.00021 [e]	J	0.000052	U	0.000055	U	0.000059	U	0.00036 [e]	J	0.00025	U	0.000048	U	0.000062	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036	0.000064	U	0.000063	U	0.000068	U	0.000074	U	0.000061	U	0.000065	U	0.00007	U	0.000074	U	0.000062	U	0.00031	U	0.00006	U	0.000078	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04	0.000067	U	0.000065	U	0.00007	U	0.000077	U	0.000064	U	0.000067	U	0.000072	U	0.000077	U	0.00013 [e]	J	0.00032	U	0.00012 [e]	J	0.00008	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1	0.000078	U	0.000076	U	0.000082	U	0.00009	U	0.000074	U	0.000079	U	0.000084	U	0.00009	U	0.000075	U	0.00038	U	0.000072	U	0.000094	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094	0.0026		0.0012		0.000063	U	0.000069	U	0.0019		0.00016	J	0.000065	U	0.000069	U	0.0015		0.0012 [e]	J	0.00029	J	0.000072	U
gamma-Chlordane	5103-74-2	mg/kg	14			0.0019		0.0011 [e]		0.00007	U	0.000077	U	0.0017		0.00012	J	0.000072	U	0.000077	U	0.0012		0.0007 [e]	J	0.00046		0.00008	U
Chlordane (alpha and gamma)	57-74-9	mg/kg				0.0044		0.0023		0.000063	U	0.000069	U	0.0036		0.00028	J	0.000065	U	0.000069	U	0.0026		0.0019	J	0.00075		0.000072	U
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005	0.00075		0.00038 [e]	J	0.000075	U	0.000082	U	0.00067		0.00016	J	0.000077	U	0.000082	U	0.0489		0.0387		0.00044		0.000086	U
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033	0.0017		0.004		0.000049	U	0.000054	U	0.0035		0.00047		0.000051	U	0.000054	U	0.0013 [e]		0.0041		0.000043	U	0.000056	U
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033	0.0011		0.002		0.000056	U	0.000062	U	0.0016		0.00017 [e]	J	0.000058	U	0.000062	U	0.0075		0.0098		0.00018 [e]	J	0.000064	U
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033	0.0026		0.0027		0.000082	U	0.00009	U	0.001		0.00056		0.000084	U	0.00009	U	0.0031		0.0021 [e]		0.0014		0.000094	U
Endrin	72-20-8	mg/kg	0.06	11	0.014	0.000064	U	0.000063	U	0.000068	U	0.000074	U	0.000061	U	0.000065	U	0.00007	U	0.000074	U	0.000062	U	0.00031	U	0.00006	U	0.000078	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4	0.000053	U	0.000052	U	0.000056	U	0.000062	U	0.000051	U	0.00069 [e]		0.000058	U	0.000062	U	0.00036 [e]	J	0.00026	U	0.00005	U	0.000064	U
Endrin aldehyde	7421-93-4	mg/kg				0.00013	U	0.00013	U	0.00014	U	0.00015	U	0.00012	U	0.00013	U	0.00014	U	0.00015	U	0.00012	U	0.00062	U	0.00012	U	0.00016	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4	0.00006	U	0.000059	U	0.000063	U	0.000069	U	0.000057	U	0.000061	U	0.000065	U	0.000069	U	0.000058	U	0.00029	U	0.000056	U	0.000072	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4	0.000062	U	0.000061	U	0.000066	U	0.000072	U	0.000059	U	0.000063	U	0.000067	U	0.000072	U	0.00014 [e]	J	0.0003	U	0.000058	U	0.000075	U
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042	0.000058	U	0.000056	U	0.000061	U	0.000067	U	0.000055	U	0.000058	U	0.000063	U	0.000067	U	0.000056	U	0.00028	U	0.000054	U	0.00007	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02			0.00024 [e]	J	0.00015 [e]	J	0.000084	U	0.000092	U	0.00014	J	0.0002 [e]	J	0.000087	U	0.000092	U	0.00016 [e]	J	0.00039	U	0.000074	U	0.000097	U
Methoxychlor	72-43-5	mg/kg	900			0.00018	U	0.00017	U	0.00019	U	0.0002	U	0.00017	U	0.00018	U	0.00019	U	0.0002	U	0.00017	U	0.00085	U	0.00016	U	0.00021	U
Endrin ketone	53494-70-5	mg/kg				0.000071	U	0.000069	U	0.000075	U	0.000082	U	0.000068	U	0.000072	U	0.000077	U	0.000082	U	0.000069	U	0.00034	U	0.000066	U	0.000086	U
Toxaphene	8001-35-2	mg/kg				0.0037	U	0.0036	U	0.0039	U	0.0042	U	0.0035	U	0.0037	U	0.004	U	0.0042	U	0.0035	U	0.018	U	0.0034	U	0.0044	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1	0.0094	U	0.0092	U	0.01	U	0.011	U	0.009	U	0.0095	U	0.01	U	0.011	U	0.0091	U	0.0091	U	0.0088	U	0.011	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1	0.0075	U	0.0073	U	0.0079	U	0.0086	U	0.0071	U	0.0075	U	0.0081	U	0.0086	U	0.0072	U	0.0072	U	0.0069	U	0.009	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1	0.018	U	0.018	U	0.019	U	0.021	U	0.018	U	0.019	U	0.02	U	0.021	U	0.018	U	0.018	U	0.017	U	0.022	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1	0.013	U	0.013	U	0.014	U	0.015	U	0.013	U	0.013	U	0.014	U	0.015	U	0.013	U	0.013	U	0.012	U	0.016	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1	0.0048	U	0.0047	U	0.0051	U	0.0055	U	0.0046	U	0.0049	U	0.0052	U	0.0055	U	0.0046	U	0.0046	U	0.0045	U	0.0058	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1	0.0024	U	0.0023	U	0.0025	U	0.0028	U	0.0023	U	0.0024	U	0.0026	U	0.0028	U	0.0023	U	0.0023	U	0.0022	U	0.0029	U
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1	0.0084	J	0.0089	J	0.0081	U	0.0089	U	0.0083 [j]	J	0.0077	U	0.0083	U	0.0089	U	0.0074	U	0.0074	U	0.0071	U	0.0092	U
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1	0.0022	U	0.0022	U	0.0024	U	0.0026	U	0.0021	U	0.0023	U	0.0024	U	0.0026	U	0.0022	U	0.0022	U	0.0021	U	0.0027	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1	0.0018	U	0.0018	U	0.002	U	0.0021	U	0.0018	U	0.0114 [j]	J	0.002	U	0.0021	U	0.0018	U	0.0018	U	0.0017	U	0.0022	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27	0.29	U	0.25	U	0.25	U	0.41	U	0.24	U	0.26	U	0.32	U	0.28	U	0.3	U	0.33	U	0.21	U	0.31	U
Solids, Percent	PERCENT SOLIDS	%				82		85.3		79		73.5		85.8		87.3		78.3		74.9		91.4		89.6		94.8		74.6	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg				11500		14700		18700		12600		14700		8890		21200		12000		8810		10100		6790		27300	
Antimony	7440-36-0	mg/kg				2.4	U	2.3	U	4.8 [l]	U	3.6 [l]	U	2.4	U	2.2	U	4.9 [l]	U	5.2 [l]	U	2.2	U	2.3	U	2.1	U	5.4 [l]	U
Arsenic	7440-38-2	mg/kg	16	16	13	2.9		4.6		3.9		1.9		5.2		3.3		4.1		2.6	U	3.2		5.4		2.1	U	3.6	
Barium	7440-39-3	mg/kg	820	410	410	197		148		90.9		84.2		125		75.8		154		104		60.4		60.8		64.4		197	
Beryllium	7440-41-7	mg/kg	47	43	4.4	0.38		0.5		0.6 [l]		0.42 [l]		0.53		0.31		0.75		0.43		0.28		0.32		0.22		0.91 [l]	
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5	0.61	U	0.59	U	0.6	U	0.45	U	0.6	U	0.56	U	0.62	U	0.65	U	0.54	U	0.57	U	0.53	U	0.68	U
Calcium	7440-70-2	mg/kg				7660		9660		946		1880		9070		14200		1330		2850		10700		15400		3780		1800	
Chromium	7440-47-3	mg/kg	19	110	30	20.7		25.4		27.6		21.9		31.4		13.9		32.1		24.7		17		19.5		16.6		41.2	
Cobalt	7440-48-4	mg/kg				7.3		8.2		12.6		9.3		7.9		5.6	U	17.4		10.5		6.1		7		5.8		21.5 [l]	
Copper	7440-50-8	mg/kg	1720	280	50	21.7		34.1		28 [l]		20 [l]		33.6		21.9		30.5 [l]		26.3		21.7		30		17.2		38.6 [l]	
Iron	7439-89-6	mg/kg				18200		21000		29000		21800		21900		11800		34900		24500		15000		18600		13400		37900	
Lead	7439-92-1	mg/kg	450	400	63	162		209		8.9		5.3		178		105		11		6		66.7		58.7		19.7		11	
Magnesium	7439-95-4	mg/kg				5380		6120		6600		5560		5420		2700		8000		6510		4990		6450		3360		9890	
Manganese	7439-96-5	mg/kg	2000	2000	1600	236		359		532		437		394		223		707		419		331		303		314		987	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18	0.11		0.29		0.033	U	0.038	U	0.37		0.037		0.036	U	0.039	U	0.086		0.11		0.035		0.039	U
Nickel	7440-02-0	mg/kg	130	320	30	16		18.5		24.8		19.9		17.8		11.7		30.6		22.6		13.8		16		11.8		35.5	
Potassium	7440-09-7	mg/kg				2220		1680		3260		3110		1590		1100	U	4970		4100		1630		1810		1650		7080	
Selenium	7782-49-2	mg/kg	4	110	3.9	2.4	U	2.3	U	4.8 [h]	U	3.6 [l]	U	2.4	U	2.2	U	4.9 [l]	U	2.6	U	2.2	U	2.3	U	2.1	U	5.4 [l]	U
Silver	7440-22-4	mg/kg	8.3	110	2	0.61	U	0.59	U	0.6	U	0.45	U	0.6	U	0.56	U	0.62	U	0.65	U	0.54	U	0.57	U	0.53	U	0.68	U
Sodium	7440-23-5	mg/kg				1200	U	1200	U	1200	U	910	U	1550		1730		1650		1630		1100	U	1100	U	1100	U	1400	U
Thallium	7440-28-0	mg/kg				1.2	U	1.2	U	1.2	U	0.91	U	1.2	U	1.1	U	1.2	U	1.3	U	1.1	U	1.1	U	1.1	U	1.4	U
Vanadium	7440-62-2	mg/kg				29.3		33.2		39.7		29.9		27.8		17.4		45.2		33.7		25		28.9		20.6		54.7	
Zinc	7440-66-6	mg/kg	2480	6600	109	136		150		62.9		48.7		156		69.3		78.5		55.7		69.5		82.2		68.5		90.9	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 1 (2-2.5)		RI-SB 1 (5-5.5)		RI-SB 1 (11-11.5)		RI-SB 1 (15.5-16)		RI-SB 2 (4.5-5)		RI-SB 2 (6-6.5)		RI-SB 2 (12-12.5)		RI-SB 2 (18-18.5)		RI-SB 3 (1.5-2)		RI-SB 3 (6-6.5)		RI-SB 3 (10-10.5)		RI-SB 3 (16-16.5)	
Lab Sample ID:						JE17599-1		JE17599-2		JE17599-3		JE17599-4		JE17599-5		JE17599-6		JE17599-7		JE17599-8		JE17599-9		JE17599-10		JE17599-11		JE17599-12	
Date Sampled:						8/22/2025 10:05 AM		8/22/2025 10:06 AM		8/22/2025 10:07 AM		8/22/2025 10:08 AM		8/22/2025 10:45 AM		8/22/2025 10:46 AM		8/22/2025 10:47 AM		8/22/2025 10:48 AM		8/22/2025 11:30 AM		8/22/2025 11:31 AM		8/22/2025 11:32 AM		8/22/2025 11:33 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00013	U	0.00013	U	0.00014	U	0.00015	U	0.00012	U	0.00012	U	0.00014	U	0.00014	U	0.00012	U	0.00012	U	0.00011	U	0.00014	U
Perfluoropentanoic acid	2706-90-3	mg/kg				0.000083	U	0.00008	U	0.000087	U	0.000093	U	0.000079	U	0.000078	U	0.000086	U	0.000091	U	0.000076	U	0.000076	U	0.000072	U	0.000092	U
Perfluorohexanoic acid	307-24-4	mg/kg				0.000036	U	0.000034	U	0.000037	U	0.00004	U	0.000034	U	0.000034	U	0.000037	U	0.000039	U	0.000032	U	0.000049	J	0.000032	J	0.000039	U
Perfluoroheptanoic acid	375-85-9	mg/kg				0.000059	U	0.000057	U	0.000062	U	0.000066	U	0.000056	U	0.000056	U	0.000062	U	0.000065	U	0.000054	U	0.000059	J	0.000052	U	0.000065	U
Perfluorooctanoic acid	335-67-1	mg/kg				0.000095	U	0.000091	U	0.000099	U	0.00011	U	0.00009	U	0.000089	U	0.000099	U	0.0001	U	0.00016	J	0.00054		0.00011	J	0.0001	U
Perfluorononanoic acid	375-95-1	mg/kg				0.000059	U	0.000057	U	0.000062	U	0.000066	U	0.000056	U	0.000056	U	0.000062	U	0.000065	U	0.000075	J	0.00012	J	0.00009	J	0.000065	U
Perfluorodecanoic acid	335-76-2	mg/kg				0.000083	U	0.00008	U	0.000087	U	0.000093	U	0.000079	U	0.000078	U	0.000086	U	0.000091	U	0.000076	U	0.00023		0.000072	U	0.000092	U
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000071	U	0.000069	U	0.000074	U	0.00008	U	0.000068	U	0.000067	U	0.000074	U	0.000078	U	0.000065	U	0.000087	J	0.000062	U	0.000079	U
Perfluorododecanoic acid	307-55-1	mg/kg				0.000095	U	0.000091	U	0.000099	U	0.00011	U	0.00009	U	0.000089	U	0.000099	U	0.0001	U	0.000086	U	0.00011	J	0.000082	U	0.0001	U
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.00011	U	0.0001	U	0.00011	U	0.00012	U	0.0001	U	0.0001	U	0.00011	U	0.00012	U	0.000097	U	0.000098	U	0.000093	U	0.00012	U
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00012	U	0.00011	U	0.00012	U	0.00013	U	0.00011	U	0.00011	U	0.00012	U	0.00013	U	0.00011	U	0.00011	U	0.0001	U	0.00013	U
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.000083	U	0.00008	U	0.000087	U	0.000093	U	0.000079	U	0.000078	U	0.000086	U	0.000091	U	0.000076	U	0.000076	U	0.000072	U	0.000092	U
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00013	U	0.00013	U	0.00014	U	0.00015	U	0.00012	U	0.00012	U	0.00014	U	0.00014	U	0.00012	U	0.00012	U	0.00011	U	0.00014	U
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00012	U	0.00011	U	0.00012	U	0.00013	U	0.00011	U	0.00011	U	0.00012	U	0.00013	U	0.00011	U	0.00011	U	0.0001	U	0.00013	U
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.00013	J	0.00044		0.000062	U	0.000066	U	0.000056	U	0.00042		0.000062	U	0.000065	U	0.00055		0.00068		0.00024		0.000065	U
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00013	U	0.00013	U	0.00014	U	0.00015	U	0.00012	U	0.00012	U	0.00014	U	0.00014	U	0.00012	U	0.00012	U	0.00011	U	0.00014	U
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00012	U	0.00011	U	0.00012	U	0.00013	U	0.00011	U	0.00011	U	0.00012	U	0.00013	U	0.00011	U	0.00011	U	0.0001	U	0.00013	U
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.00023	U	0.00022	U	0.00024	U	0.00025	U	0.00021	U	0.00021	U	0.00023	U	0.00025	U	0.00021	U	0.00021	U	0.0002	U	0.00025	U
PFOSA	754-91-6	mg/kg				0.000083	U	0.00008	U	0.000087	U	0.000093	U	0.000079	U	0.000078	U	0.000086	U	0.000091	U	0.000076	U	0.000076	U	0.000072	U	0.000092	U
MeFOSAA	2355-31-9	mg/kg				0.000095	U	0.000091	U	0.000099	U	0.00011	U	0.00009	U	0.000089	U	0.000099	U	0.0001	U	0.000086	U	0.000087	U	0.000082	U	0.0001	U
EtFOSAA	2991-50-6	mg/kg				0.00015	U	0.00015	U	0.00016	U	0.00017	U	0.00015	U	0.00015	U	0.00016	U	0.00017	U	0.00014	U	0.00014	U	0.00013	U	0.00017	U
2-Chlorophenol	95-57-8	mg/kg				0.02	U	0.019	U	0.02	U	0.021	U	0.019	U	0.019	U	0.021	U	0.022	U	0.018	U	0.091	U	0.017	U	0.022	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg				0.024	U	0.023	U	0.024	U	0.026	U	0.023	U	0.023	U	0.026	U	0.027	U	0.022	U	0.11	U	0.021	U	0.027	U
2,4-Dichlorophenol	120-83-2	mg/kg				0.034	U	0.033	U	0.034	U	0.036	U	0.033	U	0.032	U	0.036	U	0.038	U	0.031	U	0.16	U	0.029	U	0.038	U
2,4-Dimethylphenol	105-67-9	mg/kg				0.071	U	0.068	U	0.071	U	0.076	U	0.068	U	0.067	U	0.076	U	0.079	U	0.065	U	0.33	U	0.061	U	0.08	U
2,4-Dinitrophenol	51-28-5	mg/kg				0.15 [a]	U	0.14 [a]	U	0.15 [a]	U	0.16 [a]	U	0.14 [a]	U	0.14 [a]	U	0.16 [a]	U	0.17 [a]	U	0.14 [a]	U	0.69 [a]	U	0.13 [a]	U	0.17 [a]	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg				0.043 [a]	U	0.041 [a]	U	0.043 [a]	U	0.046 [a]	U	0.041 [a]	U	0.04 [a]	U	0.045 [a]	U	0.047 [a]	U	0.039 [a]	U	0.2 [a]	U	0.037 [a]	U	0.048 [a]	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33	0.025	U	0.024	U	0.025	U	0.027	U	0.024	U	0.024	U	0.027	U	0.028	U	0.023	U	0.12	U	0.022	U	0.029	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33	0.033	U	0.031	U	0.033	U	0.035	U	0.031	U	0.031	U	0.035	U	0.036	U	0.03	U	0.15	U	0.028	U	0.037	U
2-Nitrophenol	88-75-5	mg/kg				0.026 [a]	U	0.025 [a]	U	0.026 [a]	U	0.028 [a]	U	0.025 [a]	U	0.025 [a]	U	0.028 [a]	U	0.029 [a]	U	0.024 [a]	U	0.12 [a]	U	0.023 [a]	U	0.03 [a]	U
4-Nitrophenol	100-02-7	mg/kg				0.11	U	0.1	U	0.11	U	0.11	U	0.1	U	0.1	U	0.11	U	0.12	U	0.097	U	0.49	U	0.091	U	0.12	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8	0.037	U	0.036	U	0.037	U	0.04	U	0.036	U	0.035	U	0.04	U	0.042	U	0.034	U	0.17	U	0.032	U	0.042	U
Phenol	108-95-2	mg/kg	0.33	100	0.33	0.021	U	0.02	U	0.021	U	0.022	U	0.02	U	0.02	U	0.022	U	0.023	U	0.019	U	0.096	U	0.018	U	0.023	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg				0.026	U	0.025	U	0.026	U	0.028	U	0.025	U	0.025	U	0.028	U	0.029	U	0.024	U	0.12	U	0.023	U	0.03	U
2,4,5-Trichlorophenol	95-95-4	mg/kg				0.03	U	0.029	U	0.03	U	0.032	U	0.029	U	0.028	U	0.032	U	0.033	U	0.027	U	0.14	U	0.026	U	0.033	U
2,4,6-Trichlorophenol	88-06-2	mg/kg				0.024	U	0.023	U	0.024	U	0.025	U	0.023	U	0.023	U	0.025	U	0.026	U	0.022	U	0.11	U	0.02	U	0.027	U
Acenaphthene	83-32-9	mg/kg	98	100	20	0.0295	J	0.0205	J	0.014	U	0.015	U	0.0139	J	0.013	U	0.015	U	0.015	U	0.0453		0.064	U	0.0627		0.015	U
Acenaphthylene	208-96-8	mg/kg	365	100	100	0.036	J	0.0574		0.02	U	0.022	U	0.0271	J	0.019	U	0.022	U	0.022	U	0.0291	J	0.094	U	0.0462		0.023	U
Acetophenone	98-86-2	mg/kg				0.0086	U	0.0082	U	0.0086	U	0.0092	U	0.0082	U	0.0081	U	0.0091	U	0.0095	U	0.0078	U	0.04	U	0.0073	U	0.0096	U
Anthracene	120-12-7	mg/kg	1000	100	100	0.15		0.0894		0.024	U	0.026	U	0.0382		0.023	U	0.026	U	0.027	U	0.112		0.11	U	0.158		0.027	U
Atrazine	1912-24-9	mg/kg				0.017	U	0.016	U	0.017	U	0.018	U	0.016	U	0.016	U	0.018	U	0.019	U	0.016	U	0.079	U	0.015	U	0.019	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1	1.12		0.172		0.011	U	0.012	U	0.114		0.0121	J	0.012	U	0.013	U	0.385		0.171	J	0.407		0.013	U
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1	0.819		0.241		0.018	U	0.019	U	0.118		0.017	U	0.019	U	0.02	U	0.371		0.205		0.378		0.02	U
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1	0.965		0.282		0.018	U	0.019	U	0.148		0.017	U	0.019	U	0.02	U	0.414		0.268		0.4		0.02	U
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64	0.436		0.233		0.02	U	0.021	U	0.0919		0.019	U	0.021	U	0.022	U	0.241		0.205		0.238		0.022	U
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8	0.379		0.0896		0.019	U	0.02	U	0.0496		0.018	U	0.02	U	0.021	U	0.165		0.086	U	0.134		0.021	U
4-Bromophenyl phenyl ether	101-55-3	mg/kg				0.015	U	0.015	U	0.015	U	0.017	U	0.015	U	0.015	U	0.016	U	0.017	U	0.014	U	0.071	U	0.013	U	0.017	U
Butyl benzyl phthalate	85-68-7	mg/kg				0.0097 [a]	U	0.0093 [a]	U	0.0097 [a]	U	0.01 [a]	U	0.0093 [a]	U	0.0092 [a]	U	0.01 [a]	U	0.011 [a]	U	0.0089 [a]	U	1.43 [c]		0.0083 [a]	U	0.011	U
1,1'-Biphenyl	92-52-4	mg/kg				0.0055	U	0.0052	U	0.0055	U	0.0059	U	0.0052	U	0.0052	U	0.0058	U	0.0061	U	0.005	U	0.025	U	0.0079	J	0.0061	U
Benzaldehyde	100-52-7	mg/kg				0.0099	U	0.0095	U	0.0099	U	0.011	U	0.0095	U	0.0094	U	0.011	U	0.011	U	0.009	U	0.046	U	0.0085	U	0.011	U
2-Chloronaphthalene	91-58-7	mg/kg				0.0095	U	0.0091	U	0.0095	U	0.01	U	0.0091	U	0.009	U	0.01	U	0.011	U	0.0087	U	0.044	U	0.0081	U	0.011	U
4-Chloroaniline	106-47-8	mg/kg				0.014	U	0.014	U	0.014	U	0.015	U	0.014	U	0.014	U	0.015	U	0.016	U	0.013	U	0.067	U	0.012	U	0.016	U
Carbazole	86-74-8	mg/kg				0.0276	J	0.053	J	0.0058	U	0.0062	U	0.0137	J	0.0055	U	0.0062	U	0.0064	U	0.0432	J	0.027	U	0.0534	J	0.0065	U
Caprolactam	105-60-2	mg/kg				0.016	U	0.015	U	0.016	U	0.017	U	0.015	U	0.015	U	0.017	U	0.017	U	0.014	U	0.073	U	0.013	U	0.018	U
Chrysene	218-01-9	mg/kg	1	4.9	1	0.989		0.182		0.013	U	0.013	U	0.137		0.012	U	0.013	U	0.014	U	0.384		0.204		0.367		0.014	U
bis(2-Chloroethoxy)methane	111-91-1	mg/kg				0.0085	U	0.0082	U	0.0085	U	0.0092	U	0.0082	U	0.0081	U	0.0091	U	0.0095	U	0.0078	U	0.04	U	0.0073	U	0.0096	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg				0.017 [a]	U	0.016 [a]	U	0.017 [a]	U	0.018 [a]	U	0.016 [a]	U	0.016 [a]	U	0.018 [a]	U	0.019 [a]	U	0.016 [a]	U	0.08 [a]	U	0.015 [a]	U	0.019	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg				0.014	U	0.014	U	0.014	U	0.015	U	0.014	U	0.014	U	0.015	U	0.016	U	0.013	U	0.066	U	0.012	U	0.016	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg				0.013	U	0.012	U	0.013	U	0.014	U	0.012	U	0.012	U	0.014	U	0.014	U	0.012	U	0.06	U	0.011	U	0.014	U
2,4-Dinitrotoluene	121-14-2	mg/kg				0.012	U	0.012	U	0.012	U	0.013	U	0.012	U	0.012	U	0.013	U	0.014	U	0.011	U	0.057	U	0.011	U	0.014	U
2,6-Dinitrotoluene	606-20-2	mg/kg				0.02	U	0.019	U	0.02	U	0.021	U	0.019	U	0.019	U	0.021	U	0.022	U	0.018	U	0.093	U	0.017	U	0.022 [a]	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg				0.033	U	0.032	U	0.033	U	0.036	U	0.032	U	0.032	U	0.035	U	0.037	U	0.03	U	0.15	U	0.028	U	0.037	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1	0.026	U	0.025	U	0.026	U	0.028	U	0.025	U	0.025	U	0.028	U	0.029	U	0.024	U	0.12	U	0.023	U	0.03	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33	0.107		0.0485		0.018	U	0.019	U	0.0214	J	0.017	U	0.019	U	0.02	U	0.0561		0.082	U	0.0522		0.02	U
Dibenzofuran	132-64-9	mg/kg	110	18	2.1	0.016	U	0.0167	J	0.016	U	0.017	U	0.016	U	0.015	U	0.017	U	0.018	U	0.0178	J	0.075	U	0.0428	J	0.018	U
Di-n-butyl phthalate	84-74-2	mg/kg				0.0089	J	0.0062	U	0.0065	U	0.007	U	0.0062	U	0.0062	U	0.0069	U	0.0072	U	0.0059	U	0.03	U	0.0056	U	0.0073	U
Di-n-octyl phthalate	117-84-0	mg/kg				0.0099 [a]	U	0.0095 [a]	U	0.0099 [a]	U	0.011 [a]	U	0.0095 [a]	U	0.0094 [a]	U	0.011 [a]	U	0.011 [a]	U	0.0091 [a]	U	0.046 [a]	U	0.0085 [a]	U	0.011	U
Diethyl phthalate	84-66-2	mg/kg				0.0085	U	0.0081	U	0.0085	U	0.0091	U	0.0081	U	0.0081	U	0.009	U	0.0094	U	0.0077	U	0.039	U	0.0073	U	0.0095	U
Dimethyl phthalate	131-11-3	mg/kg				0.0071	U	0.0068	U	0.0071	U	0.0076	U	0.0068	U	0.0067	U	0.0076	U	0.0079	U	0.0065	U	0.033	U	0.0061	U	0.008	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg				0.0134 [c]	J	0.0092 [c]	J	0.0102 [c]	J	0.0105 [c]	J	0.325 [c]		0.0088 [a]	U	0.0099 [a]	U	0.01 [a]	U	0.0124 [c]	J	0.282 [c]	J	0.008 [a]	U	0.01	U
Fluoranthene	206-44-0	mg/kg	1000	100	85	2.03		0.351		0.018	U	0.019	U	0.197		0.017	U	0.019	U	0.02	U	0.691		0.229		0.771		0.02	U
Fluorene	86-73-7	mg/kg	386	100	30	0.0187	J	0.0202	J	0.018	U	0.02	U	0.018	U	0.017	U	0.019	U	0.02	U	0.033	J	0.085	U	0.054		0.021	U
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33	0.01	U	0.0097	U	0.01	U	0.011	U	0.0097	U	0.0096	U	0.011	U	0.011	U	0.0092	U	0.047	U	0.0086	U	0.011	U
Hexachlorobutadiene	87-68-3	mg/kg				0.016	U	0.015	U	0.016	U	0.017	U	0.015	U	0.015	U	0.017	U	0.018	U	0.015	U	0.074	U	0.014	U	0.018	U
Hexachlorocyclopentadiene	77-47-4	mg/kg				0.016	U	0.015	U	0.016	U	0.017	U	0.015	U	0.015	U	0.017	U	0.018	U	0.014	U	0.074	U	0.014	U	0.018	U
Hexachloroethane	67-72-1	mg/kg				0.02	U	0.019	U	0.02	U	0.021	U	0.019	U	0.019	U	0.021	U	0.022	U	0.018	U	0.091	U	0.017	U	0.022	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5	0.358		0.167		0.019	U	0.02	U	0.0683		0.018	U	0.02	U	0.021	U	0.191		0.126	J	0.177		0.021	U
Isophorone	78-59-1	mg/kg				0.0085	U	0.0082	U	0.0085	U	0.0092	U	0.0082	U	0.0081	U	0.0091	U	0.0095	U	0.0078	U	0.04	U	0.0073	U	0.0096	U
2-Methylnaphthalene	91-57-6	mg/kg				0.009	U	0.0153	J	0.009	U	0.0097	U	0.0105	J	0.0085	U	0.0096	U	0.01	U	0.0121	J	0.042	U	0.0263	J	0.01	U
2-Nitroaniline	88-74-4	mg/kg				0.0094	U	0.009	U	0.0094	U	0.01	U	0.009	U	0.0089	U	0.01	U	0.01	U	0.0086	U	0.044	U	0.0081	U	0.011	U
3-Nitroaniline	99-09-2	mg/kg				0.01	U	0.0095	U	0.01	U	0.011	U	0.0096	U	0.0095	U	0.011	U	0.011	U	0.0091	U	0.046	U	0.0085	U	0.011	U
4-Nitroaniline	100-01-6	mg/kg				0.01	U	0.0099	U	0.01	U	0.011	U	0.0099	U	0.0098	U	0.011	U	0.011	U	0.0094	U	0.048	U	0.0088	U	0.012	U
Naphthalene	91-20-3	mg/kg	12	100	12	0.015	J	0.0239	J	0.0153	J	0.0425	J	0.0228	J	0.0247	J	0.0172	J	0.0229	J	0.042		0.145	J	0.0623		0.013	U
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08	0.015	U	0.015	U	0.015	U	0.017	U	0.015	U	0.015	U	0.016	U	0.017	U	0.014	U	0.071	U	0.013	U	0.017	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg				0.012	U	0.011	U	0.012	U	0.012	U	0.011	U	0.011	U	0.012	U	0.013	U	0.011	U	0.053	U	0.0099	U	0.013	U
N-Nitrosodiphenylamine	86-30-6	mg/kg				0.015	U	0.014	U	0.015	U	0.016	U	0.014	U	0.014	U	0.016	U	0.016	U	0.013	U	0.068	U	0.012	U	0.016	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1	0.48		0.235		0.013	U	0.014	U	0.151		0.013	U	0.014	U	0.015	U	0.497		0.122	J	0.72		0.015	U
Pyrene	129-00-0	mg/kg	1000	100	64	2.44		0.643		0.013	U	0.014	U	0.245		0.012	U	0.014	U	0.014	U	0.855		0.327		0.982		0.014 [a]	U
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg				0.01	U	0.0097	U	0.01	U	0.011	U	0.0097	U	0.0096	U	0.011	U	0.011	U	0.0092	U	0.047	U	0.0087	U	0.011	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 1 (2-2.5)		RI-SB 1 (5-5.5)		RI-SB 1 (11-11.5)		RI-SB 1 (15.5-16)		RI-SB 2 (4.5-5)		RI-SB 2 (6-6.5)		RI-SB 2 (12-12.5)		RI-SB 2 (18-18.5)		RI-SB 3 (1.5-2)		RI-SB 3 (6-6.5)		RI-SB 3 (10-10.5)		RI-SB 3 (16-16.5)	
Lab Sample ID:						JE17599-1		JE17599-2		JE17599-3		JE17599-4		JE17599-5		JE17599-6		JE17599-7		JE17599-8		JE17599-9		JE17599-10		JE17599-11		JE17599-12	
Date Sampled:						8/22/2025 10:05 AM		8/22/2025 10:06 AM		8/22/2025 10:07 AM		8/22/2025 10:08 AM		8/22/2025 10:45 AM		8/22/2025 10:46 AM		8/22/2025 10:47 AM		8/22/2025 10:48 AM		8/22/2025 11:30 AM		8/22/2025 11:31 AM		8/22/2025 11:32 AM		8/22/2025 11:33 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03	0.0058	J	0.0216		0.009	J	0.0055	J	0.0683		0.0404		0.005	J	0.0053	U	0.0042	U	0.0051	U	0.006	J	0.0184	
Benzene	71-43-2	mg/kg	0.06	3.7	0.06	0.0005	U	0.00046	U	0.00061	U	0.0006	U	0.00043	U	0.00057	U	0.00052	U	0.00058	U	0.00046	U	0.00056	U	0.00046	U	0.00056	U
Bromochloromethane	74-97-5	mg/kg				0.00061	U	0.00057	U	0.00075	U	0.00073	U	0.00053	U	0.0007	U	0.00064	U	0.00072	U	0.00057	U	0.00069	U	0.00057	U	0.0007	U
Bromodichloromethane	75-27-4	mg/kg				0.00047	U	0.00043	U	0.00058	U	0.00056	U	0.0004	U	0.00053	U	0.00049	U	0.00055	U	0.00043	U	0.00053	U	0.00044	U	0.00053	U
Bromoform	75-25-2	mg/kg				0.0015	U	0.0014	U	0.0018	U	0.0018	U	0.0013	U	0.0017	U	0.0016	U	0.0017	U	0.0014	U	0.0017	U	0.0014	U	0.0017	U
Bromomethane	74-83-9	mg/kg				0.00083	U	0.00077	U	0.001	U	0.001	U	0.00072	U	0.00095	U	0.00087	U	0.00098	U	0.00077	U	0.00095	U	0.00077	U	0.00095	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1	0.0026	U	0.0027	J	0.0033	U	0.0032	U	0.0099		0.0038	J	0.0028	U	0.0031	U	0.0025	U	0.003	U	0.0025	U	0.003	U
Carbon disulfide	75-15-0	mg/kg				0.00058	U	0.00054	U	0.00072	U	0.0007	U	0.00051	J	0.0016	J	0.00061	U	0.00069	U	0.00054	U	0.00066	U	0.00054	U	0.00066	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76	0.00067	U	0.00062	U	0.00083	U	0.00081	U	0.00058	U	0.00077	U	0.0007	U	0.00079	U	0.00063	U	0.00077	U	0.00063	U	0.00077	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5	0.0005	U	0.00046	U	0.00062	U	0.0006	U	0.00043	U	0.00057	U	0.00052	U	0.00059	U	0.00046	U	0.00057	U	0.00047	U	0.00057	U
Chloroethane	75-00-3	mg/kg				0.00064	U	0.0006	U	0.0008	U	0.00077	U	0.00056	U	0.00074	U	0.00067	U	0.00076	U	0.0006	U	0.00073	U	0.0006	U	0.00073	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37	0.0011	U	0.001	U	0.0013	U	0.0013	U	0.00094	U	0.0012	U	0.0011	U	0.0013	U	0.001	U	0.0012	U	0.001	U	0.0012	U
Chloromethane	74-87-3	mg/kg				0.0021	U	0.002	U	0.0026	U	0.0026	U	0.0018	U	0.0024	U	0.0022	U	0.0025	U	0.002	U	0.0024	U	0.002	U	0.0024	U
Cyclohexane	110-82-7	mg/kg				0.00072	U	0.00066	U	0.00088	U	0.00086	U	0.00062	U	0.00082	U	0.00075	U	0.00084	U	0.00067	U	0.00081	U	0.00067	U	0.00082	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg				0.00076	U	0.0007	U	0.00093	U	0.00091	U	0.00065	U	0.00086	U	0.00079	U	0.00089	U	0.0007	U	0.00086	U	0.0007	U	0.00086	U
Dibromochloromethane	124-48-1	mg/kg				0.00061	U	0.00057	U	0.00075	U	0.00073	U	0.00053	U	0.0007	U	0.00064	U	0.00072	U	0.00057	U	0.00069	U	0.00057	U	0.0007	U
1,2-Dibromoethane	106-93-4	mg/kg				0.00046	U	0.00043	U	0.00057	U	0.00055	U	0.0004	U	0.00052	U	0.00048	U	0.00054	U	0.00043	U	0.00052	U	0.00043	U	0.00052	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1	0.00059	U	0.00055	U	0.00074	U	0.00071	U	0.00051	U	0.00068	U	0.00062	U	0.0007	U	0.00055	U	0.00068	U	0.00055	U	0.00068	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6	0.00054	U	0.0005	U	0.00067	U	0.00065	U	0.00047	U	0.00062	U	0.00057	U	0.00064	U	0.0005	U	0.00062	U	0.0005	U	0.00062	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8	0.00054	U	0.0005	U	0.00067	U	0.00065	U	0.00046	U	0.00062	U	0.00056	U	0.00063	U	0.0005	U	0.00061	U	0.0005	U	0.00061	U
Dichlorodifluoromethane	75-71-8	mg/kg				0.00079	U	0.00073	U	0.00098	U	0.00095	U	0.00068	U	0.00091	U	0.00083	U	0.00093	U	0.00074	U	0.0009	U	0.00074	U	0.0009	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27	0.00054	U	0.0005	U	0.00067	U	0.00065	U	0.00047	U	0.00062	U	0.00056	U	0.00064	U	0.0005	U	0.00061	U	0.0005	U	0.00061	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02	0.00051	U	0.00047	U	0.00063	U	0.00061	U	0.00044	U	0.00059	U	0.00054	U	0.0006	U	0.00048	U	0.00058	U	0.00048	U	0.00058	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24	0.00071	U	0.00066	U	0.00088	U	0.00086	U	0.00062	U	0.00082	U	0.00075	U	0.00084	U	0.00066	U	0.00081	U	0.00066	U	0.00081	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19	0.00091	U	0.00085	U	0.0011	U	0.0011	U	0.00079	U	0.001	U	0.00096	U	0.0011	U	0.00085	U	0.001	U	0.00085	U	0.001	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19	0.00067	U	0.00062	U	0.00082	U	0.0008	U	0.00057	U	0.00076	U	0.0007	U	0.00078	U	0.00062	U	0.00076	U	0.00062	U	0.00076	U
1,2-Dichloropropane	78-87-5	mg/kg				0.00052	U	0.00048	U	0.00064	U	0.00062	U	0.00044	U	0.00059	U	0.00054	U	0.00061	U	0.00048	U	0.00059	U	0.00048	U	0.00059	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg				0.00052	U	0.00048	U	0.00064	U	0.00062	U	0.00045	U	0.00059	U	0.00054	U	0.00061	U	0.00048	U	0.00059	U	0.00048	U	0.00059	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg				0.0005	U	0.00046	U	0.00062	U	0.0006	U	0.00043	U	0.00057	U	0.00052	U	0.00059	U	0.00046	U	0.00057	U	0.00046	U	0.00057	U
Ethylbenzene	100-41-4	mg/kg	1	76	1	0.00049	U	0.00046	U	0.00061	U	0.00059	U	0.00043	U	0.00056	U	0.00052	U	0.00058	U	0.00046	U	0.00056	U	0.00046	U	0.00056	U
Freon 113	76-13-1	mg/kg				0.0029	U	0.0027	U	0.0036	U	0.0035	U	0.0025	U	0.0033	U	0.003	U	0.0034	U	0.0027	U	0.0033	U	0.0027	U	0.0033	U
2-Hexanone	591-78-6	mg/kg				0.0023	U	0.0021	U	0.0029	U	0.0028	U	0.002	U	0.0026	U	0.0024	U	0.0027	U	0.0021	U	0.0026	U	0.0022	U	0.0026	U
Isopropylbenzene	98-82-8	mg/kg				0.0015	U	0.0014	U	0.0019	U	0.0019	U	0.0013	U	0.0018	U	0.0016	U	0.0018	U	0.0014	U	0.0018	U	0.0014	U	0.0018	U
Methyl Acetate	79-20-9	mg/kg				0.0015	U	0.0014	U	0.0019	U	0.0018	U	0.0013	U	0.0017	U	0.0016	U	0.0018	U	0.0014	U	0.0017	U	0.0014	U	0.0017	U
Methylcyclohexane	108-87-2	mg/kg				0.00095	U	0.00088	U	0.0012	U	0.0011	U	0.00082	U	0.0011	U	0.001	U	0.0011	U	0.00089	U	0.0011	U	0.00089	U	0.0011	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1	0.00051	U	0.00047	U	0.00063	U	0.00061	U	0.00044	U	0.00058	U	0.00053	U	0.0006	U	0.00048	U	0.00058	U	0.00048	U	0.00058	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg				0.0025	U	0.0023	U	0.0031	U	0.003	U	0.0021	U	0.0028	U	0.0026	U	0.0029	U	0.0023	U	0.0028	U	0.0023	U	0.0028	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05	0.0028	U	0.0026	U	0.0035	U	0.0034	U	0.0025	U	0.0032	U	0.003	U	0.0034	U	0.0026	U	0.0032	U	0.0026	U	0.0032	U
Styrene	100-42-5	mg/kg				0.00044	U	0.00041	U	0.00054	U	0.00053	U	0.00038	U	0.0005	U	0.00046	U	0.00052	U	0.00041	U	0.0005	U	0.00041	U	0.0005	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg				0.00065	U	0.00061	U	0.00081	U	0.00078	U	0.00056	U	0.00075	U	0.00068	U	0.00077	U	0.00061	U	0.00074	U	0.00061	U	0.00074	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3	0.00063	U	0.00059	U	0.00078	U	0.00076	U	0.00055	U	0.00072	U	0.00066	U	0.00074	U	0.00059	U	0.00072	U	0.00059	U	0.00072	U
Toluene	108-88-3	mg/kg	0.7	100	0.7	0.00057	U	0.00053	U	0.00071	U	0.00069	U	0.00049	U	0.00065	U	0.0006	U	0.00067	U	0.00053	U	0.00065	U	0.00053	U	0.00065	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg				0.0027	U	0.0025	U	0.0034	U	0.0033	U	0.0023	U	0.0031	U	0.0029	U	0.0032	U	0.0025	U	0.0031	U	0.0025	U	0.0031	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg				0.0027	U	0.0025	U	0.0034	U	0.0033	U	0.0023	U	0.0031	U	0.0029	U	0.0032	U	0.0025	U	0.0031	U	0.0025	U	0.0031	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68	0.00053	U	0.00049	U	0.00065	U	0.00063	U	0.00045	U	0.0006	U	0.00055	U	0.00062	U	0.00049	U	0.0006	U	0.00049	U	0.0006	U
1,1,2-Trichloroethane	79-00-5	mg/kg				0.0006	U	0.00056	U	0.00075	U	0.00072	U	0.00052	U	0.00069	U	0.00063	U	0.00071	U	0.00056	U	0.00069	U	0.00056	U	0.00069	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47	0.00083	U	0.00077	U	0.001	U	0.001	U	0.00072	U	0.00095	U	0.00087	U	0.00098	U	0.00077	U	0.00094	U	0.00077	U	0.00095	U
Trichlorofluoromethane	75-69-4	mg/kg				0.00074	U	0.00069	U	0.00092	U	0.00089	U	0.00064	U	0.00085	U	0.00078	U	0.00088	U	0.00069	U	0.00085	U	0.00069	U	0.00085	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03	0.00052	U	0.00049	U	0.00065	U	0.00063	U	0.00045	U	0.0006	U	0.00055	U	0.00062	U	0.00049	U	0.0006	U	0.00049	U	0.0006	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26	0.00098	U	0.00091	U	0.0012	U	0.0012	U	0.00084	U	0.0011	U	0.001	U	0.0012	U	0.00091	U	0.0011	U	0.00091	U	0.0011	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26	0.0005	U	0.00046	U	0.00062	U	0.0006	U	0.00043	U	0.00057	U	0.00052	U	0.00059	U	0.00046	U	0.00057	U	0.00046	U	0.00057	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26	0.0005	U	0.00046	U	0.00062	U	0.0006	U	0.00043	U	0.00057	U	0.00052	U	0.00059	U	0.00046	U	0.00057	U	0.00046	U	0.00057	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

= concentration exceeds USCO
= concentration exceeds RRSCO
= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 8 (3.5-4)		RI-SB 8 (5-5.5)		RI-SB 8 (10.5-11)		RI-SB 8 (17-17.5)		RI-SB 7 (2-2.5)		RI-SB 7 (5.5-6)		RI-SB 7 (10-10.5)		RI-SB 7 (17-17.5)		RI-SB 6 (2-2.5)		RI-SB 6 (7.5-8)		RI-SB 6 (11.5-12)		RI-SB 6 (17.5-18)	
Lab Sample ID:						JE17599-13		JE17599-14		JE17599-15		JE17599-16		JE17599-17		JE17599-18		JE17599-19		JE17599-20		JE17599-21		JE17599-22		JE17599-23		JE17599-24	
Date Sampled:						8/22/2025 12:20 PM		8/22/2025 12:21 PM		8/22/2025 12:22 PM		8/22/2025 12:23 PM		8/22/2025 1:20 PM		8/22/2025 1:21 PM		8/22/2025 1:22 PM		8/22/2025 1:23 PM		8/22/2025 2:20 PM		8/22/2025 2:21 PM		8/22/2025 2:22 PM		8/22/2025 2:23 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005	0.000079	U	0.000081	U	0.000079	U	0.000091	U	0.000076	U	0.000082	U	0.000083	U	0.00009	U	0.00008	U	0.00014	J	0.000078	U	0.000098	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02	0.000047	U	0.0002 [e]	J	0.000046	U	0.000054	U	0.0001 [e]	J	0.000048	U	0.000049	U	0.000053	U	0.000047	U	0.000048	U	0.0032		0.000058	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036	0.000059	U	0.000061	U	0.000058	U	0.000068	U	0.000056	U	0.000061	U	0.000062	U	0.000067	U	0.00006	U	0.000061	U	0.000058	U	0.000073	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04	0.000061	U	0.000063	U	0.00006	U	0.00007	U	0.000058	U	0.000063	U	0.000064	U	0.00007	U	0.000062	U	0.000063	U	0.00089 [e]		0.000076	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1	0.000071	U	0.000073	U	0.00007	U	0.000082	U	0.000068	U	0.000073	U	0.000074	U	0.000081	U	0.000072	U	0.000074	U	0.00007	U	0.000088	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094	0.000055	U	0.000085	J	0.000054	U	0.000063	U	0.00034	J	0.0028		0.000084 [e]	J	0.000063	U	0.00013 [e]	J	0.00097		0.000054	U	0.000068	U
gamma-Chlordane	5103-74-2	mg/kg	14			0.00026 [e]	J	0.00064		0.00006	U	0.00007	U	0.00021 [e]	J	0.0026		0.00012	J	0.00007	U	0.000062	U	0.0012		0.00087		0.000076	U
Chlordane (alpha and gamma)	57-74-9	mg/kg				0.00026	J	0.00073		0.000054	U	0.000063	U	0.00055		0.0054		0.0002	J	0.000063	U	0.00013	J	0.0022		0.00087		0.000068	U
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005	0.00054		0.0031		0.000064	U	0.000075	U	0.00025	J	0.00033 [e]	J	0.000068	U	0.000074	U	0.00028	J	0.0026		0.0011 [e]		0.000081	U
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033	0.00027	J	0.00023 [e]	J	0.000042	U	0.000049	U	0.000041	U	0.000044	U	0.000045	U	0.000049	U	0.000043	U	0.000044	U	0.00082 [e]		0.000053	U
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033	0.00053 [e]		0.00056		0.000048	U	0.000056	U	0.00029 [e]	J	0.00005	U	0.00038 [e]	J	0.000056	U	0.00037	J	0.000051	U	0.00078		0.00006	U
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033	0.0029 [e]		0.0012 [e]		0.00007	U	0.000082	U	0.00096 [e]		0.0021 [e]		0.00047		0.000081	U	0.0012		0.00024	J	0.0067 [e]		0.000088	U
Endrin	72-20-8	mg/kg	0.06	11	0.014	0.000059	U	0.000061	U	0.000058	U	0.000068	U	0.000056	U	0.000061 [a]	U	0.000062 [a]	U	0.000067 [a]	U	0.00006 [a]	U	0.000061 [a]	U	0.000058 [a]	U	0.000073 [a]	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4	0.0005 [e]		0.00035 [e]	J	0.000048	U	0.000056	U	0.000047	U	0.00005	U	0.000051	U	0.000056	U	0.000049	U	0.000051	U	0.000048	U	0.00006	U
Endrin aldehyde	7421-93-4	mg/kg				0.00012	U	0.00012	U	0.00012	U	0.00014	U	0.00011	U	0.00012	U	0.00012	U	0.00013	U	0.00012	U	0.00012	U	0.00012	U	0.00015	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4	0.000055	U	0.000056	U	0.000054	U	0.000063	U	0.000053	U	0.000056	U	0.000057	U	0.000063	U	0.000056	U	0.000057	U	0.000054	U	0.000068	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4	0.00042 [e]		0.000088 [e]	J	0.000056	U	0.000065	U	0.000054	U	0.00071 [e]		0.00047 [e]		0.000065	U	0.00017 [e]	J	0.00011 [e]	J	0.0036 [e]		0.000071	U
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042	0.00018 [e]	J	0.000054	U	0.000052	U	0.000061	U	0.000051	U	0.000054	U	0.000055	U	0.00006	U	0.000053	U	0.000055	U	0.000052	U	0.000066	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02			0.00025 [e]	J	0.00018 [e]	J	0.000072	U	0.000084	U	0.000082 [e]	J	0.000075	U	0.000076	U	0.000083	U	0.000074	U	0.000076	U	0.00073 [e]		0.000091	U
Methoxychlor	72-43-5	mg/kg	900			0.00016	U	0.00016	U	0.00016	U	0.00018	U	0.00015	U	0.00017	U	0.00017	U	0.00018	U	0.00016	U	0.00017	U	0.00016	U	0.0002	U
Endrin ketone	53494-70-5	mg/kg				0.000065	U	0.000067	U	0.000064	U	0.000075	U	0.000062	U	0.000067	U	0.000068	U	0.000074	U	0.000066	U	0.000067	U	0.000064	U	0.000081	U
Toxaphene	8001-35-2	mg/kg				0.0034	U	0.0034	U	0.0033	U	0.0039	U	0.0032	U	0.0034	U	0.0035	U	0.0038	U	0.0034	U	0.0035	U	0.0033	U	0.0042	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1	0.0086	U	0.0089	U	0.0086	U	0.0099	U	0.0083	U	0.0089	U	0.009	U	0.0098	U	0.0087	U	0.0089	U	0.0085	U	0.011	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1	0.0068	U	0.007	U	0.0068	U	0.0079	U	0.0065	U	0.007	U	0.0071	U	0.0078	U	0.0069	U	0.0071	U	0.0067	U	0.0085	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1	0.017	U	0.017	U	0.017	U	0.019	U	0.016	U	0.017	U	0.018	U	0.019	U	0.017	U	0.017	U	0.017	U	0.021	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1	0.012	U	0.013	U	0.012	U	0.014	U	0.012	U	0.013	U	0.013	U	0.014	U	0.012	U	0.013	U	0.012	U	0.015	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1	0.0044	U	0.0045	U	0.0043	U	0.005	U	0.0042	U	0.0045	U	0.0046	U	0.005	U	0.0044	U	0.0045	U	0.0043	U	0.0054	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1	0.0262		0.0113	J	0.0022	U	0.0025	U	0.0115 [j]	J	0.0023	U	0.0023	U	0.0025	U	0.0141	J	0.0023	U	0.0022	U	0.0027	U
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1	0.007	U	0.0072	U	0.0069	U	0.0081	U	0.0067	U	0.0072	U	0.0073	U	0.008	U	0.0071	U	0.0073	U	0.0069	U	0.0087	U
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1	0.0021	U	0.0021	U	0.002	U	0.0024	U	0.002	U	0.0021	U	0.0021	U	0.0023	U	0.0021	U	0.0021	U	0.002	U	0.0025	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1	0.0017	U	0.0017	U	0.0017	U	0.0019	U	0.0016	U	0.0017	U	0.0018	U	0.0019	U	0.0017	U	0.0018	U	0.0017	U	0.0021	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27	0.26	U	0.32	U	0.3	U	0.25	U	0.23	U	0.27	U	0.25	U	0.24	U	0.28	U	0.23	U	0.27	U	0.37	U
Solids, Percent	PERCENT SOLIDS	%				94.7		90.4		93.7		85.6		93.5		93.8		90.6		83		93.5		95		94		73.5	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg				7620		7260		5680		6220		6910		8870		15300		7600		5970		7090		9180		12400	
Antimony	7440-36-0	mg/kg				2.1	U	2.3	U	2.1	U	2.3	U	2.1	U	2.1	U	4.5 [l]	U	2.5	U	2.1	U	2.1	U	2.2	U	2.7	U
Arsenic	7440-38-2	mg/kg	16	16	13	4		2.3	U	2.1	U	2.3	U	2.1	U	2.1	U	3.9		2.5	U	2.1	U	2.1	U	2.2	U	2.7	U
Barium	7440-39-3	mg/kg	820	410	410	79.4		71.4		30.6		39.8		75.5		97.2		118		60.2		77.1		61.7		77.7		98.6	
Beryllium	7440-41-7	mg/kg	47	43	4.4	0.25		0.25		0.21	U	0.23		0.22		0.26		0.46		0.25	U	0.21	U	0.21		0.28		0.39	
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5	0.53	U	0.58	U	0.53	U	0.57	U	0.53	U	0.52	U	0.56	U	0.63	U	0.53	U	0.53	U	0.56	U	0.67	U
Calcium	7440-70-2	mg/kg				8650		5690		1260		1320		7350		4130		2620		1460		6890		1560		2210		2210	
Chromium	7440-47-3	mg/kg	19	110	30	14.1		13.3		10.1		11.7		14.1		20.7		24.4		14.5		11.1		12.9		17.7		23.4	
Cobalt	7440-48-4	mg/kg				5.6		5.8	U	5.3	U	5.9		5.4		6.5		10.2		6.3	U	5.3	U	5.4		6.1		8.8	
Copper	7440-50-8	mg/kg	1720	280	50	20.1		16.3		11.1		13.1		15.3		19.8		22.8 [l]		13.5		13.2		16.2		20.7		22.3	
Iron	7439-89-6	mg/kg				13500		13000		9040		12100		12600		14900		23700		15400		10000		11300		14300		21500	
Lead	7439-92-1	mg/kg	450	400	63	49.8		39.7		2.8		2.8		48.3		41.7		75.4		3.2		45.7		7.3		24.1		5.5	
Magnesium	7439-95-4	mg/kg				3630		2800		2990		2930		3740		4020		5540		4200		3570		2600		3290		6650	
Manganese	7439-96-5	mg/kg	2000	2000	1600	246		186		174		349		215		228		303		439		196		226		233		270	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18	0.047		0.03	U	0.031	U	0.036	U	0.17		0.053		0.19		0.034	U	0.11		0.03	U	0.033	U	0.04	U
Nickel	7440-02-0	mg/kg	130	320	30	11.2		10.6		8.7		11.9		11.1		14.3		19.2		13		9.5		11.5		13.7		20.1	
Potassium	7440-09-7	mg/kg				1770		1430		1290		1500		1690		2380		3750		2090		1470		1310		2030		4210	
Selenium	7782-49-2	mg/kg	4	110	3.9	2.1	U	2.3	U	2.1	U	2.3	U	2.1	U	2.1	U	4.5 [l]	U	2.5	U	2.1	U	2.1	U	2.2	U	2.7	U
Silver	7440-22-4	mg/kg	8.3	110	2	0.53	U	0.58	U	0.53	U	0.57	U	0.53	U	0.52	U	0.56	U	0.63	U	0.53	U	0.53	U	0.56	U	0.67	U
Sodium	7440-23-5	mg/kg				1100	U	1200	U	1100	U	1100	U	1100	U	1000	U	1100	U	1300	U	1100	U	1100	U	1100	U	1300	U
Thallium	7440-28-0	mg/kg				1.1	U	1.2	U	1.1	U	1.1	U	1.1	U	1	U	1.1	U	1.3	U	1.1	U	1.1	U	1.1	U	1.3	U
Vanadium	7440-62-2	mg/kg				19.3		18.7		13.3		16.4		19.9		26.7		33.3		19.3		14.6		17.9		22.2		32.1	
Zinc	7440-66-6	mg/kg	2480	6600	109	56.3		44.2		23.7		26.4		40.5		40.8		101		35.5		39.2		24.2		45.1		58.5	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 8 (3.5-4)		RI-SB 8 (5-5.5)		RI-SB 8 (10.5-11)		RI-SB 8 (17-17.5)		RI-SB 7 (2-2.5)		RI-SB 7 (5.5-6)		RI-SB 7 (10-10.5)		RI-SB 7 (17-17.5)		RI-SB 6 (2-2.5)		RI-SB 6 (7.5-8)		RI-SB 6 (11.5-12)		RI-SB 6 (17.5-18)	
Lab Sample ID:						JE17599-13		JE17599-14		JE17599-15		JE17599-16		JE17599-17		JE17599-18		JE17599-19		JE17599-20		JE17599-21		JE17599-22		JE17599-23		JE17599-24	
Date Sampled:						8/22/2025 12:20 PM		8/22/2025 12:21 PM		8/22/2025 12:22 PM		8/22/2025 12:23 PM		8/22/2025 1:20 PM		8/22/2025 1:21 PM		8/22/2025 1:22 PM		8/22/2025 1:23 PM		8/22/2025 2:20 PM		8/22/2025 2:21 PM		8/22/2025 2:22 PM		8/22/2025 2:23 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00011	U	0.00012	U	0.00012	U	0.00013	U	0.00011	U	0.00012	U	0.00012	U	0.00013	U	0.00011	U	0.00011	U	0.00012	U	0.00015	U
Perfluoropentanoic acid	2706-90-3	mg/kg				0.000072	U	0.000077	U	0.000074	U	0.000082	U	0.000073	U	0.000074	U	0.000076	U	0.000081	U	0.000072	U	0.000072	U	0.000074	U	0.000093	U
Perfluorohexanoic acid	307-24-4	mg/kg				0.000031	U	0.000033	U	0.000032	U	0.000035	U	0.000031	U	0.000032	U	0.000033	U	0.000035	U	0.000031	U	0.000031	U	0.000032	U	0.00004	U
Perfluoroheptanoic acid	375-85-9	mg/kg				0.000051	U	0.000055	U	0.000053	U	0.000058	U	0.000052	U	0.000053	U	0.000055	U	0.000058	U	0.000051	U	0.000051	U	0.000053	U	0.000066	U
Perfluorooctanoic acid	335-67-1	mg/kg				0.000083	J	0.000088	U	0.00013	J	0.000093	U	0.000083	U	0.000085	U	0.000087	U	0.000093	U	0.000082	U	0.000082	U	0.000084	U	0.00011	U
Perfluorononanoic acid	375-95-1	mg/kg				0.000073	J	0.000055	U	0.000053	U	0.000058	U	0.000052	U	0.000053	U	0.000055	U	0.000058	U	0.00011	J	0.000051	U	0.000053	U	0.000066	U
Perfluorodecanoic acid	335-76-2	mg/kg				0.000072	U	0.000077	U	0.000074	U	0.000082	U	0.000073	U	0.000074	U	0.000076	U	0.000081	U	0.000072	U	0.000072	U	0.000074	U	0.000093	U
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000062	U	0.000066	U	0.000064	U	0.00007	U	0.000062	U	0.000064	U	0.000065	U	0.00007	U	0.000062	U	0.000062	U	0.000063	U	0.000079	U
Perfluorododecanoic acid	307-55-1	mg/kg				0.000082	U	0.000088	U	0.000085	U	0.000093	U	0.000083	U	0.000085	U	0.000087	U	0.000093	U	0.000082	U	0.000082	U	0.000084	U	0.00011	U
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.000093	U	0.000099	U	0.000095	U	0.0001	U	0.000094	U	0.000096	U	0.000098	U	0.0001	U	0.000093	U	0.000093	U	0.000095	U	0.00012	U
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.0001	U	0.00011	U	0.00011	U	0.00012	U	0.0001	U	0.00011	U	0.00011	U	0.00012	U	0.0001	U	0.0001	U	0.00011	U	0.00013	U
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.000072	U	0.000077	U	0.000074	U	0.000082	U	0.000073	U	0.000074	U	0.000076	U	0.000081	U	0.000072	U	0.000072	U	0.000074	U	0.000093	U
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00011	U	0.00012	U	0.00012	U	0.00013	U	0.00011	U	0.00012	U	0.00012	U	0.00013	U	0.00011	U	0.00011	U	0.00012	U	0.00015	U
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.0001	U	0.00011	U	0.00011	U	0.00012	U	0.0001	U	0.00011	U	0.00011	U	0.00012	U	0.0001	U	0.0001	U	0.00011	U	0.00013	U
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.00096		0.000055	U	0.000053	U	0.000058	U	0.00067		0.00013	J	0.000055	U	0.000058	U	0.00061		0.0002	J	0.00043		0.00011	J
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00011	U	0.00012	U	0.00012	U	0.00013	U	0.00011	U	0.00012	U	0.00012	U	0.00013	U	0.00011	U	0.00011	U	0.00012	U	0.00015	U
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.0001	U	0.00011	U	0.00011	U	0.00012	U	0.0001	U	0.00011	U	0.00011	U	0.00012	U	0.0001	U	0.0001	U	0.00011	U	0.00013	U
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.0002	U	0.00021	U	0.0002	U	0.00022	U	0.0002	U	0.0002	U	0.00021	U	0.00022	U	0.0002	U	0.0002	U	0.0002	U	0.00025	U
PFOSA	754-91-6	mg/kg				0.000072	U	0.000077	U	0.000074	U	0.000082	U	0.000073	U	0.000074	U	0.000076	U	0.000081	U	0.000072	U	0.000072	U	0.000074	U	0.000093	U
MeFOSAA	2355-31-9	mg/kg				0.000082	U	0.000088	U	0.000085	U	0.000093	U	0.000083	U	0.000085	U	0.000087	U	0.000093	U	0.000082	U	0.000082	U	0.000084	U	0.00011	U
EtFOSAA	2991-50-6	mg/kg				0.00013	U	0.00014	U	0.00014	U	0.00015	U	0.00014	U	0.00014	U	0.00014	U	0.00015	U	0.00013	U	0.00013	U	0.00014	U	0.00017	U
2-Chlorophenol	95-57-8	mg/kg				0.017	U	0.018	U	0.017	U	0.019	U	0.017	U	0.018	U	0.018	U	0.02	U	0.017	U	0.017	U	0.018	U	0.022	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg				0.022	U	0.023	U	0.022	U	0.023	U	0.021	U	0.022	U	0.022	U	0.024	U	0.021	U	0.021	U	0.022	U	0.028	U
2,4-Dichlorophenol	120-83-2	mg/kg				0.03	U	0.031	U	0.03	U	0.032	U	0.029	U	0.03	U	0.031	U	0.034	U	0.029	U	0.029	U	0.03	U	0.039	U
2,4-Dimethylphenol	105-67-9	mg/kg				0.063	U	0.065	U	0.063	U	0.067	U	0.061	U	0.063	U	0.064	U	0.071	U	0.061	U	0.061	U	0.063	U	0.08	U
2,4-Dinitrophenol	51-28-5	mg/kg				0.13 [a]	U	0.14 [a]	U	0.13 [a]	U	0.14 [a]	U	0.13 [a]	U	0.13 [a]	U	0.14 [a]	U	0.15 [a]	U	0.13 [a]	U	0.13 [a]	U	0.13 [a]	U	0.17 [a]	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg				0.038 [a]	U	0.039 [a]	U	0.038 [a]	U	0.04 [a]	U	0.037 [a]	U	0.038 [a]	U	0.039 [a]	U	0.042 [a]	U	0.037 [a]	U	0.037 [a]	U	0.038 [a]	U	0.048 [a]	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33	0.022	U	0.023	U	0.023	U	0.024	U	0.022	U	0.023	U	0.023	U	0.025	U	0.022	U	0.022	U	0.023	U	0.029	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33	0.029	U	0.03	U	0.029	U	0.031	U	0.028	U	0.029	U	0.03	U	0.033	U	0.028	U	0.028	U	0.029	U	0.037	U
2-Nitrophenol	88-75-5	mg/kg				0.023 [a]	U	0.024 [a]	U	0.023 [a]	U	0.025 [a]	U	0.023 [a]	U	0.023	U	0.024 [a]	U	0.026 [a]	U	0.023 [a]	U	0.023 [a]	U	0.023	U	0.03 [a]	U
4-Nitrophenol	100-02-7	mg/kg				0.094	U	0.098	U	0.094	U	0.1	U	0.092 [b]	U	0.095	U	0.096 [b]	U	0.11	U	0.092	U	0.092	U	0.095	U	0.12 [b]	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8	0.033	U	0.035	U	0.033	U	0.035	U	0.032 [b]	U	0.033	U	0.034 [b]	U	0.037	U	0.032	U	0.032	U	0.033	U	0.042 [b]	U
Phenol	108-95-2	mg/kg	0.33	100	0.33	0.018	U	0.019	U	0.018	U	0.02	U	0.018	U	0.019	U	0.019	U	0.021	U	0.018	U	0.018	U	0.019	U	0.024	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg				0.023	U	0.024	U	0.023	U	0.025	U	0.023	U	0.024	U	0.024	U	0.026	U	0.023	U	0.023	U	0.023	U	0.03	U
2,4,5-Trichlorophenol	95-95-4	mg/kg				0.026	U	0.028	U	0.026	U	0.028	U	0.026	U	0.027	U	0.027	U	0.03	U	0.026	U	0.026	U	0.027	U	0.034	U
2,4,6-Trichlorophenol	88-06-2	mg/kg				0.021	U	0.022	U	0.021	U	0.022	U	0.021	U	0.021	U	0.021	U	0.024	U	0.02	U	0.021	U	0.021	U	0.027	U
Acenaphthene	83-32-9	mg/kg	98	100	20	0.0364		1.25		0.012	U	0.013	U	0.0314	J	0.189		0.078		0.014	U	0.0133	J	0.012	U	0.962		0.016	U
Acenaphthylene	208-96-8	mg/kg	365	100	100	0.0263	J	0.141		0.018	U	0.019	U	0.018	U	0.0197	J	0.0183	J	0.02	U	0.017	U	0.0257	J	0.13		0.023	U
Acetophenone	98-86-2	mg/kg				0.0076	U	0.0079	U	0.0076	U	0.0081	U	0.0074	U	0.0076	U	0.0078	U	0.0085	U	0.0074	U	0.0074	U	0.0076	U	0.0097	U
Anthracene	120-12-7	mg/kg	1000	100	100	0.114		3.14		0.022	U	0.023	U	0.0683		0.438		0.169		0.024	U	0.0319	J	0.021	U	1.98		0.028	U
Atrazine	1912-24-9	mg/kg				0.015	U	0.016	U	0.015	U	0.016	U	0.015	U	0.015	U	0.015	U	0.017	U	0.015	U	0.015	U	0.015	U	0.019	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1	0.38		5.28		0.01	U	0.011	U	0.194		1.22		0.491		0.011	U	0.078		0.0458		4.46		0.013	U
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1	0.361		4.65		0.016	U	0.017	U	0.19		1.1		0.405		0.018	U	0.0791		0.0675		3.08		0.021	U
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1	0.436		5.45		0.016	U	0.017	U	0.255		1.2		0.465		0.018	U	0.102		0.073		3.28		0.02	U
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64	0.268		2.83		0.018	U	0.019	U	0.128		0.758		0.23		0.02	U	0.0688		0.0843		1.88		0.023	U
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8	0.147		1.68		0.017	U	0.018	U	0.0727		0.397		0.16		0.019	U	0.035		0.0213	J	1.19		0.021	U
4-Bromophenyl phenyl ether	101-55-3	mg/kg				0.014	U	0.014	U	0.014	U	0.015	U	0.013	U	0.014	U	0.014	U	0.015	U	0.013	U	0.013	U	0.014	U	0.017	U
Butyl benzyl phthalate	85-68-7	mg/kg				0.0086	U	0.009	U	0.0086	U	0.0092	U	0.0084 [a]	U	0.0087	U	0.115 [c]		0.0097	U	0.0084	U	0.0084	U	0.0087	U	0.011 [a]	U
1,1'-Biphenyl	92-52-4	mg/kg				0.0052	J	0.127		0.0048	U	0.0052	U	0.0047	U	0.0096	J	0.0063	J	0.0054	U	0.0047	U	0.0047	U	0.0768		0.0062	U
Benzaldehyde	100-52-7	mg/kg				0.0087	U	0.0091	U	0.0088	U	0.0093	U	0.0086	U	0.0088	U	0.0089	U	0.0098	U	0.0085	U	0.0086	U	0.0088	U	0.011	U
2-Chloronaphthalene	91-58-7	mg/kg				0.0084	U	0.0087	U	0.0084	U	0.009	U	0.0082	U	0.0085	U	0.0086	U	0.0094	U	0.0082	U	0.0082	U	0.0084	U	0.011	U
4-Chloroaniline	106-47-8	mg/kg				0.013	U	0.013	U	0.013	U	0.014	U	0.012	U	0.013	U	0.013	U	0.014	U	0.012	U	0.012	U	0.013	U	0.016	U
Carbazole	86-74-8	mg/kg				0.0355	J	0.732		0.0051	U	0.0055	U	0.0384	J	0.0975		0.0551	J	0.0057	U	0.0153	J	0.005	U	0.417		0.0066	U
Caprolactam	105-60-2	mg/kg				0.014	U	0.015	U	0.014	U	0.015	U	0.014	U	0.014	U	0.014	U	0.016	U	0.014	U	0.014	U	0.014	U	0.018	U
Chrysene	218-01-9	mg/kg	1	4.9	1	0.335		4.59		0.011	U	0.012	U	0.166		1.23		0.43		0.012	U	0.0782		0.0407		4.6		0.014	U
bis(2-Chloroethoxy)methane	111-91-1	mg/kg				0.0075	U	0.0079	U	0.0076	U	0.0081	U	0.0074	U	0.0076	U	0.0077	U	0.0085	U	0.0074	U	0.0074	U	0.0076	U	0.0097	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg				0.015	U	0.016	U	0.015	U	0.016	U	0.015 [a]	U	0.015	U	0.016 [a]	U	0.017	U	0.015	U	0.015	U	0.015	U	0.019 [a]	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg				0.013	U	0.013	U	0.013	U	0.014	U	0.012	U	0.013	U	0.013	U	0.014	U	0.012	U	0.012	U	0.013	U	0.016	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg				0.011	U	0.012	U	0.011	U	0.012	U	0.011	U	0.012	U	0.012	U	0.013	U	0.011	U	0.011	U	0.011	U	0.015	U
2,4-Dinitrotoluene	121-14-2	mg/kg				0.011	U	0.011	U	0.011	U	0.012	U	0.011	U	0.011	U	0.011	U	0.012	U	0.011	U	0.011	U	0.011	U	0.014	U
2,6-Dinitrotoluene	606-20-2	mg/kg				0.018 [a]	U	0.018 [a]	U	0.018 [a]	U	0.019 [a]	U	0.017	U	0.018	U	0.018	U	0.02 [a]	U	0.017 [a]	U	0.017 [a]	U	0.018	U	0.023	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg				0.029	U	0.031	U	0.029	U	0.031	U	0.029	U	0.03	U	0.03	U	0.033	U	0.029	U	0.029	U	0.03	U	0.038	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1	0.023	U	0.024	U	0.023	U	0.025	U	0.023	U	0.023	U	0.024	U	0.026	U	0.023	U	0.023	U	0.023	U	0.03	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33	0.0597		0.74		0.016	U	0.017	U	0.032	J	0.159		0.0652		0.018	U	0.0155	J	0.015	U	0.465		0.02	U
Dibenzofuran	132-64-9	mg/kg	110	18	2.1	0.0205	J	0.849		0.014	U	0.015	U	0.0143	J	0.0805		0.0423	J	0.016	U	0.014	U	0.014	U	0.606		0.018	U
Di-n-butyl phthalate	84-74-2	mg/kg				0.0057	U	0.006	U	0.0058	U	0.0061	U	0.0056	U	0.0058	U	0.0059	U	0.0065	U	0.0072	J	0.0057	J	0.0058	U	0.0074	U
Di-n-octyl phthalate	117-84-0	mg/kg				0.0088	U	0.0092	U	0.0088	U	0.0094	U	0.0086 [a]	U	0.0088	U	0.009 [a]	U	0.0099	U	0.0086	U	0.0086	U	0.0088	U	0.011 [a]	U
Diethyl phthalate	84-66-2	mg/kg				0.0075	U	0.0078	U	0.0075	U	0.008	U	0.0073	U	0.0076	U	0.0077	U	0.0084	U	0.0073	U	0.0074	U	0.0076	U	0.0096	U
Dimethyl phthalate	131-11-3	mg/kg				0.0063	U	0.0065	U	0.0063	U	0.0067	U	0.0061	U	0.0063	U	0.0064	U	0.0071	U	0.0061	U	0.0061	U	0.0063	U	0.008	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg				0.0082	U	0.0103	J	0.0083	U	0.0088	U	0.011 [c]	J	0.0083	U	0.0127 [c]	J	0.0093	U	0.008	U	0.0081	U	0.0083	U	0.011 [a]	U
Fluoranthene	206-44-0	mg/kg	1000	100	85	0.655		12.1		0.016	U	0.017	U	0.405		2.29		0.895		0.018	U	0.163		0.0527		8.11		0.02	U
Fluorene	86-73-7	mg/kg	386	100	30	0.0349	J	1.65		0.016	U	0.017	U	0.0283	J	0.156		0.0669		0.018	U	0.016	U	0.016	U	0.977		0.021	U
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33	0.0089	U	0.0093	U	0.0089	U	0.0095	U	0.0087	U	0.009	U	0.0091	U	0.01	U	0.0087	U	0.0087	U	0.009	U	0.011	U
Hexachlorobutadiene	87-68-3	mg/kg				0.014	U	0.015	U	0.014	U	0.015	U	0.014	U	0.014	U	0.015	U	0.016	U	0.014	U	0.014	U	0.014	U	0.018	U
Hexachlorocyclopentadiene	77-47-4	mg/kg				0.014	U	0.015	U	0.014	U	0.015	U	0.014 [b]	U	0.014 [a]	U	0.014 [b]	U	0.016	U	0.014	U	0.014	U	0.014 [a]	U	0.018 [b]	U
Hexachloroethane	67-72-1	mg/kg				0.017	U	0.018	U	0.017	U	0.019	U	0.017	U	0.018	U	0.018	U	0.02	U	0.017	U	0.017	U	0.018	U	0.022	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5	0.217		2.51		0.017	U	0.018	U	0.0998		0.737		0.187		0.019	U	0.0518		0.055		1.87		0.021	U
Isophorone	78-59-1	mg/kg				0.0075	U	0.0079	U	0.0076	U	0.0081	U	0.0074	U	0.0076	U	0.0077	U	0.0085	U	0.0074	U	0.0074	U	0.0076	U	0.0097	U
2-Methylnaphthalene	91-57-6	mg/kg				0.0162	J	0.331		0.008	U	0.0085	U	0.0086	J	0.0266	J	0.0207	J	0.009	U	0.0078	U	0.0078	U	0.248		0.01	U
2-Nitroaniline	88-74-4	mg/kg				0.0083	U	0.0087	U	0.0083	U	0.0089	U	0.0081	U	0.0084	U	0.0085	U	0.0094	U	0.0081	U	0.0081	U	0.0084	U	0.011	U
3-Nitroaniline	99-09-2	mg/kg				0.0088	U	0.0092	U	0.0088	U	0.0094	U	0.0086	U	0.0089	U	0.009	U	0.0099	U	0.0086	U	0.0086	U	0.0089	U	0.011	U
4-Nitroaniline	100-01-6	mg/kg				0.0091	U	0.0095	U	0.0092	U	0.0098	U	0.0089	U	0.0092	U	0.0093	U	0.01	U	0.0089	U	0.0089	U	0.0092	U	0.012	U
Naphthalene	91-20-3	mg/kg	12	100	12	0.0285	JB	0.345	B	0.01	U	0.011	U	0.0219	J	0.0233	J	0.0267	J	0.011	U	0.0138	JB	0.0097	U	0.247		0.013	U
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08	0.014	U	0.014	U	0.014	U	0.015	U	0.013	U	0.014	U	0.014	U	0.015	U	0.013	U	0.013	U	0.014	U	0.017	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg				0.01	U	0.011	U	0.01	U	0.011	U	0.01	U	0.01	U	0.01	U	0.011	U	0.0099	U	0.01	U	0.01	U	0.013	U
N-Nitrosodiphenylamine	86-30-6	mg/kg				0.013	U	0.013	U	0.013	U	0.014	U	0.013	U	0.013	U	0.013	U	0.015	U	0.013	U	0.013	U	0.013	U	0.017	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1	0.416		11.3		0.012	U	0.013	U	0.278		2.2		0.912		0.013	U	0.11		0.0268	J	10.9		0.015	U
Pyrene	129-00-0	mg/kg	1000	100	64	0.788		10.4		0.0139 [d]	J	0.012 [a]	U	0.396		2.98		1.13		0.013 [a]	U	0.166		0.0722 [d]		9.73		0.014	U
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg				0.0089	U	0.0093	U	0.009	U	0.0096	U	0.0088	U	0.009	U	0.0092	U	0.01	U	0.0087	U	0.0088	U	0.009	U	0.011	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 8 (3.5-4)		RI-SB 8 (5-5.5)		RI-SB 8 (10.5-11)		RI-SB 8 (17-17.5)		RI-SB 7 (2-2.5)		RI-SB 7 (5.5-6)		RI-SB 7 (10-10.5)		RI-SB 7 (17-17.5)		RI-SB 6 (2-2.5)		RI-SB 6 (7.5-8)		RI-SB 6 (11.5-12)		RI-SB 6 (17.5-18)	
Lab Sample ID:						JE17599-13		JE17599-14		JE17599-15		JE17599-16		JE17599-17		JE17599-18		JE17599-19		JE17599-20		JE17599-21		JE17599-22		JE17599-23		JE17599-24	
Date Sampled:						8/22/2025 12:20 PM		8/22/2025 12:21 PM		8/22/2025 12:22 PM		8/22/2025 12:23 PM		8/22/2025 1:20 PM		8/22/2025 1:21 PM		8/22/2025 1:22 PM		8/22/2025 1:23 PM		8/22/2025 2:20 PM		8/22/2025 2:21 PM		8/22/2025 2:22 PM		8/22/2025 2:23 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03	0.0046	U	0.0049	U	0.0049	U	0.0041	U	0.0046	U	0.0037	U	0.0127		0.0051 [d]	J	0.0038 [a]	U	0.0039 [a]	U	0.0059 [d]	J	0.0049 [a]	U
Benzene	71-43-2	mg/kg	0.06	3.7	0.06	0.0005	U	0.00054	U	0.00054	U	0.00045	U	0.00051	U	0.0004	U	0.00042	U	0.00054	U	0.00041	U	0.00043	U	0.00042	U	0.00053	U
Bromochloromethane	74-97-5	mg/kg				0.00062	U	0.00066	U	0.00066	U	0.00055	U	0.00062	U	0.0005	U	0.00052	U	0.00066	U	0.00051	U	0.00053	U	0.00051	U	0.00066	U
Bromodichloromethane	75-27-4	mg/kg				0.00047	U	0.0005	U	0.00051	U	0.00042	U	0.00048	U	0.00038	U	0.00039	U	0.00051	U	0.00039	U	0.0004	U	0.00039	U	0.0005	U
Bromoform	75-25-2	mg/kg				0.0015	U	0.0016	U	0.0016	U	0.0013	U	0.0015	U	0.0012	U	0.0013	U	0.0016	U	0.0012	U	0.0013	U	0.0012	U	0.0016	U
Bromomethane	74-83-9	mg/kg				0.00084	U	0.0009	U	0.00091	U	0.00076	U	0.00085	U	0.00068	U	0.0007	U	0.0009	U	0.00069	U	0.00072	U	0.0007	U	0.0009	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1	0.0027	U	0.0029	U	0.0029	U	0.0024	U	0.0027	U	0.0022	U	0.0022	U	0.0029	U	0.0022	U	0.0023	U	0.0022	U	0.0029	U
Carbon disulfide	75-15-0	mg/kg				0.00059	U	0.00063	U	0.00063	U	0.00053	U	0.0006	U	0.00048	U	0.00049	U	0.00063	U	0.00048	U	0.0005	U	0.00049	U	0.00063	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76	0.00068	U	0.00073	U	0.00073	U	0.00061	U	0.00069	U	0.00055	U	0.00057	U	0.00073	U	0.00056	U	0.00058	U	0.00057	U	0.00072	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5	0.0005	U	0.00054	U	0.00054	U	0.00045	U	0.00051	U	0.00041	U	0.00042	U	0.00054	U	0.00042	U	0.00043	U	0.00042	U	0.00054	U
Chloroethane	75-00-3	mg/kg				0.00065	U	0.0007	U	0.0007	U	0.00059	U	0.00066	U	0.00053	U	0.00054	U	0.0007 [a]	U	0.00054 [a]	U	0.00056 [a]	U	0.00054 [a]	U	0.00069 [a]	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37	0.0011	U	0.0012	U	0.0012	U	0.00099	U	0.0011	U	0.00089	U	0.00092	U	0.0012	U	0.00091	U	0.00094	U	0.00092	U	0.0012	U
Chloromethane	74-87-3	mg/kg				0.0022	U	0.0023	U	0.0023	U	0.0019	U	0.0022	U	0.0017	U	0.0018	U	0.0023	U	0.0018	U	0.0018	U	0.0018	U	0.0023	U
Cyclohexane	110-82-7	mg/kg				0.00072	U	0.00077	U	0.00078	U	0.00065	U	0.00073	U	0.00058	U	0.0006	U	0.00078	U	0.0006	U	0.00062	U	0.0006	U	0.00077	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg				0.00076	U	0.00082	U	0.00082	U	0.00069	U	0.00077	U	0.00062	U	0.00064	U	0.00082	U	0.00063	U	0.00065	U	0.00064	U	0.00081	U
Dibromochloromethane	124-48-1	mg/kg				0.00062	U	0.00066	U	0.00066	U	0.00055	U	0.00062	U	0.0005	U	0.00052	U	0.00066	U	0.00051	U	0.00053	U	0.00051	U	0.00066	U
1,2-Dibromoethane	106-93-4	mg/kg				0.00046	U	0.0005	U	0.0005	U	0.00042	U	0.00047	U	0.00037	U	0.00039	U	0.0005	U	0.00038	U	0.0004	U	0.00039	U	0.00049	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1	0.0006	U	0.00064	U	0.00065	U	0.00054	U	0.00061	U	0.00049	U	0.0005	U	0.00064	U	0.00049	U	0.00051	U	0.0005	U	0.00064	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6	0.00055	U	0.00058	U	0.00059	U	0.00049	U	0.00055	U	0.00044	U	0.00046	U	0.00059	U	0.00045	U	0.00047	U	0.00045	U	0.00058	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8	0.00054	U	0.00058	U	0.00059	U	0.00049	U	0.00055	U	0.00044	U	0.00045	U	0.00058	U	0.00045	U	0.00046	U	0.00045	U	0.00058	U
Dichlorodifluoromethane	75-71-8	mg/kg				0.0008	U	0.00086	U	0.00086	U	0.00072	U	0.00081	U	0.00065	U	0.00067	U	0.00086	U	0.00066	U	0.00068	U	0.00067	U	0.00085	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27	0.00054	U	0.00058	U	0.00059	U	0.00049	U	0.00055	U	0.00044	U	0.00046	U	0.00058	U	0.00045	U	0.00047	U	0.00045	U	0.00058	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02	0.00052	U	0.00055	U	0.00056	U	0.00047	U	0.00052	U	0.00042	U	0.00043	U	0.00056	U	0.00043	U	0.00044	U	0.00043	U	0.00055	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24	0.00072	U	0.00077	U	0.00078	U	0.00065	U	0.00073	U	0.00058	U	0.0006	U	0.00077	U	0.00059	U	0.00062	U	0.0006	U	0.00077	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19	0.00092	U	0.00099	U	0.001	U	0.00083	U	0.00094	U	0.00075	U	0.00077	U	0.00099	U	0.00076	U	0.00079	U	0.00077	U	0.00099	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19	0.00067	U	0.00072	U	0.00072	U	0.0006	U	0.00068	U	0.00054	U	0.00056	U	0.00072	U	0.00055	U	0.00057	U	0.00056	U	0.00072	U
1,2-Dichloropropane	78-87-5	mg/kg				0.00052	U	0.00056	U	0.00056	U	0.00047	U	0.00053	U	0.00042	U	0.00044	U	0.00056	U	0.00043	U	0.00044	U	0.00043	U	0.00055	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg				0.00052	U	0.00056	U	0.00056	U	0.00047	U	0.00053	U	0.00042	U	0.00044	U	0.00056	U	0.00043	U	0.00045	U	0.00044	U	0.00056	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg				0.0005	U	0.00054	U	0.00054	U	0.00045	U	0.00051	U	0.00041	U	0.00042	U	0.00054	U	0.00041	U	0.00043	U	0.00042	U	0.00054	U
Ethylbenzene	100-41-4	mg/kg	1	76	1	0.0005	U	0.00053	U	0.00054	U	0.00045	U	0.0005	U	0.0004	U	0.00042	U	0.00054	U	0.00041	U	0.00043	U	0.00042	U	0.00053	U
Freon 113	76-13-1	mg/kg				0.0029	U	0.0031	U	0.0032	U	0.0026	U	0.003	U	0.0024	U	0.0025	U	0.0032	U	0.0024	U	0.0025	U	0.0024	U	0.0031	U
2-Hexanone	591-78-6	mg/kg				0.0023	U	0.0025	U	0.0025	U	0.0021	U	0.0024	U	0.0019	U	0.0019	U	0.0025	U	0.0019	U	0.002	U	0.0019	U	0.0025	U
Isopropylbenzene	98-82-8	mg/kg				0.0016	U	0.0017	U	0.0017	U	0.0014	U	0.0016	U	0.0013	U	0.0013	U	0.0017	U	0.0013	U	0.0013	U	0.0013	U	0.0017	U
Methyl Acetate	79-20-9	mg/kg				0.0015	U	0.0016	U	0.0016	U	0.0014	U	0.0015	U	0.0012	U	0.0013	U	0.0016	U	0.0013	U	0.0013	U	0.0013	U	0.0016	U
Methylcyclohexane	108-87-2	mg/kg				0.00096	U	0.001	U	0.001	U	0.00087	U	0.00097	U	0.00078	U	0.0008	U	0.001	U	0.00079	U	0.00082	U	0.0008	U	0.001	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1	0.00052	U	0.00055	U	0.00056	U	0.00046	U	0.00052	U	0.00042	U	0.00043	U	0.00055	U	0.00043	U	0.00044	U	0.00043	U	0.00055	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg				0.0025	U	0.0027	U	0.0027	U	0.0022	U	0.0025	U	0.002	U	0.0021	U	0.0027	U	0.0021	U	0.0021	U	0.0021	U	0.0027	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05	0.0029	U	0.0031	U	0.0031	U	0.0026	U	0.0029	U	0.0023	U	0.0024	U	0.0031	U	0.0024	U	0.0025	U	0.0024	U	0.0031	U
Styrene	100-42-5	mg/kg				0.00044	U	0.00047	U	0.00048	U	0.0004	U	0.00045	U	0.00036	U	0.00037	U	0.00047	U	0.00036	U	0.00038	U	0.00037	U	0.00047	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg				0.00066	U	0.0007	U	0.00071	U	0.00059	U	0.00067	U	0.00053	U	0.00055	U	0.00071	U	0.00054	U	0.00056	U	0.00055	U	0.0007	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3	0.00064	U	0.00068	U	0.00069	U	0.00057	U	0.00065	U	0.00052	U	0.00053	U	0.00069	U	0.00053	U	0.00055	U	0.00053	U	0.00068	U
Toluene	108-88-3	mg/kg	0.7	100	0.7	0.00058	U	0.00062	U	0.00062	U	0.00052	U	0.00058	U	0.00047	U	0.00048	U	0.00062	U	0.00048	U	0.00049	U	0.00048	U	0.00062	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg				0.0027	U	0.0029	U	0.003	U	0.0025	U	0.0028	U	0.0022	U	0.0023	U	0.003	U	0.0023	U	0.0023	U	0.0023	U	0.0029	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg				0.0027	U	0.0029	U	0.003	U	0.0025	U	0.0028	U	0.0022	U	0.0023	U	0.003	U	0.0023	U	0.0023	U	0.0023	U	0.0029	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68	0.00053	U	0.00057	U	0.00057	U	0.00048	U	0.00054	U	0.00043	U	0.00044	U	0.00057	U	0.00044	U	0.00045	U	0.00044	U	0.00057	U
1,1,2-Trichloroethane	79-00-5	mg/kg				0.00061	U	0.00065	U	0.00066	U	0.00055	U	0.00062	U	0.00049	U	0.00051	U	0.00065	U	0.0005	U	0.00052	U	0.00051	U	0.00065	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47	0.00084	U	0.0009	U	0.0009	U	0.00075	U	0.00085	U	0.00068	U	0.0007	U	0.0009	U	0.00069	U	0.00072	U	0.0007	U	0.00089	U
Trichlorofluoromethane	75-69-4	mg/kg				0.00075	U	0.0008	U	0.00081	U	0.00068	U	0.00076	U	0.00061	U	0.00063	U	0.00081	U	0.00062	U	0.00064	U	0.00063	U	0.0008	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03	0.00053	U	0.00057	U	0.00057	U	0.00048	U	0.00054	U	0.00043	U	0.00044	U	0.00057	U	0.00044	U	0.00045	U	0.00044	U	0.00056	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26	0.00099	U	0.0011	U	0.0011	U	0.00089	U	0.001	U	0.0008	U	0.00082	U	0.0011	U	0.00081	U	0.00084	U	0.00082	U	0.0011	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26	0.0005	U	0.00054	U	0.00054	U	0.00045	U	0.00051	U	0.00041	U	0.00042	U	0.00054	U	0.00042	U	0.00043	U	0.00042	U	0.00054	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26	0.0005	U	0.00054	U	0.00054	U	0.00045	U	0.00051	U	0.00041	U	0.00042	U	0.00054	U	0.00042	U	0.00043	U	0.00042	U	0.00054	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

	= concentration exceeds USCO
	= concentration exceeds RRSCO
#	= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 5 (3-3.5)		RI-SB 5 (8-8.5)		RI-SB 5 (13.25-13.75)		RI-SB 5 (15-15.5)		DUP 20250822		RI-SB 4 (2.75-3.25)		RI-SB 4 (2.75-3.25)		RI-SB 4 (7-7.5)		RI-SB 4 (7-7.5)		RI-SB 4 (10-10.5)		RI-SB 4 (10-10.5)		RI-SB 4 (18-18.5)	
Lab Sample ID:						JE17599-25		JE17599-26		JE17599-27		JE17599-28		JE17599-31		JE17704-1		JE17704-1A		JE17704-2		JE17704-2A		JE17704-3		JE17704-3A		JE17704-4	
Date Sampled:						8/22/2025 4:10 PM		8/22/2025 4:11 PM		8/22/2025 4:12 PM		8/22/2025 4:13 PM		8/22/2025 12:00 AM		8/25/2025 8:50 AM		8/25/2025 8:50 AM		8/25/2025 8:51 AM		8/25/2025 8:51 AM		8/25/2025 8:52 AM		8/25/2025 8:52 AM		8/25/2025 8:53 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005	0.000085	U	0.00013	J	0.00046	U	0.00009	U	0.000076	U	0.00062	U			0.00057	U			0.00063	U			0.00062	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02	0.00005	U	0.00018 [e]	J	0.0006 [e]	J	0.000053	U	0.000045	U	0.00062	U			0.00056	U			0.00062	U			0.00062	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036	0.000063	U	0.000066	U	0.00034	U	0.000067	U	0.000057	U	0.00068	U			0.00062	U			0.00069	U			0.00068	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04	0.000065	U	0.000068	U	0.00035	U	0.00007	U	0.000059	U	0.00073	U			0.00066	U			0.00073	U			0.00073	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1	0.000076	U	0.00008	U	0.00041	U	0.000081	U	0.000068	U	0.00056	U			0.00051	U			0.00056	U			0.00056	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094	0.00061		0.003		0.0035		0.000063	U	0.00023 [e]	J	0.00061	U			0.00056	U			0.00061	U			0.00061	U
gamma-Chlordane	5103-74-2	mg/kg	14			0.00065		0.0032		0.0033 [e]		0.00007	U	0.00055		0.00034	U			0.00031	U			0.00034	U			0.00034	U
Chlordane (alpha and gamma)	57-74-9	mg/kg				0.0013		0.0062		0.0068		0.000063	U	0.00078		0.00034	U			0.00031	U			0.00034	U			0.00034	U
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005	0.0004	J	0.00071		0.0023	J	0.000074	U	0.00035	J	0.00052	U			0.00047	U			0.00052	U			0.00052	U
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033	0.0019		0.0131		0.0409		0.000049	U	0.00025 [e]	J	0.00093				0.00063	U			0.0007	U			0.00069	U
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033	0.00091		0.0028		0.0083		0.000056	U	0.00018 [e]	J	0.00066	U			0.00061	U			0.00067	U			0.00066	U
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033	0.00089		0.0154		0.0022	J	0.000081	U	0.0017 [e]		0.0011				0.00097				0.00067	U			0.00067	U
Endrin	72-20-8	mg/kg	0.06	11	0.014	0.000063 [a]	U	0.000066 [a]	U	0.00034	U	0.000067 [a]	U	0.000057 [a]	U	0.00059	U			0.00054	U			0.00059	U			0.00059	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4	0.000052	U	0.000055	U	0.00028	U	0.000056	U	0.000047	U	0.0012 [b]				0.00054	U			0.00059 [a]	U			0.00059 [a]	U
Endrin aldehyde	7421-93-4	mg/kg				0.00013	U	0.00013	U	0.00068	U	0.00013	U	0.00011	U	0.00043	U			0.00039	U			0.00043	U			0.00043	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4	0.000059	U	0.000061	U	0.00032	U	0.000063	U	0.000053	U	0.00044	U			0.0004	U			0.00044	U			0.00044	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4	0.00034 [e]	J	0.00028 [e]	J	0.00033	U	0.000065	U	0.00061 [e]		0.00056 [b]	J			0.00043	U			0.00047	U			0.00047	U
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042	0.000057	U	0.000059	U	0.00031	U	0.00006	U	0.000051	U	0.00065	U			0.0006	U			0.00065	U			0.00065	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02			0.000078	U	0.00026 [e]	J	0.00042	U	0.000083	U	0.00007	U	0.00053	U			0.00048	U			0.00053	U			0.00053	U
Methoxychlor	72-43-5	mg/kg	900			0.00017	U	0.00018	U	0.00093	U	0.00018	U	0.00015	U	0.0006	U			0.00055	U			0.0006	U			0.0006	U
Endrin ketone	53494-70-5	mg/kg				0.00007	U	0.000073	U	0.00038	U	0.000074	U	0.000063	U	0.00055	U			0.0005	U			0.00055 [a]	U			0.00055 [a]	U
Toxaphene	8001-35-2	mg/kg				0.0036	U	0.0038	U	0.019	U	0.0038	U	0.0032	U	0.018	U			0.016	U			0.018	U			0.018	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1	0.0093	U	0.0097	U	0.01	U	0.0099	U	0.0083	U	0.018	U			0.016	U			0.018	U			0.018	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1	0.0073	U	0.0076	U	0.0079	U	0.0078	U	0.0066	U	0.023	U			0.021	U			0.024	U			0.023	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1	0.018	U	0.019	U	0.02	U	0.019	U	0.016	U	0.024	U			0.022	U			0.024	U			0.024	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1	0.013	U	0.014	U	0.014	U	0.014	U	0.012	U	0.016	U			0.014	U			0.016	U			0.016	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1	0.0047	U	0.0049	U	0.0051	U	0.005	U	0.0042	U	0.034	U			0.031	U			0.034	U			0.034	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1	0.0097	J	0.0096	J	0.0071	J	0.0025	U	0.0065	J	0.02	U			0.019	U			0.02	U			0.02	U
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1	0.0075	U	0.0079	U	0.0115	J	0.008	U	0.0067	U	0.016	U			0.015	U			0.016	U			0.016	U
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1	0.0022	U	0.0023	U	0.0024	U	0.0023	U	0.002	U	0.033	U			0.03	U			0.033	U			0.033	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1	0.0018	U	0.0019	U	0.002	U	0.0019	U	0.0016	U	0.025	U			0.023	U			0.025	U			0.025	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27	0.28	U	0.36	U	0.25	U	0.33	U	0.29	U	0.26	U			0.27	U			0.29	U			0.34	U
Solids, Percent	PERCENT SOLIDS	%				88.2		84.5		81.8		78.4				88				89.9				81.8				81.1	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg				9690		10800		8810		14700		7090		8610				7600				17000				10800	
Antimony	7440-36-0	mg/kg				2.3	U	2.4	U	13 [i]	U	2.7	U	2	U	2.2	U			2.3	U			2.5	U			2.3	U
Arsenic	7440-38-2	mg/kg	16	16	13	2.3		4.7		11.3		2.7	U	2	U	2.6				2.3				4.1				2.3	U
Barium	7440-39-3	mg/kg	820	410	410	97.6		154		463		150		52.3		97.5				81.2				62.2				65.1	
Beryllium	7440-41-7	mg/kg	47	43	4.4	0.33		0.45		0.28		0.45		0.21		0.31				0.25				0.51				0.36	
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5	0.57	U	0.61	U	3.2 [i]	U	0.67	U	0.51	U	0.55	U			0.56	U			0.62	U			0.58	U
Calcium	7440-70-2	mg/kg				4420		4960		15800		1820		2470		5520				16000				620	U			1600	
Chromium	7440-47-3	mg/kg	19	110	30	15.9		19.5		78.1		26.3		15.4		16.1				13.2				22.7				22.7	
Cobalt	7440-48-4	mg/kg				5.7	U	6.5		11.6		12.3		5.2		6.3				6.2				8.9				7.5	
Copper	7440-50-8	mg/kg	1720	280	50	21.2		33.5		114 [i]		26.9		16.4		21.8				20.1				21.5				18	
Iron	7439-89-6	mg/kg				14900		22700		66200		26200		11900		13800				12600				21300				16900	
Lead	7439-92-1	mg/kg	450	400	63	112		245		856 [i]		7.7		13.1		126				51.6				8.7				5.8	
Magnesium	7439-95-4	mg/kg				3220		4320		9970		6840		2870		3760				5550				4330				4970	
Manganese	7439-96-5	mg/kg	2000	2000	1600	289		309		456		315		252		211				335				236				430	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18	0.15		0.14		0.14		0.034	U	0.031	U	0.058				0.19				0.031	U			0.037	U
Nickel	7440-02-0	mg/kg	130	320	30	12.1		14.9		77		25.9		11.9		12.9				12.4				17.2				16.1	
Potassium	7440-09-7	mg/kg				1430		1520		3040		4410		1350		1560				1470				1330				2480	
Selenium	7782-49-2	mg/kg	4	110	3.9	2.3	U	2.4	U	13 [i]	U	2.7	U	2	U	2.2	U			2.3	U			2.5	U			2.3	U
Silver	7440-22-4	mg/kg	8.3	110	2	0.57	U	0.61	U	3.2 [i]	U	0.67	U	0.51	U	0.55	U			0.56	U			0.62	U			0.58	U
Sodium	7440-23-5	mg/kg				1100	U	1200	U	1420		2280		1000	U	1100	U			1100	U			1200	U			1200	U
Thallium	7440-28-0	mg/kg				1.1	U	1.2	U	1.3	U	1.3	U	1	U	1.1	U			1.1	U			1.2	U			1.2	U
Vanadium	7440-62-2	mg/kg				21.3		24.1		30.3		34.6		17.7		20.2				16.1				33.3				25.7	
Zinc	7440-66-6	mg/kg	2480	6600	109	88.3		169		445		66.2		27.5		100				50.3				48.1				41.9	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 5 (3-3.5)		RI-SB 5 (8-8.5)		RI-SB 5 (13.25-13.75)		RI-SB 5 (15-15.5)		DUP 20250822		RI-SB 4 (2.75-3.25)		RI-SB 4 (2.75-3.25)		RI-SB 4 (7-7.5)		RI-SB 4 (7-7.5)		RI-SB 4 (10-10.5)		RI-SB 4 (10-10.5)		RI-SB 4 (18-18.5)	
Lab Sample ID:						JE17599-25		JE17599-26		JE17599-27		JE17599-28		JE17599-31		JE17704-1		JE17704-1A		JE17704-2		JE17704-2A		JE17704-3		JE17704-3A		JE17704-4	
Date Sampled:						8/22/2025 4:10 PM		8/22/2025 4:11 PM		8/22/2025 4:12 PM		8/22/2025 4:13 PM		8/22/2025 12:00 AM		8/25/2025 8:50 AM		8/25/2025 8:50 AM		8/25/2025 8:51 AM		8/25/2025 8:51 AM		8/25/2025 8:52 AM		8/25/2025 8:52 AM		8/25/2025 8:53 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00012	U	0.00013	U	0.00013	U	0.00014	U	0.00011	U			0.00012	U			0.00012	U			0.00013	U		
Perfluoropentanoic acid	2706-90-3	mg/kg				0.000076	U	0.000082	U	0.000085	U	0.000089	U	0.000072	U			0.000079	U			0.000075	U			0.000085	U		
Perfluorohexanoic acid	307-24-4	mg/kg				0.000033	U	0.000035	U	0.000036	U	0.000038	U	0.000031	U			0.000034	U			0.000032	U			0.000036	U		
Perfluoroheptanoic acid	375-85-9	mg/kg				0.000054	U	0.000059	U	0.000061	U	0.000063	U	0.000051	U			0.000057	U			0.000054	U			0.000061	U		
Perfluorooctanoic acid	335-67-1	mg/kg				0.000087	U	0.000094	U	0.000097	U	0.0001	U	0.000082	U			0.000091	U			0.000086	U			0.000097	U		
Perfluorononanoic acid	375-95-1	mg/kg				0.000054	U	0.000059	U	0.000061	U	0.000063	U	0.000051	U			0.000057	U			0.000054	U			0.000061	U		
Perfluorodecanoic acid	335-76-2	mg/kg				0.000076	U	0.000082	U	0.000085	U	0.000089	U	0.000072	U			0.000079	U			0.000075	U			0.000085	U		
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000065	U	0.00007	U	0.000073	U	0.000076	U	0.000061	U			0.000068	U			0.000065	U			0.000073	U		
Perfluorododecanoic acid	307-55-1	mg/kg				0.000087	U	0.000094	U	0.000097	U	0.0001	U	0.000082	U			0.000091	U			0.000086	U			0.000097	U		
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.000098	U	0.00011	U	0.00011	U	0.00011	U	0.000092	U			0.0001	U			0.000097	U			0.00011	U		
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00011	U	0.00012	U	0.00012	U	0.00013	U	0.0001	U			0.00011	U			0.00011	U			0.00012	U		
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.000076	U	0.000082	U	0.000085	U	0.000089	U	0.000072	U			0.000079	U			0.000075	U			0.000085	U		
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00012	U	0.00013	U	0.00013	U	0.00014	U	0.00011	U			0.00012	U			0.00012	U			0.00013	U		
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00011	U	0.00012	U	0.00012	U	0.00013	U	0.0001	U			0.00011	U			0.00011	U			0.00012	U		
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.000091	J	0.0001	J	0.000061	U	0.000063	U	0.00019	J			0.000057	U			0.000054	U			0.000061	U		
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00012	U	0.00013	U	0.00013	U	0.00014	U	0.00011	U			0.00012	U			0.00012	U			0.00013	U		
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00011	U	0.00012	U	0.00012	U	0.00013	U	0.0001	U			0.00011	U			0.00011	U			0.00012	U		
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.00021	U	0.00022	U	0.00023	U	0.00024	U	0.00019	U			0.00022	U			0.0002	U			0.00023	U		
PFOSA	754-91-6	mg/kg				0.000076	U	0.000082	U	0.000085	U	0.000089	U	0.000072	U			0.000079	U			0.000075	U			0.000085	U		
MeFOSAA	2355-31-9	mg/kg				0.000087	U	0.000094	U	0.000097	U	0.0001	U	0.000082	U			0.000091	U			0.000086	U			0.000097	U		
EtFOSAA	2991-50-6	mg/kg				0.00014	U	0.00015	U	0.00062		0.00016	U	0.00013	U			0.00015	U			0.00014	U			0.00016	U		
2-Chlorophenol	95-57-8	mg/kg				0.018	U	0.019	U	0.02	U	0.02	U	0.017	U	0.018	U			0.018	U			0.019	U			0.02	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg				0.023	U	0.023	U	0.025	U	0.025	U	0.021	U	0.023	U			0.022	U			0.024	U			0.025	U
2,4-Dichlorophenol	120-83-2	mg/kg				0.032	U	0.032	U	0.035	U	0.035	U	0.029	U	0.032	U			0.031	U			0.033	U			0.034	U
2,4-Dimethylphenol	105-67-9	mg/kg				0.066	U	0.068	U	0.072	U	0.073	U	0.06	U	0.066	U			0.065	U			0.069	U			0.071	U
2,4-Dinitrophenol	51-28-5	mg/kg				0.14 [a]	U	0.14 [a]	U	0.15 [a]	U	0.16 [a]	U	0.13 [a]	U	0.14	U			0.14	U			0.15	U			0.15	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg				0.04 [a]	U	0.041 [a]	U	0.043 [a]	U	0.044 [a]	U	0.036 [a]	U	0.04	U			0.039	U			0.042	U			0.043	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33	0.024	U	0.024	U	0.026	U	0.026	U	0.022	U	0.024	U			0.023	U			0.025	U			0.026	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33	0.031	U	0.031	U	0.033	U	0.034	U	0.028	U	0.031	U			0.03	U			0.032	U			0.033	U
2-Nitrophenol	88-75-5	mg/kg				0.025 [a]	U	0.025 [a]	U	0.027 [a]	U	0.027	U	0.022 [a]	U	0.025	U			0.024	U			0.026	U			0.027	U
4-Nitrophenol	100-02-7	mg/kg				0.099 [b]	U	0.1 [b]	U	0.11 [b]	U	0.11	U	0.09 [b]	U	0.099	U			0.098	U			0.1	U			0.11	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8	0.035 [b]	U	0.036 [b]	U	0.038 [b]	U	0.039	U	0.032 [b]	U	0.035	U			0.034	U			0.037	U			0.038	U
Phenol	108-95-2	mg/kg	0.33	100	0.33	0.019	U	0.02	U	0.021	U	0.022	U	0.018	U	0.019	U			0.019	U			0.02	U			0.021	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg				0.025	U	0.025	U	0.027	U	0.027	U	0.022	U	0.025	U			0.024	U			0.026	U			0.027	U
2,4,5-Trichlorophenol	95-95-4	mg/kg				0.028	U	0.029	U	0.03	U	0.031	U	0.025	U	0.028	U			0.027	U			0.029	U			0.03	U
2,4,6-Trichlorophenol	88-06-2	mg/kg				0.022	U	0.023	U	0.024	U	0.025	U	0.02	U	0.022	U			0.022	U			0.023	U			0.024	U
Acenaphthene	83-32-9	mg/kg	98	100	20	0.013	U	0.0528		0.014	U	0.014	U	0.0487		0.0285	J			0.0228	J			0.013	U			0.014	U
Acenaphthylene	208-96-8	mg/kg	365	100	100	0.019	U	0.0383		0.021	U	0.021	U	0.167		0.019	U			0.019	U			0.02	U			0.02	U
Acetophenone	98-86-2	mg/kg				0.008	U	0.0082	U	0.0087	U	0.0089	U	0.0072	U	0.008	U			0.0079	U			0.0084	U			0.0086	U
Anthracene	120-12-7	mg/kg	1000	100	100	0.023	U	0.143		0.025	U	0.025	U	0.314		0.0814				0.0712				0.024	U			0.025	U
Atrazine	1912-24-9	mg/kg				0.016	U	0.016	U	0.017	U	0.018	U	0.014	U	0.016	U			0.016	U			0.017	U			0.017	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1	0.0245	J	0.329		0.0139	J	0.012	U	1.09		0.219				0.164				0.011	U			0.0415	
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1	0.0218	J	0.303		0.018	U	0.019	U	0.838		0.221				0.17				0.018	U			0.0373	J
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1	0.0258	J	0.351		0.018	U	0.018	U	0.815		0.236				0.19				0.017	U			0.0445	
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64	0.019	U	0.187		0.02	U	0.021	U	0.42		0.171				0.115				0.019	U			0.0246	J
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8	0.017	U	0.14		0.019	U	0.019	U	0.32		0.0941				0.073				0.018	U			0.019	U
4-Bromophenyl phenyl ether	101-55-3	mg/kg				0.014	U	0.015	U	0.016	U	0.016	U	0.013	U	0.014	U			0.014	U			0.015	U			0.016	U
Butyl benzyl phthalate	85-68-7	mg/kg				0.0091 [a]	U	0.0093 [a]	U	0.0099 [a]	U	0.01	U	0.0082 [a]	U	0.0091	U			0.0089	U			0.0095	U			0.0098	U
1,1'-Biphenyl	92-52-4	mg/kg				0.0051	U	0.011	J	0.0056	U	0.0057	U	0.0046	U	0.0051	U			0.005	U			0.0053	U			0.0055	U
Benzaldehyde	100-52-7	mg/kg				0.0092	U	0.0094	U	0.01	U	0.01	U	0.0084	U	0.0092	U			0.0091	U			0.0097	U			0.01	U
2-Chloronaphthalene	91-58-7	mg/kg				0.0088	U	0.0091	U	0.0097	U	0.0098	U	0.008	U	0.0089	U			0.0087	U			0.0093	U			0.0096	U
4-Chloroaniline	106-47-8	mg/kg				0.013	U	0.014	U	0.015	U	0.015	U	0.012	U	0.013	U			0.013	U			0.014	U			0.014	U
Carbazole	86-74-8	mg/kg				0.0054	U	0.0456	J	0.0059	U	0.006	U	0.0224	J	0.0294	J			0.0194	J			0.0056	U			0.0067	J
Caprolactam	105-60-2	mg/kg				0.015	U	0.015	U	0.016	U	0.016	U	0.013	U	0.015	U			0.014	U			0.015	U			0.016	U
Chrysene	218-01-9	mg/kg	1	4.9	1	0.0188	J	0.345		0.013	U	0.013	U	1.05		0.23				0.163				0.012	U			0.0436	
bis(2-Chloroethoxy)methane	111-91-1	mg/kg				0.008	U	0.0081	U	0.0087	U	0.0088	U	0.0072	U	0.008	U			0.0078	U			0.0083	U			0.0086	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg				0.016 [a]	U	0.016 [a]	U	0.018 [a]	U	0.018	U	0.015 [a]	U	0.016	U			0.016	U			0.017	U			0.017	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg				0.013	U	0.014	U	0.015	U	0.015	U	0.012	U	0.013	U			0.013	U			0.014	U			0.014	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg				0.012	U	0.012	U	0.013	U	0.013	U	0.011	U	0.012	U			0.012	U			0.013	U			0.013	U
2,4-Dinitrotoluene	121-14-2	mg/kg				0.012	U	0.012	U	0.013	U	0.013	U	0.01	U	0.012 [a]	U			0.011 [a]	U			0.011 [a]	U			0.012 [a]	U
2,6-Dinitrotoluene	606-20-2	mg/kg				0.019	U	0.019	U	0.02	U	0.021	U	0.017	U	0.019	U			0.018	U			0.02	U			0.02	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg				0.031	U	0.032	U	0.034	U	0.034	U	0.028	U	0.031	U			0.031	U			0.032	U			0.033	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1	0.025	U	0.025	U	0.027	U	0.027	U	0.022	U	0.025	U			0.024	U			0.026	U			0.027	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33	0.016	U	0.0512		0.018	U	0.018	U	0.135		0.0381				0.0278	J			0.017	U			0.018	U
Dibenzofuran	132-64-9	mg/kg	110	18	2.1	0.015	U	0.0285	J	0.017	U	0.017	U	0.014	U	0.02	J			0.021	J			0.016	U			0.016	U
Di-n-butyl phthalate	84-74-2	mg/kg				0.0061	U	0.0062	U	0.0066	U	0.0067	U	0.0055	U	0.0061	U			0.006	U			0.0063	U			0.0065	U
Di-n-octyl phthalate	117-84-0	mg/kg				0.0093 [a]	U	0.0095 [a]	U	0.01 [a]	U	0.01	U	0.0084 [a]	U	0.0093	U			0.0091	U			0.0097	U			0.01	U
Diethyl phthalate	84-66-2	mg/kg				0.0079	U	0.0081	U	0.0087	U	0.0088	U	0.0072	U	0.0079	U			0.0078	U			0.0083	U			0.0086	U
Dimethyl phthalate	131-11-3	mg/kg				0.0066	U	0.0068	U	0.0072	U	0.0073	U	0.006	U	0.0066	U			0.0065	U			0.0069	U			0.0071	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg				0.0087 [a]	U	0.0207 [c]	J	0.0107 [c]	J	0.0097	U	0.0144 [c]	J	0.0087	U			0.111				0.0091	U			0.0094	U
Fluoranthene	206-44-0	mg/kg	1000	100	85	0.031	J	0.629		0.018	U	0.018	U	1.25		0.412				0.323				0.017	U			0.0894	
Fluorene	86-73-7	mg/kg	386	100	30	0.017	U	0.0669		0.019	U	0.019	U	0.0632		0.0254	J			0.0204	J			0.018	U			0.018	U
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33	0.0094	U	0.0096	U	0.01	U	0.01	U	0.0085	U	0.0094	U			0.0093	U			0.0099	U			0.01	U
Hexachlorobutadiene	87-68-3	mg/kg				0.015	U	0.015	U	0.016	U	0.017	U	0.014	U	0.015	U			0.015	U			0.016	U			0.016	U
Hexachlorocyclopentadiene	77-47-4	mg/kg				0.015 [b]	U	0.015 [b]	U	0.016 [b]	U	0.016 [a]	U	0.013 [b]	U	0.015	U			0.015	U			0.015	U			0.016	U
Hexachloroethane	67-72-1	mg/kg				0.018	U	0.019	U	0.02	U	0.02	U	0.017	U	0.018	U			0.018	U			0.019	U			0.02	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5	0.017	U	0.149		0.019	U	0.019	U	0.332		0.156				0.117				0.018	U			0.0249	J
Isophorone	78-59-1	mg/kg				0.008	U	0.0081	U	0.0087	U	0.0088	U	0.0072	U	0.008	U			0.0078	U			0.0083	U			0.0086	U
2-Methylnaphthalene	91-57-6	mg/kg				0.0084	U	0.0328	J	0.0092	U	0.0093	U	0.0108	J	0.0117	J			0.0086	J			0.0088	U			0.0091	U
2-Nitroaniline	88-74-4	mg/kg				0.0088	U	0.009	U	0.0096	U	0.0097	U	0.008	U	0.0088	U			0.0086	U			0.0092	U			0.0095	U
3-Nitroaniline	99-09-2	mg/kg				0.0093	U	0.0095	U	0.01	U	0.01	U	0.0084	U	0.0093	U			0.0091	U			0.0097	U			0.01	U
4-Nitroaniline	100-01-6	mg/kg				0.0096	U	0.0099	U	0.011	U	0.011	U	0.0087	U	0.0096	U			0.0095	U			0.01	U			0.01	U
Naphthalene	91-20-3	mg/kg	12	100	12	0.01	U	0.0292	J	0.0119	J	0.012	U	0.0112	J	0.0279	J			0.0188	J			0.011	U			0.0121	J
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08	0.014	U	0.015	U	0.016	U	0.016	U	0.013	U	0.014	U			0.014	U			0.015	U			0.016	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg				0.011	U	0.011	U	0.012	U	0.012	U	0.0097	U	0.011	U			0.011	U			0.011	U			0.012	U
N-Nitrosodiphenylamine	86-30-6	mg/kg				0.014	U	0.014	U	0.015	U	0.015	U	0.012	U	0.014	U			0.013	U			0.014	U			0.015	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1	0.0171	J	0.563		0.014	U	0.014	U	1.05		0.264				0.189				0.013	U			0.0672	
Pyrene	129-00-0	mg/kg	1000	100	64	0.0356	J	0.78		0.0239	J	0.013	U	2.55		0.47				0.343				0.012	U			0.0897	
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg				0.0094	U	0.0097	U	0.01	U	0.01	U	0.0086	U	0.0095	U			0.0093	U			0.0099	U			0.01	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 5 (3-3.5)		RI-SB 5 (8-8.5)		RI-SB 5 (13.25-13.75)		RI-SB 5 (15-15.5)		DUP 20250822		RI-SB 4 (2.75-3.25)		RI-SB 4 (2.75-3.25)		RI-SB 4 (7-7.5)		RI-SB 4 (7-7.5)		RI-SB 4 (10-10.5)		RI-SB 4 (10-10.5)		RI-SB 4 (18-18.5)	
Lab Sample ID:						JE17599-25		JE17599-26		JE17599-27		JE17599-28		JE17599-31		JE17704-1		JE17704-1A		JE17704-2		JE17704-2A		JE17704-3		JE17704-3A		JE17704-4	
Date Sampled:						8/22/2025 4:10 PM		8/22/2025 4:11 PM		8/22/2025 4:12 PM		8/22/2025 4:13 PM		8/22/2025 12:00 AM		8/25/2025 8:50 AM		8/25/2025 8:50 AM		8/25/2025 8:51 AM		8/25/2025 8:51 AM		8/25/2025 8:52 AM		8/25/2025 8:52 AM		8/25/2025 8:53 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03	0.126 [d]		0.0645 [d]		0.0342 [d]		0.0112 [d]	J	0.0055 [d]	J	0.0246 [e]				0.0371 [e]				0.0147 [e]				0.0117 [e]	
Benzene	71-43-2	mg/kg	0.06	3.7	0.06	0.00059	U	0.00056	U	0.00063	U	0.00055	U	0.00048	U	0.00043	U			0.00044	U			0.00051	U			0.00048	U
Bromochloromethane	74-97-5	mg/kg				0.00072	U	0.00069	U	0.00078	U	0.00067	U	0.00059	U	0.00053	U			0.00055	U			0.00062	U			0.0006	U
Bromodichloromethane	75-27-4	mg/kg				0.00055	U	0.00053	U	0.0006	U	0.00052	U	0.00045	U	0.00041	U			0.00042	U			0.00048	U			0.00046	U
Bromoform	75-25-2	mg/kg				0.0018	U	0.0017	U	0.0019	U	0.0016	U	0.0014	U	0.0013	U			0.0013	U			0.0015	U			0.0014	U
Bromomethane	74-83-9	mg/kg				0.00098	U	0.00094	U	0.0011	U	0.00092	U	0.00081	U	0.00072 [a]	U			0.00075 [a]	U			0.00085 [a]	U			0.00081 [a]	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1	0.0162		0.0078	J	0.0034	U	0.0029	U	0.0026	U	0.0023 [c]	U			0.0033 [c]	J			0.0027 [c]	U			0.0026 [c]	U
Carbon disulfide	75-15-0	mg/kg				0.001	J	0.00066	U	0.00074	U	0.0015	J	0.00056	U	0.00051	U			0.0012	J			0.00059	U			0.00057	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76	0.0008	U	0.00076	U	0.00086	U	0.00074	U	0.00065	U	0.00059 [a]	U			0.0006 [a]	U			0.00069 [a]	U			0.00066 [a]	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5	0.00059	U	0.00057	U	0.00064	U	0.00055	U	0.00048	U	0.00043	U			0.00045	U			0.00051	U			0.00049	U
Chloroethane	75-00-3	mg/kg				0.00076 [a]	U	0.00073 [a]	U	0.00082 [a]	U	0.00071 [a]	U	0.00062 [a]	U	0.00056 [d]	U			0.00058 [d]	U			0.00066 [d]	U			0.00063 [d]	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37	0.0013	U	0.0012	U	0.0014	U	0.0012	U	0.0011	U	0.00095	U			0.00098	U			0.0011	U			0.0011	U
Chloromethane	74-87-3	mg/kg				0.0025	U	0.0024	U	0.0027	U	0.0024	U	0.0021	U	0.0019	U			0.0019	U			0.0022	U			0.0021	U
Cyclohexane	110-82-7	mg/kg				0.00085	U	0.00081	U	0.00091	U	0.00079	U	0.00069	U	0.00062 [a]	U			0.00064 [a]	U			0.00073 [a]	U			0.0007 [a]	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg				0.00089	U	0.00086	U	0.00096	U	0.00084	U	0.00073	U	0.00066	U			0.00068	U			0.00077	U			0.00074	U
Dibromochloromethane	124-48-1	mg/kg				0.00072	U	0.00069	U	0.00078	U	0.00067	U	0.00059	U	0.00053	U			0.00055	U			0.00062	U			0.0006	U
1,2-Dibromoethane	106-93-4	mg/kg				0.00054	U	0.00052	U	0.00058	U	0.00051	U	0.00044	U	0.0004	U			0.00041	U			0.00047	U			0.00045	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1	0.0007	U	0.00067	U	0.00076	U	0.00066	U	0.00058	U	0.00052	U			0.00053	U			0.00061	U			0.00058	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6	0.00064	U	0.00061	U	0.00069	U	0.0006	U	0.00052	U	0.00047	U			0.00048	U			0.00055	U			0.00053	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8	0.00064	U	0.00061	U	0.00069	U	0.00059	U	0.00052	U	0.00047	U			0.00048	U			0.00055	U			0.00053	U
Dichlorodifluoromethane	75-71-8	mg/kg				0.00094	U	0.0009	U	0.001	U	0.00087	U	0.00077	U	0.00069	U			0.00071	U			0.00081	U			0.00077	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27	0.00064	U	0.00061	U	0.00069	U	0.0006	U	0.00052	U	0.00047	U			0.00048	U			0.00055	U			0.00053	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02	0.00061	U	0.00058	U	0.00065	U	0.00057	U	0.0005	U	0.00045	U			0.00046	U			0.00052	U			0.0005	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24	0.00084	U	0.00081	U	0.00091	U	0.00079	U	0.00069	U	0.00062	U			0.00064	U			0.00073	U			0.0007	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19	0.0011	U	0.001	U	0.0012	U	0.001	U	0.00089	U	0.0008	U			0.00082	U			0.00093	U			0.00089	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19	0.00079	U	0.00075	U	0.00085	U	0.00074	U	0.00064	U	0.00058	U			0.0006	U			0.00068	U			0.00065	U
1,2-Dichloropropane	78-87-5	mg/kg				0.00061	U	0.00058	U	0.00066	U	0.00057	U	0.0005	U	0.00045	U			0.00046	U			0.00053	U			0.0005	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg				0.00061	U	0.00059	U	0.00066	U	0.00057	U	0.0005	U	0.00045	U			0.00046	U			0.00053	U			0.0005	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg				0.00059	U	0.00056	U	0.00063	U	0.00055	U	0.00048	U	0.00043	U			0.00045	U			0.00051	U			0.00049	U
Ethylbenzene	100-41-4	mg/kg	1	76	1	0.00058	U	0.00056	U	0.00063	U	0.00055	U	0.00048	U	0.00043	U			0.00044	U			0.0005	U			0.00048	U
Freon 113	76-13-1	mg/kg				0.0034	U	0.0033	U	0.0037	U	0.0032	U	0.0028	U	0.0025	U			0.0026	U			0.003	U			0.0028	U
2-Hexanone	591-78-6	mg/kg				0.0027	U	0.0026	U	0.0029	U	0.0026	U	0.0022	U	0.002	U			0.0021	U			0.0024	U			0.0023	U
Isopropylbenzene	98-82-8	mg/kg				0.0018	U	0.0018	U	0.002	U	0.0017	U	0.0015	U	0.0013	U			0.0014	U			0.0016	U			0.0015	U
Methyl Acetate	79-20-9	mg/kg				0.0018	U	0.0017	U	0.0019	U	0.0017	U	0.0015	U	0.0013	U			0.0014	U			0.0015	U			0.0015	U
Methylcyclohexane	108-87-2	mg/kg				0.0011	U	0.0011	U	0.0012	U	0.0011	U	0.00092	U	0.00083	U			0.00085	U			0.00097	U			0.00093	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1	0.0006	U	0.00058	U	0.00065	U	0.00056	U	0.00049	U	0.00044	U			0.00046	U			0.00052	U			0.0005	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg				0.0029	U	0.0028	U	0.0032	U	0.0027	U	0.0024	U	0.0021	U			0.0022	U			0.0025	U			0.0024	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05	0.0034	U	0.0032	U	0.0036	U	0.0031	U	0.0028	U	0.0025	U			0.0025	U			0.0029	U			0.0028	U
Styrene	100-42-5	mg/kg				0.00052	U	0.0005	U	0.00056	U	0.00048	U	0.00042	U	0.00038	U			0.00039	U			0.00045	U			0.00043	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg				0.00077	U	0.00074	U	0.00083	U	0.00072	U	0.00063	U	0.00057	U			0.00058	U			0.00067	U			0.00064	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3	0.00075	U	0.00071	U	0.00081	U	0.0007	U	0.00061	U	0.00055	U			0.00057	U			0.00064	U			0.00062	U
Toluene	108-88-3	mg/kg	0.7	100	0.7	0.00068	U	0.00065	U	0.00073	U	0.00063	U	0.00055	U	0.0005	U			0.00051	U			0.00058	U			0.00056	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg				0.0032	U	0.0031	U	0.0035	U	0.003	U	0.0026	U	0.0024	U			0.0024	U			0.0028	U			0.0027	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg				0.0032	U	0.0031	U	0.0035	U	0.003	U	0.0026	U	0.0024	U			0.0024	U			0.0028	U			0.0027	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68	0.00062	U	0.0006	U	0.00067	U	0.00058	U	0.00051	U	0.00046	U			0.00047	U			0.00054	U			0.00051	U
1,1,2-Trichloroethane	79-00-5	mg/kg				0.00071	U	0.00068	U	0.00077	U	0.00067	U	0.00058	U	0.00052 [c]	U			0.00054 [c]	U			0.00062 [c]	U			0.00059 [c]	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47	0.00098	U	0.00094	U	0.0011	U	0.00092	U	0.0008	U	0.00072	U			0.00074	U			0.00085	U			0.00081	U
Trichlorofluoromethane	75-69-4	mg/kg				0.00088	U	0.00084	U	0.00095	U	0.00082	U	0.00072	U	0.00065 [d]	U			0.00067 [d]	U			0.00076 [d]	U			0.00073 [d]	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03	0.00062	U	0.00059	U	0.00067	U	0.00058	U	0.00051	U	0.00046 [a]	U			0.00047 [a]	U			0.00053 [a]	U			0.00051 [a]	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26	0.0012	U	0.0011	U	0.0012	U	0.0011	U	0.00095	U	0.00085	U			0.00087	U			0.001	U			0.00095	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26	0.00059	U	0.00056	U	0.00064	U	0.00055	U	0.00048	U	0.00043	U			0.00045	U			0.00051	U			0.00049	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26	0.00059	U	0.00056	U	0.00064	U	0.00055	U	0.00048	U	0.00043	U			0.00045	U			0.00051	U			0.00049	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

	= concentration exceeds USCO
	= concentration exceeds RRSCO
#	= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 4 (18-18.5)		RI-SB 9 (3.25-3.75)		RI-SB 9 (3.25-3.75)		RI-SB 9 (5-5.5)		RI-SB 9 (5-5.5)		RI-SB 9 (10-10.5)		RI-SB 9 (10-10.5)		RI-SB 9 (17-17.5)		RI-SB 9 (17-17.5)		RI-SB 14 (1-1.5)		RI-SB 14 (1-1.5)		RI-SB 14 (7.5-8)	
Lab Sample ID:						JE17704-4A		JE17704-5		JE17704-5A		JE17704-6		JE17704-6A		JE17704-7		JE17704-7A		JE17704-8		JE17704-8A		JE17704-9		JE17704-9A		JE17704-10	
Date Sampled:						8/25/2025 8:53 AM		8/25/2025 9:40 AM		8/25/2025 9:40 AM		8/25/2025 9:41 AM		8/25/2025 9:41 AM		8/25/2025 9:42 AM		8/25/2025 9:42 AM		8/25/2025 9:43 AM		8/25/2025 9:43 AM		8/25/2025 11:10 AM		8/25/2025 11:10 AM		8/25/2025 11:11 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005			0.00059	U			0.00065	U			0.00056	U			0.00063	U			0.00059	U			0.0006	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02			0.00059	U			0.00064	U			0.00055	U			0.00062	U			0.00058	U			0.00059	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036			0.00065	U			0.00071	U			0.00061	U			0.00069	U			0.00065	U			0.00066	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04			0.00069	U			0.00075	U			0.00065	U			0.00073	U			0.00069	U			0.0007	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1			0.00053	U			0.00058	U			0.0005	U			0.00056	U			0.00053	U			0.00054	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094			0.00058	U			0.00063	U			0.00055	U			0.00061	U			0.00058	U			0.0019	
gamma-Chlordane	5103-74-2	mg/kg	14					0.00033	U			0.00035	U			0.00031	U			0.00034	U			0.00032	U			0.0024 [b]	
Chlordane (alpha and gamma)	57-74-9	mg/kg						0.00033	U			0.00035	U			0.00031	U			0.00034	U			0.00032	U			0.0043	
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005			0.0025				0.00054	U			0.00047	U			0.00052	U			0.00049	U			0.002	
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033			0.00076 [b]				0.00072	U			0.00062	U			0.0007	U			0.00092 [f]				0.0146	
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033			0.00063	U			0.00069	U			0.0006	U			0.00067	U			0.00063	U			0.0059	
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033			0.0016 [b]				0.00069	U			0.0006	U			0.00067	U			0.00099 [f]				0.0199	
Endrin	72-20-8	mg/kg	0.06	11	0.014			0.00056	U			0.00061	U			0.00053	U			0.00059	U			0.00056	U			0.00057	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4			0.0014 [i]				0.00061 [a]	U			0.00053	U			0.00059 [a]	U			0.00056 [a]	U			0.00057	U
Endrin aldehyde	7421-93-4	mg/kg						0.00041	U			0.00044	U			0.00038	U			0.00043	U			0.00041	U			0.00041	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4			0.00042	U			0.00045	U			0.00039	U			0.00044	U			0.00041	U			0.00042	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4			0.00045	U			0.00049	U			0.00042	U			0.00048	U			0.00045	U			0.00045	U
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042			0.00062	U			0.00068	U			0.00059	U			0.00066	U			0.00062	U			0.00063	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02					0.00051	U			0.00055	U			0.00048	U			0.00053	U			0.0005	U			0.00051	U
Methoxychlor	72-43-5	mg/kg	900					0.00057	U			0.00062	U			0.00054	U			0.00061	U			0.00057	U			0.00058	U
Endrin ketone	53494-70-5	mg/kg						0.00052	U			0.00057 [a]	U			0.00049	U			0.00055 [a]	U			0.00052 [a]	U			0.00053	U
Toxaphene	8001-35-2	mg/kg						0.017	U			0.018	U			0.016	U			0.018	U			0.017	U			0.017	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1			0.017	U			0.018	U			0.016	U			0.018	U			0.017	U			0.017	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1			0.022	U			0.024	U			0.021	U			0.024	U			0.022	U			0.023	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1			0.023	U			0.025	U			0.022	U			0.024	U			0.023	U			0.023	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1			0.015	U			0.016	U			0.014	U			0.016	U			0.015	U			0.015	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1			0.032	U			0.035	U			0.03	U			0.034	U			0.032	U			0.032	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1			0.019	U			0.021	U			0.018	U			0.02	U			0.019	U			0.02	U
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1			0.015	U			0.017	U			0.014	U			0.016	U			0.015	U			0.016	U
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1			0.032	U			0.034	U			0.03	U			0.033	U			0.031	U			0.032	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1			0.024	U			0.026	U			0.022	U			0.025	U			0.023	U			0.024	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27			0.29	U			0.31	U			0.25	U			0.24	U			0.29	U			0.32	U
Solids, Percent	PERCENT SOLIDS	%						90.6				84				96.9				84.2				86.6				84.3	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg						8130				10500				4060				4040				13600				13800	
Antimony	7440-36-0	mg/kg						2.2	U			2.3	U			2.1	U			2.3	U			2.2	U			2.3	U
Arsenic	7440-38-2	mg/kg	16	16	13			3.5				2.9				2.1	U			2.3	U			3.4				3.4	
Barium	7440-39-3	mg/kg	820	410	410			102				79.2				30.5				104				143				194	
Beryllium	7440-41-7	mg/kg	47	43	4.4			0.29				0.4				0.21	U			0.23	U			0.37				0.34	
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5			0.54	U			0.64				0.54	U			0.57	U			0.56	U			0.56	U
Calcium	7440-70-2	mg/kg						11300				2040				711				589				2630				6400	
Chromium	7440-47-3	mg/kg	19	110	30			14.9				14.3				6				5.7				26.3				26.9	
Cobalt	7440-48-4	mg/kg						5.4				5.8	U			5.4	U			5.7	U			10.3				9.2	
Copper	7440-50-8	mg/kg	1720	280	50			38.7				15.3				8.2				9.4				39.3				49.1	
Iron	7439-89-6	mg/kg						13900				12200				7070				8380				20400				19500	
Lead	7439-92-1	mg/kg	450	400	63			209				53.9				2.7				3.3				201				436	
Magnesium	7439-95-4	mg/kg						3630				2740				1750				1830				4820				5830	
Manganese	7439-96-5	mg/kg	2000	2000	1600			209				313				190				290				219				426	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18			0.49				0.14				0.03	U			0.036	U			0.057				0.14	
Nickel	7440-02-0	mg/kg	130	320	30			13				10.4				8.2				6.5				17.5				21.7	
Potassium	7440-09-7	mg/kg						1360				1200	U			1100	U			1100	U			1560				1550	
Selenium	7782-49-2	mg/kg	4	110	3.9			2.2	U			2.3	U			2.1	U			2.3	U			2.2	U			2.3	U
Silver	7440-22-4	mg/kg	8.3	110	2			0.97				0.58	U			0.54	U			0.57	U			0.56	U			0.56	U
Sodium	7440-23-5	mg/kg						1100	U			1200	U			1100	U			1100	U			1100	U			1100	U
Thallium	7440-28-0	mg/kg						1.1	U			1.2	U			1.1	U			1.1	U			1.1	U			1.1	U
Vanadium	7440-62-2	mg/kg						19.7				17.6				7.6				7.5				34.1				41.1	
Zinc	7440-66-6	mg/kg	2480	6600	109			182				57.3				20				21.6				152				197	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 4 (18-18.5)		RI-SB 9 (3.25-3.75)		RI-SB 9 (3.25-3.75)		RI-SB 9 (5-5.5)		RI-SB 9 (5-5.5)		RI-SB 9 (10-10.5)		RI-SB 9 (10-10.5)		RI-SB 9 (17-17.5)		RI-SB 9 (17-17.5)		RI-SB 14 (1-1.5)		RI-SB 14 (1-1.5)		RI-SB 14 (7.5-8)	
Lab Sample ID:						JE17704-4A		JE17704-5		JE17704-5A		JE17704-6		JE17704-6A		JE17704-7		JE17704-7A		JE17704-8		JE17704-8A		JE17704-9		JE17704-9A		JE17704-10	
Date Sampled:						8/25/2025 8:53 AM		8/25/2025 9:40 AM		8/25/2025 9:40 AM		8/25/2025 9:41 AM		8/25/2025 9:41 AM		8/25/2025 9:42 AM		8/25/2025 9:42 AM		8/25/2025 9:43 AM		8/25/2025 9:43 AM		8/25/2025 11:10 AM		8/25/2025 11:10 AM		8/25/2025 11:11 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00014	U			0.00012	U			0.00013	U			0.00011	U			0.00013	U			0.00012	U		
Perfluoropentanoic acid	2706-90-3	mg/kg				0.000086	U			0.000076	U			0.000083	U			0.00007	U			0.000082	U			0.000078	U		
Perfluorohexanoic acid	307-24-4	mg/kg				0.000037	U			0.000033	U			0.000035	U			0.00003	U			0.000035	U			0.000034	U		
Perfluoroheptanoic acid	375-85-9	mg/kg				0.000061	U			0.000055	U			0.000059	U			0.00005	U			0.000058	U			0.000056	U		
Perfluorooctanoic acid	335-67-1	mg/kg				0.000098	U			0.000087	U			0.0002	J			0.00008	U			0.000094	U			0.00009	U		
Perfluorononanoic acid	375-95-1	mg/kg				0.000061	U			0.000055	U			0.000059	U			0.00005	U			0.000058	U			0.000056	U		
Perfluorodecanoic acid	335-76-2	mg/kg				0.000086	U			0.000076	U			0.000083	U			0.00007	U			0.000082	U			0.000078	U		
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000074	U			0.000065	U			0.000071	U			0.00006	U			0.00007	U			0.000067	U		
Perfluorododecanoic acid	307-55-1	mg/kg				0.000098	U			0.000087	U			0.000094	U			0.00008	U			0.000094	U			0.00009	U		
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.00011	U			0.000098	U			0.00011	U			0.00009	U			0.00011	U			0.0001	U		
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00012	U			0.00011	U			0.00012	U			0.0001	U			0.00012	U			0.00011	U		
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.000086	U			0.000076	U			0.000083	U			0.00007	U			0.000082	U			0.000078	U		
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00014	U			0.00012	U			0.00013	U			0.00011	U			0.00013	U			0.00012	U		
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00012	U			0.00011	U			0.00012	U			0.0001	U			0.00012	U			0.00011	U		
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.000061	U			0.00028				0.000059	U			0.00005	U			0.000058	U			0.00024			
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00014	U			0.00012	U			0.00013	U			0.00011	U			0.00013	U			0.00012	U		
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00012	U			0.00011	U			0.00012	U			0.0001	U			0.00012	U			0.00011	U		
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.00023	U			0.00021	U			0.00022	U			0.00019	U			0.00022	U			0.00021	U		
PFOSA	754-91-6	mg/kg				0.000086	U			0.000076	U			0.000083	U			0.00007	U			0.000082	U			0.000078	U		
MeFOSAA	2355-31-9	mg/kg				0.000098	U			0.000087	U			0.000094	U			0.00008	U			0.000094	U			0.00009	U		
EtFOSAA	2991-50-6	mg/kg				0.00016	U			0.00014	U			0.00015	U			0.00013	U			0.00015	U			0.00015	U		
2-Chlorophenol	95-57-8	mg/kg						0.018	U			0.019	U			0.016	U			0.019	U			0.018	U			0.019	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg						0.023	U			0.024	U			0.02	U			0.024	U			0.023	U			0.024	U
2,4-Dichlorophenol	120-83-2	mg/kg						0.031	U			0.033	U			0.028	U			0.033	U			0.032	U			0.033	U
2,4-Dimethylphenol	105-67-9	mg/kg						0.065	U			0.069	U			0.059	U			0.068	U			0.067	U			0.068	U
2,4-Dinitrophenol	51-28-5	mg/kg						0.14	U			0.14	U			0.12	U			0.14	U			0.14	U			0.14	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg						0.039	U			0.041	U			0.036	U			0.041	U			0.04	U			0.041	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33			0.024	U			0.025	U			0.021	U			0.025	U			0.024	U			0.025	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33			0.03	U			0.032	U			0.027	U			0.032	U			0.031	U			0.032	U
2-Nitrophenol	88-75-5	mg/kg						0.024	U			0.025	U			0.022	U			0.025	U			0.025	U			0.025	U
4-Nitrophenol	100-02-7	mg/kg						0.098	U			0.1	U			0.089	U			0.1	U			0.1	U			0.1	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8			0.035	U			0.036	U			0.031	U			0.036	U			0.035	U			0.036	U
Phenol	108-95-2	mg/kg	0.33	100	0.33			0.019	U			0.02	U			0.017	U			0.02	U			0.02	U			0.02	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg						0.024	U			0.026	U			0.022	U			0.025	U			0.025	U			0.025	U
2,4,5-Trichlorophenol	95-95-4	mg/kg						0.028	U			0.029	U			0.025	U			0.029	U			0.028	U			0.029	U
2,4,6-Trichlorophenol	88-06-2	mg/kg						0.022	U			0.023	U			0.02	U			0.023	U			0.022	U			0.023	U
Acenaphthene	83-32-9	mg/kg	98	100	20			0.0255	J			0.013	U			0.011	U			0.013	U			0.013	U			0.013	U
Acenaphthylene	208-96-8	mg/kg	365	100	100			0.0611				0.04				0.017	U			0.02	U			0.019	U			0.02	U
Acetophenone	98-86-2	mg/kg						0.0079	U			0.0083	U			0.0071	U			0.0083	U			0.008	U			0.0083	U
Anthracene	120-12-7	mg/kg	1000	100	100			0.102				0.0545				0.02	U			0.024	U			0.023	U			0.024	U
Atrazine	1912-24-9	mg/kg						0.016	U			0.016	U			0.014	U			0.016	U			0.016	U			0.016	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1			0.453				0.157				0.0094	U			0.011	U			0.108				0.053	
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1			0.492				0.144				0.015	U			0.017	U			0.125				0.0507	
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1			0.578				0.169				0.015	U			0.017	U			0.155				0.0649	
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64			0.379				0.101				0.017	U			0.019	U			0.0833				0.0329	J
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8			0.228				0.0698				0.015	U			0.018	U			0.051				0.025	J
4-Bromophenyl phenyl ether	101-55-3	mg/kg						0.014	U			0.015	U			0.013	U			0.015	U			0.014	U			0.015	U
Butyl benzyl phthalate	85-68-7	mg/kg						0.009	U			0.0094	U			0.0081	U			0.0094	U			0.0091	U			0.0094	U
1,1'-Biphenyl	92-52-4	mg/kg						0.005	U			0.0053	U			0.0045	U			0.0053	U			0.0051	U			0.0053	U
Benzaldehyde	100-52-7	mg/kg						0.0091	U			0.0096	U			0.0082	U			0.0095	U			0.0107	J			0.0095	U
2-Chloronaphthalene	91-58-7	mg/kg						0.0088	U			0.0092	U			0.0079	U			0.0091	U			0.0089	U			0.0091	U
4-Chloroaniline	106-47-8	mg/kg						0.013	U			0.014	U			0.012	U			0.014	U			0.013	U			0.014	U
Carbazole	86-74-8	mg/kg						0.0494	J			0.0111	J			0.0048	U			0.0056	U			0.0084	J			0.0056	U
Caprolactam	105-60-2	mg/kg						0.015	U			0.015	U			0.013	U			0.015	U			0.015	U			0.015	U
Chrysene	218-01-9	mg/kg	1	4.9	1			0.467				0.148				0.01	U			0.012	U			0.116				0.0548	
bis(2-Chloroethoxy)methane	111-91-1	mg/kg						0.0079	U			0.0082	U			0.0071	U			0.0082	U			0.008	U			0.0082	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg						0.016	U			0.017	U			0.014	U			0.017	U			0.016	U			0.017	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg						0.013	U			0.014	U			0.012	U			0.014	U			0.013	U			0.014	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg						0.012	U			0.012	U			0.011	U			0.012	U			0.012	U			0.012	U
2,4-Dinitrotoluene	121-14-2	mg/kg						0.011 [a]	U			0.012 [a]	U			0.01 [a]	U			0.012 [a]	U			0.012 [a]	U			0.012 [a]	U
2,6-Dinitrotoluene	606-20-2	mg/kg						0.018	U			0.019	U			0.017	U			0.019	U			0.019	U			0.019	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg						0.031	U			0.032	U			0.028	U			0.032	U			0.031	U			0.032	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1			0.024	U			0.025	U			0.022	U			0.025	U			0.025	U			0.025	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33			0.0805				0.0295	J			0.015	U			0.017	U			0.0184	J			0.017	U
Dibenzofuran	132-64-9	mg/kg	110	18	2.1			0.017	J			0.016	U			0.014	U			0.016	U			0.015	U			0.016	U
Di-n-butyl phthalate	84-74-2	mg/kg						0.006	U			0.0063	U			0.0054	U			0.0063	U			0.0139	J			0.0063	U
Di-n-octyl phthalate	117-84-0	mg/kg						0.0092	U			0.0096	U			0.0083	U			0.0096	U			0.0093	U			0.0096	U
Diethyl phthalate	84-66-2	mg/kg						0.0078	U			0.0082	U			0.0071	U			0.0082	U			0.008	U			0.0082	U
Dimethyl phthalate	131-11-3	mg/kg						0.0065	U			0.0069	U			0.0059	U			0.0068	U			0.0067	U			0.0068	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg						0.0136	J			0.009	U			0.0078	U			0.009	U			0.0362	J			0.009	U
Fluoranthene	206-44-0	mg/kg	1000	100	85			0.82				0.301				0.015	U			0.017	U			0.161				0.0783	
Fluorene	86-73-7	mg/kg	386	100	30			0.0293	J			0.0186	J			0.015	U			0.018	U			0.017	U			0.018	U
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33			0.0093	U			0.0097	U			0.0084	U			0.0097	U			0.0095	U			0.0097	U
Hexachlorobutadiene	87-68-3	mg/kg						0.015	U			0.015	U			0.013	U			0.015	U			0.015	U			0.015	U
Hexachlorocyclopentadiene	77-47-4	mg/kg						0.015	U			0.015	U			0.013	U			0.015	U			0.015	U			0.015	U
Hexachloroethane	67-72-1	mg/kg						0.018	U			0.019	U			0.016	U			0.019	U			0.018	U			0.019	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5			0.376				0.101				0.016	U			0.018	U			0.0879				0.0361	J
Isophorone	78-59-1	mg/kg						0.0079	U			0.0082	U			0.0071	U			0.0082	U			0.008	U			0.0082	U
2-Methylnaphthalene	91-57-6	mg/kg						0.0151	J			0.0087	U			0.0075	U			0.0087	U			0.0084	U			0.0087	U
2-Nitroaniline	88-74-4	mg/kg						0.0087	U			0.0091	U			0.0078	U			0.0091	U			0.0088	U			0.0091	U
3-Nitroaniline	99-09-2	mg/kg						0.0092	U			0.0096	U			0.0083	U			0.0096	U			0.0093	U			0.0096	U
4-Nitroaniline	100-01-6	mg/kg						0.0095	U			0.01	U			0.0086	U			0.01	U			0.0097	U			0.0099	U
Naphthalene	91-20-3	mg/kg	12	100	12			0.0238	J			0.0344	J			0.0094	U			0.0273	J			0.0186	J			0.011	U
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08			0.014	U			0.015	U			0.013	U			0.015	U			0.014	U			0.015	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg						0.011	U			0.011	U			0.0096	U			0.011	U			0.011	U			0.011	U
N-Nitrosodiphenylamine	86-30-6	mg/kg						0.013	U			0.014	U			0.012	U			0.014	U			0.014	U			0.014	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1			0.428				0.215				0.011	U			0.013	U			0.0613				0.0336	J
Pyrene	129-00-0	mg/kg	1000	100	64			0.881				0.289				0.011	U			0.012	U			0.178				0.0818	
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg						0.0093	U			0.0098	U			0.0084	U			0.0098	U			0.0095	U			0.0098	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:						RI-SB 4 (18-18.5)		RI-SB 9 (3.25-3.75)		RI-SB 9 (3.25-3.75)		RI-SB 9 (5-5.5)		RI-SB 9 (5-5.5)		RI-SB 9 (10-10.5)		RI-SB 9 (10-10.5)		RI-SB 9 (17-17.5)		RI-SB 9 (17-17.5)		RI-SB 14 (1-1.5)		RI-SB 14 (1-1.5)		RI-SB 14 (7.5-8)	
Lab Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	JE17704-4A		JE17704-5		JE17704-5A		JE17704-6		JE17704-6A		JE17704-7		JE17704-7A		JE17704-8		JE17704-8A		JE17704-9		JE17704-9A		JE17704-10	
Date Sampled:						8/25/2025 8:53 AM		8/25/2025 9:40 AM		8/25/2025 9:40 AM		8/25/2025 9:41 AM		8/25/2025 9:41 AM		8/25/2025 9:42 AM		8/25/2025 9:42 AM		8/25/2025 9:43 AM		8/25/2025 9:43 AM		8/25/2025 11:10 AM		8/25/2025 11:10 AM		8/25/2025 11:11 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03			0.0393 [e]				0.0106 [e]	J			0.0113 [e]	J			0.0078 [e]	J			0.0109 [e]	J			0.0085 [e]	J
Benzene	71-43-2	mg/kg	0.06	3.7	0.06			0.00063	U			0.00052	U			0.00063	U			0.00053	U			0.00052	U			0.00047	U
Bromochloromethane	74-97-5	mg/kg						0.00077	U			0.00064	U			0.00078	U			0.00065	U			0.00063	U			0.00058	U
Bromodichloromethane	75-27-4	mg/kg						0.00059	U			0.00049	U			0.0006	U			0.0005	U			0.00049	U			0.00045	U
Bromoform	75-25-2	mg/kg						0.0019	U			0.0016	U			0.0019	U			0.0016	U			0.0015	U			0.0014	U
Bromomethane	74-83-9	mg/kg						0.0011 [a]	U			0.00087 [a]	U			0.0011 [a]	U			0.00089 [a]	U			0.00086 [a]	U			0.00079 [a]	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1			0.0034 [c]	U			0.0028 [c]	U			0.0034 [c]	U			0.0028 [c]	U			0.0028 [c]	U			0.0025 [c]	U
Carbon disulfide	75-15-0	mg/kg						0.00074	U			0.00061	U			0.00075	U			0.00062	U			0.00061	U			0.00056	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76			0.00085 [a]	U			0.00071 [a]	U			0.00086 [a]	U			0.00072 [a]	U			0.0007 [a]	U			0.00064 [a]	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5			0.00063	U			0.00053	U			0.00064	U			0.00053	U			0.00052	U			0.00048	U
Chloroethane	75-00-3	mg/kg						0.00082 [d]	U			0.00068 [d]	U			0.00082 [d]	U			0.00069 [d]	U			0.00067 [d]	U			0.00061 [d]	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37			0.0014	U			0.0011	U			0.0014	U			0.0012	U			0.0011	U			0.001	U
Chloromethane	74-87-3	mg/kg						0.0027	U			0.0022	U			0.0027	U			0.0023	U			0.0022	U			0.002	U
Cyclohexane	110-82-7	mg/kg						0.00091 [a]	U			0.00075 [a]	U			0.00092 [a]	U			0.00076 [a]	U			0.00074 [a]	U			0.00068 [a]	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg						0.00096	U			0.00079	U			0.00097	U			0.00081	U			0.00079	U			0.00072	U
Dibromochloromethane	124-48-1	mg/kg						0.00077	U			0.00064	U			0.00078	U			0.00065	U			0.00063	U			0.00058	U
1,2-Dibromoethane	106-93-4	mg/kg						0.00058	U			0.00048	U			0.00059	U			0.00049	U			0.00048	U			0.00044	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1			0.00075	U			0.00063	U			0.00076	U			0.00064	U			0.00062	U			0.00057	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6			0.00068	U			0.00057	U			0.00069	U			0.00058	U			0.00056	U			0.00052	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8			0.00068	U			0.00057	U			0.00069	U			0.00058	U			0.00056	U			0.00051	U
Dichlorodifluoromethane	75-71-8	mg/kg						0.001	U			0.00083	U			0.001	U			0.00085	U			0.00082	U			0.00076	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27			0.00068	U			0.00057	U			0.00069	U			0.00058	U			0.00056	U			0.00052	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02			0.00065	U			0.00054	U			0.00066	U			0.00055	U			0.00053	U			0.00049	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24			0.0009	U			0.00075	U			0.00091	U			0.00076	U			0.00074	U			0.00068	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19			0.0012	U			0.00096	U			0.0012	U			0.00098	U			0.00095	U			0.00087	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19			0.00084	U			0.0007	U			0.00085	U			0.00071	U			0.00069	U			0.00064	U
1,2-Dichloropropane	78-87-5	mg/kg						0.00065	U			0.00054	U			0.00066	U			0.00055	U			0.00054	U			0.00049	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg						0.00066	U			0.00054	U			0.00066	U			0.00055	U			0.00054	U			0.00049	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg						0.00063	U			0.00052	U			0.00064	U			0.00053	U			0.00052	U			0.00048	U
Ethylbenzene	100-41-4	mg/kg	1	76	1			0.00062	U			0.00052	U			0.00063	U			0.00053	U			0.00051	U			0.00047	U
Freon 113	76-13-1	mg/kg						0.0037	U			0.0031	U			0.0037	U			0.0031	U			0.003	U			0.0028	U
2-Hexanone	591-78-6	mg/kg						0.0029	U			0.0024	U			0.003	U			0.0025	U			0.0024	U			0.0022	U
Isopropylbenzene	98-82-8	mg/kg						0.002	U			0.0016	U			0.002	U			0.0017	U			0.0016	U			0.0015	U
Methyl Acetate	79-20-9	mg/kg						0.0019	U			0.0016	U			0.0019	U			0.0016	U			0.0016	U			0.0014	U
Methylcyclohexane	108-87-2	mg/kg						0.0012	U			0.001	U			0.0012	U			0.001	U			0.00099	U			0.00091	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1			0.00065	U			0.00054	U			0.00065	U			0.00055	U			0.00053	U			0.00049	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg						0.0031	U			0.0026	U			0.0032	U			0.0026	U			0.0026	U			0.0024	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05			0.0036	U			0.003	U			0.0036	U			0.003	U			0.003	U			0.0027	U
Styrene	100-42-5	mg/kg						0.00055	U			0.00046	U			0.00056	U			0.00047	U			0.00046	U			0.00042	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg						0.00083	U			0.00069	U			0.00084	U			0.0007	U			0.00068	U			0.00062	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3			0.0008	U			0.00066	U			0.00081	U			0.00068	U			0.00066	U			0.0006	U
Toluene	108-88-3	mg/kg	0.7	100	0.7			0.00072	U			0.0006	U			0.00073	U			0.00061	U			0.00059	U			0.00055	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg						0.0034	U			0.0029	U			0.0035	U			0.0029	U			0.0028	U			0.0026	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg						0.0034	U			0.0029	U			0.0035	U			0.0029	U			0.0028	U			0.0026	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68			0.00067	U			0.00055	U			0.00067	U			0.00056	U			0.00055	U			0.0005	U
1,1,2-Trichloroethane	79-00-5	mg/kg						0.00076 [c]	U			0.00063 [c]	U			0.00077 [c]	U			0.00065 [c]	U			0.00063 [c]	U			0.00058 [c]	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47			0.0011	U			0.00087	U			0.0011	U			0.00089	U			0.00086	U			0.00079	U
Trichlorofluoromethane	75-69-4	mg/kg						0.00094 [d]	U			0.00078 [d]	U			0.00095 [d]	U			0.0008 [d]	U			0.00077 [d]	U			0.00071 [d]	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03			0.00066 [a]	U			0.00055 [a]	U			0.00067 [a]	U			0.00056 [a]	U			0.00054 [a]	U			0.0005 [a]	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26			0.0012	U			0.001	U			0.0012	U			0.001	U			0.001	U			0.00093	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26			0.00063	U			0.00052	U			0.00064	U			0.00053	U			0.00052	U			0.00048	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26			0.00063	U			0.00052	U			0.00064	U			0.00053	U			0.00052	U			0.00048	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

	= concentration exceeds USCO
	= concentration exceeds RRSCO
#	= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 14 (7.5-8)		RI-SB 14 (13.5-14)		RI-SB 14 (13.5-14)		RI-SB 14 (15-15.5)		RI-SB 14 (15-15.5)		RI-SB 19 (3-3.5)		RI-SB 19 (3-3.5)		RI-SB 19 (7-7.5)		RI-SB 19 (7-7.5)		RI-SB 19 (13-13.5)		RI-SB 19 (13-13.5)		RI-SB 19 (17-17.5)	
Lab Sample ID:						JE17704-10A		JE17704-11		JE17704-11A		JE17704-12		JE17704-12A		JE17704-13		JE17704-13A		JE17704-14		JE17704-14A		JE17704-15		JE17704-15A		JE17704-16	
Date Sampled:						8/25/2025 11:11 AM		8/25/2025 11:12 AM		8/25/2025 11:12 AM		8/25/2025 11:13 AM		8/25/2025 11:13 AM		8/25/2025 12:15 PM		8/25/2025 12:15 PM		8/25/2025 12:16 PM		8/25/2025 12:16 PM		8/25/2025 12:17 PM		8/25/2025 12:17 PM		8/25/2025 12:18 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005			0.0006	U			0.00063	U			0.00056	U			0.00058	U			0.00058	U			0.00061	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02			0.00059	U			0.00062	U			0.00055	U			0.00057	U			0.00057	U			0.0006	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036			0.00066	U			0.00069	U			0.00061	U			0.00063	U			0.00063	U			0.00067	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04			0.0007	U			0.00073	U			0.00065	U			0.00067	U			0.00067	U			0.00071	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1			0.00054	U			0.00056	U			0.0005	U			0.00051	U			0.00052	U			0.00055	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094			0.00059	U			0.0034				0.00054	U			0.00056	U			0.00056	U			0.0006	U
gamma-Chlordane	5103-74-2	mg/kg	14					0.00033	U			0.0027				0.00031	U			0.00032	U			0.00032	U			0.00034	U
Chlordane (alpha and gamma)	57-74-9	mg/kg						0.00033	U			0.0061				0.00031	U			0.00032	U			0.00032	U			0.00034	U
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005			0.0005	U			0.0026				0.00046	U			0.00048	U			0.00048	U			0.00051	U
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033			0.00067	U			0.0029				0.00062	U			0.00064	U			0.00064	U			0.00068	U
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033			0.00064	U			0.0023				0.00059	U			0.00061	U			0.00061	U			0.00065	U
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033			0.00065	U			0.0014				0.0155 [j]				0.00062	U			0.0013 [b]				0.00066	U
Endrin	72-20-8	mg/kg	0.06	11	0.014			0.00057	U			0.00059	U			0.00052	U			0.00054	U			0.0028 [b]				0.00058	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4			0.00057	U			0.0006	U			0.00053	U			0.00055	U			0.00055	U			0.00058	U
Endrin aldehyde	7421-93-4	mg/kg						0.00041	U			0.00043	U			0.00038	U			0.0004	U			0.0004	U			0.00042	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4			0.00042	U			0.00044	U			0.00039	U			0.0004	U			0.0004	U			0.00043	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4			0.00046	U			0.00048	U			0.00042	U			0.00044	U			0.00044	U			0.00046	U
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042			0.00063	U			0.00066	U			0.00058	U			0.0006	U			0.0006	U			0.00064	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02					0.00051	U			0.00054	U			0.00047	U			0.00049	U			0.00049	U			0.00052	U
Methoxychlor	72-43-5	mg/kg	900					0.00058	U			0.00061	U			0.00054	U			0.00056	U			0.00056	U			0.00059	U
Endrin ketone	53494-70-5	mg/kg						0.00053	U			0.00055	U			0.00049	U			0.0005	U			0.00051	U			0.00054	U
Toxaphene	8001-35-2	mg/kg						0.017	U			0.018	U			0.016	U			0.016	U			0.016	U			0.017	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1			0.017	U			0.018	U			0.016	U			0.016	U			0.016	U			0.017	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1			0.023	U			0.024	U			0.021	U			0.022	U			0.022	U			0.023	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1			0.023	U			0.024	U			0.022	U			0.022	U			0.022	U			0.024	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1			0.015	U			0.016	U			0.014	U			0.014	U			0.014	U			0.015	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1			0.033	U			0.034	U			0.03	U			0.031	U			0.031	U			0.033	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1			0.02	U			0.021	U			0.018	U			0.019	U			0.019	U			0.02	U
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1			0.016	U			0.016	U			0.014	U			0.015	U			0.015	U			0.016	U
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1			0.032	U			0.033	U			0.03	U			0.031	U			0.031	U			0.033	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1			0.024	U			0.025	U			0.022	U			0.023	U			0.023	U			0.024	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27			0.27	U			0.3	U			0.89				0.26				1.8				0.3	U
Solids, Percent	PERCENT SOLIDS	%						82.6				86.1				91				92.4				88.8				89.8	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg						19900				14600				4020				8780				11300				6500	
Antimony	7440-36-0	mg/kg						4.8	U			2.4	U			2.1	U			11	U			2.2	U			2.1	U
Arsenic	7440-38-2	mg/kg	16	16	13			2.4	U			2.4	U			16.1				35.8				2.2	U			2.1	U
Barium	7440-39-3	mg/kg	820	410	410			98.1				56.6				81.7				97				132				50.1	
Beryllium	7440-41-7	mg/kg	47	43	4.4			0.5				0.39				0.37				0.32				0.31				0.21	U
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5			0.6	U			0.59	U			0.53	U			0.53	U			0.55	U			0.53	U
Calcium	7440-70-2	mg/kg						1080				1390				4300				3110				5770				956	
Chromium	7440-47-3	mg/kg	19	110	30			26.3				22.4				7.8				15.6				16.6				12.3	
Cobalt	7440-48-4	mg/kg						10.4				8.7				5.3	U			8.9				8.5				5.3	U
Copper	7440-50-8	mg/kg	1720	280	50			30.3				21.5				33				49.4				47.7				10.6	
Iron	7439-89-6	mg/kg						25700				18400				12800				32200				18100				10400	
Lead	7439-92-1	mg/kg	450	400	63			6.8				41.2				277				1330				74.7				3.9	
Magnesium	7439-95-4	mg/kg						7220				4820				2600				3740				4730				2320	
Manganese	7439-96-5	mg/kg	2000	2000	1600			247				184				86.9				239				202				72.1	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18			0.033	U			0.26				0.22				0.16				0.18				0.032	U
Nickel	7440-02-0	mg/kg	130	320	30			22.6				17.5				11.7				19.7				13.3				8.5	
Potassium	7440-09-7	mg/kg						3480				1550				1100	U			1240				2370				1100	U
Selenium	7782-49-2	mg/kg	4	110	3.9			4.8	U			2.4	U			2.1	U			11	U			2.2	U			2.1	U
Silver	7440-22-4	mg/kg	8.3	110	2			1.2	U			0.59	U			0.53	U			2.6	U			0.55	U			0.53	U
Sodium	7440-23-5	mg/kg						1200	U			1200	U			1100	U			1100	U			1100	U			1100	U
Thallium	7440-28-0	mg/kg						2.4	U			1.2	U			1.1	U			5.3	U			1.1	U			1.1	U
Vanadium	7440-62-2	mg/kg						35.1				29.3				15.4				20.9				48.1				12.7	
Zinc	7440-66-6	mg/kg	2480	6600	109			55.2				75.7				103				101				64.5				32.1	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 14 (7.5-8)		RI-SB 14 (13.5-14)		RI-SB 14 (13.5-14)		RI-SB 14 (15-15.5)		RI-SB 14 (15-15.5)		RI-SB 19 (3-3.5)		RI-SB 19 (3-3.5)		RI-SB 19 (7-7.5)		RI-SB 19 (7-7.5)		RI-SB 19 (13-13.5)		RI-SB 19 (13-13.5)		RI-SB 19 (17-17.5)	
Lab Sample ID:						JE17704-10A		JE17704-11		JE17704-11A		JE17704-12		JE17704-12A		JE17704-13		JE17704-13A		JE17704-14		JE17704-14A		JE17704-15		JE17704-15A		JE17704-16	
Date Sampled:						8/25/2025 11:11 AM		8/25/2025 11:12 AM		8/25/2025 11:12 AM		8/25/2025 11:13 AM		8/25/2025 11:13 AM		8/25/2025 12:15 PM		8/25/2025 12:15 PM		8/25/2025 12:16 PM		8/25/2025 12:16 PM		8/25/2025 12:17 PM		8/25/2025 12:17 PM		8/25/2025 12:18 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00013	U			0.00013	U			0.00013	U			0.00012	U			0.00012	U			0.00012	U		
Perfluoropentanoic acid	2706-90-3	mg/kg				0.00008	U			0.000084	U			0.00008	U			0.000075	U			0.000074	U			0.000078	U		
Perfluorohexanoic acid	307-24-4	mg/kg				0.000034	U			0.000036	U			0.000034	U			0.000032	U			0.000032	U			0.000034	U		
Perfluoroheptanoic acid	375-85-9	mg/kg				0.000057	U			0.00006	U			0.000057	U			0.000054	U			0.000053	U			0.000056	U		
Perfluorooctanoic acid	335-67-1	mg/kg				0.000092	U			0.000096	U			0.000092	U			0.000093	J			0.000084	U			0.000089	U		
Perfluorononanoic acid	375-95-1	mg/kg				0.000063	J			0.00006	U			0.000057	U			0.000054	U			0.000053	U			0.000056	U		
Perfluorodecanoic acid	335-76-2	mg/kg				0.00008	U			0.000084	U			0.00008	U			0.000075	U			0.000074	U			0.000078	U		
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000069	U			0.00011	J			0.000069	U			0.000064	U			0.000063	U			0.000067	U		
Perfluorododecanoic acid	307-55-1	mg/kg				0.000092	U			0.000096	U			0.000092	U			0.000086	U			0.000084	U			0.000089	U		
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.0001	U			0.00011	U			0.0001	U			0.000096	U			0.000095	U			0.0001	U		
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00011	U			0.00012	U			0.00011	U			0.00011	U			0.00011	U			0.00011	U		
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.00008	U			0.000084	U			0.00008	U			0.000075	U			0.000074	U			0.000078	U		
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00013	U			0.00013	U			0.00013	U			0.00012	U			0.00012	U			0.00012	U		
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00011	U			0.00012	U			0.00011	U			0.00011	U			0.00011	U			0.00011	U		
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.000057	U			0.00006	U			0.00022	J			0.000054	U			0.00026				0.000056	U		
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00013	U			0.00013	U			0.00013	U			0.00012	U			0.00012	U			0.00012	U		
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00011	U			0.00012	U			0.00011	U			0.00011	U			0.00011	U			0.00011	U		
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.00022	U			0.00023	U			0.00022	U			0.0002	U			0.00021	U			0.00021	U		
PFOSA	754-91-6	mg/kg				0.00008	U			0.000084	U			0.00008	U			0.000075	U			0.000074	U			0.000078	U		
MeFOSAA	2355-31-9	mg/kg				0.000092	U			0.000096	U			0.000092	U			0.000086	U			0.000084	U			0.000089	U		
EtFOSAA	2991-50-6	mg/kg				0.00015	U			0.00016	U			0.00015	U			0.00014	U			0.00014	U			0.00015	U		
2-Chlorophenol	95-57-8	mg/kg						0.019	U			0.019	U			0.018	U			0.017	U			0.018	U			0.018	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg						0.024	U			0.023	U			0.022	U			0.021	U			0.023	U			0.022	U
2,4-Dichlorophenol	120-83-2	mg/kg						0.033	U			0.033	U			0.031	U			0.029	U			0.032	U			0.031	U
2,4-Dimethylphenol	105-67-9	mg/kg						0.07	U			0.068	U			0.064	U			0.061	U			0.066	U			0.065	U
2,4-Dinitrophenol	51-28-5	mg/kg						0.15 [a]	U			0.14 [a]	U			0.14 [a]	U			0.13	U			0.14 [a]	U			0.14	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg						0.042 [a]	U			0.041 [a]	U			0.039 [a]	U			0.037 [a]	U			0.04 [a]	U			0.039 [a]	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33			0.025	U			0.024	U			0.0449	J			0.022	U			0.024	U			0.023	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33			0.032	U			0.031	U			0.134				0.028	U			0.031	U			0.03	U
2-Nitrophenol	88-75-5	mg/kg						0.026 [a]	U			0.025 [a]	U			0.024 [a]	U			0.023 [a]	U			0.025 [a]	U			0.024 [a]	U
4-Nitrophenol	100-02-7	mg/kg						0.1	U			0.1	U			0.097	U			0.092	U			0.1	U			0.097	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8			0.037	U			0.036	U			0.034	U			0.032	U			0.035	U			0.034	U
Phenol	108-95-2	mg/kg	0.33	100	0.33			0.02 [a]	U			0.02 [a]	U			0.102 [k]				0.018 [a]	U			0.019 [a]	U			0.019 [a]	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg						0.026	U			0.025	U			0.024	U			0.023	U			0.025	U			0.024	U
2,4,5-Trichlorophenol	95-95-4	mg/kg						0.029	U			0.029	U			0.027	U			0.026	U			0.028	U			0.027	U
2,4,6-Trichlorophenol	88-06-2	mg/kg						0.023	U			0.023	U			0.022	U			0.021	U			0.022	U			0.022	U
Acenaphthene	83-32-9	mg/kg	98	100	20			0.014	U			0.0171	J			0.27				0.012	U			0.101				0.013	U
Acenaphthylene	208-96-8	mg/kg	365	100	100			0.02	U			0.019	U			6.71				0.0779				2.49				0.0326	J
Acetophenone	98-86-2	mg/kg						0.0084	U			0.0082	U			0.47				0.0074	U			0.0681	J			0.0078	U
Anthracene	120-12-7	mg/kg	1000	100	100			0.024	U			0.0307	J			3.5				0.0583				1.11				0.022	U
Atrazine	1912-24-9	mg/kg						0.017	U			0.016	U			0.015	U			0.015	U			0.016	U			0.016	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1			0.011	U			0.0385				2.95				0.213				2.6				0.0314	J
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1			0.018	U			0.0496				8.7				0.203				2.99				0.049	
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1			0.017	U			0.0649				9.1				0.26				3.2				0.0503	
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64			0.02	U			0.0503				13.6				0.189				4.06				0.0766	
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8			0.018	U			0.0284	J			1.77				0.0902				1.2				0.0174	J
4-Bromophenyl phenyl ether	101-55-3	mg/kg						0.015	U			0.015	U			0.014	U			0.013	U			0.014	U			0.014	U
Butyl benzyl phthalate	85-68-7	mg/kg						0.0096	U			0.0093	U			0.0088	U			0.0084	U			0.0091	U			0.0089	U
1,1'-Biphenyl	92-52-4	mg/kg						0.0054	U			0.0094	J			0.373				0.0047	U			0.0632	J			0.005	U
Benzaldehyde	100-52-7	mg/kg						0.0097	U			0.0095	U			0.009	U			0.0085	U			0.0092	U			0.009	U
2-Chloronaphthalene	91-58-7	mg/kg						0.0093	U			0.0091	U			0.0758				0.0082	U			0.0089	U			0.0087	U
4-Chloroaniline	106-47-8	mg/kg						0.014	U			0.014	U			0.013	U			0.012	U			0.013	U			0.013	U
Carbazole	86-74-8	mg/kg						0.0057	U			0.0089	J			0.072				0.0135	J			0.0717	J			0.0053	U
Caprolactam	105-60-2	mg/kg						0.015	U			0.015	U			0.014	U			0.014	U			0.015	U			0.014	U
Chrysene	218-01-9	mg/kg	1	4.9	1			0.012	U			0.0518				3.31				0.202				2.47				0.0194	J
bis(2-Chloroethoxy)methane	111-91-1	mg/kg						0.0084	U			0.0082	U			0.0077	U			0.0074	U			0.008	U			0.0078	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg						0.017	U			0.016	U			0.016	U			0.015	U			0.016	U			0.016	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg						0.014	U			0.014	U			0.013	U			0.012	U			0.013	U			0.013	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg						0.013	U			0.012	U			0.012	U			0.011	U			0.012	U			0.012	U
2,4-Dinitrotoluene	121-14-2	mg/kg						0.012	U			0.012	U			0.011	U			0.011	U			0.012	U			0.011	U
2,6-Dinitrotoluene	606-20-2	mg/kg						0.02 [a]	U			0.019 [a]	U			0.018 [a]	U			0.017 [a]	U			0.019 [a]	U			0.018 [a]	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg						0.033	U			0.032	U			0.03	U			0.029	U			0.031	U			0.03	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1			0.026	U			0.025	U			0.024	U			0.023 [a]	U			0.025	U			0.024 [a]	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33			0.017	U			0.017	U			2.28				0.0489				0.85				0.016	U
Dibenzofuran	132-64-9	mg/kg	110	18	2.1			0.016	U			0.016	U			0.119				0.014	U			0.0459	J			0.015	U
Di-n-butyl phthalate	84-74-2	mg/kg						0.0064	U			0.0062	U			0.0059	U			0.0056	U			0.0061	U			0.0059	U
Di-n-octyl phthalate	117-84-0	mg/kg						0.0414	J			0.0095	U			0.009	U			0.0086	U			0.0093	U			0.0091	U
Diethyl phthalate	84-66-2	mg/kg						0.0083	U			0.0081	U			0.0077	U			0.0073	U			0.0079	U			0.0078	U
Dimethyl phthalate	131-11-3	mg/kg						0.007	U			0.0068	U			0.0064	U			0.0061	U			0.0066	U			0.0065	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg						0.0092	U			0.0089	U			0.0085	U			0.0081	U			0.0087	U			0.0095	J
Fluoranthene	206-44-0	mg/kg	1000	100	85			0.017	U			0.0632				2.48				0.288				2.08				0.0236	J
Fluorene	86-73-7	mg/kg	386	100	30			0.018	U			0.0303	J			0.62				0.016	U			0.344				0.017	U
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33			0.0099	U			0.0097	U			0.0091	U			0.0087	U			0.0094	U			0.0092	U
Hexachlorobutadiene	87-68-3	mg/kg						0.016	U			0.015	U			0.015	U			0.014	U			0.015	U			0.015	U
Hexachlorocyclopentadiene	77-47-4	mg/kg						0.016	U			0.015	U			0.014	U			0.014 [l]	U			0.015	U			0.014 [l]	U
Hexachloroethane	67-72-1	mg/kg						0.019	U			0.019	U			0.018	U			0.017	U			0.018	U			0.018	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5			0.018	U			0.0344	J			7.65				0.148				2.33				0.0468	
Isophorone	78-59-1	mg/kg						0.0084	U			0.0082	U			0.0077	U			0.0074	U			0.008	U			0.0078	U
2-Methylnaphthalene	91-57-6	mg/kg						0.0089	U			0.0184	J			2.4				0.0078	U			0.216				0.0082	U
2-Nitroaniline	88-74-4	mg/kg						0.0092 [a]	U			0.009 [a]	U			0.0085 [a]	U			0.0081 [a]	U			0.0088 [a]	U			0.0086 [a]	U
3-Nitroaniline	99-09-2	mg/kg						0.0098	U			0.0096	U			0.009	U			0.0086	U			0.0093	U			0.0091	U
4-Nitroaniline	100-01-6	mg/kg						0.01	U			0.0099	U			0.0094	U			0.0089	U			0.0097	U			0.0094	U
Naphthalene	91-20-3	mg/kg	12	100	12			0.011	U			0.0196	JB			6.04 [h]	B			0.0186	J			0.307 [h]	B			0.0147	J
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08			0.015	U			0.015	U			0.014	U			0.013	U			0.014	U			0.014	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg						0.011	U			0.011	U			0.01	U			0.01	U			0.011	U			0.011	U
N-Nitrosodiphenylamine	86-30-6	mg/kg						0.014	U			0.014	U			0.013	U			0.013	U			0.014	U			0.013	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1			0.013	U			0.0558				2.11				0.151				1.42				0.0262	J
Pyrene	129-00-0	mg/kg	1000	100	64			0.013	U			0.0793				6.21				0.355				3.5				0.0515	
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg						0.01	U			0.0097	U			0.0092	U			0.0088	U			0.0095	U			0.0092	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 14 (7.5-8)		RI-SB 14 (13.5-14)		RI-SB 14 (13.5-14)		RI-SB 14 (15-15.5)		RI-SB 14 (15-15.5)		RI-SB 19 (3-3.5)		RI-SB 19 (3-3.5)		RI-SB 19 (7-7.5)		RI-SB 19 (7-7.5)		RI-SB 19 (13-13.5)		RI-SB 19 (13-13.5)		RI-SB 19 (17-17.5)	
Lab Sample ID:						JE17704-10A		JE17704-11		JE17704-11A		JE17704-12		JE17704-12A		JE17704-13		JE17704-13A		JE17704-14		JE17704-14A		JE17704-15		JE17704-15A		JE17704-16	
Date Sampled:						8/25/2025 11:11 AM		8/25/2025 11:12 AM		8/25/2025 11:12 AM		8/25/2025 11:13 AM		8/25/2025 11:13 AM		8/25/2025 12:15 PM		8/25/2025 12:15 PM		8/25/2025 12:16 PM		8/25/2025 12:16 PM		8/25/2025 12:17 PM		8/25/2025 12:17 PM		8/25/2025 12:18 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03			0.0531 [e]				0.057 [e]				0.0076 [e]	J			0.0369 [e]				0.0136 [e]				0.0444 [e]	
Benzene	71-43-2	mg/kg	0.06	3.7	0.06			0.00063	U			0.00047	U			0.00057	U			0.0028				0.0077				0.00047	U
Bromochloromethane	74-97-5	mg/kg						0.00077	U			0.00058	U			0.0007	U			0.00067	U			0.00072	U			0.00058	U
Bromodichloromethane	75-27-4	mg/kg						0.00059	U			0.00044	U			0.00054	U			0.00052	U			0.00055	U			0.00044	U
Bromoform	75-25-2	mg/kg						0.0019	U			0.0014	U			0.0017	U			0.0016	U			0.0017	U			0.0014	U
Bromomethane	74-83-9	mg/kg						0.0011 [a]	U			0.00079 [a]	U			0.00095 [a]	U			0.00092 [a]	U			0.00098 [a]	U			0.00079 [a]	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1			0.0033 [c]	U			0.0039 [c]	J			0.003 [c]	U			0.006 [c]	J			0.0031 [c]	U			0.0047 [c]	J
Carbon disulfide	75-15-0	mg/kg						0.002	J			0.00055	U			0.00067	U			0.00064	U			0.00068	U			0.00055	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76			0.00085 [a]	U			0.00064 [a]	U			0.00077 [a]	U			0.00074 [a]	U			0.00079 [a]	U			0.00064 [a]	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5			0.00063	U			0.00048	U			0.00057	U			0.00055	U			0.00059	U			0.00047	U
Chloroethane	75-00-3	mg/kg						0.00081 [d]	U			0.00061 [d]	U			0.00074 [d]	U			0.00071 [d]	U			0.00076 [d]	U			0.00061 [d]	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37			0.0014	U			0.001	U			0.0012	U			0.0012	U			0.0013	U			0.001	U
Chloromethane	74-87-3	mg/kg						0.0027	U			0.002	U			0.0024	U			0.0024	U			0.0025	U			0.002	U
Cyclohexane	110-82-7	mg/kg						0.0009 [a]	U			0.00068 [a]	U			0.00082 [a]	U			0.00079 [a]	U			0.00084 [a]	U			0.00068 [a]	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg						0.00095	U			0.00072	U			0.00087	U			0.00083	U			0.00089	U			0.00072	U
Dibromochloromethane	124-48-1	mg/kg						0.00077	U			0.00058	U			0.0007	U			0.00067	U			0.00072	U			0.00058	U
1,2-Dibromoethane	106-93-4	mg/kg						0.00058	U			0.00044	U			0.00053	U			0.00051	U			0.00054	U			0.00043	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1			0.00075	U			0.00057	U			0.00068	U			0.00066	U			0.0007	U			0.00056	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6			0.00068	U			0.00051	U			0.00062	U			0.0006	U			0.00063	U			0.00051	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8			0.00068	U			0.00051	U			0.00062	U			0.00059	U			0.00063	U			0.00051	U
Dichlorodifluoromethane	75-71-8	mg/kg						0.001	U			0.00075	U			0.00091	U			0.00087	U			0.00093	U			0.00075	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27			0.00068	U			0.00051	U			0.00062	U			0.0006	U			0.00063	U			0.00051	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02			0.00065	U			0.00049	U			0.00059	U			0.00057	U			0.0006	U			0.00048	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24			0.0009	U			0.00068	U			0.00082	U			0.00079	U			0.00084	U			0.00068	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19			0.0012	U			0.00087	U			0.001	U			0.001	U			0.0011	U			0.00087	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19			0.00084	U			0.00063	U			0.00076	U			0.00073	U			0.00078	U			0.00063	U
1,2-Dichloropropane	78-87-5	mg/kg						0.00065	U			0.00049	U			0.00059	U			0.00057	U			0.00061	U			0.00049	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg						0.00065	U			0.00049	U			0.00059	U			0.00057	U			0.00061	U			0.00049	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg						0.00063	U			0.00047	U			0.00057	U			0.00055	U			0.00058	U			0.00047	U
Ethylbenzene	100-41-4	mg/kg	1	76	1			0.00062	U			0.00047	U			0.00057	U			0.00054	U			0.00058	U			0.00047	U
Freon 113	76-13-1	mg/kg						0.0037	U			0.0028	U			0.0033	U			0.0032	U			0.0034	U			0.0028	U
2-Hexanone	591-78-6	mg/kg						0.0029	U			0.0022	U			0.0026	U			0.0025	U			0.0027	U			0.0022	U
Isopropylbenzene	98-82-8	mg/kg						0.002	U			0.0015	U			0.0018	U			0.0017	U			0.0018	U			0.0015	U
Methyl Acetate	79-20-9	mg/kg						0.0019	U			0.0014	U			0.0017	U			0.0017	U			0.0018	U			0.0014	U
Methylcyclohexane	108-87-2	mg/kg						0.0012	U			0.00091	U			0.0011	U			0.0011	U			0.0011	U			0.0009	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1			0.00065	U			0.00049	U			0.00059	U			0.00056	U			0.0006	U			0.00048	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg						0.0031	U			0.0024	U			0.0028	U			0.0027	U			0.0029	U			0.0023	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05			0.0036	U			0.0027	U			0.0033	U			0.0031	U			0.0033	U			0.0027	U
Styrene	100-42-5	mg/kg						0.00055	U			0.00042	U			0.0005	U			0.00049	J			0.00051	U			0.00041	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg						0.00082	U			0.00062	U			0.00075	U			0.00072	U			0.00077	U			0.00062	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3			0.0008	U			0.0006	U			0.00072	U			0.0007	U			0.00074	U			0.0006	U
Toluene	108-88-3	mg/kg	0.7	100	0.7			0.00072	U			0.00054	U			0.00066	U			0.0013				0.0052				0.00054	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg						0.0034	U			0.0026	U			0.0031	U			0.003	U			0.0032	U			0.0026	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg						0.0034	U			0.0026	U			0.0031	U			0.003	U			0.0032	U			0.0026	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68			0.00066	U			0.0005	U			0.0006	U			0.00058	U			0.00062	U			0.0005	U
1,1,2-Trichloroethane	79-00-5	mg/kg						0.00076 [c]	U			0.00057 [c]	U			0.00069 [c]	U			0.00067 [c]	U			0.00071 [c]	U			0.00057 [c]	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47			0.001	U			0.00079	U			0.00095	U			0.00092	U			0.00098	U			0.00079	U
Trichlorofluoromethane	75-69-4	mg/kg						0.00094 [d]	U			0.00071 [d]	U			0.00085 [d]	U			0.00082 [d]	U			0.00088 [d]	U			0.00071 [d]	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03			0.00066 [a]	U			0.0005 [a]	U			0.0006 [a]	U			0.00058 [a]	U			0.00062 [a]	U			0.0005 [a]	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26			0.0012	U			0.00093	U			0.0011	U			0.0011	U			0.0013				0.00092	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26			0.00063	U			0.00047	U			0.00057	U			0.00055	U			0.00062	J			0.00047	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26			0.00063	U			0.00047	U			0.00057	U			0.00055	U			0.0019				0.00047	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

= concentration exceeds USCO
= concentration exceeds RRSCO
= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 19 (17-17.5)		RI-SB 10 (2-2.5)		RI-SB 10 (2-2.5)		RI-SB 10 (7.5-8)		RI-SB 10 (7.5-8)		RI-SB 10 (10.5-11)		RI-SB 10 (10.5-11)		RI-SB 10 (15.5-16)		RI-SB 10 (15.5-16)		RI-SB 11 (2-2.5)		RI-SB 11 (2-2.5)		RI-SB 11 (8-8.5)	
Lab Sample ID:						JE17704-16A		JE17704-17		JE17704-17A		JE17704-18		JE17704-18A		JE17704-19		JE17704-19A		JE17704-20		JE17704-20A		JE17704-21		JE17704-21A		JE17704-22	
Date Sampled:						8/25/2025 12:18 PM		8/25/2025 1:30 PM		8/25/2025 1:30 PM		8/25/2025 1:31 PM		8/25/2025 1:31 PM		8/25/2025 1:32 PM		8/25/2025 1:32 PM		8/25/2025 1:33 PM		8/25/2025 1:33 PM		8/25/2025 2:45 PM		8/25/2025 2:45 PM		8/25/2025 2:46 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005			0.00063	U			0.00068	U			0.00064	U			0.00065	U			0.00056	U			0.00059	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02			0.00062	U			0.00067	U			0.00064	U			0.00064	U			0.00056	U			0.00058	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036			0.00069	U			0.00075	U			0.00071	U			0.00072	U			0.00062	U			0.00065	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04			0.00073	U			0.0008	U			0.00075	U			0.00076	U			0.00066	U			0.00069	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1			0.00056	U			0.00061	U			0.00058	U			0.00058	U			0.0005	U			0.00053	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094			0.00062	U			0.0029				0.00063	U			0.00064	U			0.00055	U			0.00058	U
gamma-Chlordane	5103-74-2	mg/kg	14					0.00035	U			0.0026 [b]				0.00035	U			0.00036	U			0.00031	U			0.00032	U
Chlordane (alpha and gamma)	57-74-9	mg/kg						0.00035	U			0.0055				0.00035	U			0.00036	U			0.00031	U			0.00032	U
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005			0.00052	U			0.0018 [b]				0.00054	U			0.00054	U			0.00047	U			0.00049	U
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033			0.0025				0.0243				0.00072	U			0.00073	U			0.00063	U			0.00066	U
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033			0.00067	U			0.0072				0.00069	U			0.00069	U			0.0006	U			0.00063	U
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033			0.0013				0.0089				0.00069	U			0.0007	U			0.0011				0.00063	U
Endrin	72-20-8	mg/kg	0.06	11	0.014			0.00059	U			0.00064	U			0.00061	U			0.00061	U			0.00053	U			0.00056	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4			0.0006	U			0.00065	U			0.00061	U			0.00062 [a]	U			0.00053	U			0.00056	U
Endrin aldehyde	7421-93-4	mg/kg						0.00043	U			0.00047	U			0.00044	U			0.00045	U			0.00039	U			0.00041	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4			0.00044	U			0.00048	U			0.00045	U			0.00046	U			0.00039	U			0.00041	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4			0.00048	U			0.0011 [b]				0.00049	U			0.00049	U			0.00043	U			0.00045	U
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042			0.00066	U			0.00071	U			0.00067	U			0.00068	U			0.00059	U			0.00062	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02					0.00054	U			0.00058	U			0.00055	U			0.00055	U			0.00048	U			0.0005	U
Methoxychlor	72-43-5	mg/kg	900					0.00061	U			0.00066	U			0.00062	U			0.00063	U			0.00054	U			0.00057	U
Endrin ketone	53494-70-5	mg/kg						0.00055	U			0.0006	U			0.00057	U			0.00057 [a]	U			0.0005	U			0.00052	U
Toxaphene	8001-35-2	mg/kg						0.018	U			0.019	U			0.018	U			0.018	U			0.016	U			0.017	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1			0.018	U			0.019	U			0.018	U			0.018	U			0.016	U			0.017	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1			0.024	U			0.026	U			0.024	U			0.025	U			0.021	U			0.022	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1			0.024	U			0.026	U			0.025	U			0.025	U			0.022	U			0.023	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1			0.016	U			0.017	U			0.016	U			0.016	U			0.014	U			0.015	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1			0.034	U			0.037	U			0.035	U			0.035	U			0.031	U			0.032	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1			0.021	U			0.0417				0.021	U			0.021	U			0.018	U			0.019	U
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1			0.016	U			0.0309	J			0.017	U			0.017	U			0.015	U			0.015	U
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1			0.033	U			0.036	U			0.034	U			0.035	U			0.03	U			0.031	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1			0.025	U			0.027	U			0.026	U			0.026	U			0.022	U			0.023	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27			0.58				0.29	U			0.32	U			0.32	U			0.3	U			0.29	U
Solids, Percent	PERCENT SOLIDS	%						84.5				80.4				82				79				94.8				92.6	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg						7160				9180				13300				9140				7290				7810	
Antimony	7440-36-0	mg/kg						2.3	U			13	U			2.4	U			2.5	U			2.1	U			2.2	U
Arsenic	7440-38-2	mg/kg	16	16	13			2.3	U			7.2				2.4	U			2.5	U			2.1	U			2.2	U
Barium	7440-39-3	mg/kg	820	410	410			55.5				867				81.9				64.7				76.2				84.4	
Beryllium	7440-41-7	mg/kg	47	43	4.4			0.23				0.35				0.4				0.29				0.21	U			0.24	
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5			0.57	U			3.1	U			0.6	U			0.61	U			0.52	U			0.54	U
Calcium	7440-70-2	mg/kg						968				50500				600	U			1650				5060				3090	
Chromium	7440-47-3	mg/kg	19	110	30			13.2				21.8				22.6				17.5				16.1				14.8	
Cobalt	7440-48-4	mg/kg						5.7	U			7.9				9.3				7				5.8				6.9	
Copper	7440-50-8	mg/kg	1720	280	50			11.1				42.5				25.1				20.2				17.7				20.7	
Iron	7439-89-6	mg/kg						11000				28100				22000				16400				12700				13100	
Lead	7439-92-1	mg/kg	450	400	63			4.2				698				7.1				3.8				27.5				31.6	
Magnesium	7439-95-4	mg/kg						2520				6900				4990				4850				3670				2990	
Manganese	7439-96-5	mg/kg	2000	2000	1600			74.4				456				254				335				211				432	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18			0.36				0.3				0.034	U			0.039	U			0.046				0.045	
Nickel	7440-02-0	mg/kg	130	320	30			9.6				27.3				18.6				16.2				11.2				11.2	
Potassium	7440-09-7	mg/kg						1100	U			1300	U			2990				2510				2230				1680	
Selenium	7782-49-2	mg/kg	4	110	3.9			2.3	U			13	U			2.4	U			2.5	U			2.1	U			2.2	U
Silver	7440-22-4	mg/kg	8.3	110	2			0.57	U			3.1	U			0.6	U			0.61	U			0.52	U			0.54	U
Sodium	7440-23-5	mg/kg						1100	U			1750				1640				1200	U			1000	U			1100	U
Thallium	7440-28-0	mg/kg						1.1	U			6.3	U			1.2	U			1.2	U			1	U			1.1	U
Vanadium	7440-62-2	mg/kg						13.9				25.1				33.9				24.5				20.2				21.2	
Zinc	7440-66-6	mg/kg	2480	6600	109			33.3				745				46.5				39				54.6				40.6	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 19 (17-17.5)		RI-SB 10 (2-2.5)		RI-SB 10 (2-2.5)		RI-SB 10 (7.5-8)		RI-SB 10 (7.5-8)		RI-SB 10 (10.5-11)		RI-SB 10 (10.5-11)		RI-SB 10 (15.5-16)		RI-SB 10 (15.5-16)		RI-SB 11 (2-2.5)		RI-SB 11 (2-2.5)		RI-SB 11 (8-8.5)	
Lab Sample ID:						JE17704-16A		JE17704-17		JE17704-17A		JE17704-18		JE17704-18A		JE17704-19		JE17704-19A		JE17704-20		JE17704-20A		JE17704-21		JE17704-21A		JE17704-22	
Date Sampled:						8/25/2025 12:18 PM		8/25/2025 1:30 PM		8/25/2025 1:30 PM		8/25/2025 1:31 PM		8/25/2025 1:31 PM		8/25/2025 1:32 PM		8/25/2025 1:32 PM		8/25/2025 1:33 PM		8/25/2025 1:33 PM		8/25/2025 2:45 PM		8/25/2025 2:45 PM		8/25/2025 2:46 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00012	U			0.00013	U			0.00013	U			0.00013	U			0.00014	U			0.00012	U		
Perfluoropentanoic acid	2706-90-3	mg/kg				0.000076	U			0.00008	U			0.000085	U			0.000085	U			0.000088	U			0.000073	U		
Perfluorohexanoic acid	307-24-4	mg/kg				0.000033	U			0.000034	U			0.000037	U			0.000036	U			0.000038	U			0.000031	U		
Perfluoroheptanoic acid	375-85-9	mg/kg				0.000054	U			0.000057	U			0.000061	U			0.00006	U			0.000063	U			0.000052	U		
Perfluorooctanoic acid	335-67-1	mg/kg				0.000087	U			0.000092	U			0.000097	U			0.000097	U			0.0001	U			0.00015	J		
Perfluorononanoic acid	375-95-1	mg/kg				0.000054	U			0.000057	U			0.000061	U			0.00006	U			0.000063	U			0.000052	U		
Perfluorodecanoic acid	335-76-2	mg/kg				0.000076	U			0.00008	U			0.000085	U			0.000085	U			0.000088	U			0.000073	U		
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000065	U			0.000069	U			0.000073	U			0.000073	U			0.000075	U			0.000063	U		
Perfluorododecanoic acid	307-55-1	mg/kg				0.000087	U			0.000092	U			0.000097	U			0.000097	U			0.0001	U			0.000084	U		
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.000098	U			0.0001	U			0.00011	U			0.00011	U			0.00011	U			0.000094	U		
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00011	U			0.00011	U			0.00012	U			0.00012	U			0.00013	U			0.0001	U		
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.000076	U			0.00008	U			0.000085	U			0.000085	U			0.000088	U			0.000073	U		
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00012	U			0.00013	U			0.00013	U			0.00013	U			0.00014	U			0.00012	U		
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00011	U			0.00011	U			0.00012	U			0.00012	U			0.00013	U			0.0001	U		
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.000054	U			0.00041				0.00037				0.00019	J			0.000084	J			0.00015	J		
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00012	U			0.00013	U			0.00013	U			0.00013	U			0.00014	U			0.00012	U		
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00011	U			0.00011	U			0.00012	U			0.00012	U			0.00013	U			0.0001	U		
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.00021	U			0.00022	U			0.00023	U			0.00023	U			0.00024	U			0.0002	U		
PFOSA	754-91-6	mg/kg				0.000076	U			0.00008	U			0.000085	U			0.000085	U			0.000088	U			0.000073	U		
MeFOSAA	2355-31-9	mg/kg				0.000087	U			0.000092	U			0.000097	U			0.000097	U			0.0001	U			0.000084	U		
EtFOSAA	2991-50-6	mg/kg				0.00014	U			0.00015	U			0.00027				0.00016	U			0.00016	U			0.00014	U		
2-Chlorophenol	95-57-8	mg/kg						0.019	U			0.02	U			0.02	U			0.02	U			0.017	U			0.018	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg						0.024	U			0.025	U			0.025	U			0.025	U			0.021	U			0.022	U
2,4-Dichlorophenol	120-83-2	mg/kg						0.034	U			0.034	U			0.034	U			0.035	U			0.029	U			0.031	U
2,4-Dimethylphenol	105-67-9	mg/kg						0.07	U			0.071	U			0.071	U			0.073	U			0.061	U			0.064	U
2,4-Dinitrophenol	51-28-5	mg/kg						0.15 [a]	U			0.15 [a]	U			0.15 [a]	U			0.15 [a]	U			0.13 [a]	U			0.14 [a]	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg						0.042 [a]	U			0.043 [a]	U			0.043 [a]	U			0.044 [a]	U			0.037 [a]	U			0.039 [a]	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33			0.025	U			0.026	U			0.026	U			0.026	U			0.022	U			0.023	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33			0.032	U			0.033	U			0.033	U			0.034	U			0.028	U			0.03	U
2-Nitrophenol	88-75-5	mg/kg						0.026 [a]	U			0.026 [a]	U			0.027 [a]	U			0.027 [a]	U			0.023 [a]	U			0.024 [a]	U
4-Nitrophenol	100-02-7	mg/kg						0.1	U			0.11	U			0.11	U			0.11	U			0.091	U			0.096	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8			0.037	U			0.038	U			0.038	U			0.039	U			0.032	U			0.034	U
Phenol	108-95-2	mg/kg	0.33	100	0.33			0.021 [a]	U			0.021 [a]	U			0.021 [a]	U			0.021 [a]	U			0.018 [a]	U			0.019 [a]	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg						0.026	U			0.026	U			0.027	U			0.027	U			0.023	U			0.024	U
2,4,5-Trichlorophenol	95-95-4	mg/kg						0.029	U			0.03	U			0.03	U			0.031	U			0.026	U			0.027	U
2,4,6-Trichlorophenol	88-06-2	mg/kg						0.023	U			0.024	U			0.024	U			0.024	U			0.02	U			0.021	U
Acenaphthene	83-32-9	mg/kg	98	100	20			0.0358	J			0.153				0.014	U			0.014	U			0.0702				0.012	U
Acenaphthylene	208-96-8	mg/kg	365	100	100			0.106				0.145				0.02	U			0.021	U			0.0537				0.0255	J
Acetophenone	98-86-2	mg/kg						0.0085	U			0.0086	U			0.0086	U			0.0088	U			0.0074	U			0.0077	U
Anthracene	120-12-7	mg/kg	1000	100	100			0.129				0.178				0.025	U			0.025	U			0.229				0.0364	
Atrazine	1912-24-9	mg/kg						0.017	U			0.017	U			0.017	U			0.018	U			0.015	U			0.015	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1			0.352				0.396				0.011	U			0.012	U			0.671				0.108	
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1			0.528				0.365				0.018	U			0.019	U			0.596				0.12	
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1			0.597				0.53				0.018	U			0.018	U			0.662				0.139	
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64			0.509				0.276				0.02	U			0.021	U			0.453				0.0907	
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8			0.16				0.206				0.019	U			0.019	U			0.261				0.051	
4-Bromophenyl phenyl ether	101-55-3	mg/kg						0.015	U			0.015	U			0.015	U			0.016	U			0.013	U			0.014	U
Butyl benzyl phthalate	85-68-7	mg/kg						0.0096	U			0.0098	U			0.0098	U			0.01	U			0.0084	U			0.0088	U
1,1'-Biphenyl	92-52-4	mg/kg						0.0107	J			0.0287	J			0.0055	U			0.0056	U			0.0048	J			0.0049	U
Benzaldehyde	100-52-7	mg/kg						0.0255	J			0.0099	U			0.0099	U			0.01	U			0.0085	U			0.0089	U
2-Chloronaphthalene	91-58-7	mg/kg						0.0094	U			0.0095	U			0.0095	U			0.0098	U			0.0082	U			0.0086	U
4-Chloroaniline	106-47-8	mg/kg						0.014	U			0.014	U			0.014	U			0.015	U			0.012	U			0.013	U
Carbazole	86-74-8	mg/kg						0.0434	J			0.0671	J			0.0058	U			0.006	U			0.0341	J			0.0133	J
Caprolactam	105-60-2	mg/kg						0.016	U			0.016	U			0.016	U			0.016	U			0.014	U			0.014	U
Chrysene	218-01-9	mg/kg	1	4.9	1			0.39				0.421				0.013	U			0.013	U			0.628				0.106	
bis(2-Chloroethoxy)methane	111-91-1	mg/kg						0.0084	U			0.0086	U			0.0086	U			0.0088	U			0.0073	U			0.0077	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg						0.017	U			0.017	U			0.017	U			0.018	U			0.015	U			0.016	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg						0.014	U			0.014	U			0.014	U			0.015	U			0.012	U			0.013	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg						0.013	U			0.013	U			0.013	U			0.013	U			0.011	U			0.012	U
2,4-Dinitrotoluene	121-14-2	mg/kg						0.012	U			0.012	U			0.012	U			0.013	U			0.011	U			0.011	U
2,6-Dinitrotoluene	606-20-2	mg/kg						0.02 [a]	U			0.02 [a]	U			0.02 [a]	U			0.021 [a]	U			0.017 [a]	U			0.018 [a]	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg						0.033	U			0.033	U			0.033	U			0.034	U			0.029	U			0.03	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1			0.026	U			0.026	U			0.027	U			0.027	U			0.023	U			0.024	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33			0.12				0.0822				0.018	U			0.018	U			0.112				0.0258	J
Dibenzofuran	132-64-9	mg/kg	110	18	2.1			0.0275	J			0.016	U			0.016	U			0.017	U			0.0271	J			0.015	U
Di-n-butyl phthalate	84-74-2	mg/kg						0.0064	U			0.0065	U			0.0065	U			0.0067	U			0.0056	U			0.0059	U
Di-n-octyl phthalate	117-84-0	mg/kg						0.0098	U			0.01	U			0.01	U			0.01	U			0.0085	U			0.009	U
Diethyl phthalate	84-66-2	mg/kg						0.0084	U			0.0085	U			0.0085	U			0.0088	U			0.0073	U			0.0077	U
Dimethyl phthalate	131-11-3	mg/kg						0.007	U			0.0071	U			0.0071	U			0.0073	U			0.0061	U			0.0064	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg						0.0092	U			0.246				0.0094	U			0.0096	U			0.008	U			0.0087	J
Fluoranthene	206-44-0	mg/kg	1000	100	85			0.589				0.884				0.018	U			0.018	U			1.07				0.186	
Fluorene	86-73-7	mg/kg	386	100	30			0.0497				0.219				0.018	U			0.019	U			0.0576				0.017	U
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33			0.0099	U			0.01	U			0.01	U			0.01	U			0.0087	U			0.0091	U
Hexachlorobutadiene	87-68-3	mg/kg						0.016	U			0.016	U			0.016	U			0.017	U			0.014	U			0.014	U
Hexachlorocyclopentadiene	77-47-4	mg/kg						0.016	U			0.016	U			0.016	U			0.016	U			0.014	U			0.014	U
Hexachloroethane	67-72-1	mg/kg						0.019	U			0.02	U			0.02	U			0.02	U			0.017	U			0.018	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5			0.392				0.237				0.019	U			0.019	U			0.353				0.0773	
Isophorone	78-59-1	mg/kg						0.0084	U			0.0086	U			0.0086	U			0.0088	U			0.0073	U			0.0077	U
2-Methylnaphthalene	91-57-6	mg/kg						0.0312	J			0.244				0.0091	U			0.0093	U			0.0102	J			0.0081	U
2-Nitroaniline	88-74-4	mg/kg						0.0093 [a]	U			0.0094 [a]	U			0.0095 [a]	U			0.0097 [a]	U			0.0081 [a]	U			0.0085 [a]	U
3-Nitroaniline	99-09-2	mg/kg						0.0098	U			0.01	U			0.01	U			0.01	U			0.0086	U			0.009	U
4-Nitroaniline	100-01-6	mg/kg						0.01	U			0.01	U			0.01	U			0.011	U			0.0089	U			0.0093	U
Naphthalene	91-20-3	mg/kg	12	100	12			0.0405				0.13	B			0.0171	JB			0.0146	JB			0.0222	JB			0.0144	JB
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08			0.015	U			0.015	U			0.015	U			0.016	U			0.013	U			0.014	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg						0.011	U			0.012	U			0.012	U			0.012	U			0.0099	U			0.01	U
N-Nitrosodiphenylamine	86-30-6	mg/kg						0.014	U			0.015	U			0.015	U			0.015	U			0.013	U			0.013	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1			0.351				0.885				0.013	U			0.014	U			0.816				0.0999	
Pyrene	129-00-0	mg/kg	1000	100	64			0.684				0.696				0.013	U			0.013	U			1.4				0.227	
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg						0.01	U			0.01	U			0.01	U			0.01	U			0.0087	U			0.0091	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:						RI-SB 19 (17-17.5)		RI-SB 10 (2-2.5)		RI-SB 10 (2-2.5)		RI-SB 10 (7.5-8)		RI-SB 10 (7.5-8)		RI-SB 10 (10.5-11)		RI-SB 10 (10.5-11)		RI-SB 10 (15.5-16)		RI-SB 10 (15.5-16)		RI-SB 11 (2-2.5)		RI-SB 11 (2-2.5)		RI-SB 11 (8-8.5)	
Lab Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	JE17704-16A		JE17704-17		JE17704-17A		JE17704-18		JE17704-18A		JE17704-19		JE17704-19A		JE17704-20		JE17704-20A		JE17704-21		JE17704-21A		JE17704-22	
Date Sampled:						8/25/2025 12:18 PM		8/25/2025 1:30 PM		8/25/2025 1:30 PM		8/25/2025 1:31 PM		8/25/2025 1:31 PM		8/25/2025 1:32 PM		8/25/2025 1:32 PM		8/25/2025 1:33 PM		8/25/2025 1:33 PM		8/25/2025 2:45 PM		8/25/2025 2:45 PM		8/25/2025 2:46 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03			0.109 [e]				0.348 [e]				0.0388 [e]				0.0075 [e]	J			0.0068	J			0.0053	J
Benzene	71-43-2	mg/kg	0.06	3.7	0.06			0.00057	U			0.00076	U			0.00053	U			0.00056	U			0.00056	U			0.00048	U
Bromochloromethane	74-97-5	mg/kg						0.00071	U			0.00094	U			0.00066	U			0.00069	U			0.00069	U			0.00059	U
Bromodichloromethane	75-27-4	mg/kg						0.00054	U			0.00072	U			0.0005	U			0.00053	U			0.00053	U			0.00045	U
Bromoform	75-25-2	mg/kg						0.0017	U			0.0023	U			0.0016	U			0.0017	U			0.0017	U			0.0014	U
Bromomethane	74-83-9	mg/kg						0.00096 [a]	U			0.0013 [a]	U			0.0009 [a]	U			0.00095 [a]	U			0.00094	U			0.00081	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1			0.0113 [c]	J			0.0446 [c]				0.0028 [c]	U			0.003 [c]	U			0.003	U			0.0026	U
Carbon disulfide	75-15-0	mg/kg						0.00077	J			0.0143				0.00063	U			0.00066	U			0.00066	U			0.00057	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76			0.00078 [a]	U			0.001 [a]	U			0.00072 [a]	U			0.00077 [a]	U			0.00076	U			0.00065	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5			0.00058	U			0.00077	U			0.00054	U			0.00057	U			0.00056	U			0.00049	U
Chloroethane	75-00-3	mg/kg						0.00074 [d]	U			0.00099 [d]	U			0.00069 [d]	U			0.00073 [d]	U			0.00072 [a]	U			0.00063 [a]	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37			0.0013	U			0.0017	U			0.0012	U			0.0012	U			0.0012	U			0.0011	U
Chloromethane	74-87-3	mg/kg						0.0025	U			0.0033	U			0.0023	U			0.0024	U			0.0024	U			0.0021	U
Cyclohexane	110-82-7	mg/kg						0.00083 [a]	U			0.0011 [a]	U			0.00077 [a]	U			0.00082 [a]	U			0.00081	U			0.0007	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg						0.00087	U			0.0012	U			0.00081	U			0.00086	U			0.00085	U			0.00073	U
Dibromochloromethane	124-48-1	mg/kg						0.00071	U			0.00094	U			0.00066	U			0.00069	U			0.00069	U			0.00059	U
1,2-Dibromoethane	106-93-4	mg/kg						0.00053	U			0.00071	U			0.00049	U			0.00052	U			0.00052	U			0.00045	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1			0.00069	U			0.00092	U			0.00064	U			0.00068	U			0.00067	U			0.00058	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6			0.00062	U			0.00083	U			0.00058	U			0.00062	U			0.00061	U			0.00053	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8			0.00062	U			0.00083	U			0.00058	U			0.00061	U			0.00061	U			0.00052	U
Dichlorodifluoromethane	75-71-8	mg/kg						0.00092	U			0.0012	U			0.00085	U			0.0009	U			0.00089	U			0.00077	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27			0.00062	U			0.00083	U			0.00058	U			0.00061	U			0.00061	U			0.00052	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02			0.00059	U			0.00079	U			0.00055	U			0.00058	U			0.00058	U			0.0005	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24			0.00082	U			0.0011	U			0.00077	U			0.00081	U			0.0008	U			0.00069	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19			0.0011	U			0.0014	U			0.00098	U			0.001	U			0.001	U			0.00089	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19			0.00077	U			0.001	U			0.00072	U			0.00076	U			0.00075	U			0.00065	U
1,2-Dichloropropane	78-87-5	mg/kg						0.0006	U			0.0008	U			0.00055	U			0.00059	U			0.00058	U			0.0005	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg						0.0006	U			0.0008	U			0.00056	U			0.00059	U			0.00058	U			0.0005	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg						0.00058	U			0.00077	U			0.00054	U			0.00057	U			0.00056	U			0.00048	U
Ethylbenzene	100-41-4	mg/kg	1	76	1			0.00057	U			0.00076	U			0.00053	U			0.00056	U			0.00056	U			0.00048	U
Freon 113	76-13-1	mg/kg						0.0034	U			0.0045	U			0.0031	U			0.0033	U			0.0033	U			0.0028	U
2-Hexanone	591-78-6	mg/kg						0.0027	U			0.0036	U			0.0025	U			0.0026	U			0.0026	U			0.0022	U
Isopropylbenzene	98-82-8	mg/kg						0.0018	U			0.0024	U			0.0017	U			0.0018	U			0.0017	U			0.0015	U
Methyl Acetate	79-20-9	mg/kg						0.0017	U			0.0023	U			0.0016	U			0.0017	U			0.0017	U			0.0015	U
Methylcyclohexane	108-87-2	mg/kg						0.0011	U			0.0015	U			0.001	U			0.0011	U			0.0011	U			0.00093	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1			0.00059	U			0.00079	U			0.00055	U			0.00058	U			0.00058	U			0.0005	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg						0.0029	U			0.0038	U			0.0027	U			0.0028	U			0.0028	U			0.0024	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05			0.0033	U			0.0044	U			0.0031	U			0.0032	U			0.0032	U			0.0028	U
Styrene	100-42-5	mg/kg						0.00051	U			0.00068	U			0.00047	U			0.0005	U			0.00049	U			0.00043	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg						0.00075	U			0.001	U			0.0007	U			0.00074	U			0.00073	U			0.00063	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3			0.00073	U			0.00097	U			0.00068	U			0.00072	U			0.00071	U			0.00061	U
Toluene	108-88-3	mg/kg	0.7	100	0.7			0.00066	U			0.00088	U			0.00062	U			0.00065	U			0.00064	U			0.00056	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg						0.0031	U			0.0042	U			0.0029	U			0.0031	U			0.0031	U			0.0026	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg						0.0031	U			0.0042	U			0.0029	U			0.0031	U			0.0031	U			0.0026	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68			0.00061	U			0.00081	U			0.00057	U			0.0006	U			0.00059	U			0.00051	U
1,1,2-Trichloroethane	79-00-5	mg/kg						0.0007 [c]	U			0.00093 [c]	U			0.00065 [c]	U			0.00069 [c]	U			0.00068	U			0.00059	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47			0.00096	U			0.0013	U			0.00089	U			0.00095	U			0.00093	U			0.00081	U
Trichlorofluoromethane	75-69-4	mg/kg						0.00086 [d]	U			0.0011 [d]	U			0.0008 [d]	U			0.00085 [d]	U			0.00084	U			0.00072	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03			0.00061 [a]	U			0.00081 [a]	U			0.00056 [a]	U			0.0006 [a]	U			0.00059	U			0.00051	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26			0.0011	U			0.0015	U			0.0011	U			0.0011	U			0.0011	U			0.00095	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26			0.00058	U			0.00077	U			0.00054	U			0.00057	U			0.00056	U			0.00048	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26			0.00058	U			0.00077	U			0.00054	U			0.00057	U			0.00056	U			0.00048	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

	= concentration exceeds USCO
	= concentration exceeds RRSCO
#	= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 11 (8-8.5)		RI-SB 11 (14.5-15)		RI-SB 11 (14.5-15)		RI-SB 11 (18-18.5)		RI-SB 11 (18-18.5)		RI-SB 12 (2-2.5)		RI-SB 12 (2-2.5)		RI-SB 12 (6.5-7)		RI-SB 12 (6.5-7)		RI-SB 12 (11-11.5)		RI-SB 12 (11-11.5)		RI-SB 12 (18.5-19)	
Lab Sample ID:						JE17704-22A		JE17704-23		JE17704-23A		JE17704-24		JE17704-24A		JE17704-25		JE17704-25A		JE17704-26		JE17704-26A		JE17704-27		JE17704-27A		JE17704-28	
Date Sampled:						8/25/2025 2:46 PM		8/25/2025 2:47 PM		8/25/2025 2:47 PM		8/25/2025 2:48 PM		8/25/2025 2:48 PM		8/25/2025 3:45 PM		8/25/2025 3:45 PM		8/25/2025 3:46 PM		8/25/2025 3:46 PM		8/25/2025 3:47 PM		8/25/2025 3:47 PM		8/25/2025 3:48 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005			0.00057	U			0.00059	U			0.00054	U			0.00053	U			0.00058	U			0.00064	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02			0.00056	U			0.00059	U			0.00054	U			0.00052	U			0.00057	U			0.00063	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036			0.00063	U			0.00065	U			0.00059	U			0.00058	U			0.00063	U			0.0007	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04			0.00067	U			0.00069	U			0.00063	U			0.00061	U			0.00067	U			0.00075	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1			0.00051	U			0.00053	U			0.00049	U			0.00047	U			0.00052	U			0.00057	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094			0.00056	U			0.00058	U			0.00053	U			0.00051	U			0.00057	U			0.00063	U
gamma-Chlordane	5103-74-2	mg/kg	14					0.00031	U			0.00033	U			0.0003	U			0.00029	U			0.00032	U			0.00035	U
Chlordane (alpha and gamma)	57-74-9	mg/kg						0.00031	U			0.00033	U			0.0003	U			0.00029	U			0.00032	U			0.00035	U
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005			0.00048	U			0.0005	U			0.00045	U			0.00044	U			0.00048	U			0.00053	U
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033			0.00064	U			0.00066	U			0.0006	U			0.00059	U			0.00064	U			0.00071	U
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033			0.00061	U			0.00063	U			0.00058	U			0.00056	U			0.00061	U			0.00068	U
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033			0.0015				0.00064	U			0.0011				0.00057	U			0.00062	U			0.00069	U
Endrin	72-20-8	mg/kg	0.06	11	0.014			0.00054	U			0.00056	U			0.00051	U			0.0005	U			0.00054	U			0.0006	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4			0.0011 [b]				0.00056	U			0.00051	U			0.0005	U			0.00055	U			0.00061	U
Endrin aldehyde	7421-93-4	mg/kg						0.00039	U			0.00041	U			0.00037	U			0.00036	U			0.0004	U			0.00044	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4			0.0004	U			0.00042	U			0.00038	U			0.00037	U			0.0004	U			0.00045	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4			0.00043	U			0.00045	U			0.00041	U			0.0004	U			0.00044	U			0.00049	U
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042			0.0006	U			0.00062	U			0.00057	U			0.00055	U			0.0006	U			0.00067	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02					0.00049	U			0.00051	U			0.00046	U			0.00045	U			0.00049	U			0.00055	U
Methoxychlor	72-43-5	mg/kg	900					0.00055	U			0.00057	U			0.00052	U			0.00051	U			0.00056	U			0.00062	U
Endrin ketone	53494-70-5	mg/kg						0.0005	U			0.00052	U			0.00048	U			0.00046	U			0.00051	U			0.00056	U
Toxaphene	8001-35-2	mg/kg						0.016	U			0.017	U			0.015	U			0.015	U			0.016	U			0.018	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1			0.016	U			0.017	U			0.015	U			0.015	U			0.016	U			0.018	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1			0.022	U			0.022	U			0.02	U			0.02	U			0.022	U			0.024	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1			0.022	U			0.023	U			0.021	U			0.02	U			0.022	U			0.025	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1			0.014	U			0.015	U			0.013	U			0.013	U			0.014	U			0.016	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1			0.031	U			0.032	U			0.029	U			0.028	U			0.031	U			0.035	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1			0.019	U			0.019	U			0.018	U			0.017	U			0.019	U			0.021	U
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1			0.015	U			0.015	U			0.014	U			0.014	U			0.015	U			0.017	U
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1			0.03	U			0.032	U			0.029	U			0.028	U			0.031	U			0.034	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1			0.023	U			0.024	U			0.022	U			0.021	U			0.023	U			0.025	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27			0.24	U			0.26	U			0.28	U			0.25	U			0.29	U			0.33	U
Solids, Percent	PERCENT SOLIDS	%						94.8				85.1				93.8				95				92.7				81.9	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg						7680				5940				6310				6840				6500				10200	
Antimony	7440-36-0	mg/kg						2.2	U			2.4	U			2.1	U			2.1	U			2.2	U			2.3	U
Arsenic	7440-38-2	mg/kg	16	16	13			2.2	U			2.4	U			2.1	U			2.1	U			2.2	U			2.3	U
Barium	7440-39-3	mg/kg	820	410	410			73.6				25.1				68.9				69.1				31.8				67.3	
Beryllium	7440-41-7	mg/kg	47	43	4.4			0.22				0.24	U			0.21				0.21	U			0.22	U			0.29	
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5			0.54	U			0.6	U			0.52	U			0.51	U			0.55	U			0.58	U
Calcium	7440-70-2	mg/kg						7220				1000				4140				2970				1100				1030	
Chromium	7440-47-3	mg/kg	19	110	30			23.4				9.8				11.5				13.3				10.2				14.4	
Cobalt	7440-48-4	mg/kg						6.6				6	U			5.3				5.4				5.5	U			7	
Copper	7440-50-8	mg/kg	1720	280	50			23.3				10.6				16.7				17.7				12.2				19.7	
Iron	7439-89-6	mg/kg						13500				10400				11900				12400				9640				15700	
Lead	7439-92-1	mg/kg	450	400	63			31.1				2.7				29.2				10.2				3.5				3.7	
Magnesium	7439-95-4	mg/kg						4090				2420				2480				2900				3110				4250	
Manganese	7439-96-5	mg/kg	2000	2000	1600			222				125				205				234				231				433	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18			0.042				0.033	U			0.23				0.03	U			0.032	U			0.037	U
Nickel	7440-02-0	mg/kg	130	320	30			12.6				8.4				9.9				10.6				9.5				12.2	
Potassium	7440-09-7	mg/kg						1920				1200	U			1380				1460				1370				2220	
Selenium	7782-49-2	mg/kg	4	110	3.9			2.2	U			2.4	U			2.1	U			2.1	U			2.2	U			2.3	U
Silver	7440-22-4	mg/kg	8.3	110	2			0.54	U			0.6	U			0.52	U			0.51	U			0.55	U			0.58	U
Sodium	7440-23-5	mg/kg						1100	U			1200	U			1000	U			1000	U			1100	U			1200	U
Thallium	7440-28-0	mg/kg						1.1	U			1.2	U			1	U			1	U			1.1	U			1.2	U
Vanadium	7440-62-2	mg/kg						21.1				13.4				16.2				18.7				13.6				21.4	
Zinc	7440-66-6	mg/kg	2480	6600	109			39.2				25.5				61.7				26				30				37.3	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 11 (8-8.5)		RI-SB 11 (14.5-15)		RI-SB 11 (14.5-15)		RI-SB 11 (18-18.5)		RI-SB 11 (18-18.5)		RI-SB 12 (2-2.5)		RI-SB 12 (2-2.5)		RI-SB 12 (6.5-7)		RI-SB 12 (6.5-7)		RI-SB 12 (11-11.5)		RI-SB 12 (11-11.5)		RI-SB 12 (18.5-19)	
Lab Sample ID:						JE17704-22A		JE17704-23		JE17704-23A		JE17704-24		JE17704-24A		JE17704-25		JE17704-25A		JE17704-26		JE17704-26A		JE17704-27		JE17704-27A		JE17704-28	
Date Sampled:						8/25/2025 2:46 PM		8/25/2025 2:47 PM		8/25/2025 2:47 PM		8/25/2025 2:48 PM		8/25/2025 2:48 PM		8/25/2025 3:45 PM		8/25/2025 3:45 PM		8/25/2025 3:46 PM		8/25/2025 3:46 PM		8/25/2025 3:47 PM		8/25/2025 3:47 PM		8/25/2025 3:48 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00012	U			0.00011	U			0.00013	U			0.00011	U			0.00011	U			0.00012	U		
Perfluoropentanoic acid	2706-90-3	mg/kg				0.000075	U			0.000073	U			0.000081	U			0.000071	U			0.000072	U			0.000074	U		
Perfluorohexanoic acid	307-24-4	mg/kg				0.000032	U			0.000031	U			0.000035	U			0.000031	U			0.000031	U			0.000032	U		
Perfluoroheptanoic acid	375-85-9	mg/kg				0.000054	U			0.000052	U			0.000058	U			0.000051	U			0.000051	U			0.000053	U		
Perfluorooctanoic acid	335-67-1	mg/kg				0.000086	U			0.000083	U			0.000093	U			0.00015	J			0.000082	U			0.000089	J		
Perfluorononanoic acid	375-95-1	mg/kg				0.000054	U			0.000052	U			0.000058	U			0.000051	U			0.000051	U			0.000053	U		
Perfluorodecanoic acid	335-76-2	mg/kg				0.000075	U			0.000073	U			0.000081	U			0.000071	U			0.000072	U			0.000074	U		
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000064	U			0.000063	U			0.00007	U			0.000061	U			0.000061	U			0.000064	U		
Perfluorododecanoic acid	307-55-1	mg/kg				0.000086	U			0.000083	U			0.000093	U			0.000082	U			0.000082	U			0.000085	U		
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.000096	U			0.000094	U			0.0001	U			0.000092	U			0.000092	U			0.000096	U		
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00011	U			0.0001	U			0.00012	U			0.0001	U			0.0001	U			0.00011	U		
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.000075	U			0.000073	U			0.000081	U			0.000071	U			0.000072	U			0.000074	U		
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00012	U			0.00011	U			0.00013	U			0.00011	U			0.00011	U			0.00012	U		
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00011	U			0.0001	U			0.00012	U			0.0001	U			0.0001	U			0.00011	U		
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.000089	J			0.00011	J			0.000058	U			0.00012	J			0.000089	J			0.000053	U		
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00012	U			0.00011	U			0.00013	U			0.00011	U			0.00011	U			0.00012	U		
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00011	U			0.0001	U			0.00012	U			0.0001	U			0.0001	U			0.00011	U		
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.0002	U			0.0002	U			0.00022	U			0.00019	U			0.00019	U			0.0002	U		
PFOSA	754-91-6	mg/kg				0.000075	U			0.000073	U			0.000081	U			0.000071	U			0.000072	U			0.000074	U		
MeFOSAA	2355-31-9	mg/kg				0.000086	U			0.000083	U			0.000093	U			0.000082	U			0.000082	U			0.000085	U		
EtFOSAA	2991-50-6	mg/kg				0.00014	U			0.00014	U			0.00015	U			0.00013	U			0.00013	U			0.00014	U		
2-Chlorophenol	95-57-8	mg/kg						0.017	U			0.019	U			0.017	U			0.017	U			0.018	U			0.019	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg						0.021	U			0.024	U			0.021	U			0.021	U			0.022	U			0.024	U
2,4-Dichlorophenol	120-83-2	mg/kg						0.029	U			0.033	U			0.03	U			0.029	U			0.031	U			0.034	U
2,4-Dimethylphenol	105-67-9	mg/kg						0.061	U			0.069	U			0.062	U			0.06	U			0.064	U			0.07	U
2,4-Dinitrophenol	51-28-5	mg/kg						0.13 [a]	U			0.14 [a]	U			0.13 [a]	U			0.13 [a]	U			0.14 [a]	U			0.15 [a]	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg						0.037 [a]	U			0.041 [a]	U			0.037 [a]	U			0.036 [a]	U			0.038 [a]	U			0.042 [a]	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33			0.022	U			0.025	U			0.022	U			0.022	U			0.023	U			0.025	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33			0.028	U			0.032	U			0.029	U			0.028	U			0.03	U			0.032	U
2-Nitrophenol	88-75-5	mg/kg						0.023 [a]	U			0.025 [a]	U			0.023 [a]	U			0.022 [a]	U			0.024 [a]	U			0.026 [a]	U
4-Nitrophenol	100-02-7	mg/kg						0.092	U			0.1	U			0.093	U			0.09	U			0.096	U			0.11	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8			0.032	U			0.036	U			0.033	U			0.032	U			0.034	U			0.037	U
Phenol	108-95-2	mg/kg	0.33	100	0.33			0.018 [a]	U			0.02 [a]	U			0.018 [a]	U			0.018 [a]	U			0.019 [a]	U			0.021 [a]	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg						0.023	U			0.026	U			0.023	U			0.022	U			0.024	U			0.026	U
2,4,5-Trichlorophenol	95-95-4	mg/kg						0.026	U			0.029	U			0.026	U			0.025	U			0.027	U			0.03	U
2,4,6-Trichlorophenol	88-06-2	mg/kg						0.021	U			0.023	U			0.021	U			0.02	U			0.021	U			0.023	U
Acenaphthene	83-32-9	mg/kg	98	100	20			0.264				0.013	U			0.0236	J			0.012	U			0.012	U			0.014	U
Acenaphthylene	208-96-8	mg/kg	365	100	100			0.0261	J			0.02	U			0.018	U			0.017	U			0.018	U			0.02	U
Acetophenone	98-86-2	mg/kg						0.0074	U			0.0083	U			0.0075	U			0.0073	U			0.0077	U			0.0085	U
Anthracene	120-12-7	mg/kg	1000	100	100			0.583				0.024	U			0.0508				0.021	U			0.0221	J			0.024	U
Atrazine	1912-24-9	mg/kg						0.015	U			0.016	U			0.015	U			0.014	U			0.015	U			0.017	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1			0.931				0.011	U			0.18				0.0229	J			0.0681				0.011	U
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1			0.852				0.018	U			0.182				0.0251	J			0.0571				0.018	U
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1			1.03				0.017	U			0.22				0.0295	J			0.0703				0.017	U
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64			0.695				0.019	U			0.141				0.0281	J			0.052				0.02	U
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8			0.293				0.018	U			0.0733				0.016	U			0.0224	J			0.018	U
4-Bromophenyl phenyl ether	101-55-3	mg/kg						0.013	U			0.015	U			0.013	U			0.013	U			0.014	U			0.015	U
Butyl benzyl phthalate	85-68-7	mg/kg						0.0084	U			0.0094	U			0.0085	U			0.0083	U			0.0088	U			0.0096	U
1,1'-Biphenyl	92-52-4	mg/kg						0.0306	J			0.0053	U			0.0048	U			0.0046	U			0.0049	U			0.0054	U
Benzaldehyde	100-52-7	mg/kg						0.0085	U			0.0096	U			0.0086	U			0.0084	U			0.0089	U			0.0098	U
2-Chloronaphthalene	91-58-7	mg/kg						0.0082	U			0.0092	U			0.0083	U			0.0081	U			0.0086	U			0.0094	U
4-Chloroaniline	106-47-8	mg/kg						0.012	U			0.014	U			0.013	U			0.012	U			0.013	U			0.014	U
Carbazole	86-74-8	mg/kg						0.281				0.0056	U			0.0198	J			0.0049	U			0.0071	J			0.0057	U
Caprolactam	105-60-2	mg/kg						0.014	U			0.015	U			0.014	U			0.013	U			0.014	U			0.016	U
Chrysene	218-01-9	mg/kg	1	4.9	1			0.785				0.012	U			0.178				0.0183	J			0.0597				0.012	U
bis(2-Chloroethoxy)methane	111-91-1	mg/kg						0.0074	U			0.0082	U			0.0075	U			0.0072	U			0.0077	U			0.0084	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg						0.015	U			0.017	U			0.015	U			0.015	U			0.015	U			0.017	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg						0.012	U			0.014	U			0.013	U			0.012	U			0.013	U			0.014	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg						0.011	U			0.012	U			0.011	U			0.011	U			0.012	U			0.013	U
2,4-Dinitrotoluene	121-14-2	mg/kg						0.011	U			0.012	U			0.011	U			0.01	U			0.011	U			0.012	U
2,6-Dinitrotoluene	606-20-2	mg/kg						0.017 [a]	U			0.019 [a]	U			0.017 [a]	U			0.017 [a]	U			0.018 [a]	U			0.02 [a]	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg						0.029	U			0.032	U			0.029	U			0.028	U			0.03	U			0.033	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1			0.023	U			0.025	U			0.023	U			0.022	U			0.024	U			0.026	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33			0.149				0.017	U			0.0358				0.015	U			0.016	U			0.017	U
Dibenzofuran	132-64-9	mg/kg	110	18	2.1			0.229				0.016	U			0.014	U			0.014	U			0.015	U			0.016	U
Di-n-butyl phthalate	84-74-2	mg/kg						0.0056	U			0.0063	U			0.0057	U			0.0055	U			0.0059	U			0.0064	U
Di-n-octyl phthalate	117-84-0	mg/kg						0.0086	U			0.0096	U			0.0087	U			0.0449	J			0.009	U			0.0098	U
Diethyl phthalate	84-66-2	mg/kg						0.0073	U			0.0082	U			0.0074	U			0.0072	U			0.0077	U			0.0084	U
Dimethyl phthalate	131-11-3	mg/kg						0.0061	U			0.0069	U			0.0062	U			0.006	U			0.0064	U			0.007	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg						0.0081	U			0.009	U			0.0082	U			0.0079	U			0.0084	U			0.0092	U
Fluoranthene	206-44-0	mg/kg	1000	100	85			2.11				0.017	U			0.315				0.0285	J			0.108				0.018	U
Fluorene	86-73-7	mg/kg	386	100	30			0.196				0.018	U			0.0166	J			0.016	U			0.017	U			0.018	U
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33			0.0087	U			0.0097	U			0.0088	U			0.0086	U			0.0091	U			0.01	U
Hexachlorobutadiene	87-68-3	mg/kg						0.014	U			0.015	U			0.014	U			0.014	U			0.014	U			0.016	U
Hexachlorocyclopentadiene	77-47-4	mg/kg						0.014	U			0.015	U			0.014	U			0.013	U			0.014	U			0.016	U
Hexachloroethane	67-72-1	mg/kg						0.017	U			0.019	U			0.017	U			0.017	U			0.018	U			0.019	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5			0.561				0.018	U			0.114				0.0197	J			0.0363				0.018	U
Isophorone	78-59-1	mg/kg						0.0074	U			0.0082	U			0.0075	U			0.0072	U			0.0077	U			0.0084	U
2-Methylnaphthalene	91-57-6	mg/kg						0.0828				0.0087	U			0.0079	U			0.0076	U			0.0081	U			0.0089	U
2-Nitroaniline	88-74-4	mg/kg						0.0081 [a]	U			0.0091 [a]	U			0.0082 [a]	U			0.008 [a]	U			0.0085 [a]	U			0.0093 [a]	U
3-Nitroaniline	99-09-2	mg/kg						0.0086	U			0.0096	U			0.0087	U			0.0085	U			0.009	U			0.0098	U
4-Nitroaniline	100-01-6	mg/kg						0.0089	U			0.01	U			0.009	U			0.0088	U			0.0093	U			0.01	U
Naphthalene	91-20-3	mg/kg	12	100	12			0.187	B			0.016	JB			0.0177	JB			0.0251	JB			0.0199	J			0.0365	J
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08			0.013	U			0.015	U			0.013	U			0.013	U			0.014	U			0.015	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg						0.01	U			0.011	U			0.01	U			0.0098	U			0.01	U			0.011	U
N-Nitrosodiphenylamine	86-30-6	mg/kg						0.013	U			0.014	U			0.013	U			0.012	U			0.013	U			0.014	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1			2.47				0.013	U			0.215				0.0166	J			0.0839				0.013	U
Pyrene	129-00-0	mg/kg	1000	100	64			2.24				0.012	U			0.396				0.0372				0.156				0.013	U
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg						0.0088	U			0.0098	U			0.0088	U			0.0086	U			0.0091	U			0.01	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:						RI-SB 11 (8-8.5)		RI-SB 11 (14.5-15)		RI-SB 11 (14.5-15)		RI-SB 11 (18-18.5)		RI-SB 11 (18-18.5)		RI-SB 12 (2-2.5)		RI-SB 12 (2-2.5)		RI-SB 12 (6.5-7)		RI-SB 12 (6.5-7)		RI-SB 12 (11-11.5)		RI-SB 12 (11-11.5)		RI-SB 12 (18.5-19)	
Lab Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	JE17704-22A		JE17704-23		JE17704-23A		JE17704-24		JE17704-24A		JE17704-25		JE17704-25A		JE17704-26		JE17704-26A		JE17704-27		JE17704-27A		JE17704-28	
Date Sampled:						8/25/2025 2:46 PM		8/25/2025 2:47 PM		8/25/2025 2:47 PM		8/25/2025 2:48 PM		8/25/2025 2:48 PM		8/25/2025 3:45 PM		8/25/2025 3:45 PM		8/25/2025 3:46 PM		8/25/2025 3:46 PM		8/25/2025 3:47 PM		8/25/2025 3:47 PM		8/25/2025 3:48 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03			0.0048	J			0.0067	J			0.0051	J			0.0072	J			0.0088	J			0.006	J
Benzene	71-43-2	mg/kg	0.06	3.7	0.06			0.00044	U			0.00052	U			0.00049	U			0.00049	U			0.00051	U			0.00058	U
Bromochloromethane	74-97-5	mg/kg						0.00054	U			0.00065	U			0.00061	U			0.0006	U			0.00063	U			0.00071	U
Bromodichloromethane	75-27-4	mg/kg						0.00041	U			0.00049	U			0.00047	U			0.00046	U			0.00048	U			0.00055	U
Bromoform	75-25-2	mg/kg						0.0013	U			0.0016	U			0.0015	U			0.0015	U			0.0015	U			0.0017	U
Bromomethane	74-83-9	mg/kg						0.00073	U			0.00088	U			0.00083	U			0.00082	U			0.00086	U			0.00097	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1			0.0023	U			0.0028	U			0.0026	U			0.0026	U			0.0027	U			0.0031	U
Carbon disulfide	75-15-0	mg/kg						0.00051	U			0.00062	U			0.00058	U			0.00057	U			0.0006	U			0.00068	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76			0.00059	U			0.00071	U			0.00067	U			0.00066	U			0.00069	U			0.00079	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5			0.00044	U			0.00053	U			0.0005	U			0.00049	U			0.00052	U			0.00058	U
Chloroethane	75-00-3	mg/kg						0.00057 [a]	U			0.00068 [a]	U			0.00064 [a]	U			0.00063 [a]	U			0.00066 [a]	U			0.00075 [a]	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37			0.00096	U			0.0012	U			0.0011	U			0.0011	U			0.0011	U			0.0013	U
Chloromethane	74-87-3	mg/kg						0.0019	U			0.0023	U			0.0021	U			0.0021	U			0.0022	U			0.0025	U
Cyclohexane	110-82-7	mg/kg						0.00063	U			0.00076	U			0.00071	U			0.00071	U			0.00074	U			0.00084	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg						0.00067	U			0.0008	U			0.00075	U			0.00075	U			0.00078	U			0.00088	U
Dibromochloromethane	124-48-1	mg/kg						0.00054	U			0.00065	U			0.00061	U			0.0006	U			0.00063	U			0.00071	U
1,2-Dibromoethane	106-93-4	mg/kg						0.0004	U			0.00049	U			0.00046	U			0.00045	U			0.00047	U			0.00054	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1			0.00052	U			0.00063	U			0.00059	U			0.00059	U			0.00061	U			0.00069	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6			0.00048	U			0.00057	U			0.00054	U			0.00053	U			0.00056	U			0.00063	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8			0.00047	U			0.00057	U			0.00054	U			0.00053	U			0.00056	U			0.00063	U
Dichlorodifluoromethane	75-71-8	mg/kg						0.0007	U			0.00084	U			0.00079	U			0.00078	U			0.00082	U			0.00092	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27			0.00047	U			0.00057	U			0.00054	U			0.00053	U			0.00056	U			0.00063	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02			0.00045	U			0.00054	U			0.00051	U			0.0005	U			0.00053	U			0.0006	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24			0.00063	U			0.00075	U			0.00071	U			0.0007	U			0.00074	U			0.00083	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19			0.00081	U			0.00097	U			0.00091	U			0.0009	U			0.00094	U			0.0011	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19			0.00059	U			0.0007	U			0.00066	U			0.00066	U			0.00069	U			0.00078	U
1,2-Dichloropropane	78-87-5	mg/kg						0.00045	U			0.00054	U			0.00051	U			0.00051	U			0.00053	U			0.0006	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg						0.00046	U			0.00055	U			0.00052	U			0.00051	U			0.00053	U			0.0006	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg						0.00044	U			0.00053	U			0.0005	U			0.00049	U			0.00051	U			0.00058	U
Ethylbenzene	100-41-4	mg/kg	1	76	1			0.00043	U			0.00052	U			0.00049	U			0.00049	U			0.00051	U			0.00058	U
Freon 113	76-13-1	mg/kg						0.0026	U			0.0031	U			0.0029	U			0.0029	U			0.003	U			0.0034	U
2-Hexanone	591-78-6	mg/kg						0.002	U			0.0024	U			0.0023	U			0.0023	U			0.0024	U			0.0027	U
Isopropylbenzene	98-82-8	mg/kg						0.0014	U			0.0016	U			0.0015	U			0.0015	U			0.0016	U			0.0018	U
Methyl Acetate	79-20-9	mg/kg						0.0013	U			0.0016	U			0.0015	U			0.0015	U			0.0016	U			0.0018	U
Methylcyclohexane	108-87-2	mg/kg						0.00084	U			0.001	U			0.00095	U			0.00094	U			0.00098	U			0.0011	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1			0.00045	U			0.00054	U			0.00051	U			0.0005	U			0.00053	U			0.0006	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg						0.0022	U			0.0026	U			0.0025	U			0.0024	U			0.0026	U			0.0029	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05			0.0025	U			0.003	U			0.0028	U			0.0028	U			0.0029	U			0.0033	U
Styrene	100-42-5	mg/kg						0.00039	U			0.00046	U			0.00044	U			0.00043	U			0.00045	U			0.00051	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg						0.00057	U			0.00069	U			0.00065	U			0.00064	U			0.00067	U			0.00076	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3			0.00056	U			0.00067	U			0.00063	U			0.00062	U			0.00065	U			0.00074	U
Toluene	108-88-3	mg/kg	0.7	100	0.7			0.0005	U			0.0006	U			0.00057	U			0.00056	U			0.00059	U			0.00067	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg						0.0024	U			0.0029	U			0.0027	U			0.0027	U			0.0028	U			0.0032	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg						0.0024	U			0.0029	U			0.0027	U			0.0027	U			0.0028	U			0.0032	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68			0.00046	U			0.00056	U			0.00053	U			0.00052	U			0.00054	U			0.00061	U
1,1,2-Trichloroethane	79-00-5	mg/kg						0.00053	U			0.00064	U			0.0006	U			0.0006	U			0.00062	U			0.0007	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47			0.00073	U			0.00088	U			0.00083	U			0.00082	U			0.00086	U			0.00097	U
Trichlorofluoromethane	75-69-4	mg/kg						0.00066	U			0.00079	U			0.00074	U			0.00073	U			0.00077	U			0.00087	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03			0.00046	U			0.00055	U			0.00052	U			0.00052	U			0.00054	U			0.00061	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26			0.00086	U			0.001	U			0.00097	U			0.00096	U			0.001	U			0.0011	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26			0.00044	U			0.00053	U			0.0005	U			0.00049	U			0.00051	U			0.00058	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26			0.00044	U			0.00053	U			0.0005	U			0.00049	U			0.00051	U			0.00058	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

	= concentration exceeds USCO
	= concentration exceeds RRSCO
#	= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 12 (18.5-19)		DUP 20250825		DUP 20250825		DUP 2 20250825		DUP 2 20250825		DUP 2 20250825		DUP 2 20250825		RI-SB 13(3-3.5)		RI-SB 13(3-3.5)		RI-SB 13(6-6.5)		RI-SB 13(6-6.5)		RI-SB 13(10.5-11)	
Lab Sample ID:						JE17704-28A		JE17704-30		JE17704-30A		JE17704-31		JE17704-31A		JE17704-31		JE17704-31A		JE17802-1		JE17802-1A		JE17802-2		JE17802-2A		JE17802-3	
Date Sampled:						8/25/2025 3:48 PM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/26/2025 8:30 AM		8/26/2025 8:30 AM		8/26/2025 8:31 AM		8/26/2025 8:31 AM		8/26/2025 8:32 AM	
Matrix:						Soil		Field Blank Soil		Field Blank Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005			0.00061	U			0.00054	U			0.00054	U			0.000081	U			0.00041	U			0.000097	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02			0.0006	U			0.00054	U			0.00054	U			0.000047	U			0.00024	U			0.000057	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036			0.00067	U			0.0006	U			0.0006	U			0.00006	U			0.0003	U			0.000072	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04			0.00071	U			0.00063	U			0.00063	U			0.000062	U			0.00032	U			0.000075	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1			0.00055	U			0.00049	U			0.00049	U			0.000072	U			0.00037	U			0.000087	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094			0.002				0.00053	U			0.00053	U			0.0119 [h]				0.00028	U			0.000067	U
gamma-Chlordane	5103-74-2	mg/kg	14					0.00095 [b]				0.0003	U			0.0003	U			0.0109 [h]				0.0013	J			0.000075	U
Chlordane (alpha and gamma)	57-74-9	mg/kg						0.003				0.0003	U			0.0003	U			0.0209				0.0013	J			0.000067	U
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005			0.0332				0.00045	U			0.00045	U			0.0023				0.003 [j]				0.00008	U
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033			0.0044				0.00061	U			0.00061	U			0.011 [h]				0.0031 [j]				0.000052	U
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033			0.0023				0.00058	U			0.00058	U			0.0048				0.0022 [i]				0.00006	U
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033			0.0095				0.0022				0.0022				0.004 [i]				0.0141 [i]				0.000087	U
Endrin	72-20-8	mg/kg	0.06	11	0.014			0.0018				0.00051	U			0.00051	U			0.00006 [a]	U			0.0003 [a]				0.000072	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4			0.00058	U			0.00052	U			0.00052	U			0.00005	U			0.00025	U			0.00006	U
Endrin aldehyde	7421-93-4	mg/kg						0.00042	U			0.00037	U			0.00037	U			0.00012	U			0.00061	U			0.00014	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4			0.00043	U			0.00038	U			0.00038	U			0.000056	U			0.00028	U			0.000067	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4			0.00046	U			0.00041	U			0.00041	U			0.0044 [a]				0.0609 [k]				0.00007	U
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042			0.00064	U			0.00057	U			0.00057	U			0.000054	U			0.00027	U			0.000065	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02					0.00052	U			0.00046	U			0.00046	U			0.00051 [i]				0.00038	U			0.00009	U
Methoxychlor	72-43-5	mg/kg	900					0.00059	U			0.00053	U			0.00053	U			0.00016	U			0.00083	U			0.0002	U
Endrin ketone	53494-70-5	mg/kg						0.00054	U			0.00048	U			0.00048	U			0.000066	U			0.00034	U			0.00008	U
Toxaphene	8001-35-2	mg/kg						0.017	U			0.015	U			0.015	U			0.0034	U			0.017	U			0.0041	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1			0.017	U			0.015	U			0.015	U			0.0088 [a]	U			0.0089 [a]	U			0.011 [a]	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1			0.023	U			0.02	U			0.02	U			0.0069	U			0.0071	U			0.0084	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1			0.024	U			0.021	U			0.021	U			0.017	U			0.017	U			0.021	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1			0.015	U			0.014	U			0.014	U			0.012	U			0.013	U			0.015	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1			0.033	U			0.029	U			0.029	U			0.0045	U			0.0045	U			0.0054	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1			0.02	U			0.0276	J			0.0276	J			0.0022	U			0.0023	U			0.0027	U
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1			0.016	U			0.014	U			0.014	U			0.0071 [a]	U			0.0072 [a]	U			0.0086 [a]	U
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1			0.033	U			0.029	U			0.029	U			0.0021	U			0.0021	U			0.0025	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1			0.024	U			0.022	U			0.022	U			0.0017	U			0.0017	U			0.0021	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27			0.27	U			0.23	U			0.23	U			0.45				0.49				0.29	U
Solids, Percent	PERCENT SOLIDS	%										88.6				94.6				89.7				95.2				80.3	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg						12400				6780				6780				12100				8120				24100	
Antimony	7440-36-0	mg/kg						4.5	U			2.1	U			2.1	U			2.2	U			2.2	U			2.5	U
Arsenic	7440-38-2	mg/kg	16	16	13			5.8				2.1	U			2.1	U			5.5				3.9				3.8	
Barium	7440-39-3	mg/kg	820	410	410			131				78.9				78.9				152				65.5				114	
Beryllium	7440-41-7	mg/kg	47	43	4.4			0.49				0.23				0.23				0.43				0.22	U			0.7	
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5			1.4				0.52	U			0.52	U			0.59				0.55	U			0.63	U
Calcium	7440-70-2	mg/kg						4180				6150				6150				3590				7680				2040	
Chromium	7440-47-3	mg/kg	19	110	30			32.6				12				12				21.2				10.3				35.2	
Cobalt	7440-48-4	mg/kg						8.9				5.2				5.2				7.1				6.4				12.3	
Copper	7440-50-8	mg/kg	1720	280	50			21.9				18.4				18.4				33.3				46.2				30.8 [f]	
Iron	7439-89-6	mg/kg						27300				11300				11300				18300				17100				32400	
Lead	7439-92-1	mg/kg	450	400	63			143				43.5				43.5				557				182				9.8	
Magnesium	7439-95-4	mg/kg						3530				3180				3180				3810				4710				7810	
Manganese	7439-96-5	mg/kg	2000	2000	1600			397				202				202				201				134				519	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18			0.19				0.063				0.063				0.51				0.18				0.075	
Nickel	7440-02-0	mg/kg	130	320	30			14.5				10.3				10.3				15.7				9.4				27.9	
Potassium	7440-09-7	mg/kg						1100	U			1550				1550				1540				1290				3870	
Selenium	7782-49-2	mg/kg	4	110	3.9			4.5	U			2.1	U			2.1	U			2.2	U			2.2	U			5 [f]	U
Silver	7440-22-4	mg/kg	8.3	110	2			1.1	U			0.52	U			0.52	U			0.55	U			0.55	U			0.63	U
Sodium	7440-23-5	mg/kg						1100	U			1000	U			1000	U			1100	U			1100	U			1300	U
Thallium	7440-28-0	mg/kg						2.2	U			1	U			1	U			1.1	U			1.1	U			1.3	U
Vanadium	7440-62-2	mg/kg						42.7				15.9				15.9				26.7				42.4				45.6	
Zinc	7440-66-6	mg/kg	2480	6600	109			391				55.3				55.3				284				103				77.4	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 12 (18.5-19)		DUP 20250825		DUP 20250825		DUP 2 20250825		DUP 2 20250825		DUP 2 20250825		DUP 2 20250825		RI-SB 13(3-3.5)		RI-SB 13(3-3.5)		RI-SB 13(6-6.5)		RI-SB 13(6-6.5)		RI-SB 13(10.5-11)	
Lab Sample ID:						JE17704-28A		JE17704-30		JE17704-30A		JE17704-31		JE17704-31A		JE17704-31		JE17704-31A		JE17802-1		JE17802-1A		JE17802-2		JE17802-2A		JE17802-3	
Date Sampled:						8/25/2025 3:48 PM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/26/2025 8:30 AM		8/26/2025 8:30 AM		8/26/2025 8:31 AM		8/26/2025 8:31 AM		8/26/2025 8:32 AM	
Matrix:						Soil		Field Blank Soil		Field Blank Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00013	U			0.00012	U			0.00011	U			0.00011	U			0.00012	U			0.00011	U		
Perfluoropentanoic acid	2706-90-3	mg/kg				0.000083	U			0.000078	U			0.000073	U			0.000073	U			0.000076	U			0.000071	U		
Perfluorohexanoic acid	307-24-4	mg/kg				0.000036	U			0.000033	U			0.000046	J			0.000046	J			0.000032	U			0.000031	U		
Perfluoroheptanoic acid	375-85-9	mg/kg				0.00006	U			0.000056	U			0.000052	U			0.000052	U			0.000054	U			0.000051	U		
Perfluorooctanoic acid	335-67-1	mg/kg				0.000095	U			0.000089	U			0.000093	J			0.000093	J			0.000086	U			0.000082	U		
Perfluorononanoic acid	375-95-1	mg/kg				0.00006	U			0.000056	U			0.000052	U	0.017	U					0.000054	U			0.000051	U		
Perfluorodecanoic acid	335-76-2	mg/kg				0.000083	U			0.000078	U			0.000073	U			0.000052	U			0.000076	U			0.000071	U		
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000071	U			0.000067	U			0.000062	U			0.000073	U			0.000065	U			0.000061	U		
Perfluorododecanoic acid	307-55-1	mg/kg				0.000095	U			0.000089	U			0.000083	U	0.021	U					0.000086	U			0.000082	U		
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.00011	U			0.0001	U			0.000093	U			0.000062	U			0.000097	U			0.000092	U		
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00012	U			0.00011	U			0.0001	U			0.000083	U			0.00011	U			0.0001	U		
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.000083	U			0.000078	U			0.000073	U	0.029	U					0.000076	U			0.000071	U		
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00013	U			0.00012	U			0.00011	U			0.000093	U			0.00012	U			0.00011	U		
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00012	U			0.00011	U			0.0001	U			0.0001	U			0.00011	U			0.0001	U		
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.00006	U			0.00027				0.000092	J	0.061	U					0.00024				0.00025			
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00013	U			0.00012	U			0.00011	U	0.13	U					0.00012	U			0.00011	U		
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00012	U			0.00011	U			0.0001	U	0.036	U					0.00011	U			0.0001	U		
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.00023	U			0.00021	U			0.0002	U			0.000073	U			0.00021	U			0.00019	U		
PFOSA	754-91-6	mg/kg				0.000083	U			0.000078	U			0.000073	U	0.022	U					0.000076	U			0.000071	U		
MeFOSAA	2355-31-9	mg/kg				0.000095	U			0.000089	U			0.000083	U			0.00011	U			0.000086	U			0.000082	U		
EtFOSAA	2991-50-6	mg/kg				0.00015	U			0.00014	U			0.00013	U			0.0001	U			0.00014	U			0.00013	U		
2-Chlorophenol	95-57-8	mg/kg						0.018	U			0.017	U			0.028	U			0.018	U			0.017	U			0.02	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg						0.022	U			0.021	U					0.000092	J	0.023	U			0.021	U			0.025	U
2,4-Dichlorophenol	120-83-2	mg/kg						0.031	U			0.029	U					0.00011	U	0.032	U			0.03	U			0.035	U
2,4-Dimethylphenol	105-67-9	mg/kg						0.064	U			0.061	U			0.022	U			0.066	U			0.062	U			0.073	U
2,4-Dinitrophenol	51-28-5	mg/kg						0.13 [a]	U			0.13 [a]	U			0.091	U			0.14	U			0.13	U			0.15	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg						0.038 [a]	U			0.036 [a]	U			0.032	U			0.04	U			0.037 [a]	U			0.044	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33			0.023	U			0.022	U			0.018	U			0.024	U			0.022	U			0.026	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33			0.029	U			0.028	U			0.023	U			0.0367	J			0.115				0.034	U
2-Nitrophenol	88-75-5	mg/kg						0.024 [a]	U			0.022 [a]	U			0.025	U			0.025	U			0.023 [a]	U			0.027	U
4-Nitrophenol	100-02-7	mg/kg						0.096	U			0.091	U			0.02	U			0.099	U			0.093	U			0.11	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8			0.034	U			0.032	U					0.0001	U	0.035	U			0.033	U			0.038	U
Phenol	108-95-2	mg/kg	0.33	100	0.33			0.019 [a]	U			0.018 [a]	U					0.0002	U	0.019	U			0.018	U			0.021	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg						0.024	U			0.023	U			0.038				0.025	U			0.023	U			0.027	U
2,4,5-Trichlorophenol	95-95-4	mg/kg						0.027	U			0.025	U			0.0272	J			0.028	U			0.026	U			0.031	U
2,4,6-Trichlorophenol	88-06-2	mg/kg						0.021	U			0.02	U			0.0073	U			0.022	U			0.021	U			0.024	U
Acenaphthene	83-32-9	mg/kg	98	100	20			0.112				0.038						0.000073	U	0.129				0.0724				0.014	U
Acenaphthylene	208-96-8	mg/kg	365	100	100			0.0777				0.0272	J			0.115				0.468				2.82				0.021	U
Acetophenone	98-86-2	mg/kg						0.0077	U			0.0073	U			0.015	U			0.008	U			0.0075	U			0.0088	U
Anthracene	120-12-7	mg/kg	1000	100	100			0.325				0.115						0.000083	U	0.708				1.44				0.025	U
Atrazine	1912-24-9	mg/kg						0.015	U			0.015	U			0.321				0.016	U			0.015	U			0.017	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1			0.926				0.321						0.00013	U	2.33				6.81				0.012	U
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1			0.929				0.295				0.295				2.28				10.6				0.019	U
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1			1.05				0.344				0.344				2.56				14.2				0.018	U
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64			0.721				0.228				0.228				1.49				7.91				0.02	U
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8			0.391				0.107				0.107				0.943				2.24				0.019	U
4-Bromophenyl phenyl ether	101-55-3	mg/kg						0.014	U			0.013	U			0.013	U			0.014	U			0.013	U			0.016	U
Butyl benzyl phthalate	85-68-7	mg/kg						0.0087	U			0.0083	U			0.0083	U			0.0091	U			0.0085 [a]	U			0.01	U
1,1'-Biphenyl	92-52-4	mg/kg						0.0133	J			0.0047	U			0.0047	U			0.0255	J			0.0358	J			0.0056	U
Benzaldehyde	100-52-7	mg/kg						0.0089	U			0.0084	U			0.0084	U			0.0092	U			0.0086	U			0.01	U
2-Chloronaphthalene	91-58-7	mg/kg						0.0085	U			0.0081	U			0.0081	U			0.0088	U			0.0083	U			0.0097	U
4-Chloroaniline	106-47-8	mg/kg						0.013	U			0.012	U			0.012	U			0.013	U			0.013	U			0.015	U
Carbazole	86-74-8	mg/kg						0.0979				0.0313	J			0.0313	J			0.171				0.482				0.0059	U
Caprolactam	105-60-2	mg/kg						0.014	U			0.013	U			0.013	U			0.015 [a]	U			0.014 [a]	U			0.016 [a]	U
Chrysene	218-01-9	mg/kg	1	4.9	1			0.772				0.297				0.297				2.18				8.23				0.013	U
bis(2-Chloroethoxy)methane	111-91-1	mg/kg						0.0077	U			0.0073	U			0.0073	U			0.008	U			0.0074	U			0.0087	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg						0.015	U			0.015	U			0.015	U			0.016	U			0.015	U			0.018	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg						0.013	U			0.012	U			0.012	U			0.013	U			0.012	U			0.015	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg						0.012	U			0.011	U			0.011	U			0.012	U			0.011	U			0.013	U
2,4-Dinitrotoluene	121-14-2	mg/kg						0.011	U			0.011	U			0.011	U			0.012	U			0.011	U			0.013	U
2,6-Dinitrotoluene	606-20-2	mg/kg						0.018 [a]	U			0.017 [a]	U			0.017	U			0.019	U			0.017	U			0.02	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg						0.03	U			0.028	U			0.028	U			0.031	U			0.029	U			0.034	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1			0.024	U			0.022	U			0.022	U			0.025	U			0.023	U			0.027	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33			0.175				0.0594				0.0594				0.382				2.09				0.018	U
Dibenzofuran	132-64-9	mg/kg	110	18	2.1			0.0639	J			0.0243	J			0.0243	J			0.102				0.121				0.017	U
Di-n-butyl phthalate	84-74-2	mg/kg						0.0058	U			0.0056	J			0.0056	J			0.0061	U			0.0057	U			0.0067	U
Di-n-octyl phthalate	117-84-0	mg/kg						0.0089	U			0.0085	U			0.0085	U			0.0093	U			0.0087 [a]	U			0.01	U
Diethyl phthalate	84-66-2	mg/kg						0.0076	U			0.0072	U			0.0072	U			0.0079	U			0.0074	U			0.0087	U
Dimethyl phthalate	131-11-3	mg/kg						0.0064	U			0.0061	U			0.0061	U			0.0066	U			0.0062	U			0.0073	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg						0.0249	J			0.008	U			0.008	U			0.033	J			0.0081	U			0.0096	U
Fluoranthene	206-44-0	mg/kg	1000	100	85			1.6				0.547				0.547				4.8				6.14				0.018	U
Fluorene	86-73-7	mg/kg	386	100	30			0.121				0.0426				0.0426				0.206				0.164				0.019	U
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33			0.0091	U			0.0086	U			0.0086	U			0.0094	U			0.0088	U			0.01	U
Hexachlorobutadiene	87-68-3	mg/kg						0.014	U			0.014	U			0.014	U			0.015	U			0.014	U			0.016	U
Hexachlorocyclopentadiene	77-47-4	mg/kg						0.014	U			0.014	U			0.014	U			0.015 [b]	U			0.014 [b]	U			0.016 [b]	U
Hexachloroethane	67-72-1	mg/kg						0.018	U			0.017	U			0.017	U			0.018	U			0.017	U			0.02	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5			0.572				0.18				0.18				1.24				6.65				0.019	U
Isophorone	78-59-1	mg/kg						0.0077	U			0.0073	U			0.0073	U			0.008	U			0.0074	U			0.0087	U
2-Methylnaphthalene	91-57-6	mg/kg						0.0362				0.0092	J			0.0092	J			0.0782				0.141				0.0092	U
2-Nitroaniline	88-74-4	mg/kg						0.0085 [a]	U			0.008 [a]	U			0.008	U			0.0088	U			0.0082 [a]	U			0.0096	U
3-Nitroaniline	99-09-2	mg/kg						0.009	U			0.0085	U			0.0085	U			0.0093	U			0.0087	U			0.01	U
4-Nitroaniline	100-01-6	mg/kg						0.0093	U			0.0088	U			0.0088	U			0.0096	U			0.009	U			0.011	U
Naphthalene	91-20-3	mg/kg	12	100	12			0.0575				0.0265	J			0.0265	J			0.0998				0.346				0.012	U
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08			0.014	U			0.013	U			0.013	U			0.014	U			0.013	U			0.016	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg						0.01	U			0.0098	U			0.0098	U			0.011	U			0.01	U			0.012	U
N-Nitrosodiphenylamine	86-30-6	mg/kg						0.013	U			0.012	U			0.012	U			0.014	U			0.013	U			0.015	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1			1.11				0.517				0.517				1.88				1.57				0.014	U
Pyrene	129-00-0	mg/kg	1000	100	64			1.78				0.687				0.687				3.54				7.06				0.013	U
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg						0.0091	U			0.0086	U			0.0086	U			0.0094	U			0.0088	U			0.01	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 12 (18.5-19)		DUP 20250825		DUP 20250825		DUP 2 20250825		DUP 2 20250825		DUP 2 20250825		DUP 2 20250825		RI-SB 13(3-3.5)		RI-SB 13(3-3.5)		RI-SB 13(6-6.5)		RI-SB 13(6-6.5)		RI-SB 13(10.5-11)	
Lab Sample ID:						JE17704-28A		JE17704-30		JE17704-30A		JE17704-31		JE17704-31A		JE17704-31		JE17704-31A		JE17802-1		JE17802-1A		JE17802-2		JE17802-2A		JE17802-3	
Date Sampled:						8/25/2025 3:48 PM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/25/2025 12:00 AM		8/26/2025 8:30 AM		8/26/2025 8:30 AM		8/26/2025 8:31 AM		8/26/2025 8:31 AM		8/26/2025 8:32 AM	
Matrix:						Soil		Field Blank Soil		Field Blank Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03			0.0048	U			0.0045	U			0.0045	U			0.141				0.095				0.0064	J
Benzene	71-43-2	mg/kg	0.06	3.7	0.06			0.00052	U			0.00049	U			0.00049	U			0.00048	U			0.00047	U			0.00051	U
Bromochloromethane	74-97-5	mg/kg						0.00064	U			0.0006	U			0.0006	U			0.00059	U			0.00058	U			0.00062	U
Bromodichloromethane	75-27-4	mg/kg						0.00049	U			0.00046	U			0.00046	U			0.00045	U			0.00044	U			0.00048	U
Bromoform	75-25-2	mg/kg						0.0016	U			0.0015	U			0.0015	U			0.0014	U			0.0014	U			0.0015	U
Bromomethane	74-83-9	mg/kg						0.00088	U			0.00082	U			0.00082	U			0.0008	U			0.00079	U			0.00085	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1			0.0028	U			0.0026	U			0.0026	U			0.0206				0.0103				0.0027	U
Carbon disulfide	75-15-0	mg/kg						0.00062	U			0.00058	U			0.00058	U			0.00056	U			0.00055	U			0.00059	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76			0.00071	U			0.00067	U			0.00067	U			0.00065	U			0.00064	U			0.00069	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5			0.00053	U			0.0005	U			0.0005	U			0.00048	U			0.00047	U			0.00051	U
Chloroethane	75-00-3	mg/kg						0.00068 [a]	U			0.00064 [a]	U			0.00064	U			0.00062	U			0.00061	U			0.00066	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37			0.0012	U			0.0011	U			0.0011	U			0.0011	U			0.001	U			0.0011	U
Chloromethane	74-87-3	mg/kg						0.0023	U			0.0021	U			0.0021	U			0.0021	U			0.002	U			0.0022	U
Cyclohexane	110-82-7	mg/kg						0.00076	U			0.00071	U			0.00071	U			0.00069	U			0.00068	U			0.00073	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg						0.0008	U			0.00075	U			0.00075	U			0.00073	U			0.00071	U			0.00077	U
Dibromochloromethane	124-48-1	mg/kg						0.00064	U			0.0006	U			0.0006	U			0.00059	U			0.00058	U			0.00062	U
1,2-Dibromoethane	106-93-4	mg/kg						0.00048	U			0.00045	U			0.00045	U			0.00044	U			0.00043	U			0.00047	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1			0.00063	U			0.00059	U			0.00059	U			0.00057	U			0.00056	U			0.00061	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6			0.00057	U			0.00054	U			0.00054	U			0.00052	U			0.00051	U			0.00055	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8			0.00057	U			0.00053	U			0.00053	U			0.00052	U			0.00051	U			0.00055	U
Dichlorodifluoromethane	75-71-8	mg/kg						0.00084	U			0.00078	U			0.00078	U			0.00076	U			0.00075	U			0.00081	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27			0.00057	U			0.00053	U			0.00053	U			0.00052	U			0.00051	U			0.00055	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02			0.00054	U			0.00051	U			0.00051	U			0.00049	U			0.00048	U			0.00052	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24			0.00075	U			0.00071	U			0.00071	U			0.00069	U			0.00067	U			0.00073	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19			0.00097	U			0.00091	U			0.00091	U			0.00088	U			0.00087	U			0.00093	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19			0.0007	U			0.00066	U			0.00066	U			0.00064	U			0.00063	U			0.00068	U
1,2-Dichloropropane	78-87-5	mg/kg						0.00054	U			0.00051	U			0.00051	U			0.0005	U			0.00049	U			0.00053	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg						0.00055	U			0.00051	U			0.00051	U			0.0005	U			0.00049	U			0.00053	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg						0.00053	U			0.00049	U			0.00049	U			0.00048	U			0.00047	U			0.00051	U
Ethylbenzene	100-41-4	mg/kg	1	76	1			0.00052	U			0.00049	U			0.00049	U			0.00048	U			0.00047	U			0.0005	U
Freon 113	76-13-1	mg/kg						0.0031	U			0.0029	U			0.0029	U			0.0028	U			0.0027	U			0.003	U
2-Hexanone	591-78-6	mg/kg						0.0024	U			0.0023	U			0.0023	U			0.0022	U			0.0022	U			0.0024	U
Isopropylbenzene	98-82-8	mg/kg						0.0016	U			0.0015	U			0.0015	U			0.0015	U			0.0015	U			0.0016	U
Methyl Acetate	79-20-9	mg/kg						0.0016	U			0.0015	U			0.0015	U			0.0015	U			0.0014	U			0.0015	U
Methylcyclohexane	108-87-2	mg/kg						0.001	U			0.00094	U			0.00094	U			0.00092	U			0.0009	U			0.00097	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1			0.00054	U			0.00051	U			0.00051	U			0.00049	U			0.00048	U			0.00052	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg						0.0026	U			0.0024	U			0.0024	U			0.0024	U			0.0023	U			0.0025	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05			0.003	U			0.0028	U			0.0028	U			0.0027	U			0.0027	U			0.0029	U
Styrene	100-42-5	mg/kg						0.00046	U			0.00043	U			0.00043	U			0.00042	U			0.00041	U			0.00045	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg						0.00069	U			0.00065	U			0.00065	U			0.00063	U			0.00062	U			0.00067	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3			0.00067	U			0.00063	U			0.00063	U			0.00061	U			0.0006	U			0.00064	U
Toluene	108-88-3	mg/kg	0.7	100	0.7			0.0006	U			0.00057	U			0.00057	U			0.00055	U			0.00054	U			0.00058	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg						0.0029	U			0.0027	U			0.0027	U			0.0026	U			0.0026	U			0.0028	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg						0.0029	U			0.0027	U			0.0027	U			0.0026	U			0.0026	U			0.0028	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68			0.00056	U			0.00052	U			0.00052	U			0.00051	U			0.0005	U			0.00054	U
1,1,2-Trichloroethane	79-00-5	mg/kg						0.00064	U			0.0006	U			0.0006	U			0.00058	U			0.00057	U			0.00062	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47			0.00088	U			0.00082	U			0.00082	U			0.0008	U			0.00078	U			0.00085	U
Trichlorofluoromethane	75-69-4	mg/kg						0.00079	U			0.00074	U			0.00074	U			0.00072	U			0.0007	U			0.00076	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03			0.00055	U			0.00052	U			0.00052	U			0.00051	U			0.0005	U			0.00053	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26			0.001	U			0.00097	U			0.00097	U			0.00094	U			0.00092	U			0.001	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26			0.00053	U			0.00049	U			0.00049	U			0.00048	U			0.00047	U			0.00051	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26			0.00053	U			0.00049	U			0.00049	U			0.00048	U			0.00047	U			0.00051	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

	= concentration exceeds USCO
	= concentration exceeds RRSCO
#	= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 13(10.5-11)		RI-SB 13(18.5-19)		RI-SB 13(18.5-19)		RI-SB 15(2.5-3)		RI-SB 15(2.5-3)		RI-SB 15(8-8.5)		RI-SB 15(8-8.5)		RI-SB 15(13-13.5)		RI-SB 15(13-13.5)		RI-SB 15(17-17.5)		RI-SB 15(17-17.5)		RI-SB 16(3.5-4)	
Lab Sample ID:						JE17802-3A		JE17802-4		JE17802-4A		JE17802-5		JE17802-5A		JE17802-6		JE17802-6A		JE17802-7		JE17802-7A		JE17802-8		JE17802-8A		JE17802-9	
Date Sampled:						8/26/2025 8:32 AM		8/26/2025 8:33 AM		8/26/2025 8:33 AM		8/26/2025 9:40 AM		8/26/2025 9:40 AM		8/26/2025 9:41 AM		8/26/2025 9:41 AM		8/26/2025 9:42 AM		8/26/2025 9:42 AM		8/26/2025 9:43 AM		8/26/2025 9:43 AM		8/26/2025 10:35 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005			0.000088	U			0.00009	U			0.0001	U			0.000096	U			0.000094	U			0.000086	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02			0.000052	U			0.000053	U			0.000062	U			0.000057	U			0.000055	U			0.00005	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036			0.000066	U			0.000067	U			0.000078	U			0.000071	U			0.00007	U			0.000064	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04			0.000068	U			0.000069	U			0.00008	U			0.000074	U			0.000072	U			0.000066	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1			0.000079	U			0.000081	U			0.000094	U			0.000086	U			0.000084	U			0.000077	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094			0.000061	U			0.0048 [h]				0.000072	U			0.000066	U			0.000065	U			0.000059	U
gamma-Chlordane	5103-74-2	mg/kg	14					0.000068	U			0.0036 [h]				0.00008	U			0.000074	U			0.000072	U			0.000066	U
Chlordane (alpha and gamma)	57-74-9	mg/kg						0.000061	U			0.0076				0.000072	U			0.000066	U			0.000065	U			0.000059	U
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005			0.000073	U			0.0011 [i]				0.000086	U			0.000079	U			0.000077	U			0.00007	U
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033			0.000048	U			0.0093 [h]				0.000056	U			0.000052	U			0.000051	U			0.000046	U
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033			0.000054	U			0.0034				0.000064	U			0.000059	U			0.000058	U			0.000053	U
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033			0.000079	U			0.0028				0.00016 [i]	J			0.000086	U			0.000084	U			0.00016 [i]	J
Endrin	72-20-8	mg/kg	0.06	11	0.014			0.000066 [a]	U			0.000067 [a]	U			0.000078 [a]	U			0.000071 [a]	U			0.00007 [a]	U			0.000064 [a]	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4			0.000054	U			0.000055	U			0.000064	U			0.000059	U			0.000058	U			0.000053	U
Endrin aldehyde	7421-93-4	mg/kg						0.00013	U			0.00013	U			0.00016	U			0.00014	U			0.00014	U			0.00013	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4			0.000061	U			0.000062	U			0.000072	U			0.000066	U			0.000065	U			0.000059	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4			0.000063	U			0.0036 [g]				0.000075	U			0.000069	U			0.000068	U			0.000061	U
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042			0.000059	U			0.00006	U			0.00007	U			0.000064	U			0.000063	U			0.000057	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02					0.000082	U			0.00035 [i]	J			0.000097	U			0.000088	U			0.000087	U			0.000079	U
Methoxychlor	72-43-5	mg/kg	900					0.00018	U			0.00018	U			0.00021	U			0.00019	U			0.00019	U			0.00017	U
Endrin ketone	53494-70-5	mg/kg						0.000073	U			0.000074	U			0.000086	U			0.000079	U			0.000077	U			0.00007	U
Toxaphene	8001-35-2	mg/kg						0.0037	U			0.0038	U			0.0044	U			0.0041	U			0.004	U			0.0036	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1			0.0096 [a]	U			0.0098	U			0.011 [a]	U			0.01 [a]	U			0.01 [a]	U			0.0093 [a]	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1			0.0076	U			0.0078	U			0.009	U			0.0083	U			0.0081	U			0.0074	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1			0.019	U			0.019	U			0.022	U			0.02	U			0.02	U			0.018	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1			0.014	U			0.014	U			0.016	U			0.015	U			0.014	U			0.013	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1			0.0049	U			0.005	U			0.0058	U			0.0053	U			0.0052	U			0.0047	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1			0.0024	U			0.0025	U			0.0029	U			0.0027	U			0.0026	U			0.0024	U
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1			0.0078 [a]	U			0.013 [i]	J			0.0092 [a]	U			0.0085 [a]	U			0.0083 [a]	U			0.0076 [a]	U
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1			0.0023	U			0.0023	U			0.0027	U			0.0025	U			0.0024	U			0.0022	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1			0.0019	U			0.0019	U			0.0022	U			0.002	U			0.002	U			0.0018	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27			0.29	U			0.35				0.31	U			0.34	U			0.33	U			0.26	U
Solids, Percent	PERCENT SOLIDS	%						84.8				86.5				74.6				79.8				82.9				91.2	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg						5340				14500				15500				17300				6270				7310	
Antimony	7440-36-0	mg/kg						2.3	U			2.3	U			2.8	U			2.5	U			2.4	U			2.2	U
Arsenic	7440-38-2	mg/kg	16	16	13			2.3	U			9.4				5.1				2.5	U			2.4	U			2.2	U
Barium	7440-39-3	mg/kg	820	410	410			33.4				702				105				93.7				35.5				62.6	
Beryllium	7440-41-7	mg/kg	47	43	4.4			0.23				0.51				0.62				0.48				0.24	U			0.24	
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5			0.57	U			0.58	U			0.69	U			0.63	U			0.61	U			0.55	U
Calcium	7440-70-2	mg/kg						1310				5310				11000				1700				1060				3100	
Chromium	7440-47-3	mg/kg	19	110	30			10.8				30.4				22.1				26.9				10.9				13.6	
Cobalt	7440-48-4	mg/kg						5.7	U			10.5				9.3				11.1				6.1	U			5.5	U
Copper	7440-50-8	mg/kg	1720	280	50			11				51.5 [f]				25.3				24.3				9.2				12.9	
Iron	7439-89-6	mg/kg						11200				26700				19500				23800				11600				12400	
Lead	7439-92-1	mg/kg	450	400	63			2.7				932				751				6				2.5				11.9	
Magnesium	7439-95-4	mg/kg						2610				5210				3300				6850				2880				2470	
Manganese	7439-96-5	mg/kg	2000	2000	1600			178				246				271				256				136				359	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18			0.035	U			0.32				0.26				0.037	U			0.031	U			0.029	U
Nickel	7440-02-0	mg/kg	130	320	30			11.1				22.4				19.1				25.3				10.9				9.9	
Potassium	7440-09-7	mg/kg						1330				2480				2090				4310				1740				1360	
Selenium	7782-49-2	mg/kg	4	110	3.9			2.3	U			4.6 [f]				2.8	U			2.5	U			2.4	U			2.2	U
Silver	7440-22-4	mg/kg	8.3	110	2			0.57	U			0.58	U			0.69	U			0.63	U			0.61	U			0.55	U
Sodium	7440-23-5	mg/kg						1100	U			1200	U			1650				1300	U			1200	U			1100	U
Thallium	7440-28-0	mg/kg						1.1	U			1.2	U			1.4	U			1.3	U			1.2	U			1.1	U
Vanadium	7440-62-2	mg/kg						12.9				36.4				31.8				35.1				14.5				18.2	
Zinc	7440-66-6	mg/kg	2480	6600	109			26.1				564				90.7				59.5				25.5				25.2	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 13(10.5-11)		RI-SB 13(18.5-19)		RI-SB 13(18.5-19)		RI-SB 15(2.5-3)		RI-SB 15(2.5-3)		RI-SB 15(8-8.5)		RI-SB 15(8-8.5)		RI-SB 15(13-13.5)		RI-SB 15(13-13.5)		RI-SB 15(17-17.5)		RI-SB 15(17-17.5)		RI-SB 16(3.5-4)	
Lab Sample ID:						JE17802-3A		JE17802-4		JE17802-4A		JE17802-5		JE17802-5A		JE17802-6		JE17802-6A		JE17802-7		JE17802-7A		JE17802-8		JE17802-8A		JE17802-9	
Date Sampled:						8/26/2025 8:32 AM		8/26/2025 8:33 AM		8/26/2025 8:33 AM		8/26/2025 9:40 AM		8/26/2025 9:40 AM		8/26/2025 9:41 AM		8/26/2025 9:41 AM		8/26/2025 9:42 AM		8/26/2025 9:42 AM		8/26/2025 9:43 AM		8/26/2025 9:43 AM		8/26/2025 10:35 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00013	U			0.00012	U			0.00012	U			0.00015	U			0.00014	U			0.00013	U		
Perfluoropentanoic acid	2706-90-3	mg/kg				0.000084	U			0.00008	U			0.000078	U			0.000092	U			0.000086	U			0.000084	U		
Perfluorohexanoic acid	307-24-4	mg/kg				0.000036	U			0.000034	U			0.000033	U			0.00004	U			0.000037	U			0.000036	U		
Perfluoroheptanoic acid	375-85-9	mg/kg				0.00006	U			0.000057	U			0.000055	U			0.000066	U			0.000061	U			0.00006	U		
Perfluorooctanoic acid	335-67-1	mg/kg				0.000096	U			0.000091	U			0.000089	U			0.00011	U			0.000098	U			0.000096	U		
Perfluorononanoic acid	375-95-1	mg/kg				0.00006	U			0.000057	U			0.000055	U			0.000066	U			0.000061	U			0.00006	U		
Perfluorodecanoic acid	335-76-2	mg/kg				0.000084	U			0.00008	U			0.000078	U			0.000092	U			0.000086	U			0.000084	U		
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000072	U			0.000068	U			0.000067	U			0.000079	U			0.000074	U			0.000072	U		
Perfluorododecanoic acid	307-55-1	mg/kg				0.000096	U			0.000091	U			0.000089	U			0.00011	U			0.000098	U			0.000096	U		
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.00011	U			0.0001	U			0.0001	U			0.00012	U			0.00011	U			0.00011	U		
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00012	U			0.00011	U			0.00011	U			0.00013	U			0.00012	U			0.00012	U		
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.000084	U			0.00008	U			0.000078	U			0.000092	U			0.000086	U			0.000084	U		
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00013	U			0.00012	U			0.00012	U			0.00015	U			0.00014	U			0.00013	U		
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00012	U			0.00011	U			0.00011	U			0.00013	U			0.00012	U			0.00012	U		
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.00006	U			0.000057	U			0.000087	J			0.00018	J			0.000061	U			0.00006	U		
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00013	U			0.00012	U			0.00012	U			0.00015	U			0.00014	U			0.00013	U		
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00012	U			0.00011	U			0.00011	U			0.00013	U			0.00012	U			0.00012	U		
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.00023	U			0.00022	U			0.00021	U			0.00025	U			0.00023	U			0.00023	U		
PFOSA	754-91-6	mg/kg				0.000084	U			0.00008	U			0.000078	U			0.000092	U			0.000086	U			0.000084	U		
MeFOSAA	2355-31-9	mg/kg				0.000096	U			0.000091	U			0.000089	U			0.00011	U			0.000098	U			0.000096	U		
EtFOSAA	2991-50-6	mg/kg				0.00016	U			0.00015	U			0.00014	U			0.00017	U			0.00016	U			0.00016	U		
2-Chlorophenol	95-57-8	mg/kg						0.019	U			0.019	U			0.022	U			0.02	U			0.02	U			0.018	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg						0.024	U			0.023	U			0.027	U			0.025	U			0.025	U			0.022	U
2,4-Dichlorophenol	120-83-2	mg/kg						0.033	U			0.033	U			0.038	U			0.035	U			0.034	U			0.031	U
2,4-Dimethylphenol	105-67-9	mg/kg						0.069	U			0.068	U			0.079	U			0.072	U			0.072	U			0.064	U
2,4-Dinitrophenol	51-28-5	mg/kg						0.15	U			0.14	U			0.17	U			0.15	U			0.15	U			0.14	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg						0.042	U			0.041	U			0.048	U			0.044	U			0.043	U			0.039	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33			0.025	U			0.024	U			0.028	U			0.026	U			0.026	U			0.023	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33			0.032	U			0.031	U			0.037	U			0.033	U			0.033	U			0.03	U
2-Nitrophenol	88-75-5	mg/kg						0.026	U			0.025	U			0.029	U			0.027	U			0.027	U			0.024	U
4-Nitrophenol	100-02-7	mg/kg						0.1	U			0.1	U			0.12	U			0.11	U			0.11	U			0.096	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8			0.036	U			0.036	U			0.042	U			0.038	U			0.038	U			0.034	U
Phenol	108-95-2	mg/kg	0.33	100	0.33			0.02	U			0.02	U			0.023	U			0.021	U			0.021	U			0.019	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg						0.026	U			0.025	U			0.029	U			0.027	U			0.027	U			0.024	U
2,4,5-Trichlorophenol	95-95-4	mg/kg						0.029	U			0.029	U			0.033	U			0.03	U			0.03	U			0.027	U
2,4,6-Trichlorophenol	88-06-2	mg/kg						0.023	U			0.023	U			0.027	U			0.024	U			0.024	U			0.021	U
Acenaphthene	83-32-9	mg/kg	98	100	20			0.013	U			0.0893				0.015	U			0.014	U			0.014	U			0.031	J
Acenaphthylene	208-96-8	mg/kg	365	100	100			0.02	U			0.218				0.023	U			0.021	U			0.02	U			0.557	
Acetophenone	98-86-2	mg/kg						0.0083	U			0.0082	U			0.0096	U			0.0087	U			0.0086	U			0.0078	U
Anthracene	120-12-7	mg/kg	1000	100	100			0.024	U			0.277				0.0422	J			0.025	U			0.025	U			0.217	
Atrazine	1912-24-9	mg/kg						0.017	U			0.016	U			0.019	U			0.017	U			0.017	U			0.015	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1			0.011	U			0.635				0.0438	J			0.012	U			0.011	U			0.833	
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1			0.018	U			0.722				0.0391	J			0.019	U			0.018	U			0.791	
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1			0.017	U			0.928				0.0329	J			0.018	U			0.018	U			0.651	
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64			0.019	U			0.596				0.028	J			0.02	U			0.02	U			0.392	
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8			0.018	U			0.255				0.021	U			0.019	U			0.019	U			0.203	
4-Bromophenyl phenyl ether	101-55-3	mg/kg						0.015	U			0.015	U			0.017	U			0.016	U			0.016	U			0.014	U
Butyl benzyl phthalate	85-68-7	mg/kg						0.0095	U			0.0093	U			0.011	U			0.0099	U			0.0098	U			0.0088	U
1,1'-Biphenyl	92-52-4	mg/kg						0.0053	U			0.0239	J			0.0061	U			0.0056	U			0.0055	U			0.0049	U
Benzaldehyde	100-52-7	mg/kg						0.0096	U			0.0095	U			0.011	U			0.01	U			0.01	U			0.0089	U
2-Chloronaphthalene	91-58-7	mg/kg						0.0092	U			0.0091	U			0.011	U			0.0097	U			0.0096	U			0.0086	U
4-Chloroaniline	106-47-8	mg/kg						0.014	U			0.014	U			0.016	U			0.015	U			0.014	U			0.013	U
Carbazole	86-74-8	mg/kg						0.0056	U			0.0897				0.0065	U			0.0059	U			0.0058	U			0.0071	J
Caprolactam	105-60-2	mg/kg						0.015 [a]	U			0.015 [a]	U			0.018 [a]	U			0.016 [a]	U			0.016 [a]	U			0.014 [a]	U
Chrysene	218-01-9	mg/kg	1	4.9	1			0.012	U			0.678				0.0308	J			0.013	U			0.013	U			0.775	
bis(2-Chloroethoxy)methane	111-91-1	mg/kg						0.0083	U			0.0082	U			0.0095	U			0.0087	U			0.0086	U			0.0077	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg						0.017	U			0.016	U			0.019	U			0.018	U			0.017	U			0.016	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg						0.014	U			0.014	U			0.016	U			0.015	U			0.014	U			0.013	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg						0.013	U			0.012	U			0.014	U			0.013	U			0.013	U			0.012	U
2,4-Dinitrotoluene	121-14-2	mg/kg						0.012	U			0.012	U			0.014	U			0.013	U			0.012	U			0.011	U
2,6-Dinitrotoluene	606-20-2	mg/kg						0.019	U			0.019	U			0.022	U			0.02	U			0.02	U			0.018	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg						0.032	U			0.032	U			0.037	U			0.034	U			0.034	U			0.03	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1			0.026	U			0.025	U			0.029	U			0.027	U			0.027	U			0.024	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33			0.017	U			0.153				0.02	U			0.018	U			0.018	U			0.123	
Dibenzofuran	132-64-9	mg/kg	110	18	2.1			0.016	U			0.0542	J			0.018	U			0.017	U			0.016	U			0.015	U
Di-n-butyl phthalate	84-74-2	mg/kg						0.0063	U			0.0085	J			0.0073	U			0.0066	U			0.0066	U			0.0094	J
Di-n-octyl phthalate	117-84-0	mg/kg						0.0097	U			0.0095	U			0.011	U			0.01	U			0.01	U			0.009	U
Diethyl phthalate	84-66-2	mg/kg						0.0083	U			0.0082	U			0.0095	U			0.0087	U			0.0086	U			0.0077	U
Dimethyl phthalate	131-11-3	mg/kg						0.0069	U			0.0068	U			0.0079	U			0.0072	U			0.0072	U			0.0064	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg						0.0091	U			0.009	U			0.01	U			0.0095	U			0.0094	U			0.0084	U
Fluoranthene	206-44-0	mg/kg	1000	100	85			0.017	U			1.23				0.0826				0.018	U			0.018	U			0.825	
Fluorene	86-73-7	mg/kg	386	100	30			0.018	U			0.122				0.0281	J			0.019	U			0.018	U			0.0565	
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33			0.0098	U			0.0097	U			0.011	U			0.01	U			0.01	U			0.0091	U
Hexachlorobutadiene	87-68-3	mg/kg						0.016	U			0.015	U			0.018	U			0.016	U			0.016	U			0.014	U
Hexachlorocyclopentadiene	77-47-4	mg/kg						0.015 [b]	U			0.015 [b]	U			0.018 [b]	U			0.016 [b]	U			0.016 [b]	U			0.014 [b]	U
Hexachloroethane	67-72-1	mg/kg						0.019	U			0.019	U			0.022	U			0.02	U			0.02	U			0.018	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5			0.018	U			0.473				0.021	U			0.019	U			0.019	U			0.315	
Isophorone	78-59-1	mg/kg						0.0083	U			0.0082	U			0.0095	U			0.0087	U			0.0086	U			0.0077	U
2-Methylnaphthalene	91-57-6	mg/kg						0.0088	U			0.0796				0.01	U			0.0092	U			0.0091	U			0.0082	U
2-Nitroaniline	88-74-4	mg/kg						0.0092	U			0.009	U			0.011	U			0.0096	U			0.0095	U			0.0085	U
3-Nitroaniline	99-09-2	mg/kg						0.0097	U			0.0096	U			0.011	U			0.01	U			0.01	U			0.009	U
4-Nitroaniline	100-01-6	mg/kg						0.01	U			0.0099	U			0.012	U			0.011	U			0.01	U			0.0093	U
Naphthalene	91-20-3	mg/kg	12	100	12			0.011	U			0.0547				0.0171	J			0.011	U			0.011	U			0.01	U
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08			0.015	U			0.015	U			0.017	U			0.016	U			0.016	U			0.014	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg						0.011	U			0.011	U			0.013	U			0.012	U			0.012	U			0.01	U
N-Nitrosodiphenylamine	86-30-6	mg/kg						0.014	U			0.014	U			0.016	U			0.015	U			0.015	U			0.013	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1			0.013	U			0.7				0.131				0.014	U			0.014	U			0.121	
Pyrene	129-00-0	mg/kg	1000	100	64			0.012	U			1.03				0.101				0.013	U			0.013	U			1.71	
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg						0.0099	U			0.0097	U			0.011	U			0.01	U			0.01	U			0.0092	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:						RI-SB 13(10.5-11)		RI-SB 13(18.5-19)		RI-SB 13(18.5-19)		RI-SB 15(2.5-3)		RI-SB 15(2.5-3)		RI-SB 15(8-8.5)		RI-SB 15(8-8.5)		RI-SB 15(13-13.5)		RI-SB 15(13-13.5)		RI-SB 15(17-17.5)		RI-SB 15(17-17.5)		RI-SB 16(3.5-4)	
Lab Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	JE17802-3A		JE17802-4		JE17802-4A		JE17802-5		JE17802-5A		JE17802-6		JE17802-6A		JE17802-7		JE17802-7A		JE17802-8		JE17802-8A		JE17802-9	
Date Sampled:						8/26/2025 8:32 AM		8/26/2025 8:33 AM		8/26/2025 8:33 AM		8/26/2025 9:40 AM		8/26/2025 9:40 AM		8/26/2025 9:41 AM		8/26/2025 9:41 AM		8/26/2025 9:42 AM		8/26/2025 9:42 AM		8/26/2025 9:43 AM		8/26/2025 9:43 AM		8/26/2025 10:35 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03			0.0045	U			0.0941				0.195				0.0302				0.026				0.0071	J
Benzene	71-43-2	mg/kg	0.06	3.7	0.06			0.0005	U			0.0005	U			0.00059	U			0.00055	U			0.00051	U			0.00045	U
Bromochloromethane	74-97-5	mg/kg						0.00061	U			0.00061	U			0.00072	U			0.00067	U			0.00063	U			0.00056	U
Bromodichloromethane	75-27-4	mg/kg						0.00047	U			0.00047	U			0.00055	U			0.00052	U			0.00048	U			0.00043	U
Bromoform	75-25-2	mg/kg						0.0015	U			0.0015	U			0.0018	U			0.0016	U			0.0015	U			0.0014	U
Bromomethane	74-83-9	mg/kg						0.00083	U			0.00083	U			0.00098	U			0.00092	U			0.00085	U			0.00076	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1			0.0027	U			0.0071	J			0.0572				0.0029	U			0.0027	U			0.0024	U
Carbon disulfide	75-15-0	mg/kg						0.00058	U			0.00058	U			0.0014	J			0.00064	U			0.0006	U			0.00053	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76			0.00067	U			0.00067	U			0.0008	U			0.00074	U			0.00069	U			0.00062	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5			0.0005	U			0.0005	U			0.00059	U			0.00055	U			0.00051	U			0.00046	U
Chloroethane	75-00-3	mg/kg						0.00065	U			0.00064	U			0.00076	U			0.00071	U			0.00066	U			0.00059	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37			0.0011	U			0.0011	U			0.0013	U			0.0012	U			0.0011	U			0.001	U
Chloromethane	74-87-3	mg/kg						0.0021	U			0.0021	U			0.0025	U			0.0024	U			0.0022	U			0.002	U
Cyclohexane	110-82-7	mg/kg						0.00072	U			0.00072	U			0.00085	U			0.00079	U			0.00073	U			0.00065	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg						0.00076	U			0.00076	U			0.00089	U			0.00084	U			0.00078	U			0.00069	U
Dibromochloromethane	124-48-1	mg/kg						0.00061	U			0.00061	U			0.00072	U			0.00067	U			0.00063	U			0.00056	U
1,2-Dibromoethane	106-93-4	mg/kg						0.00046	U			0.00046	U			0.00054	U			0.00051	U			0.00047	U			0.00042	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1			0.0006	U			0.0006	U			0.0007	U			0.00066	U			0.00061	U			0.00054	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6			0.00054	U			0.00054	U			0.00064	U			0.0006	U			0.00055	U			0.00049	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8			0.00054	U			0.00054	U			0.00064	U			0.0006	U			0.00055	U			0.00049	U
Dichlorodifluoromethane	75-71-8	mg/kg						0.00079	U			0.00079	U			0.00094	U			0.00088	U			0.00081	U			0.00072	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27			0.00054	U			0.00054	U			0.00064	U			0.0006	U			0.00055	U			0.00049	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02			0.00051	U			0.00051	U			0.00061	U			0.00057	U			0.00052	U			0.00047	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24			0.00072	U			0.00071	U			0.00084	U			0.00079	U			0.00073	U			0.00065	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19			0.00092	U			0.00092	U			0.0011	U			0.001	U			0.00094	U			0.00084	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19			0.00067	U			0.00067	U			0.00079	U			0.00074	U			0.00068	U			0.00061	U
1,2-Dichloropropane	78-87-5	mg/kg						0.00052	U			0.00052	U			0.00061	U			0.00057	U			0.00053	U			0.00047	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg						0.00052	U			0.00052	U			0.00061	U			0.00057	U			0.00053	U			0.00047	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg						0.0005	U			0.0005	U			0.00059	U			0.00055	U			0.00051	U			0.00046	U
Ethylbenzene	100-41-4	mg/kg	1	76	1			0.00049	U			0.00049	U			0.0011	J			0.00055	U			0.00051	U			0.00045	U
Freon 113	76-13-1	mg/kg						0.0029	U			0.0029	U			0.0034	U			0.0032	U			0.003	U			0.0027	U
2-Hexanone	591-78-6	mg/kg						0.0023	U			0.0023	U			0.0027	U			0.0026	U			0.0024	U			0.0021	U
Isopropylbenzene	98-82-8	mg/kg						0.0016	U			0.0015	U			0.0022	J			0.0017	U			0.0016	U			0.0014	U
Methyl Acetate	79-20-9	mg/kg						0.0015	U			0.0015	U			0.0018	U			0.0017	U			0.0016	U			0.0014	U
Methylcyclohexane	108-87-2	mg/kg						0.00096	U			0.00095	U			0.0011	U			0.0011	U			0.00098	U			0.00087	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1			0.00051	U			0.00051	U			0.0006	U			0.00057	U			0.00052	U			0.00047	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg						0.0025	U			0.0025	U			0.0029	U			0.0027	U			0.0025	U			0.0023	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05			0.0028	U			0.0028	U			0.0034	U			0.0031	U			0.0029	U			0.0026	U
Styrene	100-42-5	mg/kg						0.00044	U			0.00044	U			0.00052	U			0.00048	U			0.00045	U			0.0004	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg						0.00065	U			0.00065	U			0.00077	U			0.00072	U			0.00067	U			0.0006	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3			0.00063	U			0.00063	U			0.00075	U			0.0007	U			0.00065	U			0.00058	U
Toluene	108-88-3	mg/kg	0.7	100	0.7			0.00057	U			0.00057	U			0.00068	U			0.00063	U			0.00059	U			0.00052	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg						0.0027	U			0.0027	U			0.0032	U			0.003	U			0.0028	U			0.0025	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg						0.0027	U			0.0027	U			0.0032	U			0.003	U			0.0028	U			0.0025	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68			0.00053	U			0.00053	U			0.00062	U			0.00058	U			0.00054	U			0.00048	U
1,1,2-Trichloroethane	79-00-5	mg/kg						0.0006	U			0.0006	U			0.00071	U			0.00067	U			0.00062	U			0.00055	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47			0.00083	U			0.00083	U			0.00098	U			0.00092	U			0.00085	U			0.00076	U
Trichlorofluoromethane	75-69-4	mg/kg						0.00075	U			0.00075	U			0.00088	U			0.00082	U			0.00076	U			0.00068	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03			0.00053	U			0.00052	U			0.00062	U			0.00058	U			0.00054	U			0.00048	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26			0.00098	U			0.00098	U			0.0012	U			0.0011	U			0.001	U			0.00089	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26			0.0005	U			0.0005	U			0.00059	U			0.00055	U			0.00051	U			0.00046	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26			0.0005	U			0.0005	U			0.00059	U			0.00055	U			0.00051	U			0.00046	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

	= concentration exceeds USCO
	= concentration exceeds RRSCO
#	= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 16(3.5-4)		RI-SB 16(7.25-7.75)		RI-SB 16(7.25-7.75)		RI-SB 16(13-13.5)		RI-SB 16(13-13.5)		RI-SB 16(18-18.5)		RI-SB 16(18-18.5)		RI-SB 17(3-3.5)		RI-SB 17(3-3.5)		RI-SB 17(8.5-9)		RI-SB 17(8.5-9)		RI-SB 17(11.25-11.75)	
Lab Sample ID:						JE17802-9A		JE17802-10		JE17802-10A		JE17802-11		JE17802-11A		JE17802-12		JE17802-12A		JE17802-13		JE17802-13A		JE17802-14		JE17802-14A		JE17802-15	
Date Sampled:						8/26/2025 10:35 AM		8/26/2025 10:36 AM		8/26/2025 10:36 AM		8/26/2025 10:37 AM		8/26/2025 10:37 AM		8/26/2025 10:38 AM		8/26/2025 10:38 AM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005			0.000087	U			0.000092	U			0.000095	U			0.0001	U			0.000087	U			0.0001	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02			0.000052	U			0.000054	U			0.000056	U			0.000059	U			0.000051	U			0.000059	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036			0.000065	U			0.000068	U			0.000071	U			0.000075	U			0.000065	U			0.000075	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04			0.000067	U			0.00007	U			0.000073	U			0.000078	U			0.000067	U			0.000077	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1			0.000078	U			0.000082	U			0.000085	U			0.00009	U			0.000078	U			0.00009	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094			0.00006	U			0.000063	U			0.000066	U			0.00097 [g]				0.002 [h]				0.00007	U
gamma-Chlordane	5103-74-2	mg/kg	14					0.000067	U			0.00007	U			0.000073	U			0.0018 [h]				0.0019 [h]				0.000077	U
Chlordane (alpha and gamma)	57-74-9	mg/kg						0.00006	U			0.000063	U			0.000066	U			0.002				0.0035				0.00007	U
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005			0.000072	U			0.000075	U			0.000078	U			0.00038 [i]	J			0.0006				0.00045 [h]	J
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033			0.000047	U			0.000049	U			0.000051	U			0.0128 [h]				0.0059 [h]				0.0013 [g]	
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033			0.000054	U			0.000056	U			0.000058	U			0.0044				0.0023				0.00033 [i]	J
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033			0.00064 [i]				0.000082	U			0.000085	U			0.0021 [i]				0.0018 [i]				0.00036 [i]	J
Endrin	72-20-8	mg/kg	0.06	11	0.014			0.000065 [a]	U			0.000068	U			0.000071 [a]	U			0.000075 [a]	U			0.000065 [a]	U			0.000075 [a]	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4			0.000054	U			0.000056	U			0.000058	U			0.000062	U			0.000054	U			0.000062	U
Endrin aldehyde	7421-93-4	mg/kg						0.00013	U			0.00014	U			0.00014	U			0.00015	U			0.00013	U			0.00015	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4			0.00006	U			0.000063	U			0.000066	U			0.00007	U			0.00006	U			0.00007	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4			0.000063	U			0.000066	U			0.000068	U			0.0033 [g]				0.0018 [g]				0.000072	U
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042			0.000058	U			0.000061	U			0.000063	U			0.000067	U			0.000058	U			0.000067	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02					0.000081	U			0.000085	U			0.000088	U			0.000093	U			0.00033 [i]	J			0.000093	U
Methoxychlor	72-43-5	mg/kg	900					0.00018	U			0.00019	U			0.00019	U			0.0002	U			0.00018	U			0.0002	U
Endrin ketone	53494-70-5	mg/kg						0.000072	U			0.000075	U			0.000078	U			0.000083	U			0.000071	U			0.000082	U
Toxaphene	8001-35-2	mg/kg						0.0037	U			0.0039	U			0.004	U			0.0043	U			0.0037	U			0.0043	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1			0.0095 [a]	U			0.01 [a]	U			0.01 [a]	U			0.011 [a]	U			0.0095	U			0.011 [a]	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1			0.0075	U			0.0079	U			0.0082	U			0.0087	U			0.0075	U			0.0087	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1			0.019	U			0.02	U			0.02	U			0.021	U			0.019	U			0.021	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1			0.013	U			0.014	U			0.015	U			0.016	U			0.013	U			0.015	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1			0.0048	U			0.0051	U			0.0053	U			0.0056	U			0.0048	U			0.0056	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1			0.0024	U			0.0025	U			0.0026	U			0.0028	U			0.0024	U			0.0028	U
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1			0.0077 [a]	U			0.0081 [a]	U			0.0084 [a]	U			0.0089 [a]	U			0.0198 [i]	J			0.0089 [a]	U
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1			0.0023	U			0.0024	U			0.0025	U			0.0026	U			0.0023	U			0.0026	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1			0.0019	U			0.002	U			0.002	U			0.0022	U			0.0019	U			0.0021	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27			0.34				0.26	U			0.27	U			2				0.42				0.73	
Solids, Percent	PERCENT SOLIDS	%						89.3				80.3				80.6				77.4				89.7				77.6	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg						13900				17200				15400				11400				12900				18100	
Antimony	7440-36-0	mg/kg						2.2	U			2.5	U			2.6	U			2.5	U			2.1	U			2.6	U
Arsenic	7440-38-2	mg/kg	16	16	13			2.8				2.6				2.6	U			13.3				4.9				3.4	
Barium	7440-39-3	mg/kg	820	410	410			90.3				109				128				298				85.6				84	
Beryllium	7440-41-7	mg/kg	47	43	4.4			0.43				0.55				0.44				0.5				0.43				0.6	
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5			0.56	U			0.63	U			0.64	U			2.8				0.54	U			0.65	U
Calcium	7440-70-2	mg/kg						3870				2530				2720				15000				5900				4540	
Chromium	7440-47-3	mg/kg	19	110	30			21.9				29				29.2				24.8				24.6				26.2	
Cobalt	7440-48-4	mg/kg						8.2				13.1				12.3				9.4				7.7				7.5	
Copper	7440-50-8	mg/kg	1720	280	50			19.8				28.5 [f]				29 [f]				76.8 [f]				26 [f]				16.1	
Iron	7439-89-6	mg/kg						19400				28900				27600				36700				24400				19500	
Lead	7439-92-1	mg/kg	450	400	63			68.7				7.1				5.9				1110				75.9				21.9	
Magnesium	7439-95-4	mg/kg						4880				7120				7350				4870				5250				4050	
Manganese	7439-96-5	mg/kg	2000	2000	1600			314				640				494				304				296				274	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18			0.057				0.036	U			0.036	U			1.4				0.084				0.036	U
Nickel	7440-02-0	mg/kg	130	320	30			19.6				26.5				25.9				33.7				19.5				16.8	
Potassium	7440-09-7	mg/kg						2240				4270				5850				1540				2520				1300	U
Selenium	7782-49-2	mg/kg	4	110	3.9			2.2	U			5 [f]	U			5.2 [f]	U			5 [f]	U			4.3 [f]	U			2.6	U
Silver	7440-22-4	mg/kg	8.3	110	2			0.56	U			0.63	U			0.64	U			0.63	U			0.54	U			0.65	U
Sodium	7440-23-5	mg/kg						1100	U			1300	U			1300	U			1300	U			1100	U			1300	U
Thallium	7440-28-0	mg/kg						1.1	U			1.3	U			1.3	U			1.3	U			1.1	U			1.3	U
Vanadium	7440-62-2	mg/kg						34.5				40.2				36.9				30.5				30				32.7	
Zinc	7440-66-6	mg/kg	2480	6600	109			57.6				68.6				64.9				1110				75.5				52.4	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 16(3.5-4)		RI-SB 16(7.25-7.75)		RI-SB 16(7.25-7.75)		RI-SB 16(13-13.5)		RI-SB 16(13-13.5)		RI-SB 16(18-18.5)		RI-SB 16(18-18.5)		RI-SB 17(3-3.5)		RI-SB 17(3-3.5)		RI-SB 17(8.5-9)		RI-SB 17(8.5-9)		RI-SB 17(11.25-11.75)	
Lab Sample ID:						JE17802-9A		JE17802-10		JE17802-10A		JE17802-11		JE17802-11A		JE17802-12		JE17802-12A		JE17802-13		JE17802-13A		JE17802-14		JE17802-14A		JE17802-15	
Date Sampled:						8/26/2025 10:35 AM		8/26/2025 10:36 AM		8/26/2025 10:36 AM		8/26/2025 10:37 AM		8/26/2025 10:37 AM		8/26/2025 10:38 AM		8/26/2025 10:38 AM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00012	U			0.00012	U			0.00014	U			0.00014	U			0.00014	U			0.00012	U		
Perfluoropentanoic acid	2706-90-3	mg/kg				0.000076	U			0.000078	U			0.000086	U			0.000087	U			0.000089	U			0.000078	U		
Perfluorohexanoic acid	307-24-4	mg/kg				0.000033	U			0.000033	U			0.000037	U			0.000037	U			0.000038	U			0.000033	U		
Perfluoroheptanoic acid	375-85-9	mg/kg				0.000054	U			0.000056	U			0.000061	U			0.000062	U			0.000064	U			0.000056	U		
Perfluorooctanoic acid	335-67-1	mg/kg				0.000087	U			0.000089	U			0.000098	U			0.000099	U			0.0001	U			0.000089	U		
Perfluorononanoic acid	375-95-1	mg/kg				0.000054	U			0.000056	U			0.000061	U			0.000062	U			0.000064	U			0.000056	U		
Perfluorodecanoic acid	335-76-2	mg/kg				0.000076	U			0.000078	U			0.000086	U			0.000087	U			0.000089	U			0.000078	U		
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000065	U			0.000067	U			0.000074	U			0.000074	U			0.000076	U			0.000067	U		
Perfluorododecanoic acid	307-55-1	mg/kg				0.000087	U			0.000089	U			0.000098	U			0.000099	U			0.0001	U			0.000089	U		
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.000098	U			0.0001	U			0.00011	U			0.00011	U			0.00011	U			0.0001	U		
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00011	U			0.00011	U			0.00012	U			0.00012	U			0.00013	U			0.00011	U		
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.000076	U			0.000078	U			0.000086	U			0.000087	U			0.000089	U			0.000078	U		
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00012	U			0.00012	U			0.00014	U			0.00014	U			0.00014	U			0.00012	U		
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00011	U			0.00011	U			0.00012	U			0.00012	U			0.00013	U			0.00011	U		
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.000054	U			0.000056	U			0.000061	U			0.000062	U			0.000064	U			0.000056	U		
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00012	U			0.00012	U			0.00014	U			0.00014	U			0.00014	U			0.00012	U		
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00011	U			0.00011	U			0.00012	U			0.00012	U			0.00013	U			0.00011	U		
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.00021	U			0.00021	U			0.00023	U			0.00023	U			0.00024	U			0.00021	U		
PFOSA	754-91-6	mg/kg				0.000076	U			0.000078	U			0.000086	U			0.000087	U			0.000089	U			0.000078	U		
MeFOSAA	2355-31-9	mg/kg				0.000087	U			0.000089	U			0.000098	U			0.000099	U			0.0001	U			0.000089	U		
EtFOSAA	2991-50-6	mg/kg				0.00014	U			0.00014	U			0.00016	U			0.00016	U			0.00017	U			0.00014	U		
2-Chlorophenol	95-57-8	mg/kg						0.018	U			0.02	U			0.019	U			0.021	U			0.017	U			0.021	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg						0.023	U			0.025	U			0.024	U			0.026	U			0.022	U			0.025	U
2,4-Dichlorophenol	120-83-2	mg/kg						0.032	U			0.035	U			0.034	U			0.036	U			0.03	U			0.035	U
2,4-Dimethylphenol	105-67-9	mg/kg						0.066	U			0.073	U			0.07	U			0.076	U			0.063	U			0.074	U
2,4-Dinitrophenol	51-28-5	mg/kg						0.14	U			0.15	U			0.15	U			0.16	U			0.13	U			0.16	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg						0.04	U			0.044	U			0.042	U			0.045	U			0.038	U			0.044	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33			0.024	U			0.026	U			0.025	U			0.027	U			0.023	U			0.027	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33			0.031	U			0.034	U			0.032	U			0.035	U			0.029	U			0.034	U
2-Nitrophenol	88-75-5	mg/kg						0.025	U			0.027	U			0.026	U			0.028	U			0.023	U			0.027	U
4-Nitrophenol	100-02-7	mg/kg						0.1	U			0.11	U			0.11	U			0.11	U			0.094	U			0.11	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8			0.035	U			0.038	U			0.037	U			0.04	U			0.033	U			0.039	U
Phenol	108-95-2	mg/kg	0.33	100	0.33			0.019	U			0.021	U			0.021	U			0.022	U			0.018	U			0.022	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg						0.025	U			0.027	U			0.026	U			0.028	U			0.023	U			0.028	U
2,4,5-Trichlorophenol	95-95-4	mg/kg						0.028	U			0.031	U			0.03	U			0.032	U			0.027	U			0.031	U
2,4,6-Trichlorophenol	88-06-2	mg/kg						0.022	U			0.024	U			0.023	U			0.025	U			0.021	U			0.025	U
Acenaphthene	83-32-9	mg/kg	98	100	20			0.0457				0.014	U			0.014	U			0.16				0.162				0.014	U
Acenaphthylene	208-96-8	mg/kg	365	100	100			0.589				0.021	U			0.02	U			1.06				0.124				0.0283	J
Acetophenone	98-86-2	mg/kg						0.008	U			0.0088	U			0.0085	U			0.0091	U			0.0076	U			0.0089	U
Anthracene	120-12-7	mg/kg	1000	100	100			0.284				0.025	U			0.024	U			0.939				0.347				0.025	U
Atrazine	1912-24-9	mg/kg						0.016	U			0.018	U			0.017	U			0.018	U			0.015	U			0.018	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1			0.345				0.012	U			0.011	U			2.74				0.468				0.0533	
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1			1.29				0.019	U			0.018	U			2.94				0.366				0.0459	
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1			0.902				0.018	U			0.017	U			3.31				0.421				0.0586	
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64			1.2				0.02	U			0.02	U			2.19				0.214				0.0423	
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8			0.16				0.019	U			0.018	U			1.2				0.177				0.019	U
4-Bromophenyl phenyl ether	101-55-3	mg/kg						0.014	U			0.016	U			0.015	U			0.016	U			0.014	U			0.016	U
Butyl benzyl phthalate	85-68-7	mg/kg						0.0091	U			0.01	U			0.0096	U			0.01	U			0.0086	U			0.01	U
1,1'-Biphenyl	92-52-4	mg/kg						0.0178	J			0.0056	U			0.0054	U			0.0372	J			0.0316	J			0.0057	U
Benzaldehyde	100-52-7	mg/kg						0.0093	U			0.01	U			0.0098	U			0.011	U			0.0088	U			0.01	U
2-Chloronaphthalene	91-58-7	mg/kg						0.0089	U			0.0097	U			0.0094	U			0.01	U			0.0084	U			0.0099	U
4-Chloroaniline	106-47-8	mg/kg						0.013	U			0.015	U			0.014	U			0.015	U			0.013	U			0.015	U
Carbazole	86-74-8	mg/kg						0.0188	J			0.0059	U			0.0057	U			0.157				0.137				0.006	U
Caprolactam	105-60-2	mg/kg						0.015 [a]	U			0.016 [a]	U			0.016 [a]	U			0.017 [a]	U			0.014 [a]	U			0.016 [a]	U
Chrysene	218-01-9	mg/kg	1	4.9	1			0.501				0.013	U			0.012	U			2.47				0.402				0.0504	
bis(2-Chloroethoxy)methane	111-91-1	mg/kg						0.008	U			0.0088	U			0.0084	U			0.0091	U			0.0076	U			0.0089	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg						0.016	U			0.018	U			0.017	U			0.018	U			0.015	U			0.018	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg						0.013	U			0.015	U			0.014	U			0.015	U			0.013	U			0.015	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg						0.012	U			0.013	U			0.013	U			0.014	U			0.011	U			0.013	U
2,4-Dinitrotoluene	121-14-2	mg/kg						0.012	U			0.013	U			0.012	U			0.013	U			0.011	U			0.013	U
2,6-Dinitrotoluene	606-20-2	mg/kg						0.019	U			0.021	U			0.02	U			0.021	U			0.018	U			0.021	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg						0.031	U			0.034	U			0.033	U			0.035	U			0.03	U			0.035	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1			0.025	U			0.027	U			0.026	U			0.028	U			0.023	U			0.027	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33			0.217				0.018	U			0.017	U			0.522				0.0678				0.018	U
Dibenzofuran	132-64-9	mg/kg	110	18	2.1			0.0289	J			0.017	U			0.016	U			0.0858				0.157				0.017	U
Di-n-butyl phthalate	84-74-2	mg/kg						0.0088	J			0.0067	U			0.0064	U			0.0097	J			0.0058	U			0.012	J
Di-n-octyl phthalate	117-84-0	mg/kg						0.0093	U			0.01	U			0.0098	U			0.011	U			0.0088	U			0.01	U
Diethyl phthalate	84-66-2	mg/kg						0.008	U			0.0087	U			0.0084	U			0.0091	U			0.0075	U			0.0089	U
Dimethyl phthalate	131-11-3	mg/kg						0.0066	U			0.0073	U			0.007	U			0.0076	U			0.0063	U			0.0074	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg						0.0178	J			0.0096	U			0.0092	U			0.0099	U			0.0083	U			0.0097	U
Fluoranthene	206-44-0	mg/kg	1000	100	85			0.474				0.018	U			0.018	U			4.92				1.14				0.075	
Fluorene	86-73-7	mg/kg	386	100	30			0.126				0.019	U			0.018	U			0.259				0.184				0.019	U
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33			0.0094	U			0.01	U			0.01	U			0.011	U			0.009	U			0.011	U
Hexachlorobutadiene	87-68-3	mg/kg						0.015	U			0.016	U			0.016	U			0.017	U			0.014	U			0.017	U
Hexachlorocyclopentadiene	77-47-4	mg/kg						0.015 [b]	U			0.016 [b]	U			0.016 [b]	U			0.017 [b]	U			0.014 [b]	U			0.017 [b]	U
Hexachloroethane	67-72-1	mg/kg						0.018	U			0.02	U			0.019	U			0.021	U			0.018	U			0.021	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5			0.728				0.019	U			0.018	U			1.71				0.185				0.031	J
Isophorone	78-59-1	mg/kg						0.008	U			0.0088	U			0.0084	U			0.0091	U			0.0076	U			0.0089	U
2-Methylnaphthalene	91-57-6	mg/kg						0.0589				0.0093	U			0.0089	U			0.122				0.178				0.0189	J
2-Nitroaniline	88-74-4	mg/kg						0.0088	U			0.0097	U			0.0093	U			0.01	U			0.0084	U			0.0098	U
3-Nitroaniline	99-09-2	mg/kg						0.0093	U			0.01	U			0.0098	U			0.011	U			0.0088	U			0.01	U
4-Nitroaniline	100-01-6	mg/kg						0.0097	U			0.011	U			0.01	U			0.011	U			0.0092	U			0.011	U
Naphthalene	91-20-3	mg/kg	12	100	12			0.0885				0.012	U			0.011	U			0.141				0.234				0.021	J
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08			0.014	U			0.016	U			0.015	U			0.016	U			0.014	U			0.016	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg						0.011	U			0.012	U			0.011	U			0.012	U			0.01	U			0.012	U
N-Nitrosodiphenylamine	86-30-6	mg/kg						0.014	U			0.015	U			0.014	U			0.016	U			0.013	U			0.015	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1			0.338				0.014	U			0.013	U			2.06				1.13				0.0474	
Pyrene	129-00-0	mg/kg	1000	100	64			0.814				0.013	U			0.013	U			5.42				0.803				0.0795	
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg						0.0095	U			0.01	U			0.01	U			0.011	U			0.009	U			0.011	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 16(3.5-4)		RI-SB 16(7.25-7.75)		RI-SB 16(7.25-7.75)		RI-SB 16(13-13.5)		RI-SB 16(13-13.5)		RI-SB 16(18-18.5)		RI-SB 16(18-18.5)		RI-SB 17(3-3.5)		RI-SB 17(3-3.5)		RI-SB 17(8.5-9)		RI-SB 17(8.5-9)		RI-SB 17(11.25-11.75)	
Lab Sample ID:						JE17802-9A		JE17802-10		JE17802-10A		JE17802-11		JE17802-11A		JE17802-12		JE17802-12A		JE17802-13		JE17802-13A		JE17802-14		JE17802-14A		JE17802-15	
Date Sampled:						8/26/2025 10:35 AM		8/26/2025 10:36 AM		8/26/2025 10:36 AM		8/26/2025 10:37 AM		8/26/2025 10:37 AM		8/26/2025 10:38 AM		8/26/2025 10:38 AM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03			0.0245				0.0342				0.018				0.112				0.0422				0.078	
Benzene	71-43-2	mg/kg	0.06	3.7	0.06			0.00052	U			0.00052	U			0.00052	U			0.00068	U			0.00087	U			0.00072	U
Bromochloromethane	74-97-5	mg/kg						0.00064	U			0.00063	U			0.00064	U			0.00084	U			0.0011	U			0.00088	U
Bromodichloromethane	75-27-4	mg/kg						0.00049	U			0.00049	U			0.00049	U			0.00064	U			0.00082	U			0.00067	U
Bromoform	75-25-2	mg/kg						0.0016	U			0.0015	U			0.0016	U			0.002	U			0.0026	U			0.0021	U
Bromomethane	74-83-9	mg/kg						0.00087	U			0.00086	U			0.00088	U			0.0011	U			0.0015	U			0.0012	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1			0.0028	U			0.0028	U			0.0028	U			0.0122	J			0.0047	U			0.0078	J
Carbon disulfide	75-15-0	mg/kg						0.00061	U			0.00061	U			0.00061	U			0.0008	U			0.001	U			0.00084	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76			0.00071	U			0.0007	U			0.00071	U			0.00093	U			0.0012	U			0.00097	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5			0.00052	U			0.00052	U			0.00053	U			0.00069	U			0.00088	U			0.00072	U
Chloroethane	75-00-3	mg/kg						0.00068	U			0.00067	U			0.00068	U			0.00089	U			0.0011	U			0.00093	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37			0.0011	U			0.0011	U			0.0011	U			0.0015	U			0.0019	U			0.0016	U
Chloromethane	74-87-3	mg/kg						0.0022	U			0.0022	U			0.0023	U			0.0029	U			0.0038	U			0.0031	U
Cyclohexane	110-82-7	mg/kg						0.00075	U			0.00074	U			0.00075	U			0.00099	U			0.0013	U			0.001	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg						0.00079	U			0.00079	U			0.0008	U			0.001	U			0.0013	U			0.0011	U
Dibromochloromethane	124-48-1	mg/kg						0.00064	U			0.00063	U			0.00064	U			0.00084	U			0.0011	U			0.00088	U
1,2-Dibromoethane	106-93-4	mg/kg						0.00048	U			0.00048	U			0.00048	U			0.00063	U			0.00081	U			0.00066	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1			0.00062	U			0.00062	U			0.00063	U			0.00082	U			0.001	U			0.00086	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6			0.00057	U			0.00056	U			0.00057	U			0.00075	U			0.00095	U			0.00078	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8			0.00056	U			0.00056	U			0.00057	U			0.00074	U			0.00095	U			0.00078	U
Dichlorodifluoromethane	75-71-8	mg/kg						0.00083	U			0.00082	U			0.00084	U			0.0011	U			0.0014	U			0.0011	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27			0.00057	U			0.00056	U			0.00057	U			0.00074	U			0.00095	U			0.00078	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02			0.00054	U			0.00053	U			0.00054	U			0.00071	U			0.0009	U			0.00074	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24			0.00075	U			0.00074	U			0.00075	U			0.00098	U			0.0013	U			0.001	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19			0.00096	U			0.00095	U			0.00096	U			0.0013	U			0.0016	U			0.0013	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19			0.0007	U			0.00069	U			0.0007	U			0.00092	U			0.0012	U			0.00096	U
1,2-Dichloropropane	78-87-5	mg/kg						0.00054	U			0.00054	U			0.00054	U			0.00071	U			0.00091	U			0.00074	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg						0.00054	U			0.00054	U			0.00055	U			0.00071	U			0.00091	U			0.00075	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg						0.00052	U			0.00052	U			0.00052	U			0.00069	U			0.00088	U			0.00072	U
Ethylbenzene	100-41-4	mg/kg	1	76	1			0.00052	U			0.00051	U			0.00052	U			0.00068	U			0.00087	U			0.00071	U
Freon 113	76-13-1	mg/kg						0.0031	U			0.003	U			0.0031	U			0.004	U			0.0051	U			0.0042	U
2-Hexanone	591-78-6	mg/kg						0.0024	U			0.0024	U			0.0024	U			0.0032	U			0.0041	U			0.0033	U
Isopropylbenzene	98-82-8	mg/kg						0.0016	U			0.0016	U			0.0016	U			0.0021	U			0.0027	U			0.0022	U
Methyl Acetate	79-20-9	mg/kg						0.0016	U			0.0016	U			0.0016	U			0.0021	U			0.0027	U			0.0022	U
Methylcyclohexane	108-87-2	mg/kg						0.001	U			0.00099	U			0.001	U			0.0013	U			0.0017	U			0.0014	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1			0.00054	U			0.00053	U			0.00054	U			0.0007	U			0.0009	U			0.00074	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg						0.0026	U			0.0026	U			0.0026	U			0.0034	U			0.0044	U			0.0036	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05			0.003	U			0.003	U			0.003	U			0.0039	U			0.0073	J			0.0041	U
Styrene	100-42-5	mg/kg						0.00046	U			0.00046	U			0.00046	U			0.0006	U			0.00077	U			0.00063	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg						0.00068	U			0.00068	U			0.00069	U			0.0009	U			0.0012	U			0.00094	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3			0.00066	U			0.00066	U			0.00067	U			0.00087	U			0.0011	U			0.00091	U
Toluene	108-88-3	mg/kg	0.7	100	0.7			0.0006	U			0.00059	U			0.0006	U			0.00079	U			0.001	U			0.00083	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg						0.0029	U			0.0028	U			0.0029	U			0.0038	U			0.0048	U			0.0039	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg						0.0029	U			0.0028	U			0.0029	U			0.0038	U			0.0048	U			0.0039	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68			0.00055	U			0.00055	U			0.00055	U			0.00073	U			0.00093	U			0.00076	U
1,1,2-Trichloroethane	79-00-5	mg/kg						0.00063	U			0.00063	U			0.00064	U			0.00083	U			0.0011	U			0.00087	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47			0.00087	U			0.00086	U			0.00088	U			0.0011	U			0.0015	U			0.0012	U
Trichlorofluoromethane	75-69-4	mg/kg						0.00078	U			0.00077	U			0.00079	U			0.001	U			0.0013	U			0.0011	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03			0.00055	U			0.00054	U			0.00055	U			0.00072	U			0.00092	U			0.00076	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26			0.001	U			0.001	U			0.001	U			0.0013	U			0.0017	U			0.0014	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26			0.00052	U			0.00052	U			0.00053	U			0.00069	U			0.00088	U			0.00072	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26			0.00052	U			0.00052	U			0.00053	U			0.00069	U			0.00088	U			0.00072	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

	= concentration exceeds USCO
	= concentration exceeds RRSCO
#	= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 17(11.25-11.75)		RI-SB 17(17-17.5)		RI-SB 17(17-17.5)		RI-SB 18(1-1.5)		RI-SB 18(1-1.5)		RI-SB 18(6-6.5)		RI-SB 18(6-6.5)		RI-SB 18(12.25-12.75)		RI-SB 18(12.25-12.75)		RI-SB 18(16-16.5)		RI-SB 18(16-16.5)		RI-SB 20(3-3.5)	
Lab Sample ID:						JE17802-15A		JE17802-16		JE17802-16A		JE17802-17		JE17802-17A		JE17802-18		JE17802-18A		JE17802-19		JE17802-19A		JE17802-20		JE17802-20A		JE17802-21	
Date Sampled:						8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:45 PM		8/26/2025 12:45 PM		8/26/2025 12:46 PM		8/26/2025 12:46 PM		8/26/2025 12:47 PM		8/26/2025 12:47 PM		8/26/2025 12:48 PM		8/26/2025 12:48 PM		8/26/2025 2:00 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																													
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005			0.000087	U			0.000083	U			0.000086	U			0.00011	U			0.000088	U			0.000085	U
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02			0.000051	U			0.000049	U			0.0025 [g]				0.000062	U			0.000052	U			0.00005	U
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036			0.000065	U			0.000062	U			0.000064	U			0.000079	U			0.000065	U			0.000063	U
delta-BHC	319-86-8	mg/kg	0.25	100	0.04			0.000067	U			0.000064	U			0.000066	U			0.000082	U			0.000068	U			0.000066	U
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1			0.000078	U			0.000075	U			0.000077	U			0.000095	U			0.000079	U			0.000077	U
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094			0.00006	U			0.0032 [h]				0.0132 [h]				0.000073	U			0.000061	U			0.000059	U
gamma-Chlordane	5103-74-2	mg/kg	14					0.000067	U			0.0025 [h]				0.0147 [h]				0.000082	U			0.000068	U			0.00042	J
Chlordane (alpha and gamma)	57-74-9	mg/kg						0.00006	U			0.0049				0.0237				0.000073	U			0.000061	U			0.00042	J
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005			0.000071	U			0.0091 [h]				0.006				0.000087	U			0.000072	U			0.0012 [i]	
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033			0.000047	U			0.0012 [g]				0.068 [j]				0.000057	U			0.000047	U			0.0007	
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033			0.000054	U			0.0025 [h]				0.0146 [i]				0.000065	U			0.000054	U			0.0015 [i]	
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033			0.000078	U			0.0016				0.0287 [k]				0.000095	U			0.000079	U			0.0044 [i]	
Endrin	72-20-8	mg/kg	0.06	11	0.014			0.000065 [a]	U			0.000062 [a]	U			0.000064 [a]	U			0.000079 [a]	U			0.000065 [a]	U			0.000063 [a]	U
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4			0.000054	U			0.000051	U			0.000053	U			0.000065	U			0.000054	U			0.000052	U
Endrin aldehyde	7421-93-4	mg/kg						0.00013	U			0.00012	U			0.00013	U			0.00016	U			0.00013	U			0.00013	U
Endosulfan-I	959-98-8	mg/kg	102	24	2.4			0.00006	U			0.000058	U			0.000059	U			0.000073	U			0.000061	U			0.000059	U
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4			0.000063	U			0.00072 [g]				0.012 [g]				0.000076	U			0.000063	U			0.0009 [i]	
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042			0.000058	U			0.000055	U			0.000057	U			0.000071	U			0.000059	U			0.000057	U
Heptachlor epoxide	1024-57-3	mg/kg	0.02					0.00008	U			0.00029 [i]	J			0.0025				0.000098	U			0.000081	U			0.000079	U
Methoxychlor	72-43-5	mg/kg	900					0.00018	U			0.00017	U			0.00017	U			0.00021	U			0.00018	U			0.00017	U
Endrin ketone	53494-70-5	mg/kg						0.000071	U			0.000068	U			0.00007	U			0.000087	U			0.000072	U			0.00007	U
Toxaphene	8001-35-2	mg/kg						0.0037	U			0.0035	U			0.0036	U			0.0045	U			0.0037	U			0.0036	U
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1			0.0095 [a]	U			0.0091	U			0.0099	U			0.012 [a]	U			0.0096 [a]	U			0.0093	U
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1			0.0075	U			0.0072	U			0.0078	U			0.0091	U			0.0076	U			0.0073	U
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1			0.019	U			0.018	U			0.019	U			0.023	U			0.019	U			0.018	U
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1			0.013	U			0.013	U			0.014	U			0.016	U			0.014	U			0.013	U
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1			0.0048	U			0.0046	U			0.005	U			0.0059	U			0.0049	U			0.0047	U
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1			0.0024	U			0.0023	U			0.091 [i]				0.0029	U			0.0024	U			0.156	
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1			0.0077 [a]	U			0.0073	U			0.0366 [i]				0.0094 [a]	U			0.0078 [a]	U			0.0527	
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1			0.0023	U			0.0022	U			0.0024	U			0.0027	U			0.0023	U			0.0022	U
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1			0.0019	U			0.0018	U			0.0019	U			0.0023	U			0.0019	U			0.0018	U
(General Chemistry)																													
Cyanide	57-12-5	mg/kg	40	27	27			0.26				0.29				0.48				0.47				0.29	U			0.69	
Solids, Percent	PERCENT SOLIDS	%						87.8				93.9				85.9				73.6				85.2				86.3	
(Metals Analysis)																													
Aluminum	7429-90-5	mg/kg						9300				11800				11000				21200				8650				7960	
Antimony	7440-36-0	mg/kg						2.2	U			2.2	U			2.4	U			2.7	U			2.3	U			2.4	U
Arsenic	7440-38-2	mg/kg	16	16	13			2.2	U			4.6				4.7				4.6				2.3	U			4.6	
Barium	7440-39-3	mg/kg	820	410	410			57.5				85				190				137				66.7				160	
Beryllium	7440-41-7	mg/kg	47	43	4.4			0.29				0.39				0.39				0.66				0.26				0.33	
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5			0.56	U			0.54	U			0.59	U			0.66	U			0.57	U			0.62	
Calcium	7440-70-2	mg/kg						1250				9800				10400				2450				1920				11900	
Chromium	7440-47-3	mg/kg	19	110	30			17.8				21.9				22.1				26.5				18.3				17.6	
Cobalt	7440-48-4	mg/kg						6.4				7.6				6.4				8.4				7.1				7.2	
Copper	7440-50-8	mg/kg	1720	280	50			11.2				31.5				31.8 [f]				23.1				14.3				37.2	
Iron	7439-89-6	mg/kg						15500				18400				28800				18600				15700				15400	
Lead	7439-92-1	mg/kg	450	400	63			3.9				140				650				45				4.2				466	
Magnesium	7439-95-4	mg/kg						3940				5990				4540				4530				3820				6620	
Manganese	7439-96-5	mg/kg	2000	2000	1600			204				315				415				167				125				242	
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18			0.029	U			0.22				0.49				0.1				0.033	U			0.55	
Nickel	7440-02-0	mg/kg	130	320	30			15.9				17.5				17				19.4				14.8				12.8	
Potassium	7440-09-7	mg/kg						2720				2280				2270				1440				2730				1350	
Selenium	7782-49-2	mg/kg	4	110	3.9			2.2	U			2.2	U			4.7 [f]	U			2.7	U			2.3	U			2.4	U
Silver	7440-22-4	mg/kg	8.3	110	2			0.56	U			0.54	U			0.59	U			0.66	U			0.57	U			0.59	U
Sodium	7440-23-5	mg/kg						1100	U			1100	U			1200	U			1300	U			1100	U			1200	U
Thallium	7440-28-0	mg/kg						1.1	U			1.1	U			1.2	U			1.3	U			1.1	U			1.2	U
Vanadium	7440-62-2	mg/kg						22				30.4				31.4				34.5				21.3				23.7	
Zinc	7440-66-6	mg/kg	2480	6600	109			37.3				124				257				176				37.6				249	

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 17(11.25-11.75)		RI-SB 17(17-17.5)		RI-SB 17(17-17.5)		RI-SB 18(1-1.5)		RI-SB 18(1-1.5)		RI-SB 18(6-6.5)		RI-SB 18(6-6.5)		RI-SB 18(12.25-12.75)		RI-SB 18(12.25-12.75)		RI-SB 18(16-16.5)		RI-SB 18(16-16.5)		RI-SB 20(3-3.5)	
Lab Sample ID:						JE17802-15A		JE17802-16		JE17802-16A		JE17802-17		JE17802-17A		JE17802-18		JE17802-18A		JE17802-19		JE17802-19A		JE17802-20		JE17802-20A		JE17802-21	
Date Sampled:						8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:45 PM		8/26/2025 12:45 PM		8/26/2025 12:46 PM		8/26/2025 12:46 PM		8/26/2025 12:47 PM		8/26/2025 12:47 PM		8/26/2025 12:48 PM		8/26/2025 12:48 PM		8/26/2025 2:00 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																													
Perfluorobutanoic acid	375-22-4	mg/kg				0.00014	U			0.00012	U			0.00012	U			0.00013	U			0.00015	U			0.00013	U		
Perfluoropentanoic acid	2706-90-3	mg/kg				0.00009	U			0.000077	U			0.000075	U			0.00008	U			0.00015	J			0.000082	U		
Perfluorohexanoic acid	307-24-4	mg/kg				0.000039	U			0.000033	U			0.000032	U			0.000034	U			0.000041	U			0.000035	U		
Perfluoroheptanoic acid	375-85-9	mg/kg				0.000064	U			0.000055	U			0.000053	U			0.000057	U			0.000068	U			0.000058	U		
Perfluorooctanoic acid	335-67-1	mg/kg				0.0001	U			0.000088	U			0.000085	U			0.000091	U			0.00015	J			0.000093	U		
Perfluorononanoic acid	375-95-1	mg/kg				0.000064	U			0.000055	U			0.000053	U			0.000057	U			0.000068	U			0.000058	U		
Perfluorodecanoic acid	335-76-2	mg/kg				0.00009	U			0.000077	U			0.00015	J			0.00008	U			0.000095	U			0.000082	U		
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000077	U			0.000066	U			0.000064	U			0.000068	U			0.000081	U			0.00007	U		
Perfluorododecanoic acid	307-55-1	mg/kg				0.0001	U			0.000088	U			0.000085	U			0.000091	U			0.00011	U			0.000093	U		
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.00012	U			0.0001	U			0.000096	U			0.0001	U			0.00012	U			0.0001	U		
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00013	U			0.00011	U			0.00011	U			0.00011	U			0.00014	U			0.00012	U		
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.00009	U			0.000077	U			0.000075	U			0.00008	U			0.000095	U			0.000082	U		
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00014	U			0.00012	U			0.00012	U			0.00013	U			0.00015	U			0.00013	U		
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00013	U			0.00011	U			0.00011	U			0.00011	U			0.00014	U			0.00012	U		
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.000064	U			0.000055	U			0.00037				0.00026				0.000068	U			0.000058	U		
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00014	U			0.00012	U			0.00012	U			0.00013	U			0.00015	U			0.00013	U		
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00013	U			0.00011	U			0.00011	U			0.00011	U			0.00014	U			0.00012	U		
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.00024	U			0.00021	U			0.0002	U			0.00022	U			0.00026	U			0.00022	U		
PFOSA	754-91-6	mg/kg				0.00009	U			0.000077	U			0.000075	U			0.00008	U			0.000095	U			0.000082	U		
MeFOSAA	2355-31-9	mg/kg				0.0001	U			0.000088	U			0.000085	U			0.000091	U			0.00011	U			0.000093	U		
EtFOSAA	2991-50-6	mg/kg				0.00017	U			0.00014	U			0.00014	U			0.00015	U			0.00018	U			0.00015	U		
2-Chlorophenol	95-57-8	mg/kg						0.019	U			0.017	U			0.019	U			0.022	U			0.019	U			0.019	U
4-Chloro-3-methyl phenol	59-50-7	mg/kg						0.023	U			0.021	U			0.023	U			0.028	U			0.023	U			0.024	U
2,4-Dichlorophenol	120-83-2	mg/kg						0.032	U			0.029	U			0.033	U			0.039	U			0.033	U			0.033	U
2,4-Dimethylphenol	105-67-9	mg/kg						0.067	U			0.06	U			0.068	U			0.08	U			0.068	U			0.068	U
2,4-Dinitrophenol	51-28-5	mg/kg						0.14	U			0.13	U			0.14	U			0.17	U			0.14	U			0.14	U
4,6-Dinitro-o-cresol	534-52-1	mg/kg						0.04	U			0.036	U			0.041 [a]	U			0.048	U			0.041	U			0.041	U
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33			0.024	U			0.021	U			0.024	U			0.029	U			0.024	U			0.025	U
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33			0.031	U			0.028	U			0.031	U			0.037	U			0.031	U			0.032	U
2-Nitrophenol	88-75-5	mg/kg						0.025	U			0.022	U			0.025 [a]	U			0.03	U			0.025	U			0.025	U
4-Nitrophenol	100-02-7	mg/kg						0.1	U			0.09	U			0.1	U			0.12	U			0.1	U			0.1	U
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8			0.035	U			0.032	U			0.036	U			0.042	U			0.036	U			0.036	U
Phenol	108-95-2	mg/kg	0.33	100	0.33			0.02	U			0.018	U			0.02	U			0.024	U			0.02	U			0.02	U
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg						0.025	U			0.022	U			0.025	U			0.03	U			0.025	U			0.025	U
2,4,5-Trichlorophenol	95-95-4	mg/kg						0.028	U			0.025	U			0.029	U			0.034	U			0.029	U			0.029	U
2,4,6-Trichlorophenol	88-06-2	mg/kg						0.022	U			0.02	U			0.023	U			0.027	U			0.023	U			0.023	U
Acenaphthene	83-32-9	mg/kg	98	100	20			0.013	U			0.012	U			1.48				0.016	U			0.013	U			0.0322	J
Acenaphthylene	208-96-8	mg/kg	365	100	100			0.019	U			0.0457				1.11				0.023	U			0.019	U			0.227	
Acetophenone	98-86-2	mg/kg						0.0081	U			0.0072	U			0.0621	J			0.0097	U			0.0082	U			0.0082	U
Anthracene	120-12-7	mg/kg	1000	100	100			0.023	U			0.0507				1.3				0.028	U			0.023	U			0.178	
Atrazine	1912-24-9	mg/kg						0.016	U			0.014	U			0.016	U			0.019	U			0.016	U			0.016	U
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1			0.011	U			0.168				4.37				0.0322	J			0.011	U			0.662	
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1			0.017	U			0.167				4.44				0.0304	J			0.017	U			0.75	
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1			0.017	U			0.22				6.09				0.0335	J			0.017	U			1.02	
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64			0.019	U			0.153				3.06				0.023	U			0.019	U			0.602	
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8			0.018	U			0.0626				1.47				0.021	U			0.018	U			0.289	
4-Bromophenyl phenyl ether	101-55-3	mg/kg						0.015	U			0.013	U			0.015	U			0.017	U			0.015	U			0.015	U
Butyl benzyl phthalate	85-68-7	mg/kg						0.0092	U			0.0082	U			0.0093 [a]	U			0.011	U			0.0093	U			0.0094	U
1,1'-Biphenyl	92-52-4	mg/kg						0.0051	U			0.0046	U			0.218				0.0062	U			0.0052	U			0.0053	U
Benzaldehyde	100-52-7	mg/kg						0.0093	U			0.0083	U			0.0095	U			0.011	U			0.0095	U			0.0095	U
2-Chloronaphthalene	91-58-7	mg/kg						0.0089	U			0.008	U			0.0091	U			0.011	U			0.0091	U			0.0091	U
4-Chloroaniline	106-47-8	mg/kg						0.014	U			0.012	U			0.014	U			0.016	U			0.014	U			0.014	U
Carbazole	86-74-8	mg/kg						0.0055	U			0.0149	J			0.689				0.0065	U			0.0055	U			0.0658	J
Caprolactam	105-60-2	mg/kg						0.015 [a]	U			0.013 [a]	U			0.015 [a]	U			0.018 [a]	U			0.015 [a]	U			0.015 [a]	U
Chrysene	218-01-9	mg/kg	1	4.9	1			0.012	U			0.152				3.72				0.0207	J			0.012	U			0.72	
bis(2-Chloroethoxy)methane	111-91-1	mg/kg						0.008	U			0.0072	U			0.0082	U			0.0097	U			0.0082	U			0.0082	U
bis(2-Chloroethyl)ether	111-44-4	mg/kg						0.016	U			0.014	U			0.017	U			0.019	U			0.016	U			0.017	U
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg						0.013	U			0.012	U			0.014	U			0.016	U			0.014	U			0.014	U
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg						0.012	U			0.011	U			0.012	U			0.015	U			0.012	U			0.012	U
2,4-Dinitrotoluene	121-14-2	mg/kg						0.012	U			0.01	U			0.012	U			0.014	U			0.012	U			0.012	U
2,6-Dinitrotoluene	606-20-2	mg/kg						0.019	U			0.017	U			0.019	U			0.023	U			0.019	U			0.019	U
3,3'-Dichlorobenzidine	91-94-1	mg/kg						0.031	U			0.028	U			0.032	U			0.038	U			0.032	U			0.032	U
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1			0.025	U			0.022	U			0.025	U			0.03	U			0.025	U			0.025	U
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33			0.017	U			0.0376				0.956				0.02	U			0.017	U			0.151	
Dibenzofuran	132-64-9	mg/kg	110	18	2.1			0.015	U			0.014	U			0.529				0.018	U			0.016	U			0.0181	J
Di-n-butyl phthalate	84-74-2	mg/kg						0.0061	U			0.0089	J			0.0062	U			0.0074	U			0.0062	U			0.0111	J
Di-n-octyl phthalate	117-84-0	mg/kg						0.0094	U			0.0084	U			0.0095 [a]	U			0.011	U			0.0095	U			0.0096	U
Diethyl phthalate	84-66-2	mg/kg						0.008	U			0.0072	U			0.0082	U			0.0096	U			0.0081	U			0.0082	U
Dimethyl phthalate	131-11-3	mg/kg						0.0067	U			0.006	U			0.0068	U			0.008	U			0.0068	U			0.0068	U
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg						0.0088	U			0.0079	U			0.009	U			0.011	U			0.0089	U			0.009	U
Fluoranthene	206-44-0	mg/kg	1000	100	85			0.017	U			0.298				8				0.02	U			0.017	U			1.33	
Fluorene	86-73-7	mg/kg	386	100	30			0.017	U			0.015	U			1.55				0.021	U			0.018	U			0.0398	
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33			0.0095	U			0.0085	U			0.0097	U			0.011	U			0.0097	U			0.0097	U
Hexachlorobutadiene	87-68-3	mg/kg						0.015	U			0.014	U			0.015	U			0.018	U			0.015	U			0.015	U
Hexachlorocyclopentadiene	77-47-4	mg/kg						0.015 [b]	U			0.013 [b]	U			0.015 [b]	U			0.018 [b]	U			0.015 [b]	U			0.015 [b]	U
Hexachloroethane	67-72-1	mg/kg						0.019	U			0.017	U			0.019	U			0.022	U			0.019	U			0.019	U
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5			0.018	U			0.116				2.54				0.021	U			0.018	U			0.503	
Isophorone	78-59-1	mg/kg						0.008	U			0.0072	U			0.0082	U			0.0097	U			0.0082	U			0.0082	U
2-Methylnaphthalene	91-57-6	mg/kg						0.0085	U			0.0093	J			0.297				0.01	U			0.0086	U			0.0167	J
2-Nitroaniline	88-74-4	mg/kg						0.0089	U			0.0079	U			0.009 [a]	U			0.011	U			0.009	U			0.0091	U
3-Nitroaniline	99-09-2	mg/kg						0.0094	U			0.0084	U			0.0096	U			0.011	U			0.0096	U			0.0096	U
4-Nitroaniline	100-01-6	mg/kg						0.0097	U			0.0087	U			0.0099	U			0.012	U			0.0099	U			0.0099	U
Naphthalene	91-20-3	mg/kg	12	100	12			0.011	U			0.0104	J			0.224				0.013	U			0.011	U			0.019	J
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08			0.015	U			0.013	U			0.015	U			0.017	U			0.015	U			0.015	U
N-Nitroso-di-n-propylamine	621-64-7	mg/kg						0.011	U			0.0097	U			0.011	U			0.013	U			0.011	U			0.011	U
N-Nitrosodiphenylamine	86-30-6	mg/kg						0.014	U			0.012	U			0.014	U			0.017	U			0.014	U			0.014	U
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1			0.013	U			0.142				6.6				0.015	U			0.013	U			0.515	
Pyrene	129-00-0	mg/kg	1000	100	64			0.012	U			0.254				7.51				0.0301	J			0.012	U			1.04	
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg						0.0095	U			0.0085	U			0.0097	U			0.011	U			0.0097	U			0.0097	U

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:						RI-SB 17(11.25-11.75)		RI-SB 17(17-17.5)		RI-SB 17(17-17.5)		RI-SB 18(1-1.5)		RI-SB 18(1-1.5)		RI-SB 18(6-6.5)		RI-SB 18(6-6.5)		RI-SB 18(12.25-12.75)		RI-SB 18(12.25-12.75)		RI-SB 18(16-16.5)		RI-SB 18(16-16.5)		RI-SB 20(3-3.5)	
Lab Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	JE17802-15A		JE17802-16		JE17802-16A		JE17802-17		JE17802-17A		JE17802-18		JE17802-18A		JE17802-19		JE17802-19A		JE17802-20		JE17802-20A		JE17802-21	
Date Sampled:						8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:00 PM		8/26/2025 12:45 PM		8/26/2025 12:45 PM		8/26/2025 12:46 PM		8/26/2025 12:46 PM		8/26/2025 12:47 PM		8/26/2025 12:47 PM		8/26/2025 12:48 PM		8/26/2025 12:48 PM		8/26/2025 2:00 PM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																													
Acetone	67-64-1	mg/kg	0.03	100	0.03			0.0066	J			0.0181				0.334				0.107				0.0305				0.0193	
Benzene	71-43-2	mg/kg	0.06	3.7	0.06			0.00047	U			0.00071	U			0.00062	U			0.00062	U			0.0005	U			0.00061	U
Bromochloromethane	74-97-5	mg/kg						0.00058	U			0.00088	U			0.00076	U			0.00076	U			0.00062	U			0.00075	U
Bromodichloromethane	75-27-4	mg/kg						0.00044	U			0.00067	U			0.00058	U			0.00058	U			0.00048	U			0.00058	U
Bromoform	75-25-2	mg/kg						0.0014	U			0.0021	U			0.0018	U			0.0018	U			0.0015	U			0.0018	U
Bromomethane	74-83-9	mg/kg						0.00079	U			0.0012	U			0.001	U			0.001	U			0.00085	U			0.001 [a]	U
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1			0.0025	U			0.0038	U			0.0693				0.0175				0.0027	U			0.0033	U
Carbon disulfide	75-15-0	mg/kg						0.00055	U			0.00084	U			0.0025	J			0.00073	U			0.00059	U			0.00072	U
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76			0.00064	U			0.00097	U			0.00084	U			0.00084	U			0.00068	U			0.00083 [a]	U
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5			0.00048	U			0.00072	U			0.00062	U			0.00062	U			0.00051	U			0.00062	U
Chloroethane	75-00-3	mg/kg						0.00061	U			0.00093	U			0.0008	U			0.0008	U			0.00065	U			0.0008 [a]	U
Chloroform	67-66-3	mg/kg	0.37	24	0.37			0.001	U			0.0016	U			0.0014	U			0.0014	U			0.0011	U			0.0013	U
Chloromethane	74-87-3	mg/kg						0.002	U			0.0031	U			0.0027	U			0.0027	U			0.0022	U			0.0026	U
Cyclohexane	110-82-7	mg/kg						0.00068	U			0.001	U			0.00089	U			0.00089	U			0.00073	U			0.00089	U
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg						0.00072	U			0.0011	U			0.00094	U			0.00094	U			0.00077	U			0.00094	U
Dibromochloromethane	124-48-1	mg/kg						0.00058	U			0.00088	U			0.00076	U			0.00076	U			0.00062	U			0.00075	U
1,2-Dibromoethane	106-93-4	mg/kg						0.00044	U			0.00066	U			0.00057	U			0.00057	U			0.00047	U			0.00057	U
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1			0.00057	U			0.00086	U			0.00074	U			0.00074	U			0.0006	U			0.00074	U
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6			0.00051	U			0.00078	U			0.00067	U			0.00067	U			0.00055	U			0.00067	U
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8			0.00051	U			0.00077	U			0.00067	U			0.00067	U			0.00055	U			0.00067	U
Dichlorodifluoromethane	75-71-8	mg/kg						0.00075	U			0.0011	U			0.00098	U			0.00099	U			0.0008	U			0.00098	U
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27			0.00051	U			0.00078	U			0.00067	U			0.00067	U			0.00055	U			0.00067	U
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02			0.00049	U			0.00074	U			0.00064	U			0.00064	U			0.00052	U			0.00063	U
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24			0.00068	U			0.001	U			0.00089	U			0.00089	U			0.00073	U			0.00088	U
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19			0.00087	U			0.0013	U			0.0011	U			0.0011	U			0.00093	U			0.0011	U
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19			0.00063	U			0.00096	U			0.00083	U			0.00083	U			0.00068	U			0.00082	U
1,2-Dichloropropane	78-87-5	mg/kg						0.00049	U			0.00074	U			0.00064	U			0.00064	U			0.00052	U			0.00064	U
cis-1,3-Dichloropropene	10061-01-5	mg/kg						0.00049	U			0.00074	U			0.00064	U			0.00065	U			0.00053	U			0.00064	U
trans-1,3-Dichloropropene	10061-02-6	mg/kg						0.00047	U			0.00072	U			0.00062	U			0.00062	U			0.00051	U			0.00062	U
Ethylbenzene	100-41-4	mg/kg	1	76	1			0.00047	U			0.00071	U			0.0122				0.00062	U			0.0005	U			0.00061	U
Freon 113	76-13-1	mg/kg						0.0028	U			0.0042	U			0.0036	U			0.0036	U			0.003	U			0.0036	U
2-Hexanone	591-78-6	mg/kg						0.0022	U			0.0033	U			0.0029	U			0.0029	U			0.0023	U			0.0029	U
Isopropylbenzene	98-82-8	mg/kg						0.0015	U			0.0022	U			0.0033				0.0019	U			0.0016	U			0.0019	U
Methyl Acetate	79-20-9	mg/kg						0.0014	U			0.0022	U			0.0019	U			0.0019	U			0.0015	U			0.0019	U
Methylcyclohexane	108-87-2	mg/kg						0.00091	U			0.0014	U			0.0012	U			0.0012	U			0.00097	U			0.0012	U
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1			0.00049	U			0.00073	U			0.00063	U			0.00064	U			0.00052	U			0.00063	U
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg						0.0024	U			0.0036	U			0.0031	U			0.0031	U			0.0025	U			0.0031	U
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05			0.0027	U			0.0041	U			0.0035	U			0.0035	U			0.0029	U			0.0035	U
Styrene	100-42-5	mg/kg						0.00042	U			0.00063	U			0.0021	J			0.00055	U			0.00045	U			0.00054	U
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg						0.00062	U			0.00094	U			0.00081	U			0.00081	U			0.00066	U			0.00081	U
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3			0.0006	U			0.00091	U			0.00079	U			0.00079	U			0.00064	U			0.00078	U
Toluene	108-88-3	mg/kg	0.7	100	0.7			0.00054	U			0.00082	U			0.00071	U			0.00071	U			0.00058	U			0.00071	U
1,2,3-Trichlorobenzene	87-61-6	mg/kg						0.0026	U			0.0039	U			0.0034	U			0.0034	U			0.0028	U			0.0034	U
1,2,4-Trichlorobenzene	120-82-1	mg/kg						0.0026	U			0.0039	U			0.0034	U			0.0034	U			0.0028	U			0.0034	U
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68			0.0005	U			0.00076	U			0.00065	U			0.00066	U			0.00053	U			0.00065	U
1,1,2-Trichloroethane	79-00-5	mg/kg						0.00057	U			0.00087	U			0.00075	U			0.00075	U			0.00061	U			0.00075	U
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47			0.00079	U			0.0012	U			0.001	U			0.001	U			0.00084	U			0.001	U
Trichlorofluoromethane	75-69-4	mg/kg						0.00071	U			0.0011	U			0.00093	U			0.00093	U			0.00076	U			0.00092 [a]	U
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03			0.0005	U			0.00075	U			0.00065	U			0.00065	U			0.00053	U			0.00065	U
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26			0.00093	U			0.0014	U			0.0012	U			0.0012	U			0.00099	U			0.0012	U
o-Xylene	95-47-6	mg/kg	1.2	100	0.26			0.00047	U			0.00072	U			0.00075	J			0.00062	U			0.00051	U			0.00062	U
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26			0.00047	U			0.00072	U			0.00075	J			0.00062	U			0.00051	U			0.00062	U

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

	= concentration exceeds USCO
	= concentration exceeds RRSCO
#	= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 20(3-3.5)		RI-SB 20(8-8.5)		RI-SB 20(8-8.5)		RI-SB 20(14-14.5)		RI-SB 20(14-14.5)		RI-SB 20(17.5-18)		RI-SB 20(17.5-18)		DUP20250826		DUP20250826	
Lab Sample ID:						JE17802-21A		JE17802-22		JE17802-22A		JE17802-23		JE17802-23A		JE17802-24		JE17802-24A		JE17802-25		JE17802-25A	
Date Sampled:						8/26/2025 2:00 PM		8/26/2025 2:01 PM		8/26/2025 2:01 PM		8/26/2025 2:02 PM		8/26/2025 2:02 PM		8/26/2025 2:03 PM		8/26/2025 2:03 PM		8/26/2025 12:00 AM		8/26/2025 12:00 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(GC/LC Semi-volatiles)																							
Aldrin	309-00-2	mg/kg	0.19	0.097	0.005			0.000083	U			0.000096	U			0.00012	U			0.000084	U		
alpha-BHC	319-84-6	mg/kg	0.02	0.48	0.02			0.000049	U			0.000057	U			0.000071	U			0.000049	U		
beta-BHC	319-85-7	mg/kg	0.09	0.36	0.036			0.000062	U			0.000071	U			0.00009	U			0.000062	U		
delta-BHC	319-86-8	mg/kg	0.25	100	0.04			0.000064	U			0.000074	U			0.000093	U			0.000064	U		
gamma-BHC (Lindane)	58-89-9	mg/kg	0.1	1.3	0.1			0.000074	U			0.000086	U			0.00011	U			0.000075	U		
alpha-Chlordane	5103-71-9	mg/kg	2.9	4.2	0.094			0.000057	U			0.000066	U			0.000083	U			0.000058	U		
gamma-Chlordane	5103-74-2	mg/kg	14					0.000064	U			0.000074	U			0.000093	U			0.000064	U		
Chlordane (alpha and gamma)	57-74-9	mg/kg						0.000057	U			0.000066	U			0.000083	U			0.000058	U		
Dieldrin	60-57-1	mg/kg	0.1	0.2	0.005			0.000068	U			0.000079	U			0.000099	U			0.000069	U		
4,4'-DDD	72-54-8	mg/kg	14	13	0.0033			0.000045	U			0.000052	U			0.000065	U			0.000045	U		
4,4'-DDE	72-55-9	mg/kg	17	8.9	0.0033			0.000051	U			0.000059	U			0.000074	U			0.0001	J		
4,4'-DDT	50-29-3	mg/kg	136	7.9	0.0033			0.000074	U			0.000086	U			0.00011	U			0.000082	J		
Endrin	72-20-8	mg/kg	0.06	11	0.014			0.000062 [a]	U			0.000071 [a]	U			0.00009 [a]	U			0.000062 [a]	U		
Endosulfan sulfate	1031-07-8	mg/kg	1000	24	2.4			0.000051	U			0.000059	U			0.000074	U			0.000051	U		
Endrin aldehyde	7421-93-4	mg/kg						0.00012	U			0.00014	U			0.00018	U			0.00012	U		
Endosulfan-I	959-98-8	mg/kg	102	24	2.4			0.000057	U			0.000066	U			0.000083	U			0.000058	U		
Endosulfan-II	33213-65-9	mg/kg	102	24	2.4			0.00006	U			0.000069	U			0.000087	U			0.00006	U		
Heptachlor	76-44-8	mg/kg	0.38	2.1	0.042			0.000055	U			0.000064	U			0.00008	U			0.000056	U		
Heptachlor epoxide	1024-57-3	mg/kg	0.02					0.000077	U			0.000088	U			0.00011	U			0.000077	U		
Methoxychlor	72-43-5	mg/kg	900					0.00017	U			0.00019	U			0.00024	U			0.00017	U		
Endrin ketone	53494-70-5	mg/kg						0.000068	U			0.000079	U			0.000099	U			0.000069	U		
Toxaphene	8001-35-2	mg/kg						0.0035	U			0.0041	U			0.0051	U			0.0035	U		
Aroclor 1016	12674-11-2	mg/kg	3.2	1	0.1			0.009	U			0.01	U			0.013	U			0.0091	U		
Aroclor 1221	11104-28-2	mg/kg	3.2	1	0.1			0.0071	U			0.0083	U			0.01	U			0.0072	U		
Aroclor 1232	11141-16-5	mg/kg	3.2	1	0.1			0.018	U			0.02	U			0.026	U			0.018	U		
Aroclor 1242	53469-21-9	mg/kg	3.2	1	0.1			0.013	U			0.015	U			0.019	U			0.013	U		
Aroclor 1248	12672-29-6	mg/kg	3.2	1	0.1			0.0046	U			0.0053	U			0.0067	U			0.0046	U		
Aroclor 1254	11097-69-1	mg/kg	3.2	1	0.1			0.0023	U			0.0027	U			0.0033	U			0.0023	U		
Aroclor 1260	11096-82-5	mg/kg	3.2	1	0.1			0.0073	U			0.0085	U			0.011	U			0.0074	U		
Aroclor 1268	11100-14-4	mg/kg	3.2	1	0.1			0.0021	U			0.0025	U			0.0031	U			0.0022	U		
Aroclor 1262	37324-23-5	mg/kg	3.2	1	0.1			0.0018	U			0.002	U			0.0026	U			0.0018	U		
(General Chemistry)																							
Cyanide	57-12-5	mg/kg	40	27	27			0.28	U			0.31				0.42	U			0.23	U		
Solids, Percent	PERCENT SOLIDS	%						94.1				81.4				62.2				91.5			
(Metals Analysis)																							
Aluminum	7429-90-5	mg/kg						7720				8400				10400				7290			
Antimony	7440-36-0	mg/kg						2.1	U			2.3	U			3.2	U			2.2	U		
Arsenic	7440-38-2	mg/kg	16	16	13			2.1	U			2.3	U			3.2	U			2.2	U		
Barium	7440-39-3	mg/kg	820	410	410			47.5				94.2				62.9				70.1			
Beryllium	7440-41-7	mg/kg	47	43	4.4			0.23				0.32				0.41				0.23			
Cadmium	7440-43-9	mg/kg	7.5	2.5	2.5			0.53	U			0.59	U			0.81	U			0.54	U		
Calcium	7440-70-2	mg/kg						1600				1900				3830				10800			
Chromium	7440-47-3	mg/kg	19	110	30			13.9				13.7				19				16.5			
Cobalt	7440-48-4	mg/kg						5.3	U			5.9	U			8.1	U			5.4	U		
Copper	7440-50-8	mg/kg	1720	280	50			13.6				8.5				18.9				14.6			
Iron	7439-89-6	mg/kg						12800				8820				13600				13200			
Lead	7439-92-1	mg/kg	450	400	63			76.2				3.8				6.1				15.5			
Magnesium	7439-95-4	mg/kg						3960				2680				4530				3180			
Manganese	7439-96-5	mg/kg	2000	2000	1600			232				107				196				246			
Mercury	7439-97-6	mg/kg	0.73	0.3	0.18			0.13				0.039	U			0.047	U			0.03	U		
Nickel	7440-02-0	mg/kg	130	320	30			13.9				8.9				15.8				9.7			
Potassium	7440-09-7	mg/kg						1420				1200	U			1680				1260			
Selenium	7782-49-2	mg/kg	4	110	3.9			2.1	U			2.3	U			3.2	U			2.2	U		
Silver	7440-22-4	mg/kg	8.3	110	2			0.53	U			0.59	U			0.81	U			0.54	U		
Sodium	7440-23-5	mg/kg						1100	U			1200	U			1600	U			1100	U		
Thallium	7440-28-0	mg/kg						1.1	U			1.2	U			1.6	U			1.1	U		
Vanadium	7440-62-2	mg/kg						20.3				18.3				28.3				22.3			
Zinc	7440-66-6	mg/kg	2480	6600	109			43.4				38.7				45.6				25.9			

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 20(3-3.5)		RI-SB 20(8-8.5)		RI-SB 20(8-8.5)		RI-SB 20(14-14.5)		RI-SB 20(14-14.5)		RI-SB 20(17.5-18)		RI-SB 20(17.5-18)		DUP20250826		DUP20250826	
Lab Sample ID:						JE17802-21A		JE17802-22		JE17802-22A		JE17802-23		JE17802-23A		JE17802-24		JE17802-24A		JE17802-25		JE17802-25A	
Date Sampled:						8/26/2025 2:00 PM		8/26/2025 2:01 PM		8/26/2025 2:01 PM		8/26/2025 2:02 PM		8/26/2025 2:02 PM		8/26/2025 2:03 PM		8/26/2025 2:03 PM		8/26/2025 12:00 AM		8/26/2025 12:00 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Semi-volatiles)																							
Perfluorobutanoic acid	375-22-4	mg/kg				0.00012	U			0.00011	U			0.00013	U			0.00018	U			0.00012	U
Perfluoropentanoic acid	2706-90-3	mg/kg				0.000079	U			0.000072	U			0.000085	U			0.00011	U			0.000074	U
Perfluorohexanoic acid	307-24-4	mg/kg				0.000034	U			0.000031	U			0.000036	U			0.000048	U			0.000032	U
Perfluoroheptanoic acid	375-85-9	mg/kg				0.000057	J			0.000051	U			0.000061	U			0.00008	U			0.000053	U
Perfluorooctanoic acid	335-67-1	mg/kg				0.00026				0.00011	J			0.000097	U			0.00013	U			0.000085	U
Perfluorononanoic acid	375-95-1	mg/kg				0.0001	J			0.000051	U			0.000061	U			0.00008	U			0.000053	U
Perfluorodecanoic acid	335-76-2	mg/kg				0.000079	U			0.000072	U			0.000085	U			0.00011	U			0.000074	U
Perfluoroundecanoic acid	2058-94-8	mg/kg				0.000068	U			0.000061	U			0.000073	U			0.000096	U			0.000064	U
Perfluorododecanoic acid	307-55-1	mg/kg				0.00009	U			0.000082	U			0.000097	U			0.00013	U			0.000085	U
Perfluorotridecanoic acid	72629-94-8	mg/kg				0.0001	U			0.000092	U			0.00011	U			0.00014	U			0.000095	U
Perfluorotetradecanoic acid	376-06-7	mg/kg				0.00011	U			0.0001	U			0.00012	U			0.00016	U			0.00011	U
Perfluorobutanesulfonic acid	375-73-5	mg/kg				0.000079	U			0.000072	U			0.000085	U			0.00011	U			0.000074	U
Perfluorohexanesulfonic acid	355-46-4	mg/kg				0.00012	U			0.00011	U			0.00013	U			0.00018	U			0.00012	U
Perfluoroheptanesulfonic acid	375-92-8	mg/kg				0.00011	U			0.0001	U			0.00012	U			0.00016	U			0.00011	U
Perfluorooctanesulfonic acid	1763-23-1	mg/kg				0.00033				0.000051	U			0.000061	U			0.00008	U			0.000069	J
Perfluorodecanesulfonic acid	335-77-3	mg/kg				0.00012	U			0.00011	U			0.00013	U			0.00018	U			0.00012	U
6:2 Fluorotelomer sulfonate	27619-97-2	mg/kg				0.00011	U			0.0001	U			0.00012	U			0.00016	U			0.00011	U
8:2 Fluorotelomer sulfonate	39108-34-4	mg/kg				0.00021	U			0.00019	U			0.00023	U			0.0003	U			0.0002	U
PFOSA	754-91-6	mg/kg				0.000079	U			0.000072	U			0.000085	U			0.00011	U			0.000074	U
MeFOSAA	2355-31-9	mg/kg				0.00009	U			0.000082	U			0.000097	U			0.00013	U			0.000085	U
EtFOSAA	2991-50-6	mg/kg				0.00015	U			0.00013	U			0.00016	U			0.00021	U			0.00014	U
2-Chlorophenol	95-57-8	mg/kg						0.017	U			0.02	U			0.026	U			0.018	U		
4-Chloro-3-methyl phenol	59-50-7	mg/kg						0.021	U			0.025	U			0.033	U			0.022	U		
2,4-Dichlorophenol	120-83-2	mg/kg						0.03	U			0.034	U			0.046	U			0.03	U		
2,4-Dimethylphenol	105-67-9	mg/kg						0.062	U			0.071	U			0.095	U			0.064	U		
2,4-Dinitrophenol	51-28-5	mg/kg						0.13	U			0.15	U			0.2	U			0.13	U		
4,6-Dinitro-o-cresol	534-52-1	mg/kg						0.037	U			0.043	U			0.057	U			0.038	U		
2-Methylphenol	95-48-7	mg/kg	0.33	100	0.33			0.022	U			0.026	U			0.034	U			0.023	U		
3&4-Methylphenol	M+P-CRESOLS	mg/kg	0.33	100	0.33			0.028	U			0.033	U			0.044	U			0.029	U		
2-Nitrophenol	88-75-5	mg/kg						0.023	U			0.026	U			0.035	U			0.024	U		
4-Nitrophenol	100-02-7	mg/kg						0.092	U			0.11	U			0.14	U			0.095	U		
Pentachlorophenol	87-86-5	mg/kg	0.8	1.3	0.8			0.033	U			0.038	U			0.05	U			0.034	U		
Phenol	108-95-2	mg/kg	0.33	100	0.33			0.018	U			0.021	U			0.028	U			0.019	U		
2,3,4,6-Tetrachlorophenol	58-90-2	mg/kg						0.023	U			0.026	U			0.035	U			0.024	U		
2,4,5-Trichlorophenol	95-95-4	mg/kg						0.026	U			0.03	U			0.04	U			0.027	U		
2,4,6-Trichlorophenol	88-06-2	mg/kg						0.021	U			0.024	U			0.032	U			0.021	U		
Acenaphthene	83-32-9	mg/kg	98	100	20			0.012	U			0.014	U			0.018	U			0.012	U		
Acenaphthylene	208-96-8	mg/kg	365	100	100			0.018	U			0.02	U			0.027	U			0.018	U		
Acetophenone	98-86-2	mg/kg						0.0074	U			0.0086	U			0.011	U			0.0077	U		
Anthracene	120-12-7	mg/kg	1000	100	100			0.021	U			0.025	U			0.033	U			0.022	U		
Atrazine	1912-24-9	mg/kg						0.015	U			0.017	U			0.023	U			0.015	U		
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	1			0.0098	U			0.011	U			0.015	U			0.0297	J		
Benzo(a)pyrene	50-32-8	mg/kg	22	1	1			0.016	U			0.018	U			0.024	U			0.0266	J		
Benzo(b)fluoranthene	205-99-2	mg/kg	2.1	1.4	1			0.015	U			0.018	U			0.024	U			0.0306	J		
Benzo(g,h,i)perylene	191-24-2	mg/kg	1000	4.9	0.64			0.017	U			0.02	U			0.027	U			0.0226	J		
Benzo(k)fluoranthene	207-08-9	mg/kg	2	4.9	0.8			0.016	U			0.019	U			0.025	U			0.017	U		
4-Bromophenyl phenyl ether	101-55-3	mg/kg						0.013	U			0.015	U			0.021	U			0.014	U		
Butyl benzyl phthalate	85-68-7	mg/kg						0.0084	U			0.0098	U			0.013	U			0.0087	U		
1,1'-Biphenyl	92-52-4	mg/kg						0.0047	U			0.0055	U			0.0073	U			0.0049	U		
Benzaldehyde	100-52-7	mg/kg						0.0086	U			0.0099	U			0.013	U			0.0089	U		
2-Chloronaphthalene	91-58-7	mg/kg						0.0082	U			0.0095	U			0.013	U			0.0085	U		
4-Chloroaniline	106-47-8	mg/kg						0.012	U			0.014	U			0.019	U			0.013	U		
Carbazole	86-74-8	mg/kg						0.005	U			0.0058	U			0.0077	U			0.0052	U		
Caprolactam	105-60-2	mg/kg						0.014 [a]	U			0.016 [a]	U			0.021 [a]	U			0.014 [a]	U		
Chrysene	218-01-9	mg/kg	1	4.9	1			0.011	U			0.013	U			0.017	U			0.0188	J		
bis(2-Chloroethoxy)methane	111-91-1	mg/kg						0.0074	U			0.0086	U			0.011	U			0.0076	U		
bis(2-Chloroethyl)ether	111-44-4	mg/kg						0.015	U			0.017	U			0.023	U			0.015	U		
2,2'-Oxybis(1-chloropropane)	108-60-1	mg/kg						0.012	U			0.014	U			0.019	U			0.013	U		
4-Chlorophenyl phenyl ether	7005-72-3	mg/kg						0.011	U			0.013	U			0.017	U			0.012	U		
2,4-Dinitrotoluene	121-14-2	mg/kg						0.011	U			0.012	U			0.017	U			0.011	U		
2,6-Dinitrotoluene	606-20-2	mg/kg						0.017	U			0.02	U			0.027	U			0.018	U		
3,3'-Dichlorobenzidine	91-94-1	mg/kg						0.029	U			0.033	U			0.045	U			0.03	U		
1,4-Dioxane	123-91-1	mg/kg	0.1	5.7	0.1			0.023	U			0.026	U			0.035	U			0.024	U		
Dibenzo(a,h)anthracene	53-70-3	mg/kg	1000	0.33	0.33			0.015	U			0.018	U			0.024	U			0.016	U		
Dibenzofuran	132-64-9	mg/kg	110	18	2.1			0.014	U			0.016	U			0.022	U			0.015	U		
Di-n-butyl phthalate	84-74-2	mg/kg						0.0056	U			0.0065	U			0.0087	U			0.0058	U		
Di-n-octyl phthalate	117-84-0	mg/kg						0.0086	U			0.01	U			0.013	U			0.0089	U		
Diethyl phthalate	84-66-2	mg/kg						0.0074	U			0.0085	U			0.011	U			0.0076	U		
Dimethyl phthalate	131-11-3	mg/kg						0.0062	U			0.0071	U			0.0095	U			0.0064	U		
bis(2-Ethylhexyl)phthalate	117-81-7	mg/kg						0.0081	U			0.0094	U			0.012	U			0.0084	U		
Fluoranthene	206-44-0	mg/kg	1000	100	85			0.015	U			0.018	U			0.024	U			0.0376			
Fluorene	86-73-7	mg/kg	386	100	30			0.016	U			0.018	U			0.025	U			0.016	U		
Hexachlorobenzene	118-74-1	mg/kg	3.2	0.33	0.33			0.0088	U			0.01	U			0.014	U			0.009	U		
Hexachlorobutadiene	87-68-3	mg/kg						0.014	U			0.016	U			0.021	U			0.014	U		
Hexachlorocyclopentadiene	77-47-4	mg/kg						0.014 [b]	U			0.016 [b]	U			0.021 [b]	U			0.014 [b]	U		
Hexachloroethane	67-72-1	mg/kg						0.017	U			0.02	U			0.026	U			0.018	U		
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	6.6	1.4	0.5			0.016	U			0.019	U			0.025	U			0.0171	J		
Isophorone	78-59-1	mg/kg						0.0074	U			0.0086	U			0.011	U			0.0076	U		
2-Methylnaphthalene	91-57-6	mg/kg						0.0078	U			0.009	U			0.012	U			0.0081	U		
2-Nitroaniline	88-74-4	mg/kg						0.0082	U			0.0094	U			0.013	U			0.0084	U		
3-Nitroaniline	99-09-2	mg/kg						0.0087	U			0.01	U			0.013	U			0.0089	U		
4-Nitroaniline	100-01-6	mg/kg						0.009	U			0.01	U			0.014	U			0.0093	U		
Naphthalene	91-20-3	mg/kg	12	100	12			0.0098	U			0.011	U			0.015	U			0.01	U		
Nitrobenzene	98-95-3	mg/kg	0.08	1.8	0.08			0.013	U			0.015	U			0.021	U			0.014	U		
N-Nitroso-di-n-propylamine	621-64-7	mg/kg						0.01	U			0.012	U			0.015	U			0.01	U		
N-Nitrosodiphenylamine	86-30-6	mg/kg						0.013	U			0.015	U			0.02	U			0.013	U		
Phenanthrene	85-01-8	mg/kg	1000	4.9	1.1			0.012	U			0.013	U			0.018	U			0.0186	J		
Pyrene	129-00-0	mg/kg	1000	100	64			0.011	U			0.013	U			0.017	U			0.0374			
1,2,4,5-Tetrachlorobenzene	95-94-3	mg/kg						0.0088	U			0.01	U			0.014	U			0.0091	U		

Table 5.1
Summary of Soil Sampling Results

Client Sample ID:	CAS #	Units	NY PGWSCO	NY RRSCO	NY UUSCO	RI-SB 20(3-3.5)		RI-SB 20(8-8.5)		RI-SB 20(8-8.5)		RI-SB 20(14-14.5)		RI-SB 20(14-14.5)		RI-SB 20(17.5-18)		RI-SB 20(17.5-18)		DUP20250826		DUP20250826	
Lab Sample ID:						JE17802-21A		JE17802-22		JE17802-22A		JE17802-23		JE17802-23A		JE17802-24		JE17802-24A		JE17802-25		JE17802-25A	
Date Sampled:						8/26/2025 2:00 PM		8/26/2025 2:01 PM		8/26/2025 2:01 PM		8/26/2025 2:02 PM		8/26/2025 2:02 PM		8/26/2025 2:03 PM		8/26/2025 2:03 PM		8/26/2025 12:00 AM		8/26/2025 12:00 AM	
Matrix:						Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
(MS Volatiles)																							
Acetone	67-64-1	mg/kg	0.03	100	0.03			0.0162				0.0329				0.0555				0.0128			
Benzene	71-43-2	mg/kg	0.06	3.7	0.06			0.00058	U			0.0005	U			0.00064	U			0.00052	U		
Bromochloromethane	74-97-5	mg/kg						0.00071	U			0.00061	U			0.00079	U			0.00064	U		
Bromodichloromethane	75-27-4	mg/kg						0.00054	U			0.00047	U			0.00061	U			0.00049	U		
Bromoform	75-25-2	mg/kg						0.0017	U			0.0015	U			0.0019	U			0.0015	U		
Bromomethane	74-83-9	mg/kg						0.00097 [a]	U			0.00084 [a]	U			0.0011 [a]	U			0.00087 [a]	U		
2-Butanone (MEK)	78-93-3	mg/kg	0.1	100	0.1			0.0031	U			0.0027	U			0.0096	J			0.0028	U		
Carbon disulfide	75-15-0	mg/kg						0.00068	U			0.00059	U			0.00078	J			0.00061	U		
Carbon tetrachloride	56-23-5	mg/kg	0.76	7.1	0.76			0.00078 [a]	U			0.00068 [a]	U			0.00087 [a]	U			0.0007 [a]	U		
Chlorobenzene	108-90-7	mg/kg	4.5	100	4.5			0.00058	U			0.0005	U			0.00065	U			0.00052	U		
Chloroethane	75-00-3	mg/kg						0.00075 [a]	U			0.00065 [a]	U			0.00083 [a]	U			0.00067 [a]	U		
Chloroform	67-66-3	mg/kg	0.37	24	0.37			0.0013	U			0.0011	U			0.0014	U			0.0011	U		
Chloromethane	74-87-3	mg/kg						0.0025	U			0.0021	U			0.0028	U			0.0022	U		
Cyclohexane	110-82-7	mg/kg						0.00083	U			0.00072	U			0.00093	U			0.00075	U		
1,2-Dibromo-3-chloropropane	96-12-8	mg/kg						0.00088	U			0.00076	U			0.00098	U			0.00079	U		
Dibromochloromethane	124-48-1	mg/kg						0.00071	U			0.00061	U			0.00079	U			0.00064	U		
1,2-Dibromoethane	106-93-4	mg/kg						0.00053	U			0.00046	U			0.00059	U			0.00048	U		
1,2-Dichlorobenzene	95-50-1	mg/kg	1.1	100	1.1			0.00069	U			0.0006	U			0.00077	U			0.00062	U		
1,3-Dichlorobenzene	541-73-1	mg/kg	2.6	38	2.6			0.00063	U			0.00054	U			0.0007	U			0.00056	U		
1,4-Dichlorobenzene	106-46-7	mg/kg	1.8	24	1.8			0.00062	U			0.00054	U			0.0007	U			0.00056	U		
Dichlorodifluoromethane	75-71-8	mg/kg						0.00092	U			0.0008	U			0.001	U			0.00083	U		
1,1-Dichloroethane	75-34-3	mg/kg	0.27	47	0.27			0.00063	U			0.00054	U			0.0007	U			0.00056	U		
1,2-Dichloroethane	107-06-2	mg/kg	0.02	5.8	0.02			0.00059	U			0.00052	U			0.00066	U			0.00054	U		
1,1-Dichloroethene	75-35-4	mg/kg	0.33	0.98	0.24			0.00083	U			0.00072	U			0.00092	U			0.00075	U		
cis-1,2-Dichloroethene	156-59-2	mg/kg	0.19	41	0.19			0.0011	U			0.00092	U			0.0012	U			0.00096	U		
trans-1,2-Dichloroethene	156-60-5	mg/kg	0.19	100	0.19			0.00077	U			0.00067	U			0.00086	U			0.0007	U		
1,2-Dichloropropane	78-87-5	mg/kg						0.0006	U			0.00052	U			0.00067	U			0.00054	U		
cis-1,3-Dichloropropene	10061-01-5	mg/kg						0.0006	U			0.00052	U			0.00067	U			0.00054	U		
trans-1,3-Dichloropropene	10061-02-6	mg/kg						0.00058	U			0.0005	U			0.00064	U			0.00052	U		
Ethylbenzene	100-41-4	mg/kg	1	76	1			0.00057	U			0.0005	U			0.00064	U			0.00052	U		
Freon 113	76-13-1	mg/kg						0.0034	U			0.0029	U			0.0038	U			0.003	U		
2-Hexanone	591-78-6	mg/kg						0.0027	U			0.0023	U			0.003	U			0.0024	U		
Isopropylbenzene	98-82-8	mg/kg						0.0018	U			0.0016	U			0.002	U			0.0016	U		
Methyl Acetate	79-20-9	mg/kg						0.0018	U			0.0015	U			0.002	U			0.0016	U		
Methylcyclohexane	108-87-2	mg/kg						0.0011	U			0.00096	U			0.0012	U			0.001	U		
Methyl Tert Butyl Ether	1634-04-4	mg/kg	0.1	100	0.1			0.00059	U			0.00051	U			0.00066	U			0.00053	U		
4-Methyl-2-pentanone(MIBK)	108-10-1	mg/kg						0.0029	U			0.0025	U			0.0032	U			0.0026	U		
Methylene chloride	75-09-2	mg/kg	0.05	81	0.05			0.0033	U			0.0029	U			0.0037	U			0.003	U		
Styrene	100-42-5	mg/kg						0.00051	U			0.00044	U			0.00057	U			0.00046	U		
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg						0.00076	U			0.00066	U			0.00084	U			0.00068	U		
Tetrachloroethene	127-18-4	mg/kg	1.3	18	1.3			0.00073	U			0.00064	U			0.00082	U			0.00066	U		
Toluene	108-88-3	mg/kg	0.7	100	0.7			0.00066	U			0.00058	U			0.00074	U			0.0006	U		
1,2,3-Trichlorobenzene	87-61-6	mg/kg						0.0032	U			0.0027	U			0.0035	U			0.0028	U		
1,2,4-Trichlorobenzene	120-82-1	mg/kg						0.0032	U			0.0027	U			0.0035	U			0.0028	U		
1,1,1-Trichloroethane	71-55-6	mg/kg	0.68	100	0.68			0.00061	U			0.00053	U			0.00068	U			0.00055	U		
1,1,2-Trichloroethane	79-00-5	mg/kg						0.0007	U			0.00061	U			0.00078	U			0.00063	U		
Trichloroethene	79-01-6	mg/kg	0.47	6.4	0.47			0.00096	U			0.00084	U			0.0011	U			0.00087	U		
Trichlorofluoromethane	75-69-4	mg/kg						0.00087 [a]	U			0.00075 [a]	U			0.00096 [a]	U			0.00078 [a]	U		
Vinyl chloride	75-01-4	mg/kg	0.03	0.48	0.03			0.00061	U			0.00053	U			0.00068	U			0.00055	U		
m,p-Xylene	M,P-XYLENE	mg/kg	1.2	100	0.26			0.0011	U			0.00098	U			0.0013	U			0.001	U		
o-Xylene	95-47-6	mg/kg	1.2	100	0.26			0.00058	U			0.0005	U			0.00065	U			0.00052	U		
Xylene (total)	1330-20-7	mg/kg	1.2	100	0.26			0.00058	U			0.0005	U			0.00065	U			0.00052	U		

NOTES:
1. Results are measured in mg/kg.
2. Results are compared to NYSDEC USCOs, NYSDEC RRSCOs, and NYSDEC PGWSCOs.
3. Sample Depth is reported in feet below ground surface.

	= concentration exceeds USCO
	= concentration exceeds RRSCO
#	= concentration exceeds PGWSCO

U: concentration not detected.
J: indicates an estimated value.

ABBREVIATIONS:
NYSDEC = New York State Department of Environmental Conservation.
USCO = NYSDEC Unrestricted Use Soil Cleanup Objectives
RRSCO = NYSDEC Restricted Use Soil Cleanup Objectives w/CP-51
PGWSCO = NYSDEC Protection of Groundwater Soil Cleanup Objectives
mg/kg = Miligrams per kilogram

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-6		RI-MW-6		DUP-2025.01.29		DUP-2025.01.29		RI-MW-3		RI-MW-3		RI-MW-1	
Lab Sample ID:					JE4824-1		JE4824-1A		JE4824-2		JE4824-2A		JE4824-3		JE4824-3A		JE4824-4	
Date Sampled:					1/29/2025 10:15 AM		1/29/2025 10:15 AM		1/29/2025 9:55 AM		1/29/2025 9:55 AM		1/29/2025 11:20 AM		1/29/2025 11:20 AM		1/29/2025 2:40 PM	
Matrix:					Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
(GC/LC Semi-Volatiles (SW846 8081B))																		
Aldrin	309-00-2	ug/l	ND		0.0026	U			0.0026	U			0.0026	U			0.0026	U
alpha-BHC	319-84-6	ug/l	0.01		0.0026	U			0.0026	U			0.0026	U			0.0026	U
beta-BHC	319-85-7	ug/l	0.04		0.004	U			0.004	U			0.004	U			0.004	U
delta-BHC	319-86-8	ug/l	0.04		0.0033	U			0.0033	U			0.0033	U			0.0033	U
gamma-BHC (Lindane)	58-89-9	ug/l	0.05		0.003	U			0.003	U			0.003	U			0.003	U
alpha-Chlordane	5103-71-9	ug/l			0.0025	U			0.0025	U			0.0025	U			0.0025	U
gamma-Chlordane	5103-74-2	ug/l			0.0021	U			0.0021	U			0.0021	U			0.0021	U
Dieldrin	60-57-1	ug/l	0.004		0.0038	U			0.0038	U			0.0038	U			0.0038	U
4,4'-DDD	72-54-8	ug/l	0.3		0.0029	U			0.0029	U			0.0029	U			0.0029	U
4,4'-DDE	72-55-9	ug/l	0.2		0.0025	U			0.0025	U			0.0025	U			0.0025	U
4,4'-DDT	50-29-3	ug/l	0.2		0.0034	U			0.0034	U			0.0034	U			0.0034	U
Endrin	72-20-8	ug/l	ND		0.003	U			0.003	U			0.003	U			0.003	U
Endosulfan sulfate	1031-07-8	ug/l			0.0027	U			0.0027	U			0.0027	U			0.0027	U
Endrin aldehyde	7421-93-4	ug/l	5		0.0034	U			0.0034	U			0.0034	U			0.0034	U
Endrin ketone	53494-70-5	ug/l	5		0.0031	U			0.0031	U			0.0031	U			0.0031	U
Endosulfan-I	959-98-8	ug/l			0.0026	U			0.0026	U			0.0026	U			0.0026	U
Endosulfan-II	33213-65-9	ug/l			0.0024	U			0.0024	U			0.0024	U			0.0024	U
Heptachlor	76-44-8	ug/l	0.04		0.0022	U			0.0022	U			0.0022	U			0.0022	U
Heptachlor epoxide	1024-57-3	ug/l	0.03		0.003	U			0.003	U			0.003	U			0.003	U
Methoxychlor	72-43-5	ug/l	35		0.0034	U			0.0034	U			0.0034	U			0.0034	U
Toxaphene	8001-35-2	ug/l	0.06		0.082	U			0.082	U			0.082	U			0.082	U
Tetrachloro-m-xylene	877-09-8	%			75				58				64				61	
Tetrachloro-m-xylene (1)	877-09-8	%			76				57				64				60	
Decachlorobiphenyl	2051-24-3	%			55				45				42				57	
Decachlorobiphenyl (1)	2051-24-3	%			48				40				37				50	
(GC/LC Semi-Volatiles (SW846 8082A))																		
Aroclor 1016	12674-11-2	ug/l	0.09		0.098	U			0.098	U			0.098	U			0.098	U
Aroclor 1221	11104-28-2	ug/l	0.09		0.21	U			0.21	U			0.21	U			0.21	U
Aroclor 1232	11141-16-5	ug/l	0.09		0.13	U			0.13	U			0.13	U			0.13	U
Aroclor 1242	53469-21-9	ug/l	0.09		0.23	U			0.23	U			0.23	U			0.23	U
Aroclor 1248	12672-29-6	ug/l	0.09		0.22	U			0.22	U			0.22	U			0.22	U
Aroclor 1254	11097-69-1	ug/l	0.09		0.21	U			0.21	U			0.21	U			0.21	U
Aroclor 1260	11096-82-5	ug/l	0.09		0.21	U			0.21	U			0.21	U			0.21	U
Aroclor 1268	11100-14-4	ug/l	0.09		0.087	U			0.087	U			0.087	U			0.087	U
Aroclor 1262	37324-23-5	ug/l	0.09		0.23	U			0.23	U			0.23	U			0.23	U
Tetrachloro-m-xylene (2)	877-09-8	%			84				71				68				56	
Tetrachloro-m-xylene (3)	877-09-8	%			76				64				72				54	
Decachlorobiphenyl (2)	2051-24-3	%			41				43				42				49	
Decachlorobiphenyl (3)	2051-24-3	%			52				47				45				53	
(General Chemistry (EPA 335.4/LACHAT))																		
Cyanide	57-12-5	mg/l	0.2		0.01	U			0.01	U			0.01	U			0.01	U
(Metals Analysis (SW846 6010D))																		
Aluminum	7429-90-5	ug/l			636				3180				695				338	
Antimony	7440-36-0	ug/l	3		6	U			6	U			6	U			6	U
Arsenic	7440-38-2	ug/l	25		3	U			3	U			3	U			3	U
Barium	7440-39-3	ug/l	1000		200	U			200	U			200	U			200	U
Beryllium	7440-41-7	ug/l		3	1	U			1	U			1	U			1	U
Cadmium	7440-43-9	ug/l	5		3	U			3	U			3	U			3	U
Calcium	7440-70-2	ug/l			54800				57000				56400				70100	
Chromium	7440-47-3	ug/l	50		10	U			10	U			10	U			10	U
Cobalt	7440-48-4	ug/l			50	U			50	U			50	U			50	U
Copper	7440-50-8	ug/l	200		10	U			10	U			10	U			10	U
Iron	7439-89-6	ug/l	300		1170				5700				1390				605	
Lead	7439-92-1	ug/l	25		3	U			4.1				3	U			3	U

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-6		RI-MW-6		DUP-2025.01.29		DUP-2025.01.29		RI-MW-3		RI-MW-3		RI-MW-1	
Lab Sample ID:					JE4824-1		JE4824-1A		JE4824-2		JE4824-2A		JE4824-3		JE4824-3A		JE4824-4	
Date Sampled:					1/29/2025 10:15 AM		1/29/2025 10:15 AM		1/29/2025 9:55 AM		1/29/2025 9:55 AM		1/29/2025 11:20 AM		1/29/2025 11:20 AM		1/29/2025 2:40 PM	
Matrix:					Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
Magnesium	7439-95-4	ug/l		35000	10700				11800				11400				11600	
Manganese	7439-96-5	ug/l	300		322				556				463				416	
Nickel	7440-02-0	ug/l	100		10	U			10	U			10	U			10	U
Potassium	7440-09-7	ug/l			10000	U			10000	U			10000	U			10000	U
Selenium	7782-49-2	ug/l	10		10	U			10	U			10	U			10	U
Silver	7440-22-4	ug/l	50		10	U			10	U			10	U			10	U
Sodium	7440-23-5	ug/l	20000		113000				94000				136000				354000	
Thallium	7440-28-0	ug/l		0.5	10	U			10	U			10	U			10	U
Vanadium	7440-62-2	ug/l			50	U			50	U			50	U			50	U
Zinc	7440-66-6	ug/l		2000	20	U			20	U			20	U			20	U
(Metals Analysis (SW846 7470A))																		
Mercury	7439-97-6	ug/l	0.7		0.2	U			0.2	U			0.2	U			0.2	U
(MS Semi-volatiles (EPA 1633))																		
Perfluorobutanoic acid	375-22-4	ug/l					0.00095	U			0.00093	U			0.0104			
Perfluoropentanoic acid	2706-90-3	ug/l					0.005				0.0037	J			0.0193			
Perfluorohexanoic acid	307-24-4	ug/l					0.0056				0.0043				0.02			
Perfluoroheptanoic acid	375-85-9	ug/l					0.0042				0.0034				0.0122			
Perfluorooctanoic acid	335-67-1	ug/l		0.0067			0.0179				0.015				0.0385			
Perfluorononanoic acid	375-95-1	ug/l					0.00041	U			0.0004	U			0.0026			
Perfluorodecanoic acid	335-76-2	ug/l					0.00063	U			0.00062	U			0.00062	U		
Perfluoroundecanoic acid	2058-94-8	ug/l					0.00056	U			0.00055	U			0.00055	U		
Perfluorododecanoic acid	307-55-1	ug/l					0.00079	U			0.00077	U			0.00077	U		
Perfluorotridecanoic acid	72629-94-8	ug/l					0.00081	U			0.00079	U			0.00079	U		
Perfluorotetradecanoic acid	376-06-7	ug/l					0.00078	U			0.00076	U			0.00076	U		
Perfluorobutanesulfonic acid	375-73-5	ug/l					0.0034				0.0025				0.01			
Perfluoropentanesulfonic acid	2706-91-4	ug/l					0.001	U			0.001	U			0.001	U		
Perfluorohexanesulfonic acid	355-46-4	ug/l					0.0015	J			0.0011	U			0.0063			
Perfluoroheptanesulfonic acid	375-92-8	ug/l					0.001	U			0.00098	U			0.00098	U		
Perfluorooctanesulfonic acid	1763-23-1	ug/l		0.0027			0.0069				0.0066				0.0219			
Perfluorononanesulfonic acid	68259-12-1	ug/l					0.0015	U			0.0014	U			0.0014	U		
Perfluorodecanesulfonic acid	335-77-3	ug/l					0.0011	U			0.0011	U			0.0011	U		
Perfluorododecanesulfonic acid	79780-39-5	ug/l					0.00041	U			0.0004	U			0.0004	U		
4:2 Fluorotelomer sulfonate	757124-72-4	ug/l					0.0023	U			0.0022	U			0.0023	U		
6:2 Fluorotelomer sulfonate	27619-97-2	ug/l					0.00093	U			0.00091	U			0.00091	U		
8:2 Fluorotelomer sulfonate	39108-34-4	ug/l					0.0015	U			0.0014	U			0.0015	U		
PFOSA	754-91-6	ug/l					0.00071	U			0.00069	U			0.00069	U		
MeFOSA	31506-32-8	ug/l					0.00065	U			0.00064	U			0.00064	U		
EtFOSA	4151-50-2	ug/l					0.00054	U			0.00053	U			0.00053	U		
MeFOSAA	2355-31-9	ug/l					0.00052	U			0.00051	U			0.00051	U		
EtFOSAA	2991-50-6	ug/l					0.00093	U			0.00091	U			0.00091	U		
MeFOSE	24448-09-7	ug/l					0.0028	U			0.0028	U			0.0028	U		
EtFOSE	1691-99-2	ug/l					0.0038	U			0.0037	U			0.0038	U		
HFPO-DA (GenX)	13252-13-6	ug/l					0.0018	U			0.0018	U			0.0018	U		
ADONA	919005-14-4	ug/l					0.0013	U			0.0012	U			0.0012	U		
PFMPA	377-73-1	ug/l					0.00031	U			0.0003	U			0.0003	U		
PFMBA	863090-89-5	ug/l					0.00057	U			0.00056	U			0.00056	U		
NFDHA	151772-58-6	ug/l					0.0013	U			0.0013	U			0.0013	U		
9Cl-PF3ONS (F-53B Major)	756426-58-1	ug/l					0.0025	U			0.0024	U			0.0024	U		
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	ug/l					0.0018	U			0.0018	U			0.0018	U		
PFEESA	113507-82-7	ug/l					0.00028	U			0.00027	U			0.00027	U		
3:3 Fluorotelomer carboxylate	356-02-5	ug/l					0.0025	U			0.0024	U			0.0024	U		
5:3 Fluorotelomer carboxylate	914637-49-3	ug/l					0.0073	U			0.0071	U			0.0071	U		
7:3 Fluorotelomer carboxylate	812-70-4	ug/l					0.0063	U			0.0062	U			0.0062	U		
13C4-PFBA	13C4-PFBA	%					63				57				88			
13C5-PFPeA	13C5-PFPEA	%					92				94				91			

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-6		RI-MW-6		DUP-2025.01.29		DUP-2025.01.29		RI-MW-3		RI-MW-3		RI-MW-1	
Lab Sample ID:					JE4824-1		JE4824-1A		JE4824-2		JE4824-2A		JE4824-3		JE4824-3A		JE4824-4	
Date Sampled:					1/29/2025 10:15 AM		1/29/2025 10:15 AM		1/29/2025 9:55 AM		1/29/2025 9:55 AM		1/29/2025 11:20 AM		1/29/2025 11:20 AM		1/29/2025 2:40 PM	
Matrix:					Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
13C5-PFHxA	13C5-PFHXA	%					92				94				92			
13C4-PFHpA	13C4-PFHPA	%					94				100				100			
13C8-PFOA	13C8-PFOA	%					89				94				93			
13C9-PFNA	13C9-PFNA	%					90				100				94			
13C6-PFDA	13C6-PFDA	%					90				92				100			
13C7-PFUnDA	13C7-PFUNDA	%					85				92				99			
13C2-PFDoDA	13C2-PFDODA	%					84				86				88			
13C2-PFTeDA	13C2-PFTEDA	%					75				82				86			
13C3-PFBS	13C3-PFBS	%					90				89				93			
13C3-PFHxS	13C3-PFHXS	%					86				86				89			
13C8-PFOS	13C8-PFOS	%					91				98				92			
13C8-FOSA	13C8-FOSA	%					95				95				96			
d3-MeFOSA	D3-NMEFOSA	%					79				77				80			
d5-EtFOSA	D5-NETFOSA	%					76				73				79			
d3-MeFOSAA	D3-NMEFOSAA	%					96				100				110			
d5-EtFOSAA	D5-NETFOSAA	%					91				100				100			
d7-MeFOSE	D7-NMEFOSE	%					83				83				91			
d9-EtFOSE	D9-NETFOSE	%					76				80				85			
13C2-4:2FTS	13C2-4:2FTS	%					110				120				110			
13C2-6:2FTS	13C2-6:2FTS	%					110				110				120			
13C2-8:2FTS	13C2-8:2FTS	%					91				110				110			
13C3-HFPO-DA	13C3-HFPO-DA	%					75				83				80			
(MS Semi-volatiles (SW846 8270E BY SIM))																		
1,4-Dioxane	123-91-1	ug/l		0.35	0.05	U			0.05	U			0.05	U			0.05	U
Nitrobenzene-d5	4165-60-0	%			86				90				82				83	
2-Fluorobiphenyl	321-60-8	%			86				86				77				76	
Terphenyl-d14	1718-51-0	%			77				69				75				64	
(MS Semi-volatiles (SW846 8270E))																		
2-Chlorophenol	95-57-8	ug/l			0.82	U			0.82	U			0.82	U			0.82	U
4-Chloro-3-methyl phenol	59-50-7	ug/l			0.89	U			0.89	U			0.89	U			0.89	U
2,4-Dichlorophenol	120-83-2	ug/l	1		1.3	U			1.3	U			1.3	U			1.3	U
2,4-Dimethylphenol	105-67-9	ug/l	1	50	2.4	U			2.4	U			2.4	U			2.4	U
2,4-Dinitrophenol	51-28-5	ug/l	1	10	1.6	U			1.6	U			1.6	U			1.6	U
4,6-Dinitro-o-cresol	534-52-1	ug/l			1.3	U			1.3	U			1.3	U			1.3	U
2-Methylphenol	95-48-7	ug/l			0.89	U			0.89	U			0.89	U			0.89	U
3&4-Methylphenol	M+P-CRESOLS	ug/l			0.88	U			0.88	U			0.88	U			0.88	U
2-Nitrophenol	88-75-5	ug/l			0.96	U			0.96	U			0.96	U			0.96	U
4-Nitrophenol	100-02-7	ug/l			1.2	U			1.2	U			1.2	U			1.2	U
Pentachlorophenol	87-86-5	ug/l	1		1.4	U			1.4	U			1.4	U			1.4	U
Phenol	108-95-2	ug/l	1		0.39	U			0.39	U			0.39	U			0.39	U
2,3,4,6-Tetrachlorophenol	58-90-2	ug/l			1.5	U			1.5	U			1.5	U			1.5	U
2,4,5-Trichlorophenol	95-95-4	ug/l			1.3	U			1.3	U			1.3	U			1.3	U
2,4,6-Trichlorophenol	88-06-2	ug/l			0.92	U			0.92	U			0.92	U			0.92	U
Acenaphthene	83-32-9	ug/l		20	0.19	U			0.19	U			0.19	U			0.19	U
Acenaphthylene	208-96-8	ug/l			0.14	U			0.14	U			0.14	U			0.14	U
Acetophenone	98-86-2	ug/l			0.21	U			0.21	U			0.21	U			0.21	U
Anthracene	120-12-7	ug/l		50	0.21	U			0.21	U			0.21	U			0.21	U
Atrazine	1912-24-9	ug/l	7.5		0.45	U			0.45	U			0.45	U			0.45	U
Benzaldehyde	100-52-7	ug/l			0.29	U			0.29	U			0.29	U			0.29	U
Benzo(a)anthracene	56-55-3	ug/l		0.002	0.2	U			0.2	U			0.2	U			0.2	U
Benzo(a)pyrene	50-32-8	ug/l	ND		0.21	U			0.21	U			0.21	U			0.21	U
Benzo(b)fluoranthene	205-99-2	ug/l		0.002	0.21	U			0.21	U			0.21	U			0.21	U
Benzo(g,h,i)perylene	191-24-2	ug/l			0.34	U			0.34	U			0.34	U			0.34	U
Benzo(k)fluoranthene	207-08-9	ug/l		0.002	0.21	U			0.21	U			0.21	U			0.21	U
4-Bromophenyl phenyl ether	101-55-3	ug/l			0.4	U			0.4	U			0.4	U			0.4	U

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-6		RI-MW-6		DUP-2025.01.29		DUP-2025.01.29		RI-MW-3		RI-MW-3		RI-MW-1	
Lab Sample ID:					JE4824-1		JE4824-1A		JE4824-2		JE4824-2A		JE4824-3		JE4824-3A		JE4824-4	
Date Sampled:					1/29/2025 10:15 AM		1/29/2025 10:15 AM		1/29/2025 9:55 AM		1/29/2025 9:55 AM		1/29/2025 11:20 AM		1/29/2025 11:20 AM		1/29/2025 2:40 PM	
Matrix:					Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
Butyl benzyl phthalate	85-68-7	ug/l		50	0.46	U			0.46	U			0.46	U			0.46	U
1,1'-Biphenyl	92-52-4	ug/l	5		0.21	U			0.21	U			0.21	U			0.21	U
2-Chloronaphthalene	91-58-7	ug/l		10	0.24	U			0.24	U			0.24	U			0.24	U
4-Chloroaniline	106-47-8	ug/l	5		0.34	U			0.34	U			0.34	U			0.34	U
Carbazole	86-74-8	ug/l			0.23	U			0.23	U			0.23	U			0.23	U
Caprolactam	105-60-2	ug/l			0.65	U			0.65	U			0.65	U			0.65	U
Chrysene	218-01-9	ug/l		0.002	0.18	U			0.18	U			0.18	U			0.18	U
bis(2-Chloroethoxy)methane	111-91-1	ug/l	5		0.28	U			0.28	U			0.28	U			0.28	U
bis(2-Chloroethyl)ether	111-44-4	ug/l	1		0.25	U			0.25	U			0.25	U			0.25	U
2,2'-Oxybis(1-chloropropane)	108-60-1	ug/l	5		0.4	U			0.4	U			0.4	U			0.4	U
4-Chlorophenyl phenyl ether	7005-72-3	ug/l			0.37	U			0.37	U			0.37	U			0.37	U
2,4-Dinitrotoluene	121-14-2	ug/l	5		0.55	U			0.55	U			0.55	U			0.55	U
2,6-Dinitrotoluene	606-20-2	ug/l	5		0.48	U			0.48	U			0.48	U			0.48	U
3,3'-Dichlorobenzidine	91-94-1	ug/l	5		0.51	U			0.51	U			0.51	U			0.51	U
1,4-Dioxane (1)	123-91-1	ug/l			0.66	U			0.66	U			0.66	U			0.66	U
Dibenzo(a,h)anthracene	53-70-3	ug/l			0.33	U			0.33	U			0.33	U			0.33	U
Dibenzofuran	132-64-9	ug/l			0.22	U			0.22	U			0.22	U			0.22	U
Di-n-butyl phthalate	84-74-2	ug/l	50		0.5	U			0.5	U			0.5	U			0.5	U
Di-n-octyl phthalate	117-84-0	ug/l		50	0.23	U			0.23	U			0.23	U			0.23	U
Diethyl phthalate	84-66-2	ug/l		50	0.26	U			0.26	U			0.26	U			0.26	U
Dimethyl phthalate	131-11-3	ug/l		50	0.22	U			0.22	U			0.22	U			0.22	U
bis(2-Ethylhexyl)phthalate	117-81-7	ug/l	5		1.7	U			1.7	U			1.7	U			1.7	U
Fluoranthene	206-44-0	ug/l		50	0.17	U			0.17	U			0.17	U			0.17	U
Fluorene	86-73-7	ug/l		50	0.17	U			0.17	U			0.17	U			0.17	U
Hexachlorobenzene	118-74-1	ug/l	0.04		0.33	U			0.33	U			0.33	U			0.33	U
Hexachlorobutadiene	87-68-3	ug/l	0.5		0.49	U			0.49	U			0.49	U			0.49	U
Hexachlorocyclopentadiene	77-47-4	ug/l	5		2.8	U			2.8	U			2.8	U			2.8	U
Hexachloroethane	67-72-1	ug/l	5		0.39	U			0.39	U			0.39	U			0.39	U
Indeno(1,2,3-cd)pyrene	193-39-5	ug/l		0.002	0.33	U			0.33	U			0.33	U			0.33	U
Isophorone	78-59-1	ug/l		50	0.28	U			0.28	U			0.28	U			0.28	U
2-Methylnaphthalene	91-57-6	ug/l			0.21	U			0.21	U			0.21	U			0.21	U
2-Nitroaniline	88-74-4	ug/l	5		0.28	U			0.28	U			0.28	U			0.28	U
3-Nitroaniline	99-09-2	ug/l	5		0.39	U			0.39	U			0.39	U			0.39	U
4-Nitroaniline	100-01-6	ug/l	5		0.44	U			0.44	U			0.44	U			0.44	U
Naphthalene	91-20-3	ug/l		10	0.23	U			0.23	U			0.23	U			0.23	U
Nitrobenzene	98-95-3	ug/l	0.4		0.64	U			0.64	U			0.64	U			0.64	U
N-Nitroso-di-n-propylamine	621-64-7	ug/l			0.48	U			0.48	U			0.48	U			0.48	U
N-Nitrosodiphenylamine	86-30-6	ug/l		50	0.22	U			0.22	U			0.22	U			0.22	U
Phenanthrene	85-01-8	ug/l		50	0.18	U			0.18	U			0.18	U			0.18	U
Pyrene	129-00-0	ug/l		50	0.22	U			0.22	U			0.22	U			0.22	U
1,2,4,5-Tetrachlorobenzene	95-94-3	ug/l	5	10	0.37	U			0.37	U			0.37	U			0.37	U
2-Fluorophenol	367-12-4	%			51				52				48				45	
Phenol-d5	4165-62-2	%			34				34				33				31	
2,4,6-Tribromophenol	118-79-6	%			87				92				86				91	
Nitrobenzene-d5 (1)	4165-60-0	%			82				87				80				83	
2-Fluorobiphenyl (1)	321-60-8	%			81				85				76				75	
Terphenyl-d14 (1)	1718-51-0	%			96				98				95				87	

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-6		RI-MW-6		DUP-2025.01.29		DUP-2025.01.29		RI-MW-3		RI-MW-3		RI-MW-1	
Lab Sample ID:					JE4824-1		JE4824-1A		JE4824-2		JE4824-2A		JE4824-3		JE4824-3A		JE4824-4	
Date Sampled:					1/29/2025 10:15 AM		1/29/2025 10:15 AM		1/29/2025 9:55 AM		1/29/2025 9:55 AM		1/29/2025 11:20 AM		1/29/2025 11:20 AM		1/29/2025 2:40 PM	
Matrix:					Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
(MS Volatiles (SW846 8260D))																		
Acetone	67-64-1	ug/l		50	8.3	J			9.5	J			10.2				24.6	
Benzene	71-43-2	ug/l	1		0.43	U			0.43	U			0.43	U			0.43	U
Bromochloromethane	74-97-5	ug/l	5		0.48	U			0.48	U			0.48	U			0.48	U
Bromodichloromethane	75-27-4	ug/l		50	0.45	U			0.45	U			0.45	U			0.45	U
Bromoform	75-25-2	ug/l		50	0.63	U			0.63	U			0.63	U			0.63	U
Bromomethane	74-83-9	ug/l	5		1.6	U			1.6	U			1.6	U			1.6	U
2-Butanone (MEK)	78-93-3	ug/l		50	2.7	U			2.7	U			2.7	U			2.7	U
Carbon disulfide	75-15-0	ug/l	60	60	1.8	U			1.8	U			1.8	U			1.8	U
Carbon tetrachloride	56-23-5	ug/l	5		0.55	U			0.55	U			0.55	U			0.55	U
Chlorobenzene	108-90-7	ug/l	5		0.56	U			0.56	U			0.56	U			0.56	U
Chloroethane	75-00-3	ug/l	5		0.73	U			0.73	U			0.73	U			0.73	U
Chloroform	67-66-3	ug/l	7		0.5	U			0.5	U			0.5	U			0.5	U
Chloromethane	74-87-3	ug/l	5		0.76	U			0.76	U			0.76	U			0.76	U
Cyclohexane	110-82-7	ug/l			0.78	U			0.78	U			0.78	U			0.78	U
1,2-Dibromo-3-chloropropane	96-12-8	ug/l	0.04		0.53	U			0.53	U			0.53	U			0.53	U
Dibromochloromethane	124-48-1	ug/l		50	0.56	U			0.56	U			0.56	U			0.56	U
1,2-Dibromoethane	106-93-4	ug/l	0.0006		0.48	U			0.48	U			0.48	U			0.48	U
1,2-Dichlorobenzene	95-50-1	ug/l	3		0.53	U			0.53	U			0.53	U			0.53	U
1,3-Dichlorobenzene	541-73-1	ug/l	3		0.54	U			0.54	U			0.54	U			0.54	U
1,4-Dichlorobenzene	106-46-7	ug/l	3		0.51	U			0.51	U			0.51	U			0.51	U
Dichlorodifluoromethane	75-71-8	ug/l	5		0.56	U			0.56	U			0.56	U			0.56	U
1,1-Dichloroethane	75-34-3	ug/l	5		0.57	U			0.57	U			0.57	U			0.57	U
1,2-Dichloroethane	107-06-2	ug/l	0.6		0.6	U			0.6	U			0.6	U			0.6	U
1,1-Dichloroethene	75-35-4	ug/l	5		0.59	U			0.59	U			0.59	U			0.59	U
cis-1,2-Dichloroethene	156-59-2	ug/l	5		0.51	U			0.51	U			0.51	U			0.51	U
trans-1,2-Dichloroethene	156-60-5	ug/l	5		0.54	U			0.54	U			0.54	U			0.54	U
1,2-Dichloropropane	78-87-5	ug/l	1		0.51	U			0.51	U			0.51	U			0.51	U
cis-1,3-Dichloropropene	10061-01-5	ug/l			0.47	U			0.47	U			0.47	U			0.47	U
trans-1,3-Dichloropropene	10061-02-6	ug/l			0.43	U			0.43	U			0.43	U			0.43	U
Ethylbenzene	100-41-4	ug/l	5		0.6	U			0.6	U			0.6	U			0.6	U
Freon 113	76-13-1	ug/l	5		0.58	U			0.58	U			0.58	U			0.58	U
2-Hexanone	591-78-6	ug/l		50	4.8	U			4.8	U			4.8	U			4.8	U
Isopropylbenzene	98-82-8	ug/l	5		0.65	U			0.65	U			0.65	U			0.65	U
Methyl Acetate	79-20-9	ug/l			0.8	U			0.8	U			0.8	U			0.8	U
Methylcyclohexane	108-87-2	ug/l			0.6	U			0.6	U			0.6	U			0.6	U
Methyl Tert Butyl Ether	1634-04-4	ug/l	10	10	0.51	U			0.51	U			0.51	U			0.51	U
4-Methyl-2-pentanone(MIBK)	108-10-1	ug/l			4.9	U			4.9	U			4.9	U			4.9	U
Methylene chloride	75-09-2	ug/l	5		1	U			1	U			1	U			1	U
Styrene	100-42-5	ug/l	5		0.49	U			0.49	U			0.49	U			0.49	U
1,1,2,2-Tetrachloroethane	79-34-5	ug/l	5		0.65	U			0.65	U			0.65	U			0.65	U
Tetrachloroethene	127-18-4	ug/l	5		0.56	U			0.56	U			0.56	U			0.56	U
Toluene	108-88-3	ug/l	5		0.49	U			0.49	U			0.49	U			0.49	U
1,2,3-Trichlorobenzene	87-61-6	ug/l	5		0.5	U			0.5	U			0.5	U			0.5	U
1,2,4-Trichlorobenzene	120-82-1	ug/l	5		0.5	U			0.5	U			0.5	U			0.5	U
1,1,1-Trichloroethane	71-55-6	ug/l	5		0.54	U			0.54	U			0.54	U			0.54	U
1,1,2-Trichloroethane	79-00-5	ug/l	1		0.53	U			0.53	U			0.53	U			0.53	U
Trichloroethene	79-01-6	ug/l	5		0.53	U			0.53	U			0.53	U			0.53	U
Trichlorofluoromethane	75-69-4	ug/l	5		0.4	U			0.4	U			0.4	U			0.4	U
Vinyl chloride	75-01-4	ug/l	2		0.52	U			0.52	U			0.52	U			0.52	U
m,p-Xylene	M,P-XYLENE	ug/l			0.78	U			0.78	U			0.78	U			0.78	U
o-Xylene	95-47-6	ug/l	5		0.59	U			0.59	U			0.59	U			0.59	U
Xylene (total)	1330-20-7	ug/l	5		0.59	U			0.59	U			0.59	U			0.59	U

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	**CAS #**	**Units**	**NY TOGS Class GA GW Standards**	**NY TOGS Class GA GW Standard Guidance Values**	RI-MW-6		RI-MW-6		DUP-2025.01.29		DUP-2025.01.29		RI-MW-3		RI-MW-3		RI-MW-1	
Lab Sample ID:					JE4824-1		JE4824-1A		JE4824-2		JE4824-2A		JE4824-3		JE4824-3A		JE4824-4	
Date Sampled:					1/29/2025 10:15 AM		1/29/2025 10:15 AM		1/29/2025 9:55 AM		1/29/2025 9:55 AM		1/29/2025 11:20 AM		1/29/2025 11:20 AM		1/29/2025 2:40 PM	
Matrix:					Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
Dibromofluoromethane	1868-53-7	%			105				104				93				94	
1,2-Dichloroethane-D4	17060-07-0	%			106				108				99				98	
Toluene-D8	2037-26-5	%			100				100				94				95	
4-Bromofluorobenzene	460-00-4	%			97				98				93				97	

NOTES:

1. Results are measured in ug/L.

= concentration exceeds the NY TOGS Class GA GW Standards (NYSDEC 6/2004).

= concentration exceeds the NY TOGS Class GA GW Standard Guidance Values (NYSDEC 2/2023).

U: concentration not detected.

J: indicates an estimated value.

ABBREVIATIONS:

NY TOGS: New York Technical and Operational Guidance Series.

ug/L = micrograms per liter.

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-1		TB-2025.01.29		RI-MW-2		RI-MW-2		RI-MW-4		RI-MW-4		RI-MW-5	
Lab Sample ID:					JE4824-4A		JE4824-5		JE4914-1		JE4914-1A		JE4914-2		JE4914-2A		JE4914-3	
Date Sampled:					1/29/2025 2:40 PM		1/29/2025 2:40 PM		1/30/2025 1:55 PM		1/30/2025 1:55 PM		1/30/2025 11:15 AM		1/30/2025 11:15 AM		1/30/2025 3:05 PM	
Matrix:					Ground Water		Trip Blank Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
(GC/LC Semi-Volatiles (SW846 8081B))																		
Aldrin	309-00-2	ug/l	ND						0.0026	U			0.0026	U			0.0026	U
alpha-BHC	319-84-6	ug/l	0.01						0.0026	U			0.0026	U			0.0026	U
beta-BHC	319-85-7	ug/l	0.04						0.004	U			0.004	U			0.004	U
delta-BHC	319-86-8	ug/l	0.04						0.0033	U			0.0033	U			0.0033	U
gamma-BHC (Lindane)	58-89-9	ug/l	0.05						0.0061				0.003	U			0.003	U
alpha-Chlordane	5103-71-9	ug/l							0.0025	U			0.0025	U			0.0025	U
gamma-Chlordane	5103-74-2	ug/l							0.0021	U			0.0021	U			0.0021	U
Dieldrin	60-57-1	ug/l	0.004						0.0038	U			0.0038	U			0.0038	U
4,4'-DDD	72-54-8	ug/l	0.3						0.0029	U			0.0029	U			0.0029	U
4,4'-DDE	72-55-9	ug/l	0.2						0.0025	U			0.0025	U			0.0025	U
4,4'-DDT	50-29-3	ug/l	0.2						0.0034	U			0.0034	U			0.0034	U
Endrin	72-20-8	ug/l	ND						0.003	U			0.003	U			0.003	U
Endosulfan sulfate	1031-07-8	ug/l							0.0027	U			0.0027	U			0.0027	U
Endrin aldehyde	7421-93-4	ug/l	5						0.0034	U			0.0034	U			0.0034	U
Endrin ketone	53494-70-5	ug/l	5						0.0031	U			0.0031	U			0.0031	U
Endosulfan-I	959-98-8	ug/l							0.0026	U			0.0026	U			0.0026	U
Endosulfan-II	33213-65-9	ug/l							0.0024	U			0.0024	U			0.0024	U
Heptachlor	76-44-8	ug/l	0.04						0.0022	U			0.0022	U			0.0022	U
Heptachlor epoxide	1024-57-3	ug/l	0.03						0.003	U			0.003	U			0.003	U
Methoxychlor	72-43-5	ug/l	35						0.0034	U			0.0034	U			0.0034	U
Toxaphene	8001-35-2	ug/l	0.06						0.082	U			0.082	U			0.082	U
Tetrachloro-m-xylene	877-09-8	%							110				69				82	
Tetrachloro-m-xylene (1)	877-09-8	%							110				72				86	
Decachlorobiphenyl	2051-24-3	%							56				34				66	
Decachlorobiphenyl (1)	2051-24-3	%							52				32				60	
(GC/LC Semi-Volatiles (SW846 8082A))																		
Aroclor 1016	12674-11-2	ug/l	0.09						0.098	U			0.098	U			0.098	U
Aroclor 1221	11104-28-2	ug/l	0.09						0.21	U			0.21	U			0.21	U
Aroclor 1232	11141-16-5	ug/l	0.09						0.13	U			0.13	U			0.13	U
Aroclor 1242	53469-21-9	ug/l	0.09						0.23	U			0.23	U			0.23	U
Aroclor 1248	12672-29-6	ug/l	0.09						0.22	U			0.22	U			0.22	U
Aroclor 1254	11097-69-1	ug/l	0.09						0.21	U			0.21	U			0.21	U
Aroclor 1260	11096-82-5	ug/l	0.09						0.21	U			0.21	U			0.21	U
Aroclor 1268	11100-14-4	ug/l	0.09						0.087	U			0.087	U			0.087	U
Aroclor 1262	37324-23-5	ug/l	0.09						0.23	U			0.23	U			0.23	U
Tetrachloro-m-xylene (2)	877-09-8	%							100				73				84	
Tetrachloro-m-xylene (3)	877-09-8	%							88				64				74	
Decachlorobiphenyl (2)	2051-24-3	%							46				29				55	
Decachlorobiphenyl (3)	2051-24-3	%							51				31				61	
(General Chemistry (EPA 335.4/LACHAT))																		
Cyanide	57-12-5	mg/l	0.2						0.01	U			0.015				0.01	U
(Metals Analysis (SW846 6010D))																		
Aluminum	7429-90-5	ug/l							4120				609				967	
Antimony	7440-36-0	ug/l	3						6	U			7.7				6	U
Arsenic	7440-38-2	ug/l	25						3	U			5				3	U
Barium	7440-39-3	ug/l	1000						200	U			1340				200	U
Beryllium	7440-41-7	ug/l		3					1	U			1	U			1	U
Cadmium	7440-43-9	ug/l	5						3	U			6	U			3	U
Calcium	7440-70-2	ug/l							17200				245000				185000	
Chromium	7440-47-3	ug/l	50						10	U			10	U			10	U
Cobalt	7440-48-4	ug/l							50	U			50	U			50	U
Copper	7440-50-8	ug/l	200						10	U			10	U			10	U
Iron	7439-89-6	ug/l	300						6540				88400				1420	
Lead	7439-92-1	ug/l	25						3	U			3	U			3	U

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-1		TB-2025.01.29		RI-MW-2		RI-MW-2		RI-MW-4		RI-MW-4		RI-MW-5	
Lab Sample ID:					JE4824-4A		JE4824-5		JE4914-1		JE4914-1A		JE4914-2		JE4914-2A		JE4914-3	
Date Sampled:					1/29/2025 2:40 PM		1/29/2025 2:40 PM		1/30/2025 1:55 PM		1/30/2025 1:55 PM		1/30/2025 11:15 AM		1/30/2025 11:15 AM		1/30/2025 3:05 PM	
Matrix:					Ground Water		Trip Blank Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
Magnesium	7439-95-4	ug/l		35000					5000	U			74300				31600	
Manganese	7439-96-5	ug/l	300						470				5570				2970	
Nickel	7440-02-0	ug/l	100						10	U			10	U			10	U
Potassium	7440-09-7	ug/l							10000	U			128000				29100	
Selenium	7782-49-2	ug/l	10						10	U			10	U			10	U
Silver	7440-22-4	ug/l	50						10	U			10	U			10	U
Sodium	7440-23-5	ug/l	20000						468000				2200000				53300	
Thallium	7440-28-0	ug/l		0.5					10	U			10	U			10	U
Vanadium	7440-62-2	ug/l							50	U			50	U			50	U
Zinc	7440-66-6	ug/l		2000					40.1				20	U			20	U
(Metals Analysis (SW846 7470A))																		
Mercury	7439-97-6	ug/l	0.7						0.2	U			0.2	U			0.2	U
(MS Semi-volatiles (EPA 1633))																		
Perfluorobutanoic acid	375-22-4	ug/l			0.00092	U					0.00093	U			0.026			
Perfluoropentanoic acid	2706-90-3	ug/l			0.0063						0.0269				0.0377			
Perfluorohexanoic acid	307-24-4	ug/l			0.0084						0.0314				0.0342			
Perfluoroheptanoic acid	375-85-9	ug/l			0.0062						0.0191				0.0143			
Perfluorooctanoic acid	335-67-1	ug/l		0.0067	0.0149						0.0735				0.0302			
Perfluorononanoic acid	375-95-1	ug/l			0.0011	J					0.0052				0.00042	U		
Perfluorodecanoic acid	335-76-2	ug/l			0.00061	U					0.00062	U			0.00066	U		
Perfluoroundecanoic acid	2058-94-8	ug/l			0.00054	U					0.00055	U			0.00058	U		
Perfluorododecanoic acid	307-55-1	ug/l			0.00076	U					0.00077	U			0.00082	U		
Perfluorotridecanoic acid	72629-94-8	ug/l			0.00078	U					0.00079	U			0.00084	U		
Perfluorotetradecanoic acid	376-06-7	ug/l			0.00075	U					0.00076	U			0.00081	U		
Perfluorobutanesulfonic acid	375-73-5	ug/l			0.0062						0.0043				0.0048			
Perfluoropentanesulfonic acid	2706-91-4	ug/l			0.001	U					0.0012	J			0.0019	J		
Perfluorohexanesulfonic acid	355-46-4	ug/l			0.0028						0.0048				0.0065			
Perfluoroheptanesulfonic acid	375-92-8	ug/l			0.00097	U					0.001	J			0.001	U		
Perfluorooctanesulfonic acid	1763-23-1	ug/l		0.0027	0.009						0.0414				0.0043			
Perfluorononanesulfonic acid	68259-12-1	ug/l			0.0014	U					0.0014	U			0.0015	U		
Perfluorodecanesulfonic acid	335-77-3	ug/l			0.0011	U					0.0011	U			0.0012	U		
Perfluorododecanesulfonic acid	79780-39-5	ug/l			0.0004	U					0.0004	U			0.00042	U		
4:2 Fluorotelomer sulfonate	757124-72-4	ug/l			0.0022	U					0.0023	U			0.0024	U		
6:2 Fluorotelomer sulfonate	27619-97-2	ug/l			0.0009	U					0.00091	U			0.00097	U		
8:2 Fluorotelomer sulfonate	39108-34-4	ug/l			0.0014	U					0.0015	U			0.0015	U		
PFOSA	754-91-6	ug/l			0.00068	U					0.00069	U			0.00073	U		
MeFOSA	31506-32-8	ug/l			0.00063	U					0.00064	U			0.00068	U		
EtFOSA	4151-50-2	ug/l			0.00052	U					0.00053	U			0.00056	U		
MeFOSAA	2355-31-9	ug/l			0.0005	U					0.00051	U			0.00054	U		
EtFOSAA	2991-50-6	ug/l			0.0009	U					0.00091	U			0.00097	U		
MeFOSE	24448-09-7	ug/l			0.0028	U					0.0028	U			0.003	U		
EtFOSE	1691-99-2	ug/l			0.0037	U					0.0038	U			0.004	U		
HFPO-DA (GenX)	13252-13-6	ug/l			0.0018	U					0.0018	U			0.0019	U		
ADONA	919005-14-4	ug/l			0.0012	U					0.0012	U			0.0013	U		
PFMPA	377-73-1	ug/l			0.0003	U					0.0003	U			0.00032	U		
PFMBA	863090-89-5	ug/l			0.00055	U					0.00056	U			0.00059	U		
NFDHA	151772-58-6	ug/l			0.0013	U					0.0013	U			0.0014	U		
9Cl-PF3ONS (F-53B Major)	756426-58-1	ug/l			0.0024	U					0.0024	U			0.0026	U		
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	ug/l			0.0018	U					0.0018	U			0.0019	U		
PFEESA	113507-82-7	ug/l			0.00027	U					0.00027	U			0.00029	U		
3:3 Fluorotelomer carboxylate	356-02-5	ug/l			0.0024	U					0.0024	U			0.0026	U		
5:3 Fluorotelomer carboxylate	914637-49-3	ug/l			0.007	U					0.0071	U			0.0076	U		
7:3 Fluorotelomer carboxylate	812-70-4	ug/l			0.0061	U					0.0062	U			0.0066	U		
13C4-PFBA	13C4-PFBA	%			39						20				32			
13C5-PFPeA	13C5-PFPEA	%			88						92				53			

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-1		TB-2025.01.29		RI-MW-2		RI-MW-2		RI-MW-4		RI-MW-4		RI-MW-5	
Lab Sample ID:					JE4824-4A		JE4824-5		JE4914-1		JE4914-1A		JE4914-2		JE4914-2A		JE4914-3	
Date Sampled:					1/29/2025 2:40 PM		1/29/2025 2:40 PM		1/30/2025 1:55 PM		1/30/2025 1:55 PM		1/30/2025 11:15 AM		1/30/2025 11:15 AM		1/30/2025 3:05 PM	
Matrix:					Ground Water		Trip Blank Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
13C5-PFHxA	13C5-PFHXA	%			92						100				66			
13C4-PFHpA	13C4-PFHPA	%			97						110				76			
13C8-PFOA	13C8-PFOA	%			87						100				69			
13C9-PFNA	13C9-PFNA	%			97						110				63			
13C6-PFDA	13C6-PFDA	%			86						100				69			
13C7-PFUnDA	13C7-PFUNDA	%			84						110				59			
13C2-PFDoDA	13C2-PFDODA	%			80						110				65			
13C2-PFTeDA	13C2-PFTEDA	%			71						110				66			
13C3-PFBS	13C3-PFBS	%			90						110				75			
13C3-PFHxS	13C3-PFHXS	%			91						100				69			
13C8-PFOS	13C8-PFOS	%			93						100				65			
13C8-FOSA	13C8-FOSA	%			91						110				62			
d3-MeFOSA	D3-NMEFOSA	%			76						86				54			
d5-EtFOSA	D5-NETFOSA	%			74						78				52			
d3-MeFOSAA	D3-NMEFOSAA	%			98						120				67			
d5-EtFOSAA	D5-NETFOSAA	%			100						110				68			
d7-MeFOSE	D7-NMEFOSE	%			80						91				58			
d9-EtFOSE	D9-NETFOSE	%			72						82				52			
13C2-4:2FTS	13C2-4:2FTS	%			160						190				180			
13C2-6:2FTS	13C2-6:2FTS	%			150						180				140			
13C2-8:2FTS	13C2-8:2FTS	%			110						160				110			
13C3-HFPO-DA	13C3-HFPO-DA	%			75						86				44			
(MS Semi-volatiles (SW846 8270E BY SIM))																		
1,4-Dioxane	123-91-1	ug/l		0.35					0.159				0.198				0.805	
Nitrobenzene-d5	4165-60-0	%							82				72				88	
2-Fluorobiphenyl	321-60-8	%							77				75				85	
Terphenyl-d14	1718-51-0	%							53				31				62	
(MS Semi-volatiles (SW846 8270E))																		
2-Chlorophenol	95-57-8	ug/l							0.82	U			0.82	U			0.82	U
4-Chloro-3-methyl phenol	59-50-7	ug/l							0.89	U			0.89	U			0.89	U
2,4-Dichlorophenol	120-83-2	ug/l	1						1.3	U			1.3	U			1.3	U
2,4-Dimethylphenol	105-67-9	ug/l	1	50					2.4	U			2.4	U			2.4	U
2,4-Dinitrophenol	51-28-5	ug/l	1	10					1.6	U			1.6	U			1.6	U
4,6-Dinitro-o-cresol	534-52-1	ug/l							1.3	U			1.3	U			1.3	U
2-Methylphenol	95-48-7	ug/l							0.89	U			0.89	U			0.89	U
3&4-Methylphenol	M+P-CRESOLS	ug/l							0.88	U			0.88	U			0.88	U
2-Nitrophenol	88-75-5	ug/l							0.96	U			0.96	U			0.96	U
4-Nitrophenol	100-02-7	ug/l							1.2	U			1.2	U			1.2	U
Pentachlorophenol	87-86-5	ug/l	1						1.4	U			1.4	U			1.4	U
Phenol	108-95-2	ug/l	1						0.39	U			0.39	U			0.39	U
2,3,4,6-Tetrachlorophenol	58-90-2	ug/l							1.5	U			1.5	U			1.5	U
2,4,5-Trichlorophenol	95-95-4	ug/l							1.3	U			1.3	U			1.3	U
2,4,6-Trichlorophenol	88-06-2	ug/l							0.92	U			0.92	U			0.92	U
Acenaphthene	83-32-9	ug/l		20					0.19	U			0.19	U			0.74	J
Acenaphthylene	208-96-8	ug/l							0.14	U			0.14	U			0.14	U
Acetophenone	98-86-2	ug/l							0.21	U			0.21	U			0.21	U
Anthracene	120-12-7	ug/l		50					0.21	U			0.21	U			0.23	J
Atrazine	1912-24-9	ug/l	7.5						0.45	U			0.45	U			0.45	U
Benzaldehyde	100-52-7	ug/l							0.29	U			0.29	U			0.29	U
Benzo(a)anthracene	56-55-3	ug/l		0.002					0.2	U			0.2	U			0.2	U
Benzo(a)pyrene	50-32-8	ug/l	ND						0.21	U			0.21	U			0.21	U
Benzo(b)fluoranthene	205-99-2	ug/l		0.002					0.21	U			0.21	U			0.21	U
Benzo(g,h,i)perylene	191-24-2	ug/l							0.34	U			0.34	U			0.34	U
Benzo(k)fluoranthene	207-08-9	ug/l		0.002					0.21	U			0.21	U			0.21	U
4-Bromophenyl phenyl ether	101-55-3	ug/l							0.4	U			0.4	U			0.4	U

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-1		TB-2025.01.29		RI-MW-2		RI-MW-2		RI-MW-4		RI-MW-4		RI-MW-5	
Lab Sample ID:					JE4824-4A		JE4824-5		JE4914-1		JE4914-1A		JE4914-2		JE4914-2A		JE4914-3	
Date Sampled:					1/29/2025 2:40 PM		1/29/2025 2:40 PM		1/30/2025 1:55 PM		1/30/2025 1:55 PM		1/30/2025 11:15 AM		1/30/2025 11:15 AM		1/30/2025 3:05 PM	
Matrix:					Ground Water		Trip Blank Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
Butyl benzyl phthalate	85-68-7	ug/l		50					0.46	U			0.46	U			0.46	U
1,1'-Biphenyl	92-52-4	ug/l	5						0.21	U			0.21	U			0.21	U
2-Chloronaphthalene	91-58-7	ug/l		10					0.24	U			0.24	U			0.24	U
4-Chloroaniline	106-47-8	ug/l	5						0.34	U			0.34	U			0.34	U
Carbazole	86-74-8	ug/l							0.85	J			0.23	U			0.47	J
Caprolactam	105-60-2	ug/l							0.65	U			0.65	U			0.65	U
Chrysene	218-01-9	ug/l		0.002					0.18	U			0.18	U			0.18	U
bis(2-Chloroethoxy)methane	111-91-1	ug/l	5						0.28	U			0.28	U			0.28	U
bis(2-Chloroethyl)ether	111-44-4	ug/l	1						0.25	U			0.25	U			0.25	U
2,2'-Oxybis(1-chloropropane)	108-60-1	ug/l	5						0.4	U			0.4	U			0.4	U
4-Chlorophenyl phenyl ether	7005-72-3	ug/l							0.37	U			0.37	U			0.37	U
2,4-Dinitrotoluene	121-14-2	ug/l	5						0.55	U			0.55	U			0.55	U
2,6-Dinitrotoluene	606-20-2	ug/l	5						0.48	U			0.48	U			0.48	U
3,3'-Dichlorobenzidine	91-94-1	ug/l	5						0.51	U			0.51	U			0.51	U
1,4-Dioxane (1)	123-91-1	ug/l							0.66	U			0.66	U			0.87	J
Dibenzo(a,h)anthracene	53-70-3	ug/l							0.33	U			0.33	U			0.33	U
Dibenzofuran	132-64-9	ug/l							2.2	J			0.22	U			0.38	J
Di-n-butyl phthalate	84-74-2	ug/l	50						0.5	U			0.5	U			0.5	U
Di-n-octyl phthalate	117-84-0	ug/l		50					0.23	U			0.23	U			0.23	U
Diethyl phthalate	84-66-2	ug/l		50					0.26	U			0.26	U			0.26	U
Dimethyl phthalate	131-11-3	ug/l		50					0.22	U			0.22	U			0.22	U
bis(2-Ethylhexyl)phthalate	117-81-7	ug/l	5						1.7	U			1.7	U			1.7	U
Fluoranthene	206-44-0	ug/l		50					0.17	U			0.17	U			0.17	U
Fluorene	86-73-7	ug/l		50					0.17	U			0.17	U			0.37	J
Hexachlorobenzene	118-74-1	ug/l	0.04						0.33	U			0.33	U			0.33	U
Hexachlorobutadiene	87-68-3	ug/l	0.5						0.49	U			0.49	U			0.49	U
Hexachlorocyclopentadiene	77-47-4	ug/l	5						2.8	U			2.8	U			2.8	U
Hexachloroethane	67-72-1	ug/l	5						0.39	U			0.39	U			0.39	U
Indeno(1,2,3-cd)pyrene	193-39-5	ug/l		0.002					0.33	U			0.33	U			0.33	U
Isophorone	78-59-1	ug/l		50					0.28	U			0.28	U			0.28	U
2-Methylnaphthalene	91-57-6	ug/l							0.21	U			0.21	U			0.24	J
2-Nitroaniline	88-74-4	ug/l	5						0.28	U			0.28	U			0.28	U
3-Nitroaniline	99-09-2	ug/l	5						0.39	U			0.39	U			0.39	U
4-Nitroaniline	100-01-6	ug/l	5						0.44	U			0.44	U			0.44	U
Naphthalene	91-20-3	ug/l		10					0.23	U			0.23	U			0.6	J
Nitrobenzene	98-95-3	ug/l	0.4						0.64	U			0.64	U			0.64	U
N-Nitroso-di-n-propylamine	621-64-7	ug/l							0.48	U			0.48	U			0.48	U
N-Nitrosodiphenylamine	86-30-6	ug/l		50					0.22	U			0.22	U			0.22	U
Phenanthrene	85-01-8	ug/l		50					0.18	U			0.18	U			1.3	
Pyrene	129-00-0	ug/l		50					0.22	U			0.22	U			0.22	U
1,2,4,5-Tetrachlorobenzene	95-94-3	ug/l	5	10					0.37	U			0.37	U			0.37	U
2-Fluorophenol	367-12-4	%							43				34				44	
Phenol-d5	4165-62-2	%							27				21				27	
2,4,6-Tribromophenol	118-79-6	%							93				77				90	
Nitrobenzene-d5 (1)	4165-60-0	%							75				64				72	
2-Fluorobiphenyl (1)	321-60-8	%							80				68				76	
Terphenyl-d14 (1)	1718-51-0	%							71				40				67	

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-1		TB-2025.01.29		RI-MW-2		RI-MW-2		RI-MW-4		RI-MW-4		RI-MW-5	
Lab Sample ID:					JE4824-4A		JE4824-5		JE4914-1		JE4914-1A		JE4914-2		JE4914-2A		JE4914-3	
Date Sampled:					1/29/2025 2:40 PM		1/29/2025 2:40 PM		1/30/2025 1:55 PM		1/30/2025 1:55 PM		1/30/2025 11:15 AM		1/30/2025 11:15 AM		1/30/2025 3:05 PM	
Matrix:					Ground Water		Trip Blank Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
(MS Volatiles (SW846 8260D))																		
Acetone	67-64-1	ug/l		50			3.1	U	3.3	J			17				20	
Benzene	71-43-2	ug/l	1				0.43	U	0.43	U			0.43	U			0.43	U
Bromochloromethane	74-97-5	ug/l	5				0.48	U	0.48	U			0.48	U			0.48	U
Bromodichloromethane	75-27-4	ug/l		50			0.45	U	0.45	U			0.45	U			0.45	U
Bromoform	75-25-2	ug/l		50			0.63	U	0.63	U			0.63	U			0.63	U
Bromomethane	74-83-9	ug/l	5				1.6	U	1.6	U			1.6	U			1.6	U
2-Butanone (MEK)	78-93-3	ug/l		50			2.7	U	2.7	U			2.7	U			2.7	U
Carbon disulfide	75-15-0	ug/l	60	60			1.8	U	1.8	U			1.8	U			1.8	U
Carbon tetrachloride	56-23-5	ug/l	5				0.55	U	0.55	U			0.55	U			0.55	U
Chlorobenzene	108-90-7	ug/l	5				0.56	U	0.56	U			0.56	U			0.56	U
Chloroethane	75-00-3	ug/l	5				0.73	U	0.73	U			0.73	U			0.73	U
Chloroform	67-66-3	ug/l	7				0.5	U	0.5	U			0.5	U			0.5	U
Chloromethane	74-87-3	ug/l	5				0.76	U	0.76	U			0.76	U			0.76	U
Cyclohexane	110-82-7	ug/l					0.78	U	0.78	U			0.78	U			0.78	U
1,2-Dibromo-3-chloropropane	96-12-8	ug/l	0.04				0.53	U	0.53	U			0.53	U			0.53	U
Dibromochloromethane	124-48-1	ug/l		50			0.56	U	0.56	U			0.56	U			0.56	U
1,2-Dibromoethane	106-93-4	ug/l	0.0006				0.48	U	0.48	U			0.48	U			0.48	U
1,2-Dichlorobenzene	95-50-1	ug/l	3				0.53	U	0.53	U			0.53	U			0.53	U
1,3-Dichlorobenzene	541-73-1	ug/l	3				0.54	U	0.54	U			0.54	U			0.54	U
1,4-Dichlorobenzene	106-46-7	ug/l	3				0.51	U	0.51	U			0.51	U			0.51	U
Dichlorodifluoromethane	75-71-8	ug/l	5				0.56	U	0.56	U			0.56	U			0.56	U
1,1-Dichloroethane	75-34-3	ug/l	5				0.57	U	0.57	U			0.57	U			0.57	U
1,2-Dichloroethane	107-06-2	ug/l	0.6				0.6	U	0.6	U			0.6	U			0.6	U
1,1-Dichloroethene	75-35-4	ug/l	5				0.59	U	0.59	U			0.59	U			0.59	U
cis-1,2-Dichloroethene	156-59-2	ug/l	5				0.51	U	0.51	U			0.51	U			0.51	U
trans-1,2-Dichloroethene	156-60-5	ug/l	5				0.54	U	0.54	U			0.54	U			0.54	U
1,2-Dichloropropane	78-87-5	ug/l	1				0.51	U	0.51	U			0.51	U			0.51	U
cis-1,3-Dichloropropene	10061-01-5	ug/l					0.47	U	0.47	U			0.47	U			0.47	U
trans-1,3-Dichloropropene	10061-02-6	ug/l					0.43	U	0.43	U			0.43	U			0.43	U
Ethylbenzene	100-41-4	ug/l	5				0.6	U	0.6	U			0.6	U			0.6	U
Freon 113	76-13-1	ug/l	5				0.58	U	0.58	U			0.58	U			0.58	U
2-Hexanone	591-78-6	ug/l		50			4.8	U	4.8	U			4.8	U			4.8	U
Isopropylbenzene	98-82-8	ug/l	5				0.65	U	0.65	U			0.65	U			0.65	U
Methyl Acetate	79-20-9	ug/l					0.8	U	0.8	U			0.8	U			0.8	U
Methylcyclohexane	108-87-2	ug/l					0.6	U	0.6	U			0.6	U			0.6	U
Methyl Tert Butyl Ether	1634-04-4	ug/l	10	10			0.51	U	0.51	U			0.51	U			0.51	U
4-Methyl-2-pentanone(MIBK)	108-10-1	ug/l					4.9	U	4.9	U			4.9	U			4.9	U
Methylene chloride	75-09-2	ug/l	5				1	U	1	U			1	U			1	U
Styrene	100-42-5	ug/l	5				0.49	U	0.49	U			0.49	U			0.49	U
1,1,2,2-Tetrachloroethane	79-34-5	ug/l	5				0.65	U	0.65	U			0.65	U			0.65	U
Tetrachloroethene	127-18-4	ug/l	5				0.56	U	0.56	U			0.56	U			0.56	U
Toluene	108-88-3	ug/l	5				0.49	U	0.49	U			0.49	U			0.49	U
1,2,3-Trichlorobenzene	87-61-6	ug/l	5				0.5	U	0.5	U			0.5	U			0.5	U
1,2,4-Trichlorobenzene	120-82-1	ug/l	5				0.5	U	0.5	U			0.5	U			0.5	U
1,1,1-Trichloroethane	71-55-6	ug/l	5				0.54	U	0.54	U			0.54	U			0.54	U
1,1,2-Trichloroethane	79-00-5	ug/l	1				0.53	U	0.53	U			0.53	U			0.53	U
Trichloroethene	79-01-6	ug/l	5				0.53	U	0.53	U			0.53	U			0.53	U
Trichlorofluoromethane	75-69-4	ug/l	5				0.4	U	0.4	U			0.4	U			0.4	U
Vinyl chloride	75-01-4	ug/l	2				0.52	U	0.52	U			0.52	U			0.52	U
m,p-Xylene	M,P-XYLENE	ug/l					0.78	U	0.78	U			0.78	U			0.78	U
o-Xylene	95-47-6	ug/l	5				0.59	U	0.59	U			0.59	U			0.59	U
Xylene (total)	1330-20-7	ug/l	5				0.59	U	0.59	U			0.59	U			0.59	U

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-1		TB-2025.01.29		RI-MW-2		RI-MW-2		RI-MW-4		RI-MW-4		RI-MW-5	
Lab Sample ID:					JE4824-4A		JE4824-5		JE4914-1		JE4914-1A		JE4914-2		JE4914-2A		JE4914-3	
Date Sampled:					1/29/2025 2:40 PM		1/29/2025 2:40 PM		1/30/2025 1:55 PM		1/30/2025 1:55 PM		1/30/2025 11:15 AM		1/30/2025 11:15 AM		1/30/2025 3:05 PM	
Matrix:					Ground Water		Trip Blank Water		Ground Water		Ground Water		Ground Water		Ground Water		Ground Water	
Dibromofluoromethane	1868-53-7	%					102		101				102				102	
1,2-Dichloroethane-D4	17060-07-0	%					107		106				104				106	
Toluene-D8	2037-26-5	%					100		102				101				102	
4-Bromofluorobenzene	460-00-4	%					96		94				96				95	

NOTES:

1. Results are measured in ug/L.

= concentration exceeds the NY TOGS Class GA GW Standards (NYSDEC (

= concentration exceeds the NY TOGS Class GA GW Standard Guidance Va 2/2023).

U: concentration not detected.

J: indicates an estimated value.

ABBREVIATIONS:

NY TOGS: New York Technical and Operational Guidance Series.

ug/L = micrograms per liter.

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-5		FB-2025.01.30		FB-2025.01.30	
Lab Sample ID:					JE4914-3A		JE4914-4		JE4914-4A	
Date Sampled:					1/30/2025 3:05 PM		1/30/2025 3:45 PM		1/30/2025 3:45 PM	
Matrix:					Ground Water		Field Blank Water		Field Blank Water	
(GC/LC Semi-Volatiles (SW846 8081B))										
Aldrin	309-00-2	ug/l	ND				0.0026	U		
alpha-BHC	319-84-6	ug/l	0.01				0.0026	U		
beta-BHC	319-85-7	ug/l	0.04				0.004	U		
delta-BHC	319-86-8	ug/l	0.04				0.0033	U		
gamma-BHC (Lindane)	58-89-9	ug/l	0.05				0.003	U		
alpha-Chlordane	5103-71-9	ug/l					0.0025	U		
gamma-Chlordane	5103-74-2	ug/l					0.0021	U		
Dieldrin	60-57-1	ug/l	0.004				0.0038	U		
4,4'-DDD	72-54-8	ug/l	0.3				0.0029	U		
4,4'-DDE	72-55-9	ug/l	0.2				0.0025	U		
4,4'-DDT	50-29-3	ug/l	0.2				0.0034	U		
Endrin	72-20-8	ug/l	ND				0.003	U		
Endosulfan sulfate	1031-07-8	ug/l					0.0027	U		
Endrin aldehyde	7421-93-4	ug/l	5				0.0034	U		
Endrin ketone	53494-70-5	ug/l	5				0.0031	U		
Endosulfan-I	959-98-8	ug/l					0.0026	U		
Endosulfan-II	33213-65-9	ug/l					0.0024	U		
Heptachlor	76-44-8	ug/l	0.04				0.0022	U		
Heptachlor epoxide	1024-57-3	ug/l	0.03				0.003	U		
Methoxychlor	72-43-5	ug/l	35				0.0034	U		
Toxaphene	8001-35-2	ug/l	0.06				0.082	U		
Tetrachloro-m-xylene	877-09-8	%					87			
Tetrachloro-m-xylene (1)	877-09-8	%					90			
Decachlorobiphenyl	2051-24-3	%					54			
Decachlorobiphenyl (1)	2051-24-3	%					51			
(GC/LC Semi-Volatiles (SW846 8082A))										
Aroclor 1016	12674-11-2	ug/l	0.09				0.098	U		
Aroclor 1221	11104-28-2	ug/l	0.09				0.21	U		
Aroclor 1232	11141-16-5	ug/l	0.09				0.13	U		
Aroclor 1242	53469-21-9	ug/l	0.09				0.23	U		
Aroclor 1248	12672-29-6	ug/l	0.09				0.22	U		
Aroclor 1254	11097-69-1	ug/l	0.09				0.21	U		
Aroclor 1260	11096-82-5	ug/l	0.09				0.21	U		
Aroclor 1268	11100-14-4	ug/l	0.09				0.087	U		
Aroclor 1262	37324-23-5	ug/l	0.09				0.23	U		
Tetrachloro-m-xylene (2)	877-09-8	%					99			
Tetrachloro-m-xylene (3)	877-09-8	%					92			
Decachlorobiphenyl (2)	2051-24-3	%					53			
Decachlorobiphenyl (3)	2051-24-3	%					54			
(General Chemistry (EPA 335.4/LACHAT))										
Cyanide	57-12-5	mg/l	0.2				0.01	U		
(Metals Analysis (SW846 6010D))										
Aluminum	7429-90-5	ug/l					200	U		
Antimony	7440-36-0	ug/l	3				6	U		
Arsenic	7440-38-2	ug/l	25				3	U		
Barium	7440-39-3	ug/l	1000				200	U		
Beryllium	7440-41-7	ug/l		3			1	U		
Cadmium	7440-43-9	ug/l	5				3	U		
Calcium	7440-70-2	ug/l					5000	U		
Chromium	7440-47-3	ug/l	50				10	U		
Cobalt	7440-48-4	ug/l					50	U		
Copper	7440-50-8	ug/l	200				10	U		
Iron	7439-89-6	ug/l	300				100	U		
Lead	7439-92-1	ug/l	25				3	U		

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-5		FB-2025.01.30		FB-2025.01.30	
Lab Sample ID:					JE4914-3A		JE4914-4		JE4914-4A	
Date Sampled:					1/30/2025 3:05 PM		1/30/2025 3:45 PM		1/30/2025 3:45 PM	
Matrix:					Ground Water		Field Blank Water		Field Blank Water	
Magnesium	7439-95-4	ug/l		35000			5000	U		
Manganese	7439-96-5	ug/l	300				15	U		
Nickel	7440-02-0	ug/l	100				10	U		
Potassium	7440-09-7	ug/l					10000	U		
Selenium	7782-49-2	ug/l	10				10	U		
Silver	7440-22-4	ug/l	50				10	U		
Sodium	7440-23-5	ug/l	20000				10000	U		
Thallium	7440-28-0	ug/l		0.5			10	U		
Vanadium	7440-62-2	ug/l					50	U		
Zinc	7440-66-6	ug/l		2000			20	U		
(Metals Analysis (SW846 7470A))										
Mercury	7439-97-6	ug/l	0.7				0.2	U		
(MS Semi-volatiles (EPA 1633))										
Perfluorobutanoic acid	375-22-4	ug/l			0.0202				0.00094	U
Perfluoropentanoic acid	2706-90-3	ug/l			0.0106				0.00073	U
Perfluorohexanoic acid	307-24-4	ug/l			0.0167				0.00029	U
Perfluoroheptanoic acid	375-85-9	ug/l			0.01				0.0005	U
Perfluorooctanoic acid	335-67-1	ug/l		0.0067	0.0229				0.00075	U
Perfluorononanoic acid	375-95-1	ug/l			0.00041	U			0.0004	U
Perfluorodecanoic acid	335-76-2	ug/l			0.00063	U			0.00062	U
Perfluoroundecanoic acid	2058-94-8	ug/l			0.00056	U			0.00055	U
Perfluorododecanoic acid	307-55-1	ug/l			0.00078	U			0.00077	U
Perfluorotridecanoic acid	72629-94-8	ug/l			0.0008	U			0.00079	U
Perfluorotetradecanoic acid	376-06-7	ug/l			0.00077	U			0.00076	U
Perfluorobutanesulfonic acid	375-73-5	ug/l			0.0045				0.00066	U
Perfluoropentanesulfonic acid	2706-91-4	ug/l			0.0014	J			0.001	U
Perfluorohexanesulfonic acid	355-46-4	ug/l			0.002				0.0011	U
Perfluoroheptanesulfonic acid	375-92-8	ug/l			0.001	U			0.00099	U
Perfluorooctanesulfonic acid	1763-23-1	ug/l		0.0027	0.006				0.00043	U
Perfluorononanesulfonic acid	68259-12-1	ug/l			0.0015	U			0.0014	U
Perfluorodecanesulfonic acid	335-77-3	ug/l			0.0011	U			0.0011	U
Perfluorododecanesulfonic acid	79780-39-5	ug/l			0.00041	U			0.0004	U
4:2 Fluorotelomer sulfonate	757124-72-4	ug/l			0.0023	U			0.0023	U
6:2 Fluorotelomer sulfonate	27619-97-2	ug/l			0.00092	U			0.00092	U
8:2 Fluorotelomer sulfonate	39108-34-4	ug/l			0.0015	U			0.0015	U
PFOSA	754-91-6	ug/l			0.0007	U			0.00069	U
MeFOSA	31506-32-8	ug/l			0.00065	U			0.00064	U
EtFOSA	4151-50-2	ug/l			0.00054	U			0.00053	U
MeFOSAA	2355-31-9	ug/l			0.00052	U			0.00051	U
EtFOSAA	2991-50-6	ug/l			0.00092	U			0.00092	U
MeFOSE	24448-09-7	ug/l			0.0028	U			0.0028	U
EtFOSE	1691-99-2	ug/l			0.0038	U			0.0038	U
HFPO-DA (GenX)	13252-13-6	ug/l			0.0018	U			0.0018	U
ADONA	919005-14-4	ug/l			0.0012	U			0.0012	U
PFMPA	377-73-1	ug/l			0.0003	U			0.0003	U
PFMBA	863090-89-5	ug/l			0.00057	U			0.00056	U
NFDHA	151772-58-6	ug/l			0.0013	U			0.0013	U
9Cl-PF3ONS (F-53B Major)	756426-58-1	ug/l			0.0025	U			0.0025	U
11Cl-PF3OUdS (F-53B Minor)	763051-92-9	ug/l			0.0018	U			0.0018	U
PFEESA	113507-82-7	ug/l			0.00027	U			0.00027	U
3:3 Fluorotelomer carboxylate	356-02-5	ug/l			0.0025	U			0.0024	U
5:3 Fluorotelomer carboxylate	914637-49-3	ug/l			0.0072	U			0.0072	U
7:3 Fluorotelomer carboxylate	812-70-4	ug/l			0.0063	U			0.0062	U
13C4-PFBA	13C4-PFBA	%			62				93	
13C5-PFPeA	13C5-PFPEA	%			75				93	

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-5		FB-2025.01.30		FB-2025.01.30	
Lab Sample ID:					JE4914-3A		JE4914-4		JE4914-4A	
Date Sampled:					1/30/2025 3:05 PM		1/30/2025 3:45 PM		1/30/2025 3:45 PM	
Matrix:					Ground Water		Field Blank Water		Field Blank Water	
13C5-PFHxA	13C5-PFHXA	%			78				95	
13C4-PFHpA	13C4-PFHPA	%			82				95	
13C8-PFOA	13C8-PFOA	%			83				96	
13C9-PFNA	13C9-PFNA	%			76				100	
13C6-PFDA	13C6-PFDA	%			69				92	
13C7-PFUnDA	13C7-PFUNDA	%			75				91	
13C2-PFDoDA	13C2-PFDODA	%			75				88	
13C2-PFTeDA	13C2-PFTEDA	%			72				79	
13C3-PFBS	13C3-PFBS	%			93				98	
13C3-PFHxS	13C3-PFHXS	%			93				110	
13C8-PFOS	13C8-PFOS	%			68				100	
13C8-FOSA	13C8-FOSA	%			78				94	
d3-MeFOSA	D3-NMEFOSA	%			65				72	
d5-EtFOSA	D5-NETFOSA	%			62				71	
d3-MeFOSAA	D3-NMEFOSAA	%			83				100	
d5-EtFOSAA	D5-NETFOSAA	%			85				100	
d7-MeFOSE	D7-NMEFOSE	%			71				83	
d9-EtFOSE	D9-NETFOSE	%			69				78	
13C2-4:2FTS	13C2-4:2FTS	%			160				120	
13C2-6:2FTS	13C2-6:2FTS	%			130				120	
13C2-8:2FTS	13C2-8:2FTS	%			99				130	
13C3-HFPO-DA	13C3-HFPO-DA	%			73				92	
(MS Semi-volatiles (SW846 8270E BY SIM))										
1,4-Dioxane	123-91-1	ug/l		0.35			0.05	U		
Nitrobenzene-d5	4165-60-0	%					86			
2-Fluorobiphenyl	321-60-8	%					87			
Terphenyl-d14	1718-51-0	%					68			
(MS Semi-volatiles (SW846 8270E))										
2-Chlorophenol	95-57-8	ug/l					0.82	U		
4-Chloro-3-methyl phenol	59-50-7	ug/l					0.89	U		
2,4-Dichlorophenol	120-83-2	ug/l	1				1.3	U		
2,4-Dimethylphenol	105-67-9	ug/l	1	50			2.4	U		
2,4-Dinitrophenol	51-28-5	ug/l	1	10			1.6	U		
4,6-Dinitro-o-cresol	534-52-1	ug/l					1.3	U		
2-Methylphenol	95-48-7	ug/l					0.89	U		
3&4-Methylphenol	M+P-CRESOLS	ug/l					0.88	U		
2-Nitrophenol	88-75-5	ug/l					0.96	U		
4-Nitrophenol	100-02-7	ug/l					1.2	U		
Pentachlorophenol	87-86-5	ug/l	1				1.4	U		
Phenol	108-95-2	ug/l	1				0.39	U		
2,3,4,6-Tetrachlorophenol	58-90-2	ug/l					1.5	U		
2,4,5-Trichlorophenol	95-95-4	ug/l					1.3	U		
2,4,6-Trichlorophenol	88-06-2	ug/l					0.92	U		
Acenaphthene	83-32-9	ug/l		20			0.19	U		
Acenaphthylene	208-96-8	ug/l					0.14	U		
Acetophenone	98-86-2	ug/l					0.21	U		
Anthracene	120-12-7	ug/l		50			0.21	U		
Atrazine	1912-24-9	ug/l	7.5				0.45	U		
Benzaldehyde	100-52-7	ug/l					0.29	U		
Benzo(a)anthracene	56-55-3	ug/l		0.002			0.2	U		
Benzo(a)pyrene	50-32-8	ug/l	ND				0.21	U		
Benzo(b)fluoranthene	205-99-2	ug/l		0.002			0.21	U		
Benzo(g,h,i)perylene	191-24-2	ug/l					0.34	U		
Benzo(k)fluoranthene	207-08-9	ug/l		0.002			0.21	U		
4-Bromophenyl phenyl ether	101-55-3	ug/l					0.4	U		

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-5		FB-2025.01.30		FB-2025.01.30	
Lab Sample ID:					JE4914-3A		JE4914-4		JE4914-4A	
Date Sampled:					1/30/2025 3:05 PM		1/30/2025 3:45 PM		1/30/2025 3:45 PM	
Matrix:					Ground Water		Field Blank Water		Field Blank Water	
Butyl benzyl phthalate	85-68-7	ug/l		50			0.46	U		
1,1'-Biphenyl	92-52-4	ug/l	5				0.21	U		
2-Chloronaphthalene	91-58-7	ug/l		10			0.24	U		
4-Chloroaniline	106-47-8	ug/l	5				0.34	U		
Carbazole	86-74-8	ug/l					0.23	U		
Caprolactam	105-60-2	ug/l					0.65	U		
Chrysene	218-01-9	ug/l		0.002			0.18	U		
bis(2-Chloroethoxy)methane	111-91-1	ug/l	5				0.28	U		
bis(2-Chloroethyl)ether	111-44-4	ug/l	1				0.25	U		
2,2'-Oxybis(1-chloropropane)	108-60-1	ug/l	5				0.4	U		
4-Chlorophenyl phenyl ether	7005-72-3	ug/l					0.37	U		
2,4-Dinitrotoluene	121-14-2	ug/l	5				0.55	U		
2,6-Dinitrotoluene	606-20-2	ug/l	5				0.48	U		
3,3'-Dichlorobenzidine	91-94-1	ug/l	5				0.51	U		
1,4-Dioxane (1)	123-91-1	ug/l					0.66	U		
Dibenzo(a,h)anthracene	53-70-3	ug/l					0.33	U		
Dibenzofuran	132-64-9	ug/l					0.22	U		
Di-n-butyl phthalate	84-74-2	ug/l	50				0.5	U		
Di-n-octyl phthalate	117-84-0	ug/l		50			0.23	U		
Diethyl phthalate	84-66-2	ug/l		50			0.26	U		
Dimethyl phthalate	131-11-3	ug/l		50			0.22	U		
bis(2-Ethylhexyl)phthalate	117-81-7	ug/l	5				1.7	U		
Fluoranthene	206-44-0	ug/l		50			0.17	U		
Fluorene	86-73-7	ug/l		50			0.17	U		
Hexachlorobenzene	118-74-1	ug/l	0.04				0.33	U		
Hexachlorobutadiene	87-68-3	ug/l	0.5				0.49	U		
Hexachlorocyclopentadiene	77-47-4	ug/l	5				2.8	U		
Hexachloroethane	67-72-1	ug/l	5				0.39	U		
Indeno(1,2,3-cd)pyrene	193-39-5	ug/l		0.002			0.33	U		
Isophorone	78-59-1	ug/l		50			0.28	U		
2-Methylnaphthalene	91-57-6	ug/l					0.21	U		
2-Nitroaniline	88-74-4	ug/l	5				0.28	U		
3-Nitroaniline	99-09-2	ug/l	5				0.39	U		
4-Nitroaniline	100-01-6	ug/l	5				0.44	U		
Naphthalene	91-20-3	ug/l		10			0.23	U		
Nitrobenzene	98-95-3	ug/l	0.4				0.64	U		
N-Nitroso-di-n-propylamine	621-64-7	ug/l					0.48	U		
N-Nitrosodiphenylamine	86-30-6	ug/l		50			0.22	U		
Phenanthrene	85-01-8	ug/l		50			0.18	U		
Pyrene	129-00-0	ug/l		50			0.22	U		
1,2,4,5-Tetrachlorobenzene	95-94-3	ug/l	5	10			0.37	U		
2-Fluorophenol	367-12-4	%					46			
Phenol-d5	4165-62-2	%					28			
2,4,6-Tribromophenol	118-79-6	%					80			
Nitrobenzene-d5 (1)	4165-60-0	%					78			
2-Fluorobiphenyl (1)	321-60-8	%					77			
Terphenyl-d14 (1)	1718-51-0	%					74			

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	CAS #	Units	NY TOGS Class GA GW Standards	NY TOGS Class GA GW Standard Guidance Values	RI-MW-5		FB-2025.01.30		FB-2025.01.30	
Lab Sample ID:					JE4914-3A		JE4914-4		JE4914-4A	
Date Sampled:					1/30/2025 3:05 PM		1/30/2025 3:45 PM		1/30/2025 3:45 PM	
Matrix:					Ground Water		Field Blank Water		Field Blank Water	
(MS Volatiles (SW846 8260D))										
Acetone	67-64-1	ug/l		50			3.1	U		
Benzene	71-43-2	ug/l	1				0.43	U		
Bromochloromethane	74-97-5	ug/l	5				0.48	U		
Bromodichloromethane	75-27-4	ug/l		50			0.45	U		
Bromoform	75-25-2	ug/l		50			0.63	U		
Bromomethane	74-83-9	ug/l	5				1.6	U		
2-Butanone (MEK)	78-93-3	ug/l		50			2.7	U		
Carbon disulfide	75-15-0	ug/l	60	60			1.8	U		
Carbon tetrachloride	56-23-5	ug/l	5				0.55	U		
Chlorobenzene	108-90-7	ug/l	5				0.56	U		
Chloroethane	75-00-3	ug/l	5				0.73	U		
Chloroform	67-66-3	ug/l	7				0.5	U		
Chloromethane	74-87-3	ug/l	5				0.76	U		
Cyclohexane	110-82-7	ug/l					0.78	U		
1,2-Dibromo-3-chloropropane	96-12-8	ug/l	0.04				0.53	U		
Dibromochloromethane	124-48-1	ug/l		50			0.56	U		
1,2-Dibromoethane	106-93-4	ug/l	0.0006				0.48	U		
1,2-Dichlorobenzene	95-50-1	ug/l	3				0.53	U		
1,3-Dichlorobenzene	541-73-1	ug/l	3				0.54	U		
1,4-Dichlorobenzene	106-46-7	ug/l	3				0.51	U		
Dichlorodifluoromethane	75-71-8	ug/l	5				0.56	U		
1,1-Dichloroethane	75-34-3	ug/l	5				0.57	U		
1,2-Dichloroethane	107-06-2	ug/l	0.6				0.6	U		
1,1-Dichloroethene	75-35-4	ug/l	5				0.59	U		
cis-1,2-Dichloroethene	156-59-2	ug/l	5				0.51	U		
trans-1,2-Dichloroethene	156-60-5	ug/l	5				0.54	U		
1,2-Dichloropropane	78-87-5	ug/l	1				0.51	U		
cis-1,3-Dichloropropene	10061-01-5	ug/l					0.47	U		
trans-1,3-Dichloropropene	10061-02-6	ug/l					0.43	U		
Ethylbenzene	100-41-4	ug/l	5				0.6	U		
Freon 113	76-13-1	ug/l	5				0.58	U		
2-Hexanone	591-78-6	ug/l		50			4.8	U		
Isopropylbenzene	98-82-8	ug/l	5				0.65	U		
Methyl Acetate	79-20-9	ug/l					0.8	U		
Methylcyclohexane	108-87-2	ug/l					0.6	U		
Methyl Tert Butyl Ether	1634-04-4	ug/l	10	10			0.51	U		
4-Methyl-2-pentanone(MIBK)	108-10-1	ug/l					4.9	U		
Methylene chloride	75-09-2	ug/l	5				1	U		
Styrene	100-42-5	ug/l	5				0.49	U		
1,1,2,2-Tetrachloroethane	79-34-5	ug/l	5				0.65	U		
Tetrachloroethene	127-18-4	ug/l	5				0.56	U		
Toluene	108-88-3	ug/l	5				0.49	U		
1,2,3-Trichlorobenzene	87-61-6	ug/l	5				0.5	U		
1,2,4-Trichlorobenzene	120-82-1	ug/l	5				0.5	U		
1,1,1-Trichloroethane	71-55-6	ug/l	5				0.54	U		
1,1,2-Trichloroethane	79-00-5	ug/l	1				0.53	U		
Trichloroethene	79-01-6	ug/l	5				0.53	U		
Trichlorofluoromethane	75-69-4	ug/l	5				0.4	U		
Vinyl chloride	75-01-4	ug/l	2				0.52	U		
m,p-Xylene	M,P-XYLENE	ug/l					0.78	U		
o-Xylene	95-47-6	ug/l	5				0.59	U		
Xylene (total)	1330-20-7	ug/l	5				0.59	U		

Table 5.5
Summary of Groundwater Sample Results

Client Sample ID:	**CAS #**	**Units**	**NY TOGS Class GA GW Standards**	**NY TOGS Class GA GW Standard Guidance Values**	RI-MW-5		FB-2025.01.30		FB-2025.01.30	
Lab Sample ID:					JE4914-3A		JE4914-4		JE4914-4A	
Date Sampled:					1/30/2025 3:05 PM		1/30/2025 3:45 PM		1/30/2025 3:45 PM	
Matrix:					Ground Water		Field Blank Water		Field Blank Water	
Dibromofluoromethane	1868-53-7	%					99			
1,2-Dichloroethane-D4	17060-07-0	%					107			
Toluene-D8	2037-26-5	%					100			
4-Bromofluorobenzene	460-00-4	%					94			

NOTES:

1. Results are measured in ug/L.

= concentration exceeds the NY TOGS Class GA GW Standards (NYSDEC (

= concentration exceeds the NY TOGS Class GA GW Standard Guidance Va 2/2023).

U: concentration not detected.

J: indicates an estimated value.

ABBREVIATIONS:

NY TOGS: New York Technical and Operational Guidance Series.

ug/L = micrograms per liter.

Table 5.7
Summary of Sub-Slab Soil Vapor Results

Client Sample ID:	CAS #	Units	OA-1		SV-1		SV-2		SV-5		SV-4		SV-6		SV-3	
Lab Sample ID:			JE17883-1		JE17883-2		JE17883-3		JE17883-5		JE17883-6		JE17883-7		JE18460-1	
Date Sampled:			8/27/2025 12:45 PM		8/27/2025 12:17 PM		8/27/2025 1:19 PM		8/27/2025 12:50 PM		8/27/2025 12:48 PM		8/27/2025 12:58 PM		9/2/2025 11:37 AM	
Matrix:			Ambient Air Comp.		Soil Vapor Comp.		Soil Vapor Comp.		Soil Vapor Comp.		Soil Vapor Comp.		Soil Vapor Comp.		Soil Vapor Comp.	
(MS Volatiles (TO-15))																
Acetone (2-Propanone)	67-64-1	ug/m3	11		342		359		179		257		211		209	
1,3-Butadiene	106-99-0	ug/m3	0.15	U	15	U	0.75	U	0.38	U	0.55	U	0.38	U	0.19	U
Benzene	71-43-2	ug/m3	0.12	U	46	J	2.2	J	3.8		5.8		8.9		27	
Bromodichloromethane	75-27-4	ug/m3	0.16	U	16	U	0.8	U	0.4	U	0.6	U	0.4	U	0.2	U
Bromoform	75-25-2	ug/m3	0.59	U	59	U	2.9	U	1.4	U	2.2	U	1.4	U	0.73	U
Bromomethane	74-83-9	ug/m3	0.21	U	21	U	1.1	U	0.54	U	0.78	U	0.54	U	0.27	U
Bromoethene	593-60-2	ug/m3	0.21	U	21	U	1	U	0.52	U	0.79	U	0.52	U	0.27	U
Benzyl Chloride	100-44-7	ug/m3	0.52	U	52	U	2.6	U	1.3	U	1.9	U	1.3	U	0.67	U
Carbon disulfide	75-15-0	ug/m3	0.28	U	262		7.8		5.6		4.4		29		14	
Chlorobenzene	108-90-7	ug/m3	0.27	U	27	U	1.4	U	0.69	U	1	U	0.69	U	0.34	U
Chloroethane	75-00-3	ug/m3	0.14	U	14	U	0.71	U	0.37	U	0.53	U	0.37	U	0.18	U
Chloroform	67-66-3	ug/m3	0.15	U	15	U	0.73	U	0.36	U	0.54	U	0.36	U	0.18	U
Chloromethane	74-87-3	ug/m3	1.1		15	U	0.74	U	0.45	J	0.56	U	0.81	J	1.6	
3-Chloropropene	107-05-1	ug/m3	0.21	U	21	U	1	U	0.53	U	0.78	U	0.53	U	0.26	U
2-Chlorotoluene	95-49-8	ug/m3	0.3	U	30	U	1.5	U	0.72	U	1.1	U	0.72	U	0.37	U
Carbon tetrachloride	56-23-5	ug/m3	0.2	U	20	U	1	U	0.5	U	0.75	U	0.5	U	0.25	U
Cyclohexane	110-82-7	ug/m3	0.12	U	12	U	2.1	J	4.1		3.2		1.1	J	43.7	
1,1-Dichloroethane	75-34-3	ug/m3	0.19	U	19	U	0.93	U	0.45	U	0.69	U	0.45	U	0.23	U
1,1-Dichloroethylene	75-35-4	ug/m3	0.19	U	19	U	0.95	U	0.48	U	0.67	U	0.48	U	0.23	U
1,2-Dibromoethane (EDB)	106-93-4	ug/m3	0.18	U	18	U	0.92	U	0.46	U	0.68	U	0.46	U	0.23	U
1,2-Dichloroethane	107-06-2	ug/m3	0.23	U	23	U	1.1	U	0.57	U	0.85	U	0.57	U	0.28	U
1,2-Dichloropropane	78-87-5	ug/m3	0.23	U	23	U	1.2	U	0.55	U	0.83	U	0.55	U	0.29	U
1,4-Dioxane	123-91-1	ug/m3	0.14	U	14	U	0.68	U	0.35	U	0.5	U	0.35	U	0.17	U
Dichlorodifluoromethane	75-71-8	ug/m3	2.9		216		2.1	U	17		4.7		1	U	1.7	
Dibromochloromethane	124-48-1	ug/m3	0.83	U	83	U	4.2	U	2	U	3.1	U	2	U	1	U
trans-1,2-Dichloroethylene	156-60-5	ug/m3	0.22	U	22	U	1.1	U	0.56	U	0.79	U	0.56	U	0.27	U
cis-1,2-Dichloroethylene	156-59-2	ug/m3	0.095	U	9.5	U	3.8		2.1		0.35	U	0.24	U	0.52	J
cis-1,3-Dichloropropene	10061-01-5	ug/m3	0.23	U	23	U	1.1	U	0.54	U	0.82	U	0.54	U	0.28	U
m-Dichlorobenzene	541-73-1	ug/m3	0.13	U	13	U	0.66	U	0.34	U	0.5	U	0.34	U	0.17	U
o-Dichlorobenzene	95-50-1	ug/m3	0.33	U	33	U	1.7	U	0.84	U	1.2	U	0.84	U	0.41	U
p-Dichlorobenzene	106-46-7	ug/m3	0.38	U	38	U	1.9	U	0.96	U	1.4	U	0.96	U	0.47	U
trans-1,3-Dichloropropene	10061-02-6	ug/m3	0.37	U	37	U	1.8	U	0.91	U	1.4	U	0.91	U	0.45	U
Ethanol	64-17-5	ug/m3	3.8		60	U	6.4		30.9		4.7		17		19.4	
Ethylbenzene	100-41-4	ug/m3	0.21	U	43	J	48.2		9.6		55.2		4.3		4.1	
Ethyl Acetate	141-78-6	ug/m3	1.9		30	U	2.7	J	4		6.1		2.4		0.36	U
4-Ethyltoluene	622-96-8	ug/m3	0.37	U	37	U	3.8	J	4.9		3		2.9		1	
Freon 113	76-13-1	ug/m3	0.65	J	19	U	0.92	U	0.48	U	0.71	U	0.48	U	0.24	U
Freon 114	76-14-2	ug/m3	0.28	U	28	U	1.4	U	6.7		3.1	J	0.7	U	0.35	U
Heptane	142-82-5	ug/m3	0.3	U	32	J	2.3	J	11		7		0.78	J	18	
Hexachlorobutadiene	87-68-3	ug/m3	0.53	U	53	U	2.7	U	1.3	U	1.9	U	1.3	U	0.66	U
Hexane	110-54-3	ug/m3	20		15	U	3.5		15		29		3.1		44.8	
2-Hexanone	591-78-6	ug/m3	0.49	U	49	U	2.6	J	2.9		3.9		3		9.4	

Table 5.7
Summary of Sub-Slab Soil Vapor Results

Client Sample ID:	CAS #	Units	OA-1		SV-1		SV-2		SV-5		SV-4		SV-6		SV-3	
Lab Sample ID:			JE17883-1		JE17883-2		JE17883-3		JE17883-5		JE17883-6		JE17883-7		JE18460-1	
Date Sampled:			8/27/2025 12:45 PM		8/27/2025 12:17 PM		8/27/2025 1:19 PM		8/27/2025 12:50 PM		8/27/2025 12:48 PM		8/27/2025 12:58 PM		9/2/2025 11:37 AM	
Matrix:			Ambient Air Comp.		Soil Vapor Comp.		Soil Vapor Comp.		Soil Vapor Comp.		Soil Vapor Comp.		Soil Vapor Comp.		Soil Vapor Comp.	
Isopropyl Alcohol	67-63-0	ug/m3	1.6		27	U	12		2.5		4.4		0.69	U	3.2	
Methylene chloride	75-09-2	ug/m3	30		38	U	1.8	U	0.94	U	17		2.5		1.8	
Methyl ethyl ketone	78-93-3	ug/m3	0.38	J	12	U	8.3		8.8		17		11		17	
Methyl Isobutyl Ketone	108-10-1	ug/m3	0.24	U	24	U	1.2	U	0.61	U	0.9	U	0.61	U	0.3	U
Methyl Tert Butyl Ether	1634-04-4	ug/m3	0.23	U	23	U	1.2	U	0.58	U	0.87	U	0.58	U	0.29	U
Methylmethacrylate	80-62-6	ug/m3	0.23	U	23	U	1.1	U	0.57	U	0.86	U	0.57	U	0.29	U
Propylene	115-07-1	ug/m3	0.065	U	6.5	U	0.33	U	0.16	U	0.24	U	23.4		0.082	U
Styrene	100-42-5	ug/m3	0.18	U	18	U	0.89	U	0.85	J	0.68	U	0.47	U	0.23	U
1,1,1-Trichloroethane	71-55-6	ug/m3	0.34	U	34	U	1.7	U	0.87	U	1.3	U	0.87	U	0.43	U
1,1,2,2-Tetrachloroethane	79-34-5	ug/m3	0.26	U	26	U	1.3	U	0.66	U	0.96	U	0.66	U	0.33	U
1,1,2-Trichloroethane	79-00-5	ug/m3	0.16	U	16	U	0.82	U	0.41	U	0.6	U	0.41	U	0.21	U
1,2,4-Trichlorobenzene	120-82-1	ug/m3	0.72	U	72	U	3.6	U	1.8	U	2.7	U	1.8	U	0.89	U
1,2,4-Trimethylbenzene	95-63-6	ug/m3	0.34	U	46	J	30		25		20		23		8.8	
1,3,5-Trimethylbenzene	108-67-8	ug/m3	0.31	U	31	U	7.4		6.4		5.4		5.4		2.9	
2,2,4-Trimethylpentane	540-84-1	ug/m3	0.15	U	15	U	0.75	U	11		3		0.37	U	161	
Tertiary Butyl Alcohol	75-65-0	ug/m3	1		34.6	J	34.9		20		37.6		44.3		44.3	
Tetrachloroethylene	127-18-4	ug/m3	0.16	U	16	U	6.7		1.1		5.8		4.9		1.8	
Tetrahydrofuran	109-99-9	ug/m3	0.21	U	21	U	1.1	U	0.53	U	0.8	U	0.53	U	0.27	U
Toluene	108-88-3	ug/m3	0.17	U	41.1	J	6.8		6.8		7.5		13		12	
Trichloroethylene	79-01-6	ug/m3	0.081	U	8.1	U	0.97		0.2	U	1		0.2	U	0.64	
Trichlorofluoromethane	75-69-4	ug/m3	2.2		25600		28		6.7		0.96	U	89.9		0.96	J
Vinyl chloride	75-01-4	ug/m3	0.14	U	14	U	0.72	U	0.36	U	0.51	U	0.36	U	0.18	U
Vinyl Acetate	108-05-4	ug/m3	0.32	J	32	U	1.6	U	0.77	U	1.2	U	0.77	U	0.39	U
m,p-Xylene	M,P-XYLENE	ug/m3	0.48	U	185		339		26		283		25		12	
o-Xylene	95-47-6	ug/m3	0.27	U	112		153		15		110		14		8.7	
Xylenes (total)	1330-20-7	ug/m3	0.27	U	297		492		41		393		39		21	
4-Bromofluorobenzene	460-00-4	%	110		105		107		107		104		102		96	
4-Bromofluorobenzene (1)	460-00-4	%													97	

NOTES:

1. Results are measured in ug/m^3.

= concentration detected.

U: concentration not detected.

J: indicates an estimated value.

ABBREVIATIONS:

ug/m^3 = micrograms per meter cubed

Table 5.7
Summary of Sub-Slab Soil Vapor Results

Client Sample ID:	CAS #	Units	OA-1	
Lab Sample ID:			JE18460-2	
Date Sampled:			9/2/2025 11:41 AM	
Matrix:			Ambient Air Comp.	
(MS Volatiles (TO-15))				
Acetone (2-Propanone)	67-64-1	ug/m3	6.4	
1,3-Butadiene	106-99-0	ug/m3	0.15	U
Benzene	71-43-2	ug/m3	0.12	U
Bromodichloromethane	75-27-4	ug/m3	0.16	U
Bromoform	75-25-2	ug/m3	0.59	U
Bromomethane	74-83-9	ug/m3	0.21	U
Bromoethene	593-60-2	ug/m3	0.21	U
Benzyl Chloride	100-44-7	ug/m3	0.52	U
Carbon disulfide	75-15-0	ug/m3	0.28	U
Chlorobenzene	108-90-7	ug/m3	0.27	U
Chloroethane	75-00-3	ug/m3	0.14	U
Chloroform	67-66-3	ug/m3	0.15	U
Chloromethane	74-87-3	ug/m3	0.72	
3-Chloropropene	107-05-1	ug/m3	0.21	U
2-Chlorotoluene	95-49-8	ug/m3	0.3	U
Carbon tetrachloride	56-23-5	ug/m3	0.2	U
Cyclohexane	110-82-7	ug/m3	0.12	U
1,1-Dichloroethane	75-34-3	ug/m3	0.19	U
1,1-Dichloroethylene	75-35-4	ug/m3	0.19	U
1,2-Dibromoethane (EDB)	106-93-4	ug/m3	0.18	U
1,2-Dichloroethane	107-06-2	ug/m3	0.23	U
1,2-Dichloropropane	78-87-5	ug/m3	0.23	U
1,4-Dioxane	123-91-1	ug/m3	0.14	U
Dichlorodifluoromethane	75-71-8	ug/m3	1.9	
Dibromochloromethane	124-48-1	ug/m3	0.83	U
trans-1,2-Dichloroethylene	156-60-5	ug/m3	0.22	U
cis-1,2-Dichloroethylene	156-59-2	ug/m3	0.095	U
cis-1,3-Dichloropropene	10061-01-5	ug/m3	0.23	U
m-Dichlorobenzene	541-73-1	ug/m3	0.13	U
o-Dichlorobenzene	95-50-1	ug/m3	0.33	U
p-Dichlorobenzene	106-46-7	ug/m3	0.38	U
trans-1,3-Dichloropropene	10061-02-6	ug/m3	0.37	U
Ethanol	64-17-5	ug/m3	1.6	
Ethylbenzene	100-41-4	ug/m3	0.21	U
Ethyl Acetate	141-78-6	ug/m3	3.6	
4-Ethyltoluene	622-96-8	ug/m3	0.37	U
Freon 113	76-13-1	ug/m3	0.19	U
Freon 114	76-14-2	ug/m3	0.28	U
Heptane	142-82-5	ug/m3	0.3	U
Hexachlorobutadiene	87-68-3	ug/m3	0.53	U
Hexane	110-54-3	ug/m3	0.53	J
2-Hexanone	591-78-6	ug/m3	0.49	U

Table 5.7
Summary of Sub-Slab Soil Vapor Results

Client Sample ID:	**CAS #**	**Units**	OA-1	
Lab Sample ID:			JE18460-2	
Date Sampled:			9/2/2025 11:41 AM	
Matrix:			Ambient Air Comp.	
Isopropyl Alcohol	67-63-0	ug/m3	0.57	
Methylene chloride	75-09-2	ug/m3	0.83	
Methyl ethyl ketone	78-93-3	ug/m3	0.47	
Methyl Isobutyl Ketone	108-10-1	ug/m3	0.24	U
Methyl Tert Butyl Ether	1634-04-4	ug/m3	0.23	U
Methylmethacrylate	80-62-6	ug/m3	0.23	U
Propylene	115-07-1	ug/m3	0.065	U
Styrene	100-42-5	ug/m3	0.18	U
1,1,1-Trichloroethane	71-55-6	ug/m3	0.34	U
1,1,2,2-Tetrachloroethane	79-34-5	ug/m3	0.26	U
1,1,2-Trichloroethane	79-00-5	ug/m3	0.16	U
1,2,4-Trichlorobenzene	120-82-1	ug/m3	0.72	U
1,2,4-Trimethylbenzene	95-63-6	ug/m3	0.34	U
1,3,5-Trimethylbenzene	108-67-8	ug/m3	0.31	U
2,2,4-Trimethylpentane	540-84-1	ug/m3	0.15	U
Tertiary Butyl Alcohol	75-65-0	ug/m3	0.22	U
Tetrachloroethylene	127-18-4	ug/m3	0.16	U
Tetrahydrofuran	109-99-9	ug/m3	0.21	U
Toluene	108-88-3	ug/m3	0.33	J
Trichloroethylene	79-01-6	ug/m3	0.081	U
Trichlorofluoromethane	75-69-4	ug/m3	1.1	
Vinyl chloride	75-01-4	ug/m3	0.14	U
Vinyl Acetate	108-05-4	ug/m3	0.32	U
m,p-Xylene	M,P-XYLENE	ug/m3	0.48	U
o-Xylene	95-47-6	ug/m3	0.27	U
Xylenes (total)	1330-20-7	ug/m3	0.27	U
4-Bromofluorobenzene	460-00-4	%	97	
4-Bromofluorobenzene (1)	460-00-4	%		

NOTES:

1. Results are measured in ug/m^3.

= concentration detecte

U: concentration not detected.

J: indicates an estimated value.

ABBREVIATIONS:

ug/m^3 = micrograms per meter cubed

Appendix D:

SEFA and CVA Analysis

SESI
CONSULTING ENGINEERS

Geotechnical
Environmental
Site Civil

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Remedial Investigation Work Plan
Environmental Footprint Analysis

For:

One Water Street Blacksmith & Wheelwright Site

1 Water Street

White Plains, Westchester County, NY

BCP No. C360235

Prepared for:

1 Water Street Acquisition LLC &
1 Water Street LLC

December 22, 2025

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SESI Project No:

14077

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FIGURE 10: Accident Risk – Injury

FIGURE 11: Lost Hours – Injury

1.0 PURPOSE

This environmental footprint analysis (EFA) serves to quantitatively evaluate the potential environmental and social impacts, specifically accident risks, associated with the Remedial Action Work Plan (RAWP) for this project. This sustainability assessment was performed utilizing SiteWise version 3.2 (NAVFAC 2018), a specialized tool designed to measure various quantifiable sustainability metrics.

SiteWise operates through a series of Excel sheets, generating a detailed baseline assessment of sustainability metrics. These encompass greenhouse gases (GHGs), energy consumption, electricity usage from both renewable and non-renewable sources, criteria air pollutants such as sulfur oxides (SO_x), oxides of nitrogen (NO_x), and particulate matter (PM_{10}), water usage, resource consumption, and accident risk. The analysis integrates several key inputs: (1) the production of all necessary materials for SMP activities; (2) the transportation of these materials, equipment, and personnel to and from the site; (3) all on-site activities, including equipment operation; and (4) the comprehensive management of waste generated by these activities. The reported quantitative metrics include GHGs in metric tons of carbon dioxide equivalents (CO_2e), water usage in gallons, energy usage in millions of British thermal units (MMBTU), criteria air pollutants in metric tons, and accident risk (measured as injury and fatality risk).

To ensure relevance, the sustainability footprint assessment for the RAWP focused exclusively on elements with significant sustainability impacts, with a lower footprint indicating reduced negative effects on environmental and social metrics. The primary activities evaluated encompassed material production, transportation of personnel and equipment, equipment use for monitoring well installation, groundwater monitoring, and on-site labor hours to estimate accident risks during these operations. It is important to note that SiteWise calculates these footprints using industry averages, published emission factors, and generalized data sources, meaning the results may not precisely reflect actual emissions but are valuable for comparative analysis.

The assumptions used for the SiteWise evaluation are as follows:

- The environmental footprint for the production of the equipment used, or the production of vehicles used for transportation, is not considered in this analysis.
- Water use for consumable manufacturing is not included in this analysis, which may lead to an underestimation of the total water usage for associated activities.
- Small amounts of clean deionized water (less than two [2] gallons per quarter) may be used for cleaning dedicated sampling equipment.
- Site monitoring activities are assumed not to disturb the land and/or ecosystems.

Note that SiteWise calculates environmental and risk footprints based on industry averages, published emissions factors and generalized data sources. The footprint results may not be representative of actual emissions and may only be used for comparative purposes only.

2.0 RESULTS AND CONCLUSIONS

The quantitative assessment of the potential environmental impact and social impact (accident risks) of RAWP activities is summarized in *Table 1* and Figures 1 through 8. *Table 1* presents the environmental footprint summary of remedial activities. Green House Gas (GHG) emissions are primarily associated with the excavation of soil/fill exceeding Track 1 Unrestricted Use Soil Cleanup Objectives (USCOs) and Support of Excavation (SOE) activities (91.55%, *Figure 1*), largely due to consumables and residual handling (materials for backfilling, transportation). The

energy consumed by the project is predominantly from the excavation of soil/fill exceeding Track 1 USCOs & SOE (94.72%, *Figure 2*).

The excavation of soil/fill exceeding Track 1 USCOs & SOE also accounts for the majority of onsite criteria air pollutant emissions, specifically NO_x (96.31%, *Figure 3*), SO_x (96.51%, *Figure 4*), and PM_{10} (93.88%, *Figure 5*), primarily attributed to equipment use and other miscellaneous activities. Similarly, excavation of soil/fill exceeding Track 1 USCOs & SOE accounts for the majority of total NO_x (89.14%, *Figure 6*) , SO_x (95.63%, *Figure 7*), and PM_{10} (68.61%,*Figure 8*) emissions from consumables, residual handling, and equipment use and miscellaneous. Furthermore, a significant portion of the accident risk, both for fatality (54.32%, *Figure 9*) and injury (64.51%, *Figure 10*) including lost hours (64.51%, *Figure 11*), is attributed to the excavation of soil/fill exceeding Track 1 USCOs & SOE due to equipment use and associated activities.

The results clearly indicate that the excavation of soil/fill exceeding Track 1 USCOs & SOE generates the largest environmental footprints across multiple categories, including GHG emissions, energy use, NO_x, SO_x, and PM_{10}. These impacts are predominantly driven by the associated equipment use, the consumption of materials, and the extensive residual handling requirements.

The overall remedial action program will involve comprehensive monitoring activities, including groundwater monitoring, to assess the performance of the remedy and any natural attenuation following the removal of contaminant sources. These activities will be conducted under the guidance of the New York State Department of Environmental Conservation (NYSDEC) project manager, in consultation with the New York State Department of Health (NYSDOH) project manager, and will continue until residual groundwater concentrations meet NYSDEC standards or become asymptotic over an extended period. This approach ensures that the remedy is effective and that the site achieves environmental quality goals.

This thorough and ongoing monitoring, coupled with the environmental footprint analysis, aligns with Green Remediation principles by ensuring that the remedial actions are continually optimized for environmental performance. By precisely targeting and evaluating the effectiveness of the remedy, the overall environmental footprint and resource expenditure are minimized over the long term, contributing to a more sustainable and efficient remediation process.

Table 1: Environmental Footprint Summary

Phase	Activities	GHG Emissions	Total Energy Used	Water Consumption	Electricity Usage	Onsite NOx Emissions	Onsite SOx Emissions	Onsite PM10 Emissions	Total NOx Emissions	Total SOx Emissions	Total PM10 Emissions	Accident Risk Fatality	Accident Risk Injury
		metric ton	MMBTU	gallons	MWH	metric ton	metric ton	metric ton	metric ton	metric ton	metric ton		
Excavation of soil/fill exceeding Track 1 USCOs & SOE	Consumables	7,511.57	2.4E+05	NA	NA	NA	NA	NA	1.6E+01	2.8E+01	4.2E+00	NA	NA
	Transportation-Personnel	13.41	1.7E+02	NA	NA	NA	NA	NA	4.4E-03	9.6E-05	5.1E-04	4.1E-04	3.3E-02
	Transportation-Equipment	1.37	1.8E+01	NA	NA	NA	NA	NA	4.3E-04	7.6E-06	3.8E-05	2.3E-06	1.9E-04
	Equipment Use and Misc	178.64	3.0E+03	0.0E+00	0.0E+00	1.1E+00	2.8E-01	8.8E-02	1.2E+00	3.5E-01	1.1E-01	8.4E-04	1.9E-01
	Residual Handling	782.75	1.4E+04	NA	NA	0.0E+00	0.0E+00	0.0E+00	3.3E+00	1.7E+00	9.3E+00	6.6E-04	5.3E-02
	Sub-Total	8,487.73	2.62E+05	0.00E+00	0.00E+00	1.07E+00	2.75E-01	8.81E-02	2.03E+01	2.98E+01	1.36E+01	1.91E-03	2.73E-01
Screening of excavated soil for contamination (visual, odor, PID)	Consumables	0.00	0.0E+00	NA	NA	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00	NA	NA
	Transportation-Personnel	1.14	1.4E+01	NA	NA	NA	NA	NA	4.2E-04	1.5E-05	8.6E-05	4.7E-05	3.8E-03
	Transportation-Equipment	0.00	0.0E+00	NA	NA	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Equipment Use and Misc	6.92	9.9E+01	5.0E+01	0.0E+00	1.2E-04	1.8E-05	7.5E-04	3.3E-02	2.5E-02	3.5E-03	5.4E-06	6.6E-03
	Residual Handling	0.00	0.0E+00	NA	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Sub-Total	8.06	1.13E+02	5.00E+01	0.00E+00	1.22E-04	1.77E-05	7.47E-04	3.33E-02	2.46E-02	3.57E-03	5.22E-05	1.04E-02
Collection and analysis of end-point samples	Consumables	0.00	0.0E+00	NA	NA	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00	NA	NA
	Transportation-Personnel	0.08	9.6E-01	NA	NA	NA	NA	NA	2.8E-05	9.9E-07	5.7E-06	1.6E-06	1.3E-04
	Transportation-Equipment	0.07	9.4E-01	NA	NA	NA	NA	NA	2.2E-05	9.0E-07	1.8E-06	3.9E-07	3.1E-05
	Equipment Use and Misc	4.54	6.5E+01	0.0E+00	0.0E+00	4.1E-06	5.9E-07	2.5E-05	2.2E-02	1.6E-02	1.8E-03	1.9E-07	2.2E-04
	Residual Handling	0.03	3.8E-01	NA	NA	0.0E+00	0.0E+00	0.0E+00	8.8E-06	3.6E-07	7.2E-07	1.6E-07	1.3E-05
	Sub-Total	4.71	6.72E+01	0.00E+00	0.00E+00	4.06E-06	5.89E-07	2.49E-05	2.18E-02	1.63E-02	1.85E-03	2.30E-06	3.91E-04
Off-Site disposal of all removed material	Consumables	0.00	0.0E+00	NA	NA	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00	NA	NA
	Transportation-Personnel	0.00	0.0E+00	NA	NA	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Transportation-Equipment	0.34	4.4E+00	NA	NA	NA	NA	NA	1.1E-04	1.9E-06	9.4E-06	7.8E-07	6.3E-05
	Equipment Use and Misc	1.16	1.8E+01	0.0E+00	0.0E+00	8.8E-03	1.8E-03	1.7E-03	9.6E-03	2.2E-03	1.8E-03	3.4E-05	7.0E-03
	Residual Handling	716.16	1.2E+04	NA	NA	0.0E+00	0.0E+00	0.0E+00	2.3E+00	1.2E+00	6.2E+00	1.3E-03	1.1E-01
	Sub-Total	717.65	1.17E+04	0.00E+00	0.00E+00	8.76E-03	1.79E-03	1.69E-03	2.27E+00	1.16E+00	6.18E+00	1.36E-03	1.14E-01
Import of materials for backfill and cover	Consumables	0.00	0.0E+00	NA	NA	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00	NA	NA
	Transportation-Personnel	2.11	2.8E+01	NA	NA	NA	NA	NA	6.6E-04	1.2E-05	5.9E-05	2.3E-05	1.9E-03
	Transportation-Equipment	0.25	3.3E+00	NA	NA	NA	NA	NA	7.9E-05	1.4E-06	7.0E-06	5.9E-07	4.7E-05
	Equipment Use and Misc	1.63	3.6E+01	0.0E+00	0.0E+00	9.0E-03	2.2E-03	1.1E-03	1.1E-02	3.1E-03	1.4E-03	2.3E-05	4.3E-03
	Residual Handling	0.00	0.0E+00	NA	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Sub-Total	3.99	6.67E+01	0.00E+00	0.00E+00	9.05E-03	2.25E-03	1.13E-03	1.14E-02	3.11E-03	1.44E-03	4.72E-05	6.25E-03
Post soil excavation groundwater monitoring	Consumables	2.04	1.4E+03	NA	NA	NA	NA	NA	4.3E-03	5.4E-03	7.9E-04	NA	NA
	Transportation-Personnel	0.76	9.6E+00	NA	NA	NA	NA	NA	2.8E-04	9.9E-06	5.7E-05	3.1E-05	2.5E-03
	Transportation-Equipment	0.00	0.0E+00	NA	NA	NA	NA	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Equipment Use and Misc	6.80	9.7E+01	4.0E+01	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-02	2.4E-02	2.7E-03	1.6E-06	1.1E-03
	Residual Handling	0.07	9.4E-01	NA	NA	0.0E+00	0.0E+00	0.0E+00	2.2E-05	9.0E-07	1.8E-06	3.9E-07	3.1E-05
	Sub-Total	9.67	1.52E+03	4.00E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.73E-02	2.99E-02	3.57E-03	3.31E-05	3.62E-03

Phase	Activities	GHG Emissions	Total Energy Used	Water Consumption	Electricity Usage	Onsite NOx Emissions	Onsite SOx Emissions	Onsite PM10 Emissions	Total NOx Emissions	Total SOx Emissions	Total PM10 Emissions	Accident Risk Fatality	Accident Risk Injury
		metric ton	MMBTU	gallons	MWH	metric ton	metric ton	metric ton	metric ton	metric ton	metric ton		
Installation of elements of a sub-slab depressurization system (SSDS)	Consumables	33.73	1.0E+03	NA	NA	NA	NA	NA	7.0E-02	1.2E-01	1.8E-02	NA	NA
	Transportation-Personnel	1.42	1.7E+01	NA	NA	NA	NA	NA	6.5E-04	1.2E-05	9.5E-05	5.9E-05	4.7E-03
	Transportation-Equipment	0.50	6.6E+00	NA	NA	NA	NA	NA	1.6E-04	2.8E-06	1.4E-05	1.2E-06	9.4E-05
	Equipment Use and Misc	3.95	7.2E+01	0.0E+00	0.0E+00	2.3E-02	5.9E-03	2.1E-03	2.6E-02	7.6E-03	2.6E-03	5.3E-05	1.1E-02
	Residual Handling	0.00	0.0E+00	NA	NA	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
	Sub-Total	39.60	1.11E+03	0.00E+00	0.00E+00	2.28E-02	5.90E-03	2.14E-03	9.65E-02	1.28E-01	2.08E-02	1.12E-04	1.56E-02
Total		**9.3E+03**	**2.8E+05**	**9.0E+01**	**0.0E+00**	**1.1E+00**	**2.9E-01**	**9.4E-02**	**2.3E+01**	**3.1E+01**	**2.0E+01**	**3.5E-03**	**4.2E-01**

Figure 1: GHG Emissions

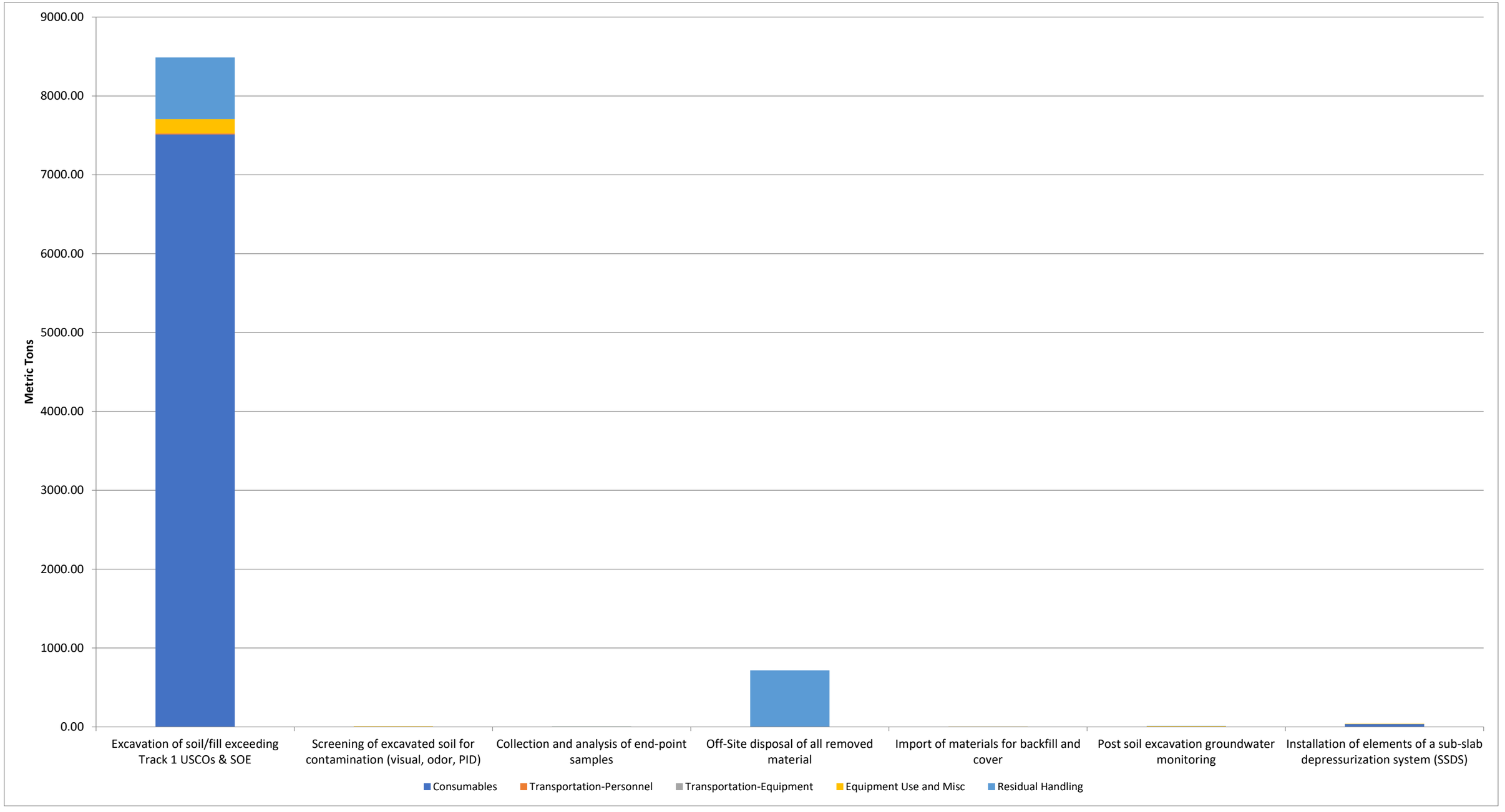


Figure 2: Total Energy Used

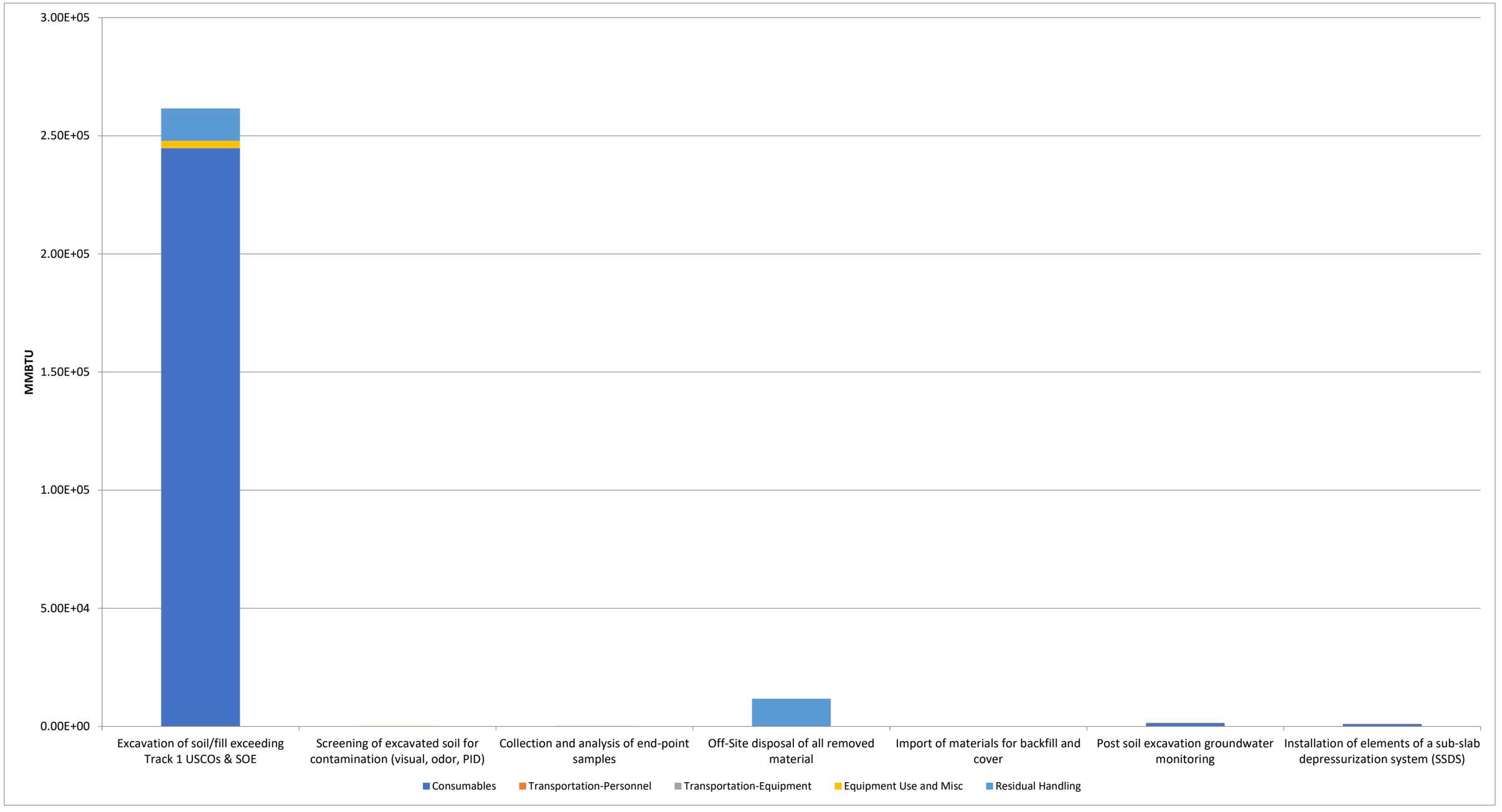


Figure 3: Onsite NO_x Emissions

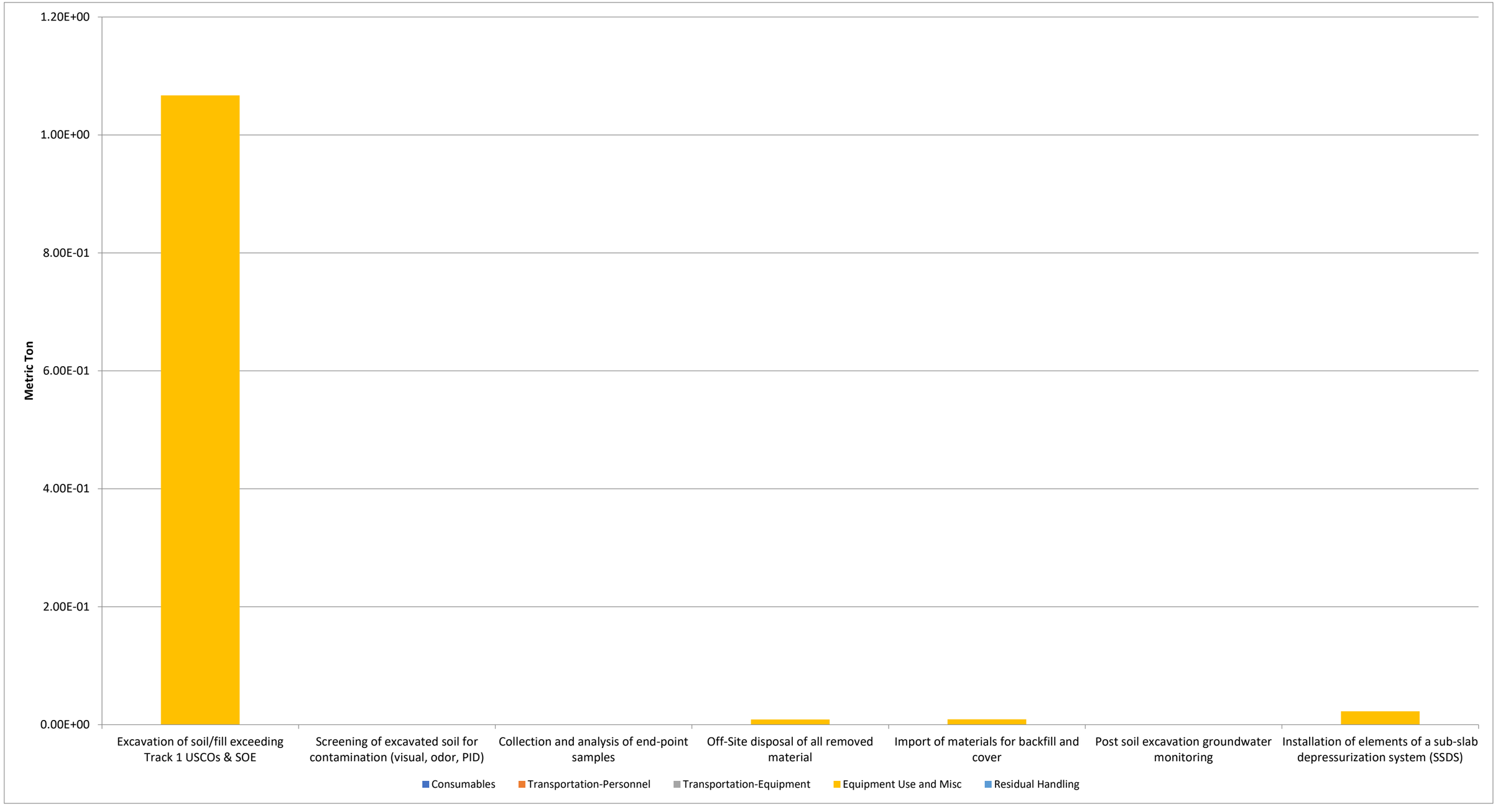


Figure 4: Onsite SO_x Emissions

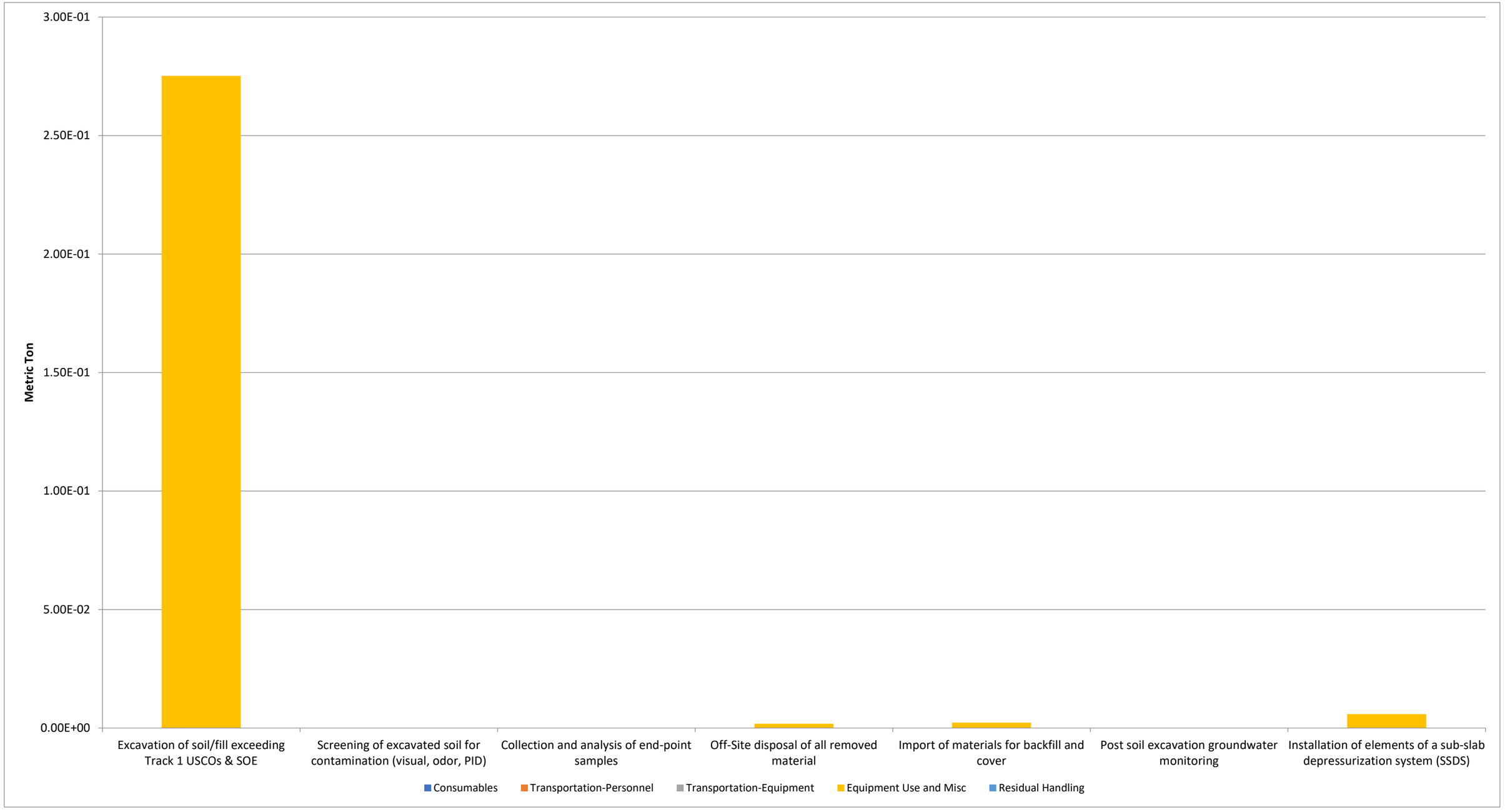


Figure 5: Onsite PM_{10} Emissions

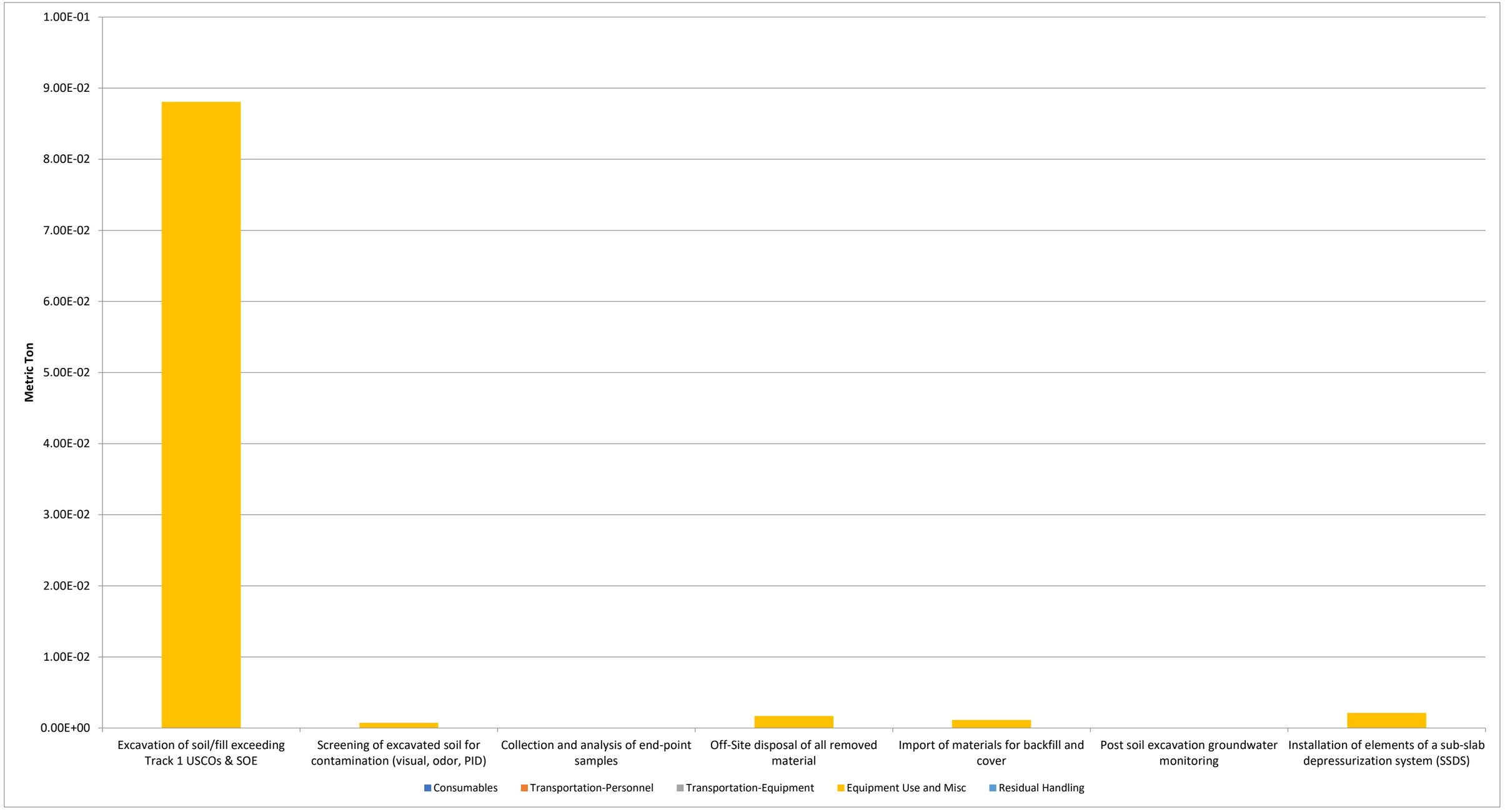


Figure 6: Total NO_x Emissions

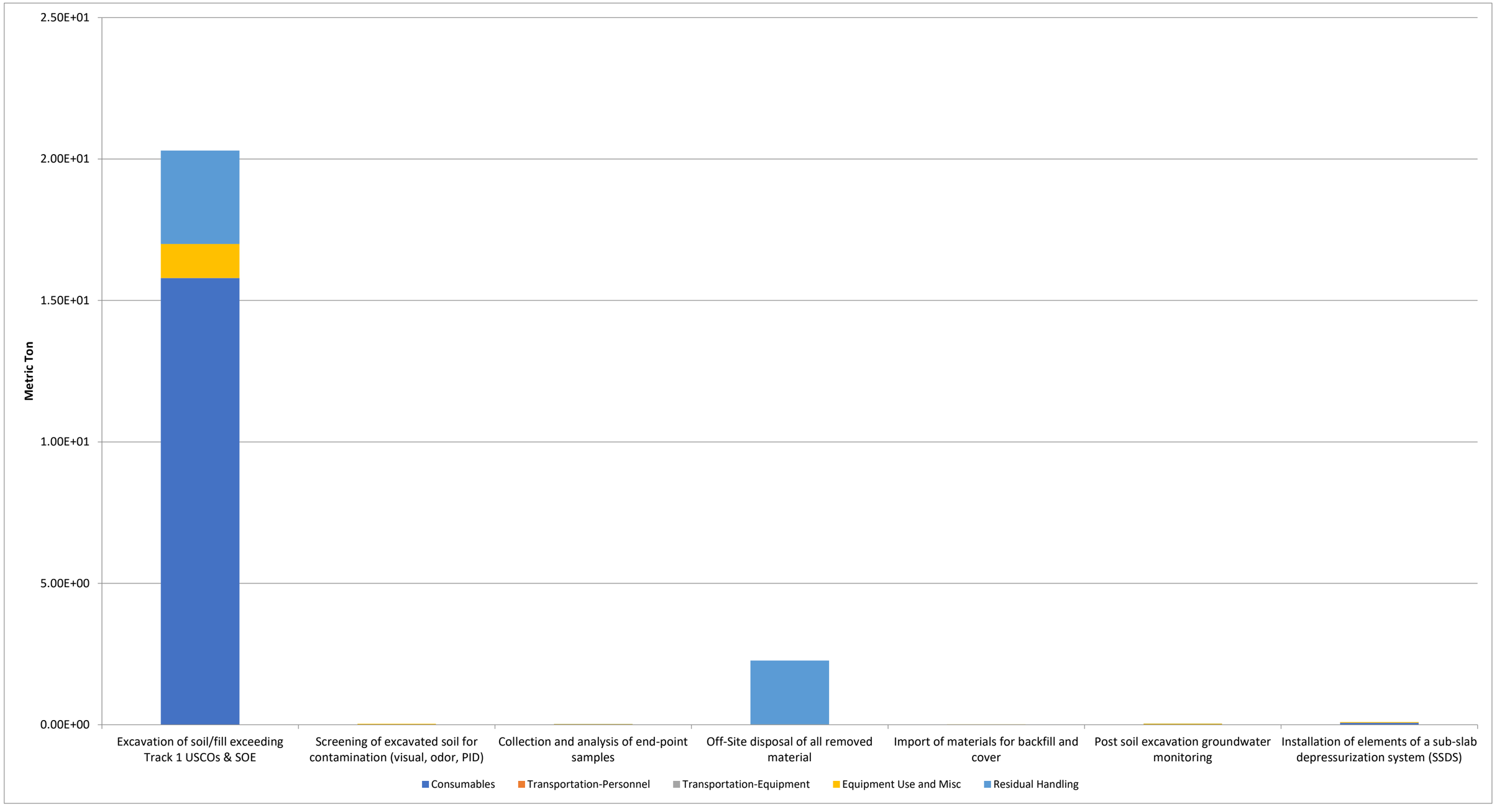


Figure 7: Total SO_x Emissions

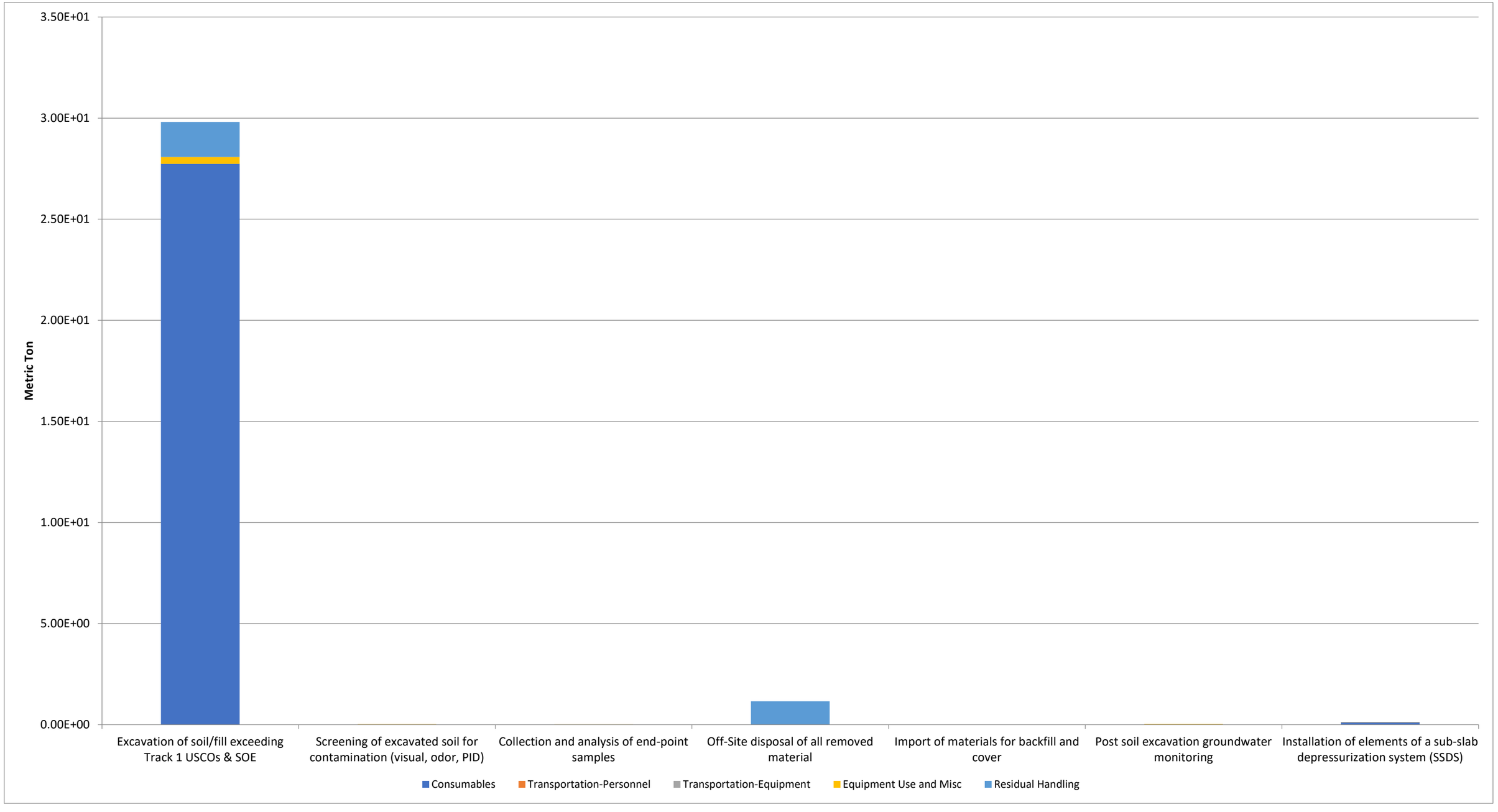


Figure 8: Total PM_{10} Emissions

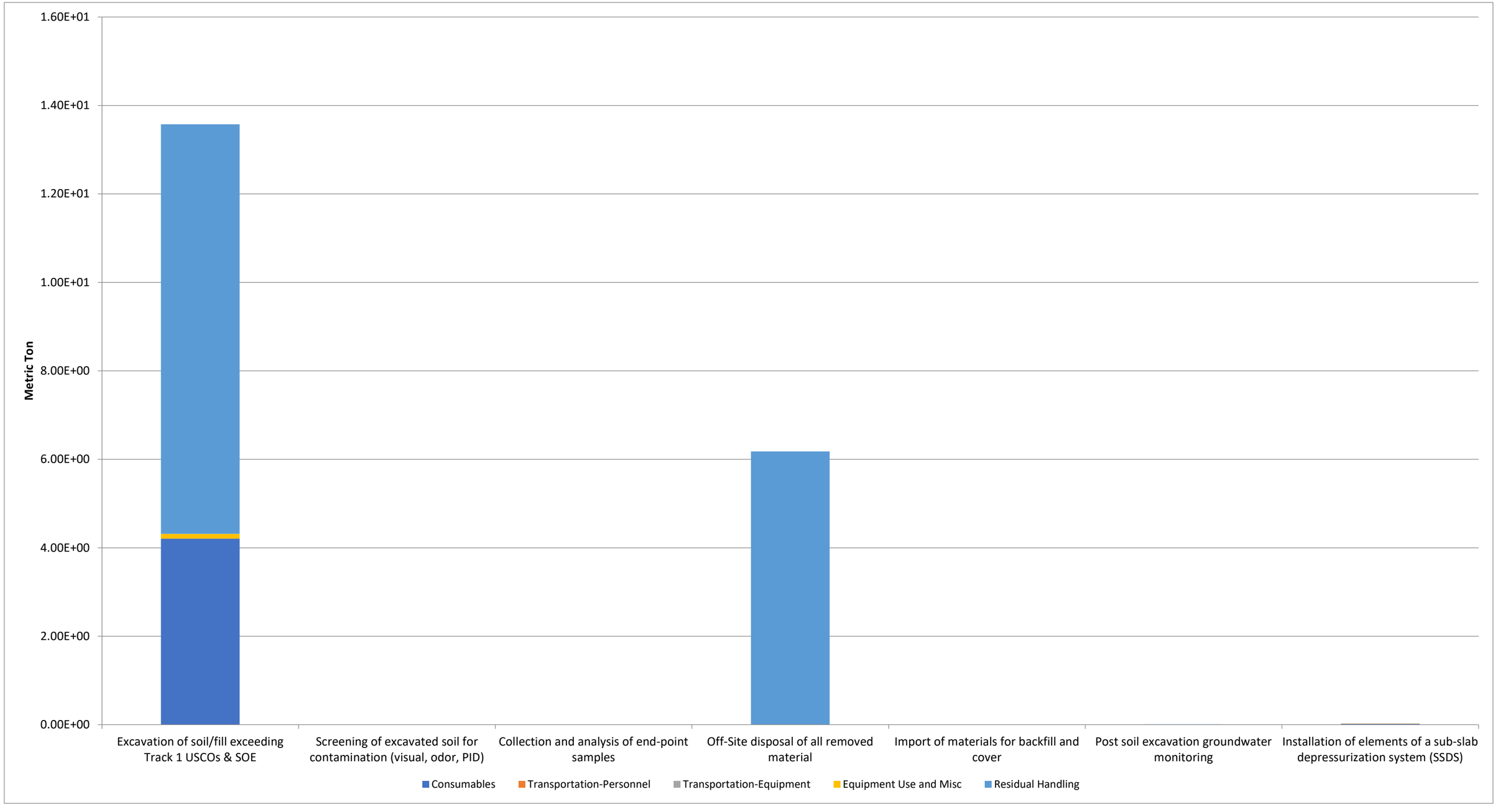


Figure 9: Accident Risk – Fatality

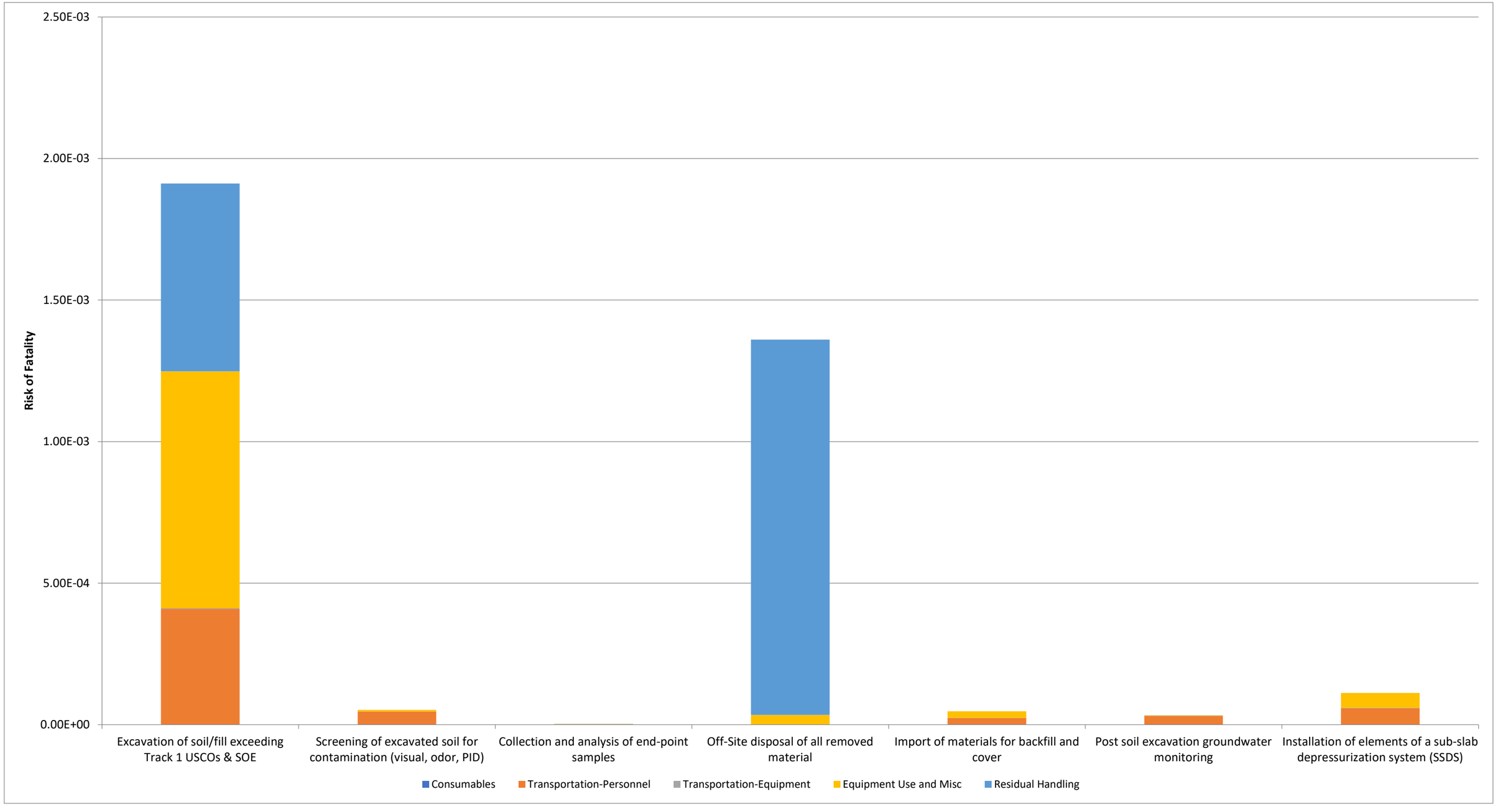


Figure 10: Accident Risk – Injury

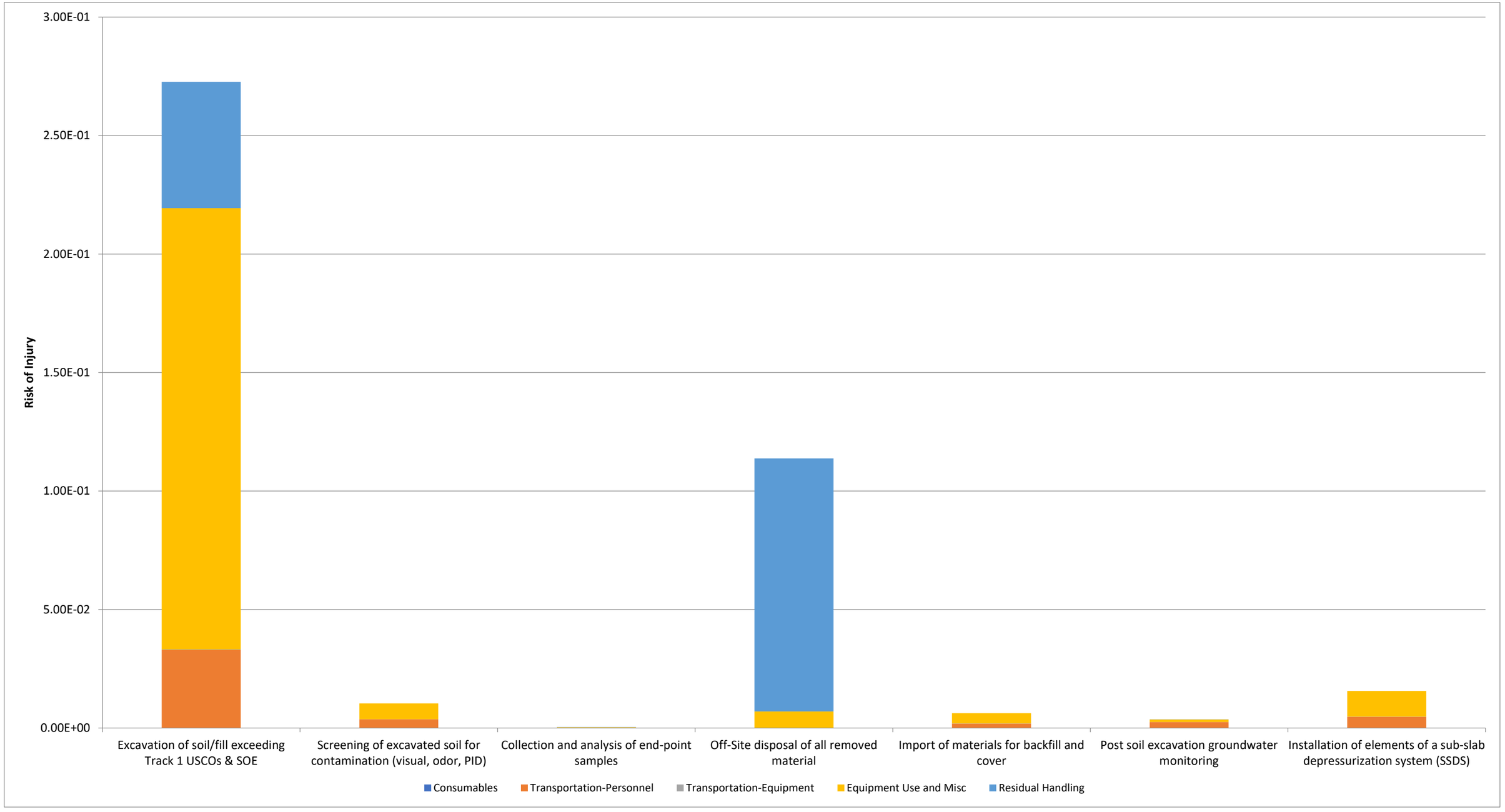
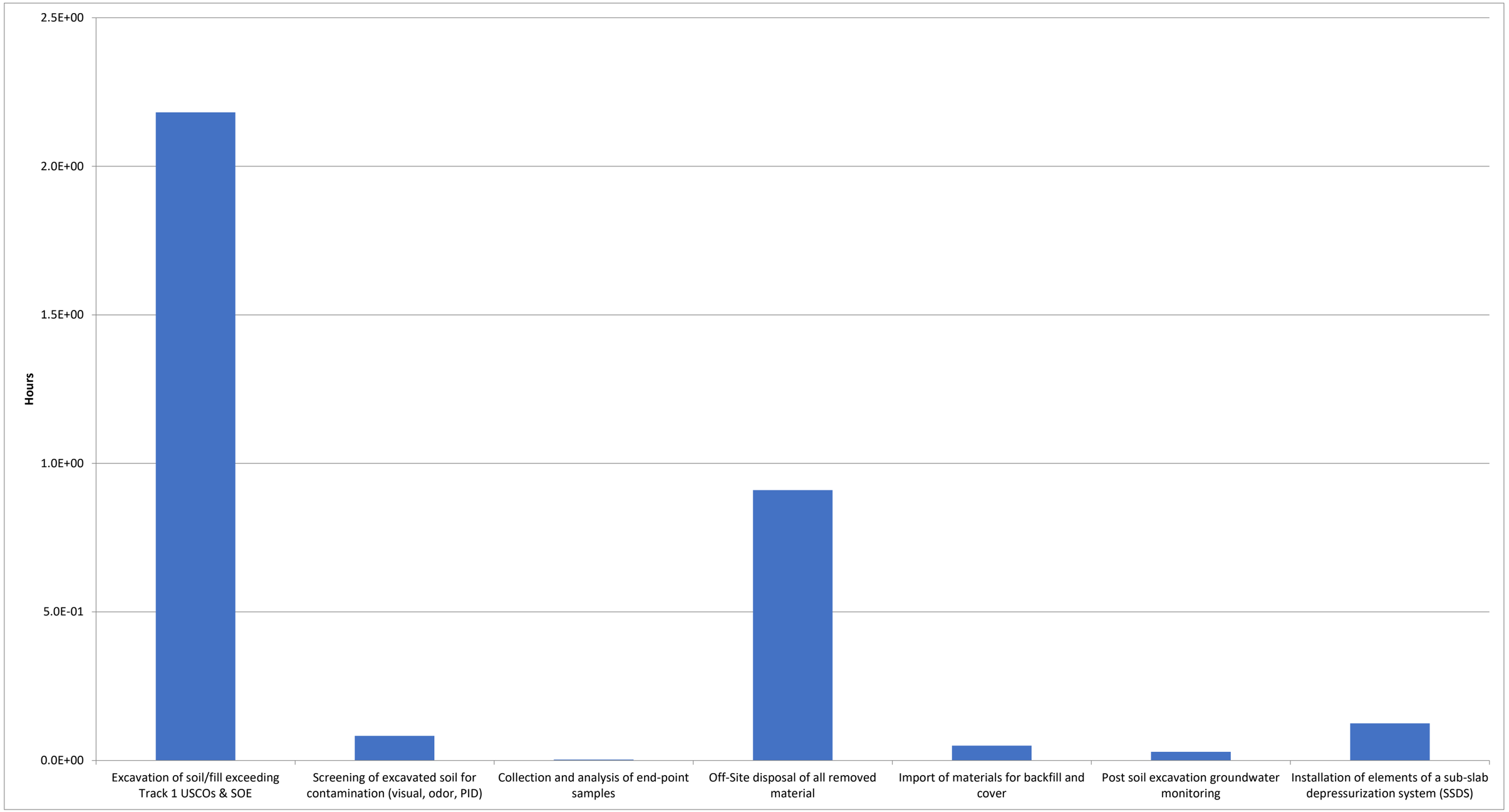


Figure 11: Lost Hours – Injury



Appendix E:

Health and Safety Plan

SESI
CONSULTING ENGINEERS

Geotechnical
Environmental
Site Civil

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Site Specific Health and Safety Plan
For

One Water Street Blacksmith & Wheelwright Site
BCP No. C360235
White Plains, Westchester County, NY

Prepared for:
1 Water Street L.L.C.

February 2026

SESI Project No:
14077

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Disclaimer: This Health and Safety Plan (HASP) is based upon information provided [and, if applicable, conditions discovered during a site visit], and is limited by the project scope.

The HASP should be periodically reviewed and updated based on a number of factors, including but not limited to: (1) changes in applicable governmental requirements; (2) changes in procedures at the site; and (3) site conditions which were unknown to SESI Consulting Engineers (SESI) as of the time the HASP was prepared.

This HASP has been prepared for the sole and exclusive use of Client listed above, and may not be relied upon by any other person without the express written consent and authorization of SESI.

SITE-SPECIFIC HEALTH AND SAFETY PLAN

For

One Water Street Blacksmith and Wheelwright Site
1 Water Street
White Plains, Westchester County, New York

Prepared by: Steven Gustems
SESI- Project Manager

Approved by: Fuad Dahan
SESI-Principal

LIST OF ACRONYMS

Acronym	Definition
ACGIH	American Conference of Governmental Industrial Hygienists
COC	Contaminants(s) of Concern
CRZ	Contamination Reduction Zone
EMS	Emergency Medical Services
EZ	Exclusion Zone
FS	Field Supervisor
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HSM	Health and Safety Manager
LEL	Lower Explosive Limit
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
NRR	Noise Reduction Rating
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyls
PEL	Permissible Exposure Limit
PFD	Personal Flotation Device
PID	Photoionization Detector
PM	Project Manager
PO	Project Officer
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
SESI	SESI Consulting Engineers
SSO	Site Safety Officer
SVOC	Semi-Volatile Organic Compound
SZ	Support Zone
TLV	Threshold Limit Value
USCG	United States Coast Guard

Acronym	Definition
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOC	Volatile Organic Compound

1.0 PROJECT DESCRIPTION

1.1 OBJECTIVE

The objective of this Health and Safety Plan (HASP) is to provide a mechanism for establishing safe working conditions during activities at Brownfield Cleanup Program project (BCP No. C360235) known as the One Water Street Blacksmith & Wheelwright Site (the 'Site'). The safety organization, procedures, and protective equipment have been established based on an analysis of potential physical, chemical, and biological hazards. Specific hazard control methodologies have been evaluated and selected to minimize the potential of injury, illness, or other hazardous incidents.

The HASP was written to meet the requirements of all applicable Federal, State, and local health and safety regulations, including 29 CFR 1910.120. The HASP is based on current knowledge regarding the specific chemical and physical hazards that are known or anticipated at the Site. This HASP is a dynamic document, for which changes and/or revisions may be realized as changes in scope and/or Site conditions are encountered. Should revised documents be produced, said revised documents will refer to the specific changes and why they were made.

1.2 SITE AND FACILITY DESCRIPTION

The Site is bound to the east by a public parking lot. The Site is bound to the south by Water Street, a City of White Plains bus terminal, and a parking garage beyond, to the west by Ferris Avenue, the White Plains Fire Station and a municipal building and to the north by a public parking lot and Hillside Terrace beyond.

1.3 POLICY STATEMENT

The policy of SESI Consulting Engineers (SESI) is to provide a safe and healthful work environment. No aspect of operations is of greater importance than injury and illness prevention. A fundamental principle of safety management is that all injuries, illnesses, and incidents are preventable. SESI will take every reasonable step to eliminate or control hazards in order to minimize the possibility of injury, illness, or incident.

This HASP prescribes the procedures that must be followed by SESI personnel during activities at the Site. Operational changes that could affect the health and safety of personnel, the community, or the environment will not be made without the prior approval of the Project Manager (PM) and the Health and Safety Manager (HSM). This document will be reviewed periodically by the HSM to ensure that it is current and technically correct. Any changes in Site conditions and/or the scope of work will require a review and modification to this HASP. Such changes will be completed in the form of an addendum or a revision to the plan.

The provisions of this plan are mandatory for all SESI personnel and are advisory for all contractors, and subcontractors assigned to the project. ***Subcontractors will be responsible for preparing their own Site-specific HASPs that meet the basic requirements outlined in***

this HASP. All visitors to SESI work areas at the Site must abide by the requirements of this plan.

1.4 REFERENCES

This HASP complies with applicable Occupational Safety and Health Administration (OSHA) regulations, United States Environmental Protection Agency (USEPA) regulations, and SESI health and safety policies and procedures. This plan follows the guidelines established in the following:

- *Standard Operating Safety Guides*, USEPA (Publication 9285.1-03, June 1992).
- *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, NIOSH, OSHA, USCG, USEPA (86116, October 1985).
- *Title 29 of the Code of Federal Regulations* (CFR), Part 1910.
- *Title 29 of the Code of Federal Regulations* (CFR), Part 1926.
- *Pocket Guide to Chemical Hazards*, DHHS, PHS, CDC, NIOSH (2004).
- *Threshold Limit Values*, ACGIH (2005).
- *Guide to Occupational Exposure Values*, ACGIH (2005).
- *Quick Selection Guide to Chemical Protective Clothing*, Forsberg, K. and S.Z. Mansdorf, 2nd Ed. (1993).

1.5 DEFINITIONS

The following definitions (listed alphabetically) are applicable to this HASP:

- *Contamination Reduction Zone (CRZ)* - Area between the exclusion zone and support zone that provides a transition between contaminated and clean areas. Decontamination stations are located in this zone.
- *Exclusion Zone (EZ)* - Any portions of the site where hazardous substances are, or are reasonably suspected to be present, and pose an exposure hazard to on-Site personnel.
- *Incident* - All losses, including first aid cases, injuries, illnesses, spills/leaks, equipment and property damage, motor vehicle accidents, regulatory violations, fires, and business interruptions.
- *On-Site Personnel* - All SESI and subcontractors involved with the project.
- *Project* - All on-site work performed under the scope of work.
- *Site* - The area described in Section 1.2, Site and Facility Description, where the work is to be performed by SESI personnel and subcontractors.
- *Support Zone (SZ)* - All areas of the Site except the EZ and CRZ. The SZ surrounds the CRZ and EZ. Support equipment and break areas are located in this zone.
- *Subcontractor* - Includes contractor personnel hired by SESI.
- *Visitor* - All other personnel, except the on-Site personnel.

Work Area - The portion of the Site where work activities are actively being performed. This area may change daily as work progresses and includes the SZ, CRZ, and EZ. If the work area is located in an area on the Site that is not contaminated, or suspected of being contaminated, the entire work area may be a SZ.

2.0 PROJECT SCOPE OF WORK

This HASP contains information for the following tasks that SESI is anticipated to conduct at the Site. Should additional and/or different tasks be identified, amendments to this HASP will be required to address these changed items.

- Mobilization;
- Excavation of Contaminated Soil;
- End Point Chemical Sampling of Soil;
- Installation of a Vapor Barrier for Buildings;
- Groundwater Sampling;
- Decontamination and Demobilization.

3.0 ROLES AND RESPONSIBILITIES

3.1 ALL PERSONNEL

All SESI project personnel must adhere to the procedures outlined in this HASP during the performance of their work. Each person is responsible for completing tasks safely and reporting any unsafe acts or conditions to their supervisor. No person may work in a manner that conflicts with these procedures. After due warnings, the PM will dismiss from the site any SESI employee or subcontractor who violates safety procedures.

All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating site activities. In addition, all SESI personnel will attend an initial hazard briefing prior to beginning work at the Site.

The roles of key safety personnel and subcontractors are outlined in the following sections. Key project personnel and contacts are summarized in **Table 3.1**.

3.2 KEY SAFETY PERSONNEL

3.2.1 PROJECT SAFETY OFFICER

The PO is responsible for providing resources to assure project activities are completed in accordance with this HASP, and for meeting all regulatory and contractual requirements.

3.2.2 PROJECT MANAGER (PM)

The PM is responsible for verifying that project activities are completed in accordance with the requirements of this HASP. The PM is responsible for confirming that the Field Supervisor (FS) has the equipment, materials, and qualified personnel to fully implement the safety requirements of this HASP, and/or that subcontractors assigned to this project meet the requirements established by SESI. It is also the responsibility of the PM to:

- Consult with the HSM on Site health and safety issues;
- Verify that subcontractors meet health and safety requirements prior to commencing work;
- Verify that all incidents are thoroughly investigated;
- Approve, in writing, addenda or modifications of this HASP; and
- Suspend work or modify work practices, as necessary, for personal safety, protection of property, and regulatory compliance.

3.2.3 HEALTH AND SAFETY MANAGER (HSM)

The HSM or his designee has overall responsibility for the technical health and safety aspects of the project, including review and approval of this HASP. Inquiries regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The HSM or his designee must approve changes or addenda to this HASP.

3.2.4 SITE SAFETY OFFICER (SSO)

The SSO is responsible for field health and safety issues, including the execution of this HASP. Questions in the field regarding health and safety procedures, project procedures, and other technical or regulatory issues should be addressed to this individual. The SSO will advise the PM on health and safety issues and will establish and coordinate the project air-monitoring program if one is deemed necessary (see Section 5.1, Air Monitoring). The SSO is the primary Site contact on health and safety matters. It is the responsibility of the SSO to:

- Provide on-Site technical assistance, if necessary;
- Participate in all accident/incident reports and ensure that they are reported to the HSM, client, and PM within 24 hours;
- Coordinate Site and personal air monitoring as required, including equipment maintenance and calibration;
- Conduct Site safety orientation training and safety meetings;
- Verify that project personnel have received the required physical examinations and medical certifications;
- Review Site activities with respect to compliance with this HASP;
- Maintain required health and safety documents and records; and
- Assist the FS in instructing field personnel on project hazards and protective procedures.

3.2.5 FIELD SUPERVISOR (FS)

The FS is responsible for implementing this HASP, including communicating requirements to on-Site personnel and subcontractors. The FS will be responsible for informing the PM of changes in the work plan, procedures, or Site conditions so that those changes may be addressed in this HASP. Other responsibilities are to:

- Consult with the SSO on Site health and safety issues;
- Stop work, as necessary, for personal safety, protection of property, and regulatory compliance;

- Obtain a Site map and determine and post routes to medical facilities and emergency telephone numbers;
- Notify local public emergency representatives (as appropriate) of the nature of the Site operations, and post their telephone numbers (i.e., local fire department personnel who would respond for a confined space rescue);
- Observe on-Site project personnel for signs of ill health effects;
- Investigate and report any incidents to the SSO;
- Verify that all on-Site personnel have had applicable training;
- Verify that on-Site personnel are informed of the physical, chemical, and biological hazards associated with the Site activities, and the procedures and protective equipment necessary to control the hazards; and issue/obtain any required work permits (hot work, confined space, etc.)

3.3 SUBCONTRACTORS

Subcontractors and their personnel must understand and comply with applicable regulations and Site requirements established in this HASP. Subcontractors will prepare their own Site-specific HASP that must be consistent with the requirements of this HASP.

All subcontractor personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating Site activities. All subcontractor personnel will attend an initial hazard briefing prior to beginning work at the Site. Additionally, on-Site subcontractor personnel must conduct daily Site safety meetings.

Subcontractors must designate individuals to function as the PM, HSM, SSO, and FS. In some firms the HSM to be carried out by the PM. This is acceptable provided the PM has the required knowledge, training, and experience to properly address all hazards associated with the work, and to prepare, approve, and oversee the execution of the Site-specific HASP. A subcontractor may designate the same person to perform the duties of both the SSO and the FS. However, depending on the level of complexity of a contractor's scope of work, it may be infeasible for one person to perform both functions satisfactorily.

3.4 STOP WORK AUTHORITY

Every SESI employee and subcontractor is empowered, expected, and has the responsibility to stop the work of another co-worker if the working conditions or behaviors are considered unsafe.

3.5 ALL ON-SITE PERSONNEL

All on-Site SESI personnel (including SESI subcontractors) must read and acknowledge their understanding of their respective HASPs before commencing work and abide by the requirements of the plans. All on-Site SESI personnel shall sign their HASP Acknowledgement Form following their review of their HASP.

All SESI project personnel will receive training in accordance with applicable regulations and be familiar with the requirements and procedures contained in this HASP prior to initiating Site

activities. In addition, all on-Site personnel will attend an initial hazard briefing provided by the SSO prior to beginning work at the Site and conduct daily safety meetings thereafter.

On-Site personnel will immediately report the following to the FS or SSO:

- Personal injuries and illnesses no matter how minor;
- Unexpected or uncontrolled release of chemical substances;
- Symptoms of chemical exposure;
- Unsafe or hazardous situations;
- Unsafe or malfunctioning equipment;
- Changes in site conditions that may affect the health and safety of project personnel;
- Damage to equipment or property; and

Situations or activities for which they are not properly trained.

3.6 VISITORS

All SESI personnel and subcontractors visiting the Site must check in with the FS. Visitors will be cautioned to avoid skin contact with surfaces, soils, groundwater, or other materials that may impacted or be suspected to be impacted by contaminants of concern (COCs).

Visitors requesting to observe work at the site must don appropriate personal protective equipment (PPE) prior to entry to the work area and must have the appropriate training and medical clearances to do so. If respiratory protective devices are necessary, visitors who wish to enter the work area must have been respirator-trained and fit tested for a respirator within the past 12 months.

Table 3.1 – Key Safety Personnel

SESI Personnel		
Role	**Name**	**Telephone No.**
Project Principal	Fuad Dahan, P.E., PhD	973-808-9050 x249
Project Manager	Steven Gustems, PG	973-808-9050 x282
Principal Engineer	Fuad Dahan, P.E., PhD	973-808-9050 x249
Field Team Leader	Chris Malvicini	973-808-9050 x273
Quality Assurance Officer	Chris Malvicini	973-808-9050 x273
Field Personnel	Tracey McMeekin	573-518-8056

4.0 PERSONAL PROTECTIVE EQUIPMENT

4.1 LEVELS OF PROTECTION

PPE is required to safeguard site personnel from various hazards. Varying levels of protection may be required depending on the levels of COCs and the degree of physical hazard. This section presents the various levels of protection and defines the conditions of use for each level. A summary of the levels is presented in **Table 4.1**.

4.1.1 LEVEL D PROTECTION

The minimum level of protection that will be required of project personnel at the site will be Level D, which will be worn when site conditions or air monitoring indicates no inhalation hazard exists. The following equipment will be used:

- Work clothing as prescribed by weather;
- Steel toe work boots, meeting American National Standards Institute (ANSI) Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Leather work gloves and/or nitrile surgical gloves;
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used); and

Personal floatation device (PFD) if working on or near the water.

4.1.2 MODIFIED LEVEL D PROTECTION

Modified Level D will be used when airborne contaminants are not present at levels of concern, but site activities present an increased potential for skin contact with contaminated materials. Modified Level D consists of:

- Nitrile gloves worn over nitrile surgical gloves;
- Latex/polyvinyl chloride (PVC) overboots when contact with COC-impacted media is anticipated;
- Steel toe work boots, meeting ANSI Z41;
- Safety glasses or goggles, meeting ANSI Z87;
- Face shield in addition to safety glasses or goggles when projectiles or splash hazards exist (e.g. during Power Washing activities);
- Hard hat, meeting ANSI Z89, when falling object hazards are present;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used);
- Tyvek® suit (polyethylene coated Tyvek® suits for handling liquids) when body contact with COC-impacted media is anticipated; and
- PFD if working on or near the water.

4.1.3 LEVEL C PROTECTION

Level C protection will be required when the airborne concentration of COC reaches one-half of the OSHA Permissible Exposure Limit or ACGIH TLV. The following equipment will be used for Level C protection:

- Full-face, air-purifying respirator with combination organic vapor/HEPA cartridges;
- Polyethylene-coated Tyvek® suit, with ankles and cuffs taped to boots and gloves;
- Nitrile gloves worn over nitrile surgical gloves;
- Steel toe work boots, meeting ANSI Z41;
- Chemical-resistant boots with steel toes or latex/PVC overboots over steel toe boots;
- Hard hat, meeting ANSI Z89;
- Hearing protection (if noise levels exceed 85 dBA, then hearing protection with a USEPA NRR of at least 20 dBA must be used); and
- PFD if working on or near the water.

4.2 SELECTION OF PPE

Equipment for personal protection will be selected based on the potential for contact, site conditions, ambient air quality, and the judgment of supervising Site personnel and health and safety professionals. The PPE used will be chosen to be effective against the COCs present on the Site.

4.3 SITE RESPIRATOR PROTECTION PROGRAM

Respiratory protection is an integral part of employee health and safety at the Site due to potentially hazardous concentrations of airborne COCs. The Site respiratory protection program will consist of the following (as a minimum):

- All on-Site personnel who may use respiratory protection will have an assigned respirator.
- All on-Site personnel who may use respiratory protection will have been fit tested and trained in the use of a full-face air-purifying respirator within the past 12 months. Documentation of the fit test must be provided to the SSO prior to commencement of work.
- All on-Site personnel who may use respiratory protection must within the past year have been medically certified as being capable of wearing a respirator. Documentation of the medical certification must be provided to the SSO, prior to commencement of Site work.
- Only cleaned, maintained, NIOSH-approved respirators will be used.
- If respirators are used, the respirator cartridge is to be properly disposed of at the end of each work shift, or when load-up or breakthrough occurs.
- Contact lenses are not to be worn when a respirator is worn.
- All on-Site personnel who may use respiratory protection must be clean-shaven. Mustaches and sideburns are permitted, but they must not touch the sealing surface of the respirator.
- Respirators will be inspected, and a negative pressure test performed prior to each use.

After each use, the respirator will be wiped with a disinfectant, cleansing wipe. When used, the respirator will be thoroughly cleaned at the end of the work shift. The respirator will be stored in a clean plastic bag, away from direct sunlight in a clean, dry location, in a manner that will not distort the face piece.

4.4 USING PPE

Depending upon the level of protection selected, specific donning and doffing procedures may be required. The procedures presented in this section are mandatory if Modified Level D or Level C PPE is used. All personnel entering the EZ must put on the required PPE in accordance with the requirements of this HASP. When leaving the EZ, PPE will be removed in accordance with the procedures listed, to minimize the spread of COCs.

4.4.1 DONNING PROCEDURES

These procedures are mandatory only if Modified Level D or Level C PPE is used on the Site:

- Remove bulky outerwear. Remove street clothes and store in clean location;
- Put on work clothes or coveralls;
- Put on the required chemical protective coveralls;
- Put on the required chemical protective boots or boot covers;
- Tape the legs of the coveralls to the boots with duct tape;
- Put on the required chemical protective gloves;
- Tape the wrists of the protective coveralls to the gloves;
- Don the required respirator and perform appropriate fit check (Level C);
- Put hood or head covering over-head and respirator straps and tape hood to facepiece (Level C); and
- Don remaining PPE, such as safety glasses or goggles and hard hat.

When these procedures are instituted, one person must remain outside the work area to ensure that each person entering has the proper protective equipment.

4.4.2 DOFFING PROCEDURES

The following procedures are only mandatory if Modified Level D or Level C PPE is required for the Site. Whenever a person leaves the work area, the following decontamination sequence will be followed:

- Upon entering the CRZ, rinse contaminated materials from the boots or remove contaminated boot covers;
- Clean reusable protective equipment;
- Remove protective garments, equipment, and respirator (Level C). All disposable clothing should be placed in plastic bags, which are labeled with contaminated waste labels;
- Wash hands, face, and neck (or shower if necessary);
- Proceed to clean area and dress in clean clothing; and

- Clean and disinfect respirator for next use.

All disposable equipment, garments, and PPE must be bagged in plastic bags, labeled for disposal. See Section 6.2, Decontamination, for detailed information on decontamination stations.

4.5 SELECTION MATRIX

The level of personal protection selected will be based on air monitoring of the work environment and an assessment by the FS and SSO of the potential for skin contact with COCs. The PPE selection matrix is presented in **Table 4.1** below. This matrix is based on information available at the time this plan was written. The Airborne Contaminant Action Levels in **Table 5.1**, Airborne Contaminant Action Levels, should be used to verify that the PPE prescribed in these matrices is appropriate.

Table 4.1 – PPE Selection Matrix

Task	Anticipated Level of Protection
Mobilization	Level D
Subsurface Intrusive Activities (Excavation, Drilling)	Modified Level D/Level C
Earthwork/Grading	Level D
Chemical Sampling / Delineation	Modified Level D/Level C
Decontamination	Modified Level D
Demobilization	Level D

5.0 AIR AND NOISE MONITORING

5.1 AIR MONITORING

Air monitoring, sampling, and testing will be conducted to determine employee exposure to airborne constituents. The monitoring results will dictate work procedures and the selection of PPE. The SESI SSO will be responsible for defining appropriate air monitoring procedures and for utilizing the air monitoring results to determine appropriate procedures and PPE for project personnel. Air monitoring results should be recorded in field notebooks or on an air monitoring log (see Attachment 1 for a copy of the Air Monitoring Log). Any deviations from the procedures listed here should be documented and explained in the Air Monitoring Log.

The monitoring devices to be used are a PDR1000 particulate monitor (or equivalent) and a Rae Systems MultiRAE detector (PID with a 11.7 eV lamp/oxygen/LEL/hydrogen sulfide sensors). Colorimetric detector tubes may be utilized to estimate airborne concentrations of benzene and

should be onsite during any activities that may result in elevated PID readings including drilling, excavating, and groundwater sampling.

Air monitoring will be conducted continuously with the LEL/Oxygen meter during drilling in areas where flammable vapors or gases are suspect. All work activity must stop where tests indicate the concentration of flammable vapors exceeds 10% of the LEL at a location with a potential ignition source. Such an area must be ventilated to reduce the concentration to an acceptable level.

5.2 NOISE MONITORING

Noise monitoring may be conducted as required. Hearing protection is mandatory for all employees in noise hazardous areas, such as around heavy equipment. As a general rule, sound levels that cause speech interference at normal conversation distance should require the use of hearing protection.

5.3 MONITORING EQUIPMENT MAINTENANCE AND CALIBRATION

All direct-reading instrumentation calibrations should be conducted under the approximate environmental conditions the instrument will be used. Instruments must be calibrated before and after use, noting the reading(s) and any adjustments that are necessary. All air monitoring equipment calibrations, including the standard used for calibration, must be documented on a calibration log or in the field notebook. All completed health and safety documentation/forms must be reviewed by the SSO and maintained by the FS.

All air monitoring equipment will be maintained and calibrated in accordance with the specific manufacturer's procedures. Preventive maintenance and repairs will be conducted in accordance with the respective manufacturer's procedures. When applicable, only manufacturer-trained and/or authorized personnel will be allowed to perform instrument repairs or preventive maintenance.

If an instrument is found to be inoperative or suspected of giving erroneous readings, the SSO must be responsible for immediately removing the instrument from service and obtaining a replacement unit. If the instrument is essential for safe operation during a specific activity, that activity must cease until an appropriate replacement unit is obtained. The SSO will be responsible for ensuring a replacement unit is obtained and/or repairs are initiated on the defective equipment.

5.4 ACTION LEVELS

Table 5.1 below presents airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the Site.

Table 5.1 – Airborne Contaminant Action Levels

Parameter	Reading	Action
Total Hydrocarbons	0 ppm to ≤ 1 ppm	Normal operations; continue hourly breathing zone monitoring
	> 1 ppm to 5 ppm	Increase monitoring frequency to every 15 minutes and use benzene detector tube to screen for the presence of benzene
	≥ 5 ppm to ≤ 50 ppm	Upgrade to Level C PPE; continue screening for benzene
	> 50 ppm	Stop work; investigate cause of reading
	At any reading > 5 ppm	Monitor perimeter per CAMP
Benzene	≥ 1 ppm to 5 ppm	Upgrade to Level C PPE
	> 5 ppm	Stop work; investigate cause of reading
Dust	0 to .05 mg/m3	Normal operations
	0.05 to 0.1 mg/m3	Begin soil wetting procedure (Level C protection would be needed beyond this point)
	> 0.15 mg/m3	Stop work, fully implement dust control plan
Oxygen	≤ 19.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
	> 19.5% to < 23.5%	Normal operations
	≥ 23.5%	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Carbon Monoxide	0 ppm to ≤ 20 ppm	Normal operations
	> 20 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area
Hydrogen Sulfide	0 ppm to ≤ 5 ppm	Normal operations
	> 5 ppm	Stop work, evacuate confined spaces/work area, investigate cause of reading, and ventilate area

Parameter	Reading	Action
Flammable Vapors (LEL)	< 10% LEL	Normal operations
	≥ 10% LEL	Stop work, ventilate area, investigate source of vapors

6.0 WORK ZONES AND DECONTAMINATION

6.1 WORK ZONES

6.1.1 AUTHORIZATION TO ENTER

Only personnel with the appropriate training and medical certifications (if respirators are required) will be allowed to work at the project Site. The FS will maintain a list of authorized persons; only personnel on the authorized persons list will be allowed to enter the Site work areas.

6.1.2 SITE ORIENTATION AND HAZARD BRIEFING

No person will be allowed in the work area during Site operations without first being given a Site orientation and hazard briefing. This orientation will be presented by the FS or SSO and will consist of a review of this HASP. This review must cover the chemical, physical, and biological hazards, protective equipment, safe work procedures, and emergency procedures for the project. Following this initial meeting, daily safety meetings will be held each day before work begins.

All people entering the Site work areas, including visitors, must document their attendance at this briefing, as well as the daily safety meetings on the forms included with this plan.

6.1.3 CERTIFICATION DOCUMENTS

A training and medical file may be established for the project and kept on Site during all Site operations. Specialty training, such as first aid/cardiopulmonary resuscitation (CPR) certificates, as well as current medical clearances for all project field personnel required to wear respirators, will be maintained within that file. All project personnel must provide their training and medical documentation to the SSO prior to starting work.

6.1.4 ENTRY LOG

A log-in/log-out sheet will be maintained at the Site by the FS. Personnel must sign in and out on a log sheet as they enter and leave the work area, and the FS may document entry and exit in the field notebook.

6.1.5 ENTRY REQUIREMENTS

In addition to the authorization, hazard briefing, and certification requirements listed above, no person will be allowed in any SESI work area unless they are wearing the minimum PPE as described in Section 4.0.

6.1.6 EMERGENCY ENTRANCE AND EXIT

People who must enter the work area on an emergency basis will be briefed of the hazards by the FS or SSO. All activities will cease in the event of an emergency. People exiting the work area because of an emergency will gather in a designated safe area for a head count. The FS is responsible for ensuring that all people who entered the work area have exited in the event of an emergency.

6.1.7 CONTAMINATION CONTROL ZONES

Contamination control zones are maintained to prevent the spread of contamination and to prevent unauthorized people from entering hazardous areas.

6.1.8 EXCLUSION ZONE (EZ)

An EZ may consist of a specific work area or may be the entire area of potential contamination. All employees entering an EZ must use the required PPE and must have the appropriate training and medical clearance for hazardous waste work. The EZ is the defined area where there is a possible respiratory and/or contact health hazard. Cones, caution tape, or a posted Site diagram will identify the location of each EZ.

6.1.9 CONTAMINATION REDUCTION ZONE

The CRZ or transition area will be established, if necessary, to perform decontamination of personnel and equipment. All personnel entering or leaving the EZ will pass through this area to prevent any cross-contamination. Tools, equipment, and machinery will be decontaminated in a specific location. The decontamination of all personnel will be performed on Site adjacent to the EZ. Personal protective outer garments and respiratory protection will be removed in the CRZ and prepared for cleaning or disposal. This zone is the only appropriate corridor between the EZ and the support zone discussed below.

6.1.10 SUPPORT ZONE (SZ)

The SZ is a clean area outside the CRZ located to prevent employee exposure to hazardous substances. Eating and drinking will be permitted in the support area only after proper decontamination. Smoking may be permitted in the SZ, subject to Site requirements.

6.1.11 POSTING

Work areas will be prominently marked and delineated using cones, caution tape, or a posted Site diagram.

6.2 DECONTAMINATION

6.2.1 PERSONNEL DECONTAMINATION

All personnel wearing Modified Level D or Level C protective equipment in the EZ must undergo personal decontamination prior to entering the SZ. The personnel decontamination area will consist of the following stations at a minimum:

- *Station 1*: Personnel leaving the contaminated zone will remove the gross contamination from their outer clothing and boots.
- *Station 2*: Personnel will remove their outer garment and gloves and dispose of it in properly labeled containers. Personnel will then decontaminate their hard hats, and boots with an aqueous solution of detergent or other appropriate cleaning solution. These items are then hand carried to the next station.
- *Station 3*: Personnel will thoroughly wash their hands and face before leaving the CRZ. Respirators will be sanitized and then placed in a clean plastic bag.

6.2.2 EQUIPMENT DECONTAMINATION

All vehicles that have entered the EZ will be decontaminated at the decontamination pad prior to leaving the zone. If the level of vehicle contamination is low, decontamination may be limited to rinsing of tires and wheel wells with water. If the vehicle is significantly contaminated, steam cleaning or pressure washing of vehicles and equipment may be required.

6.2.3 PERSONAL PROTECTIVE EQUIPMENT DECONTAMINATION

Where and whenever possible, single-use, external protective clothing must be used for work within the EZ or CRZ. This protective clothing must be disposed of in properly labeled containers. Reusable protective clothing will be rinsed at the Site with detergent and water. The rinsate will be collected for disposal.

When removed from the CRZ, the respirator will be thoroughly cleaned with soap and water. The respirator face piece, straps, valves, and covers must be thoroughly cleaned at the end of each work shift, and ready for use prior to the next shift. Respirator parts may be disinfected with a solution of bleach and water (mixed at 2% bleach by volume), or by using a spray disinfectant.

7.0 TRAINING AND MEDICAL SURVEILLANCE

7.1 TRAINING

7.1.1 GENERAL

All on-Site project personnel who work in areas where they may be exposed to Site contaminants must be trained as required by OSHA Regulation 29 CFR 1910.120 (HAZWOPER). Field employees also must receive a minimum of three (3) days of actual field experience under the direct supervision of a trained, experienced supervisor. Personnel who completed their initial training more than 12 months prior to the start of the project must have completed an eight (8)-hour refresher course within the past 12 months. The FS must have completed an additional eight (8) hours of supervisory training and must have a current first-aid/CPR certificate (See Attachment 2).

7.1.2 BASIC 40-HOUR COURSE

The following is a list of the topics typically covered in a 40-hour HAZWOPER training course:

- General safety procedures;
- Physical hazards (fall protection, noise, heat stress, cold stress);
- Names and job descriptions of key personnel responsible for site health and safety;
- Safety, health, and other hazards typically present at hazardous waste sites;
- Use, application, and limitations of PPE;
- Work practices by which employees can minimize risks from hazards;
- Safe use of engineering controls and equipment on site;
- Medical surveillance requirements;
- Recognition of symptoms and signs which might indicate overexposure to hazards;
- Worker right-to-know (Hazard Communication OSHA 1910.1200);
- Routes of exposure to contaminants;
- Engineering controls and safe work practices;
- Components of a health and safety program and a site-specific HASP;
- Decontamination practices for personnel and equipment;
- Confined-space entry procedures; and
- General emergency response procedures.

7.1.3 SUPERVISOR COURSE

Management and supervisors must receive an additional eight (8) hours of training, which typically includes:

- General Site safety and health procedures;
- PPE programs; and
- Air monitoring techniques

7.1.4 SITE-SPECIFIC TRAINING

Site-specific training will be accomplished by on-Site personnel reading this HASP, and through a thorough site briefing by the PM, FS, or SSO on the contents of this HASP before work begins. The review must include a discussion of the chemical, physical, and biological hazards; the protective equipment and safety procedures; and emergency procedures.

7.1.5 DAILY SAFETY MEETINGS

Daily safety meetings will be held to cover the work to be accomplished, the hazards anticipated, the PPE and procedures required to minimize site hazards, and emergency procedures. The FS or SSO should present these meetings prior to beginning the day's fieldwork. No work will be performed in an EZ before a daily safety meeting has been held. An additional safety meeting must also be held prior to new tasks, or if new hazards are encountered. The daily safety meetings will be logged in the field notebook.

7.1.6 FIRST AID AND CPR

At least one (1) employee current in first aid/CPR will be assigned to the work crew and will be on the Site during operations. Site records will document the presence of this individual. Refresher training in first aid (triennially) and CPR (annually) is required to keep the certificate current. These individuals must also receive training regarding the precautions and protective equipment necessary to protect against exposure to blood-borne pathogens.

7.2 MEDICAL SURVEILLANCE

7.2.1 MEDICAL EXAMINATION

All personnel who are potentially exposed to Site contaminants must participate in a medical surveillance program as defined by OSHA at 29 CFR 1910.120 (f).

7.2.2 PRE-PLACEMENT MEDICAL EXAMINATION

All potentially exposed personnel must have completed a comprehensive medical examination prior to assignment, and periodically thereafter as defined by applicable regulations. The pre-placement and periodic medical examinations typically include the following elements:

- Medical and occupational history questionnaire;
- Physical examination;
- Complete blood count, with differential;
- Liver enzyme profile;
- Chest X-ray, at a frequency determined by the physician;
- Pulmonary function test;
- Audiogram;
- Electrocardiogram for persons older than 45 years of age, or if indicated during the physical examination;
- Drug and alcohol screening, as required by job assignment;
- Visual acuity; and
- Follow-up examinations, at the discretion of the examining physician or the corporate medical director.

The examining physician provides the employee with a letter summarizing his findings and recommendations, confirming the worker's fitness for work and ability to wear a respirator. Documentation of medical clearance will be available for each employee during all project Site work.

Subcontractors will certify that all their employees have successfully completed a physical examination by a qualified physician. The physical examinations must meet the requirements of 29 CFR 1910.120 and 29 CFR 1910.134. Subcontractors will supply copies of the medical examination certificate for each on-site employee.

7.2.3 OTHER MEDICAL EXAMINATIONS

In addition to pre-employment, annual, and exit physicals, personnel may be examined:

- At employee request after known or suspected exposure to toxic or hazardous materials; and
- At the discretion of the SSO, HSM, or occupational physician in anticipation of, or after known or suspected exposure to toxic or hazardous materials.

7.2.4 PERIODIC EXAM

Following the placement examination, all employees must undergo a periodic examination, similar in scope to the placement examination. For employees potentially exposed over 30 days per year, the frequency of periodic examinations will be annual. For employees potentially exposed less than 30 days per year, the frequency for periodic examinations will be 24 months.

7.2.5 MEDICAL RESTRICTION

When the examining physician identifies a need to restrict work activity, the employee's supervisor must communicate the restriction to the employee and the SSO. The terms of the restriction will be discussed with the employee and the supervisor.

8.0 GENERAL SAFETY PRACTICES

8.1 GENERAL SAFETY RULES

General safety rules for site activities include, but are not limited to, the following:

- At least one copy of this HASP must be in a location at the Site that is readily available to personnel, and all project personnel shall review the plan prior to starting work.
- Consume or use food, beverages, chewing gum, and tobacco products only in the SZ or other designated area outside the EZ and CRZ. Cosmetics shall not be applied in the EZ or CRZ.
- Wash hands before eating, drinking, smoking, or using toilet facilities.
- Wear all PPE as required and stop work and replace damaged PPE immediately.
- Secure disposable coveralls, boots, and gloves at the wrists and legs and ensure closure of the suit around the neck.
- Upon skin contact with materials that may be impacted by COCs, remove contaminated clothing and wash the affected area immediately. Contaminated clothing must be changed. Any skin contact with materials potentially impacted by COCs must be reported to the FS or SSO immediately. If needed, medical attention should be sought.
- Practice contamination avoidance. Avoid contact with surfaces either suspected or known to be impacted by COCs, such as standing water, mud, or discolored soil. Equipment must be stored on elevated or protected surfaces to reduce the potential for incidental contamination.
- Remove PPE as required in the CRZ to limit the spread of COC-containing materials.
- At the end of each shift or as required, dispose of all single-use coveralls, soiled gloves, and respirator cartridges in designated receptacles designated for this purpose.

- Removing soil containing Site COCs from protective clothing or equipment with compressed air, shaking, or any other means that disperses contaminants into the air is prohibited.
- Inspect all non-disposable PPE for contamination in the CRZ. Any PPE found to be contaminated must be decontaminated or disposed of appropriately.
- Recognize emergency signals used for evacuation, injury, fire, etc.
- Report all injuries, illnesses, and unsafe conditions or work practices to the FS or SSO.
- Use the "buddy system" during all operations requiring Level C PPE, and when appropriate, during Modified Level D operations.
- Obey all warning signs, tags, and barriers. Do not remove any warnings unless authorized to do so.
- Use, adjust, alter, and repair equipment only if trained and authorized to do so, and in accordance with the manufacturer's directions.
- Personnel are to perform only tasks for which they have been properly trained and will advise their supervisor if they have been assigned a task for which they are not trained.
- The presence or consumption of alcoholic beverages or illicit drugs during the workday, including breaks, is strictly prohibited. Notify your supervisor if you must take prescription or over-the-counter drugs that indicate they may cause drowsiness or, that you should not operate heavy equipment.
- Remain upwind during site activities whenever possible.

8.2 BUDDY SYSTEM

On-Site personnel must use the buddy system as required by operations. Use of the "buddy system" is required during all operations requiring Level C to Level A PPE, and when appropriate, during Level D operations. Crewmembers must observe each other for signs of chemical exposure, and heat or cold stress. Indications of adverse effects include, but are not limited to:

- Changes in complexion and skin coloration;
- Changes in coordination;
- Changes in demeanor;
- Excessive salivation and pupillary response; and
- Changes in speech pattern.

Crewmembers must also be aware of the potential exposure to possible safety hazards, unsafe acts, or non-compliance with safety procedures.

Field personnel must inform their partners or fellow crewmembers of non-visible effects of exposure to toxic materials that they may be experiencing. The symptoms of such exposure may include, but are not limited to:

- Headaches;
- Dizziness;
- Nausea;
- Blurred vision;
- Cramps; and
- Irritation of eyes, skin, or respiratory tract.

If protective equipment or noise levels impair communications, prearranged hand signals must be used for communication. Personnel must stay within line of sight of another team member.

8.3 HEAT STRESS

Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, etc., as well as the physical and conditioning characteristics of the individual. Since heat stress is one of the most common illnesses associated with heavy outdoor work conducted with direct solar load and, in particular, because wearing PPE can increase the risk of developing heat stress, workers must be capable of recognizing the signs and symptoms of heat-related illnesses. Personnel must be aware of the types and causes of heat-related illnesses and be able to recognize the signs and symptoms of these illnesses in both themselves and their co-workers.

Heat rashes are one of the most common problems in hot work environments. Commonly known as prickly heat, a heat rash is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

Heat cramps are usually caused by performing hard physical labor in a hot environment. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused both by too much or too little salt.

Cramps appear to be caused by the lack of water replenishment. Because sweat is a hypotonic solution (plus or minus 0.3% NaCl), excess salt can build up in the body if the water lost through sweating is not replaced. Thirst cannot be relied on as a guide to the need for water; instead, water must be taken every 15 to 20 minutes in hot environments.

Under extreme conditions, such as working for six (6) to eight (8) hours in heavy protective gear, a loss of sodium may occur. Drinking commercially available carbohydrate electrolyte replacement liquids is effective in minimizing physiological disturbances during recovery.

Heat exhaustion occurs from increased stress on various body organs due to inadequate blood circulation, cardiovascular insufficiency, or dehydration. Signs and symptoms include pale, cool, moist skin; heavy sweating; dizziness; nausea; headache, vertigo, weakness, thirst, and giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat exhaustion should not be dismissed lightly, however, for several reasons. One is that the fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended; moreover, the victim may be injured when he or she faints. Also, the signs and symptoms seen in heat exhaustion are similar to those of heat stroke, which is a medical emergency.

Workers suffering from heat exhaustion should be removed from the hot environment, be given fluid replacement, and be encouraged to get adequate rest.

Heat stroke is the most serious form of heat stress. Heat stroke occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. This condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. Heat stroke is a medical emergency. The primary signs and symptoms of heat stroke are confusion; irrational behavior; loss of consciousness; convulsions; a lack of sweating (usually); hot, dry skin; and an abnormally high body temperature, e.g., a rectal temperature of 41°C (105.8°F). If body temperature is too high, it causes death. The elevated metabolic temperatures caused by a combination of workload and environmental heat load, both of which contribute to heat stroke, are also highly variable and difficult to predict.

If a worker shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment.

Regardless of the worker's protestations, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or exhaustion, that person may be predisposed to additional heat injuries.

8.4 HEAT STRESS SAFETY PRECAUTIONS

Heat stress monitoring and work rest cycle implementation should commence when the ambient adjusted temperature exceeds 72°F. A minimum work rest regimen and procedures for calculating ambient adjusted temperature are described in **Table 8.1** below.

Table 8.1 – Work/Rest Schedule

Adjusted Temperature[b]	Work/Rest Regimen Normal Work Ensemble[c]	Work/Rest Regimen Impermeable Ensemble
90ºF (32.2ºC) or above	After each 45 minutes of work	After each 15 minutes of work
87.5º - 90ºF (30.8º-32.2ºC)	After each 60 minutes of work	After each 30 minutes of work

Adjusted Temperature[b]	Work/Rest Regimen Normal Work Ensemble[c]	Work/Rest Regimen Impermeable Ensemble
82.5º - 87.5ºF (28.1º - 30.8ºC)	After each 90 minutes of work	After each 60 minutes of work
77.5º - 82.5ºF (25.3º - 28.1ºC)	After each 120 minutes of work	After each 90 minutes of work
72.5º - 77.5ºF (30.8º - 32.2ºC)	After each 150 minutes of work	After each 120 minutes of work

a. For work levels of 250 kilocalories/hour (Light-Moderate Type of Work)

b. Calculate the adjusted air temperature (ta adj) by using this equation: ta adj °F = ta °F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

c. A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

d. The information presented above was generated using the information provided in the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) Handbook.

In order to determine if the work rest cycles are adequate for the personnel and specific Site conditions, additional monitoring of individual heart rates will be conducted during the rest cycle. To check the heart rate, count the radial pulse for 30 seconds at the beginning of the rest period. If the heart rate exceeds 110 beats per minute, shorten the next work period by one third and maintain the same rest period.

Additionally, one or more of the following control measures can be used to help control heat stress and are mandatory if any Site worker has a heart rate (measure immediately prior to rest period) exceeding 115 beats per minute:

- Site workers will be encouraged to drink plenty of water and electrolyte replacement fluids throughout the day.
- On-Site drinking water will be kept cool (50 to 60°F).
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All personnel will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Cooling devices, such as vortex tubes or cooling vests, should be used when personnel must wear impermeable clothing in conditions of extreme heat.
- Employees should be instructed to monitor themselves and co-workers for signs of heat stress and to take additional breaks as necessary.
- A shaded rest area must be provided. All breaks should take place in the shaded rest area.
- Employees must not be assigned to other tasks during breaks.
- Employees must remove impermeable garments during rest periods. This includes white Tyvek-type garments.

All employees must be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.

8.5 COLD STRESS

Cold stress normally occurs in temperatures at or below freezing, or under certain circumstances, in temperatures of 40°F. Extreme cold for a short time may cause severe injury to exposed body surfaces or result in profound generalized cooling, causing death. Areas of the body that have high surface area-to-volume ratio, such as fingers, toes, and ears, are the most susceptible. Two (2) factors influence the development of a cold weather injury: ambient temperature and the velocity of the wind. For instance, 10°F with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at -18°F. An equivalent chill temperature chart relating the actual dry bulb temperature and wind velocity is presented in **Table 8.2** below.

Table 8.2– Wind Chill Temperature Chart

Estimated Wind Speed (in mph)	**Actual Temperature Reading (ºF)**											
	50	**40**	**30**	**20**	**10**	**0**	**-10**	**-20**	**-30**	**-40**	**-50**	**-60**
	Equivalent Chill Temperature (ºF)											
Calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-121
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little additional effect.)	**LITTLE DANGER** **Maximum danger of false sense of security.**				**INCREASING DANGER** **Danger from freezing of exposed flesh within one minute.**			**GREAT DANGER** **Flesh may freeze within 30 seconds.**				
	Trench foot and immersion foot may occur at any point on this chart.											

[This chart was developed by the U.S. Army Research Institute of Environmental Medicine, Natick, MA (Source: ACGIH Threshold Limit Values for Chemical Substances and Physical Agents)].

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of tissue damage associated with frostbite. Frostbite of the extremities can be categorized into:

- *Frost Nip or Incipient Frostbite* - characterized by sudden blanching or whitening of skin.
- *Superficial Frostbite* - skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.
- *Deep Frostbite* - tissues are cold, pale, and solid; extremely serious injury.

Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperature. It can be fatal. Its symptoms are usually exhibited in five stages: 1) shivering; 2) apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95°F; 3) unconsciousness, glassy stare, slow pulse, and slow respiratory rate; 4) freezing of the extremities; and 5) death. Trauma sustained in freezing or sub-zero conditions requires special attention because an injured worker is predisposed to secondary cold injury. Special provisions must be made to prevent hypothermia and secondary freezing of damaged tissues in addition to providing for first aid treatment. To avoid cold stress, site personnel must wear protective clothing appropriate for the level of cold and physical activity. In addition to protective clothing, preventive safe work practices, additional training, and warming regimens may be utilized to prevent cold stress.

8.6 SAFETY PRECAUTIONS FOR COLD STRESS PREVENTION

For air temperature of 0°F or less, mittens should be used to protect the hands. For exposed skin, continuous exposure should not be permitted when air speed and temperature results in a wind chill temperature of -25°F.

At air temperatures of 36°F or less, field personnel who become immersed in water or whose clothing becomes wet must be immediately provided with a change of clothing and be treated for hypothermia.

If work is done at normal temperature or in a hot environment before entering the cold, the field personnel must ensure that their clothing is not wet as a consequence of sweating. Wet field personnel must change into dry clothes prior to entering the cold area.

If the available clothing does not give adequate protection to prevent hypothermia or frostbite, work must be modified or suspended until adequate clothing is made available or until weather conditions improve.

Field personnel handling evaporative liquid (e.g., gasoline, alcohol, or cleaning fluids) at air temperatures below 40°F must take special precaution to avoid soaking of clothing or gloves with the liquids because of the added danger of cold injury due to evaporative cooling.

8.7 SAFE WORK PROCEDURES

Direct contact between bare skin and cold surfaces (< 20°F) should be avoided. Metal tool handles and/or equipment controls should be covered by thermal insulating material.

For work performed in a wind chill temperature at or below 10°F, workers should be under constant protective observation (buddy system). The work rate should be established to prevent heavy sweating that will result in wet clothing. For heavy work, rest periods must be taken in heated shelters and workers should be provided with an opportunity to change into dry clothing if needed.

Field personnel should be provided the opportunity to become accustomed to cold-weather working conditions and required protective clothing. Work should be arranged in such a way that sitting or standing still for long periods is minimized.

During the warming regimen (rest period), field personnel should be encouraged to remove outer clothing to permit sweat evaporation or to change into dry work clothing. Dehydration, or loss of body fluids, occurs insidiously in the cold environment and may increase susceptibility to cold injury due to a significant change in blood flow to the extremities. Fluid replacement with warm, sweet drinks and soups is recommended. The intake of coffee should be limited because of diuretic and circulatory effects.

8.8 BIOLOGICAL HAZARDS

Biological hazards may include poison ivy, snakes, thorny bushes and trees, ticks, mosquitoes, spiders, and other pests.

8.8.1 TICK BORNE DISEASES

Lyme Disease - The disease commonly occurs in summer and is transmitted by the bite of infected ticks. “Hot spots” in the United States include New York, New Jersey, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

Erlichiosis - The disease also commonly occurs in summer and is transmitted by the bite of infected ticks. “Hot spots” in the United States include New York, Massachusetts, Connecticut, Rhode Island, Minnesota, and Wisconsin.

These diseases are transmitted primarily by the deer tick, which is smaller and redder than the common wood tick. The disease may be transmitted by immature ticks, which are small and hard to see. The tick may be as small as a period on this page.

Symptoms of Lyme disease include a rash or a peculiar red spot, like a bull’s eye, which expands outward in a circular manner. The victim may have headache, weakness, fever, a stiff neck, and

swelling and pain in the joints, and eventually, arthritis. Symptoms of erlichiosis include muscle and joint aches, flu-like symptoms, but there is typically no skin rash.

Rocky Mountain Spotted Fever (RMSF) - This disease is transmitted via the bite of an infected tick. The tick must be attached 4 to 6 hours before the disease-causing organism (Rickettsia rickettsii) becomes reactivated and can infect humans. The primary symptom of RMSF is the sudden appearance of a moderate-to-high fever. The fever may persist for two to three weeks. The victim may also have a headache, deep muscle pain, and chills. A rash appears on the hands and feet on about the third day and eventually spreads to all parts of the body. For this reason, RMSF may be confused with measles or meningitis. The disease may cause death, if untreated, but if identified and treated promptly, death is uncommon.

Control - Tick repellant containing diethyltoluamide (DEET) should be used when working in tick-infested areas, and pant legs should be tucked into boots. In addition, workers should search the entire body every three or four hours for attached ticks. Ticks should be removed promptly and carefully without crushing, since crushing can squeeze the disease-causing organism into the skin. A gentle and steady pulling action should be used to avoid leaving the head or mouth parts in the skin. Hands should be protected with surgical gloves when removing ticks.

8.8.2 POISONOUS PLANTS

Poisonous plants may be present in the work area. Personnel should be alerted to its presence and instructed on methods to prevent exposure.

Control - The main control is to avoid contact with the plant, cover arms and hands, and frequently wash potentially exposed skin. Particular attention must be given to avoiding skin contact with objects or protective clothing that have touched the plants. Treat every surface that may have touched the plant as contaminated, and practice contamination avoidance. If skin contact is made, the area should be washed immediately with soap and water and observed for signs of reddening.

8.8.3 SNAKES

The possibility of encountering snakes exists, specifically for personnel working in wooded/vegetated areas. Snake venoms are complex and include proteins, some of which have enzymatic activity. The effects produced by venoms include neurotoxic effects with sensory, motor, cardiac, and respiratory difficulties; cytotoxic effects on red blood cells, blood vessels, heart muscle, kidneys, and lungs; defects in coagulation; and effects from local release of substances by enzymatic actions. Other noticeable effects of venomous snakebites include swelling, edema, and pain around the bite, and the development of ecchymosis (the escape of blood into tissues from ruptured blood vessels).

Control - To minimize the threat of snakebites, all personnel walking through vegetated areas must be aware of the potential for encountering snakes, and the need to avoid actions potentiating encounters, such as turning over logs, etc. If a snakebite occurs, an attempt should be made to safely identify the snake via size and markings. The victim must be transported to the nearest

hospital within 30 minutes; first aid consists of applying a constriction band and washing the area around the wound to remove any unabsorbed venom.

8.8.4 SPIDERS

Personnel may encounter spiders during work activities.

Two spiders are of concern: the black widow and the brown recluse. Both prefer dark sheltered areas such as basements, equipment sheds and enclosures, and around woodpiles or other scattered debris. The black widow is shiny black, approximately one inch long, and has a distinctive red hourglass marking on the underside of its body. The black widow is found throughout the United States. The bite of a black widow is seldom fatal to healthy adults, but effects include respiratory distress, nausea, vomiting, and muscle spasms. The brown recluse is smaller than the black widow and gets its name from its brown coloring and behavior. It has a distinctive violin shape on the top of its body. The brown recluse is more prevalent in the southern United States. The bite of the brown recluse is painful and the bite site ulcerates and takes many weeks to heal completely.

Control - To minimize the threat of spider bites, all personnel walking through vegetated areas must be aware of the potential for encountering these arachnids. Personnel need to avoid actions that may result in encounters, such as turning over logs, and placing hands in dark places such as behind equipment or in corners of equipment sheds or enclosures. If a spider bite occurs, the victim must be transported to the nearest hospital as soon as possible; first aid consists of applying ice packs and washing the area around the wound to remove any unabsorbed venom.

8.9 NOISE

Exposure to noise over the OSHA action level can cause temporary impairment of hearing; prolonged and repeated exposure can cause permanent damage to hearing. The risk and severity of hearing loss increases with the intensity and duration of exposure to noise. In addition to damaging hearing, noise can impair voice communication, thereby increasing the risk of accidents on site.

Control - All personnel must wear hearing protection, with a Noise Reduction Rating (NRR) of at least 20, when noise levels exceed 85 dBA. When it is difficult to hear a co-worker at normal conversation distance, the noise level is approaching or exceeding 85 dBA, and hearing protection is necessary. All site personnel who may be exposed to noise must also receive baseline and annual audiograms and training as to the causes and prevention of hearing loss. Noise monitoring is discussed in Section 5.2, Noise Monitoring.

Whenever possible, equipment that does not generate excessive noise levels will be selected for this project. If the use of noisy equipment is unavoidable, barriers or increased distance will be used to minimize worker exposure to noise, if feasible.

All personnel must take every precaution to minimize the potential for spills during site operations. All on-Site personnel shall immediately report any discharge, no matter how small, to the FS.

Spill control equipment and materials will be located on the Site at locations that present the potential for discharge. All sorbent materials used for the cleanup of spills will be containerized and labeled appropriately. In the event of a spill, the FS will follow the provisions in Section 10.0, Emergency Procedures, to contain and control released materials and to prevent their spread to off-Site areas.

8.10 SPILL CONTROL

All personnel must take every precaution to minimize the potential for spills during site operations. All on-Site personnel shall immediately report any discharge, no matter how small, to the FS.

Spill control equipment and materials will be located on the Site at locations that present the potential for discharge. All sorbent materials used for the cleanup of spills will be containerized and labeled appropriately. In the event of a spill, the FS will follow the provisions in Section 10.0, Emergency Procedures, to contain and control released materials and to prevent their spread to off-Site areas.

8.11 SANITATION

Site sanitation will be maintained according to OSHA requirements.

8.11.1 BREAK AREA

Breaks must be taken in the SZ, away from the active work area after Site personnel go through decontamination procedures. There will be no smoking, eating, drinking, or chewing gum or tobacco in any area other than the SZ.

8.11.2 POTABLE WATER

The following rules apply to all field operations:

- An adequate supply of potable water will be provided at each project site. Potable water must be kept away from hazardous materials or media, and contaminated clothing or equipment.
- Portable containers used to dispense drinking water must be capable of being tightly closed and must be equipped with a tap dispenser. Water must not be consumed directly from the container (drinking from the tap is prohibited) nor may it be removed from the container by dipping.
- Containers used for drinking water must be clearly marked and shall not be used for any other purpose.
- Disposable drinking cups must be provided. A sanitary container for dispensing cups and a receptacle for disposing of used cups is required.

8.11.3 SANITARY FACILITIES

Access to facilities for washing before eating, drinking, or smoking, or alternate methods such as waterless hand-cleaner and paper towels will be provided.

8.11.4 LAVATORY

If permanent toilet facilities are not available, an appropriate number of portable chemical toilets will be provided. This requirement does not apply to mobile crews or to normally unattended Site locations so long as employees at these locations have transportation immediately available to nearby toilet facilities.

8.12 EMERGENCY EQUIPMENT

Adequate emergency equipment for the activities being conducted on site and as required by applicable sections of 29 CFR 1910 and 29 CFR 1926 will be on Site prior to the commencement of project activities. Personnel will be provided with access to emergency equipment, including, but not limited to, the following:

- Fire extinguishers of adequate size, class, number, and location as required by applicable sections of 29 CFR 1910 and 1926;
- Industrial first aid kits of adequate size for the number of personnel on site; and
- Emergency eyewash and/or shower if required by operations being conducted on Site.

8.13 LOCKOUT/TAGOUT PROCEDURES

Only fully qualified and trained personnel will perform maintenance procedures. Before maintenance begins, lockout/tagout procedures per OSHA 29 CFR 1910.147 will be followed.

Lockout is the placement of a device that uses a positive means, such as lock, to hold an energy or material-isolating device such that the equipment cannot be operated until the lockout device is removed. If a device cannot be locked out, a tagout system shall be used. Tagout is the placement of a warning tag on an energy or material isolating device indicating that the equipment controls may not be operated until the personnel who attached the tag remove the tag.

8.14 ELECTRICAL SAFETY

Electricity may pose a particular hazard to Site workers due to the use of portable electrical equipment. If wiring or other electrical work is needed, a qualified electrician must perform it.

General electrical safety requirements include:

- All electrical wiring and equipment must be a type listed by Underwriters Laboratories (UL), Factory Mutual Engineering Corporation (FM), or other recognized testing or listing agency.

- All installations must comply with the National Electrical Safety Code (NESC), the National Electrical Code (NEC), or USCG regulations.
- Portable and semi-portable tools and equipment must be grounded by a multi-conductor cord having an identified grounding conductor and a multi-contact polarized plug-in receptacle.
- Tools protected by an approved system of double insulation, or its equivalent, need not be grounded. Double insulated tools must be distinctly marked and listed by UL or FM.
- Live parts of wiring or equipment must be guarded to prevent persons or objects from touching them.
- Electric wire or flexible cord passing through work areas must be covered or elevated to protect it from damage by foot traffic, vehicles, sharp corners, projections, or pinching.
- All circuits must be protected from overload.
- Temporary power lines, switchboxes, receptacle boxes, metal cabinets, and enclosures around equipment must be marked to indicate the maximum operating voltage.
- Plugs and receptacles must be kept out of water unless of an approved submersible construction.
- All extension cord outlets must be equipped with ground fault circuit interrupters (GFCI).
- Attachment plugs or other connectors must be equipped with a cord grip and be constructed to endure rough treatment.
- Extension cords or cables must be inspected prior to each use and replaced if worn or damaged. Cords and cables must not be fastened with staples, hung from nails, or suspended by bare wire.
- Flexible cords must be used only in continuous lengths without splice, with the exception of molded or vulcanized splices made by a qualified electrician.

8.15 LIFTING SAFETY

Using proper lifting techniques may prevent back strain or injury. The fundamentals of proper lifting include:

- Consider the size, shape, and weight of the object to be lifted. A mechanical lifting device or additional persons must be used to lift an object if it cannot be lifted safely alone.
- The hands and the object should be free of dirt or grease that could prevent a firm grip.
- Gloves must be used, and the object inspected for metal slivers, jagged edges, burrs, or rough or slippery surfaces.
- Fingers must be kept away from points that could crush or pinch them, especially when putting an object down.
- Feet must be placed far enough apart for balance. The footing should be solid and the intended pathway should be clear.
- The load should be kept as low as possible, close to the body with the knees bent.
- To lift the load, grip firmly and lift with the legs, keeping the back as straight as possible.
- A worker should not carry a load that he or she cannot see around or over.
- When putting an object down, the stance and position are identical to that for lifting; the legs are bent at the knees, and the back is straight as the object is lowered.

8.16 LADDER SAFETY

When portable ladders are used for access to an upper landing surface, the ladder side rails shall extend at least three (3) feet (9 m) above the upper landing surface to which the ladder is used to gain access; or, when such an extension is not possible because of the ladder's length, then the ladder shall be secured at its top to a rigid support that will not deflect, and a grasping device, such as a grabrail, shall be provided to assist employees in mounting and dismounting the ladder. In no case shall the extension be such that ladder deflection under a load would, by itself, cause the ladder to slip off its support.

- Ladders shall be maintained free of oil, grease, and other slipping hazards.
- Ladders shall not be loaded beyond the maximum intended load for which they were built, or beyond their manufacturer's rated capacity.
- Ladders shall be used only for the purpose for which they were designed.
- Non-self-supporting ladders shall be used at an angle such that the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (the distance along the ladder between the foot and the top support).
- Wood job-made ladders with spliced side rails shall be used at an angle such that the horizontal distance is one-eighth the working length of the ladder.
- Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal, as measured to the back side of the ladder.
- Ladders shall be used only on stable and level surfaces unless secured to prevent accidental displacement.
- Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement. Slip-resistant feet shall not be used as a substitute for care in placing, lashing, or holding a ladder that is used upon slippery surfaces, including, but not limited to, flat metal or concrete surfaces that are constructed so they cannot be prevented from becoming slippery.
- Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement, or a barricade shall be used to keep the activities or traffic away from the ladder.
- The area around the top and bottom of ladders shall be kept clear.
- The top of a non-self-supporting ladder shall be placed with the two rails supported equally unless it is equipped with a single support attachment.
- Ladders shall not be moved, shifted, or extended while occupied.
- Ladders shall have non-conductive side rails if they are used where the employee or the ladder could contact exposed energized electrical equipment.
- The top, top step, or the step labeled that it or any step above it should not be used as a step.
- Cross-bracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
- Ladders shall be inspected by the HSM for visible defects on a daily basis and after any occurrence that could affect their safe use.
- Portable ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; corroded components; or other faulty or defective components shall either be immediately marked in a manner that readily identifies them as defective or be tagged with "Do Not Use" or similar language and shall be withdrawn from service.

- Fixed ladders with structural defects, such as, but not limited to, broken or missing rungs, cleats, or steps; broken or split rails; or corroded components; shall be withdrawn from service.
- Ladder repairs shall restore the ladder to a condition meeting its original design criteria, before the ladder is returned to use.
- Single-rail ladders shall not be used.
- When ascending or descending a ladder, the user shall face the ladder.
- Each employee shall use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- An employee shall not carry any object or load that could cause the employee to lose balance and fall.

8.17 TRAFFIC SAFETY

The project Site may be located adjacent to a public roadway where exposure to vehicular traffic is likely. Traffic may also be encountered as vehicles enter and exit the area. To minimize the likelihood of project personnel and activities being affected by traffic, the following procedures will be implemented.

Cones must be placed along the shoulder of the roadway starting 100 feet from the work area to alert passing motorists to the presence of personnel and equipment. A “Slow” or “Men Working” sign must be placed at the first cone. Barricades with flashing lights should be placed between the roadway and the work area.

During activities along a roadway, equipment will be aligned parallel to the roadway to the extent feasible, facing into the oncoming traffic so as to place a barrier between the work crew and the oncoming traffic. All crewmembers must remain behind the equipment and the traffic barrier.

All Site personnel who are potentially exposed to vehicular traffic must wear an outer layer of orange warning garments, such as vests, jackets, or shirts. If work is performed in hours of dusk or darkness, workers will be outfitted with reflective garments either orange, white (including silver-coated reflective coatings or elements that reflect white light), yellow, fluorescent red-orange, or fluorescent yellow-orange.

The flow of traffic into and out of the adjacent business must be assessed, and precautions taken to warn motorists of the presence of workers and equipment. Where possible, vehicles should be aligned to provide physical protection of people and equipment.

9.0 SITE-SPECIFIC HAZARDS AND CONTROL MEASURES

9.1 EVALUATION OF HAZARDS

The evaluation of hazards is provided as a quick reference as to the known conditions for the Site, wherein the level of detail for each of the subsections is identified.

9.1.1 HAZARD CHARACTERISTICS

Existing information for Site:

_X_ Detailed _____ Preliminary _____ None

Hazardous/Contaminated Material Form(s):

_X_ Solid _X_ Liquid _____Sludge _____Gas _X_ Vapor

Containment Type(s):

_____ Drum _____ Tank _____ Pit _____ Debris

_____ Pond _____Lagoon Other: None known

Hazardous Material Characteristics:

_X_ Volatile _____ Corrosive _____ Reactive
_____ Radioactive

_____ Ignitable _X_ Toxic _X_ Unknown

Routes of Exposure:

_X_ Oral _____ Dermal _X_ Eye _X_ Respiratory

9.1.2 POTENTIAL HEALTH AND SAFETY HAZARDS

_X_ Heat _X_ Congested areas

_X_ Cold _X_ General Construction

_____ Confined space entry _X_ Physical injury

_____ Oxygen depletion _X_ Electrical hazards

_____ Asphyxiation _X_ Handling and product transfer

_X_ Excavation _X_ Fire

_X_ Cave-ins _X_ Explosion

_X_ Falls, slippage _X_ Biological Hazards

_X_ Plants – Poison Ivy, Poison Oak

_X_ Insects – Ticks

_X_ Insects – Mosquitoes

_X_ Insects – Bees and Wasps

_X_ Rats and Mice

_X_ Heavy equipment _____ Non-ionizing Radiation (i.e. UV, IR, etc.)

_____ Other: Potential Ignition Hazard

9.2 FIELD ACTIVITIES, HAZARDS AND CONTROL PROCEDURES

The following task-specific safety analyses identify potential health, safety, and environmental hazards associated with each type of field activity. Because of the complex and changing nature of field projects, supervisors must continually inspect the Site to identify hazards that may affect on-Site personnel, the community, or the environment. The FS must be aware of these changing conditions and discuss them with the PM whenever these changes impact employee health, safety, the environment, or performance of the project. The FS will keep on-Site personnel informed of the changing conditions, and the PM will write and/or approve addenda or revisions to this HASP as necessary.

9.2.1 MOBILIZATION/CONSTRUCTION STAKEOUT

Description of Tasks

Site mobilization will include establishing excavation locations, determining the location of utilities and other installations, and establishing work areas. Mobilization will also include setting up equipment and establishing a temporary Site office. A break area will be set up outside of regulated work areas. Mobilization may involve clearing areas for the SZ and CRZ. During this initial phase, project personnel will walk the Site to confirm the existence of anticipated hazards and identify safety and health issues that may have arisen since the writing of this plan.

Hazard Identification

The hazards of this phase of activity are associated with heavy equipment operation, manual materials handling, installation of temporary on-site facilities, and manual site preparation.

Manual materials handling and manual site preparation may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Installation of temporary field office and support facilities may expose personnel to electrical hazards, underground and overhead utilities, and physical injury due to the manual lifting and moving of materials. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat- or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Controls

Control procedures for these hazards are discussed in Section 8.0, General Safety Practices.

9.2.2 DEMOLITION/SITE-CLEARING

Description of Tasks

Site clearance will involve manual or mechanical removal of objects impeding access to the construction footprint. These obstructions are both natural and man-made items and will include, but not be limited to, fabricated metal and concrete structures, trees, vegetation, rubble, and miscellaneous trash/debris.

Hazard Identification

Hazards associated with demolition and site clearance include personnel working in and around potentially unstable structures, or locations of potential contact with hazardous chemicals, utilities, and/or falling objects. This task will involve manual, as well as mechanical demolition/clearance efforts so exertion and equipment hazards exist.

Controls

PPE – Personnel shall be protected from hazards of irritant and toxic plants and suitably instructed in the first aid treatment available.

Preparatory Operations – Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a licensed Professional Engineer, of the structure to determine the stability of the structure. Any adjacent structure shall where personnel may be exposed shall also be similarly checked. The PO shall have in writing evidence that such a survey has been performed. All structural instabilities shall be shored or braced, under the supervision of a licensed Professional Engineer, prior to access by an FP.

Utilities – All electric, gas, water, steam, sewer, and other service lines shall be shut off, caped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company that is involved shall be notified in advance. If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary.

Hazardous Substances – It shall also be determined if any type of hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances have been used in any pipes, tanks, or other equipment on the property. When the presence of any such substances is apparent or suspected, testing and purging shall be performed and the hazard eliminated before demolition is started.

Falling Debris/Objects – No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effective protected. Access to the area where falling objects/debris may be encountered must be gated and controlled.

Structural Collapse – Structural or load supporting members on any floor shall not be cut or removed until all stories above such a floor have been demolished and removed. Walls, which

are to serve as retaining walls against which debris will be piled, shall not be so used unless capable of safely supporting the imposed load. Mechanical equipment shall not be used on floors or working surfaces unless such floors or surfaces are not of sufficient strength to support the imposed load.

Rollover Guards – All equipment used in site clearing operations shall be equipped with rollover guards meeting the applicable requirements. In addition, rider-operated equipment shall be equipped with an overhead and rear canopy guard meeting the applicable requirements.

Inspections – During demolition, continuing inspections by a licensed Professional Engineer shall be made as the work progresses to detect hazards resulting from weakened or deteriorated floors, walls, or loosened material. No FP shall be permitted to work where such hazards exist until they are corrected by shoring, bracing, or other effective means.

9.2.3 EXCAVATION AND CUT/FILL OPERATIONS

9.2.3.1 EXCAVATION TRENCHING

Description of Tasks

This task includes the excavation of contaminated soils and superficial debris. Excavation depths vary across the Site.

Hazard Identification

The hazards of this activity are associated with heavy equipment operation, subsurface intrusion, manual materials handling, stockpiling, and disposal. Subsurface intrusion presents hazards associated with negotiating buried utilities, cave-ins of the excavated areas, and regress methods for personnel working inside the excavated areas. Disruption of contaminated soil also presents a health hazard.

Controls

Underground Utilities – The estimated locations of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during the excavation work, shall be determined prior to opening an excavation. Utility companies or owners shall be contacted (“Call Before You Dig”) within established or customary local response times, advised of the proposed work, and asked to establish the location of the utility underground installations prior to the start of actual excavation.

When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by save and acceptable means. While the excavation is open, underground installations shall be protected, supported, or removed, as necessary, to safeguard site personnel.

Cave-Ins – Project personnel in an excavation shall be protected from cave-ins by an adequate protective system, except when:

- Excavations are made entirely in stable rock or excavations are less than five feet in depth and examination of the ground by the SSO provides no indication of a potential cave-in.
- Protective systems shall have the capacity to resist, without failure, all loads that are intended or could reasonably be expected to be applied or transmitted to the system.

Project personnel shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least two feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

Daily inspections of excavations, the adjacent areas, and protective systems shall be made by the SSO for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. An inspection shall be conducted by the SSO prior to the start of work and as needed throughout operations. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence. These inspections are only required when project personnel exposure can be reasonably anticipated.

Where the SSO finds evidence of a situation that could result in a possible cave-in, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions, exposed personnel shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

Excavation Egress – A stairway, ladder, ramp, or other safe means of egress shall be located in trench excavations that are four feet or more in depth so as to require no more than 25 feet or lateral travel for project personnel.

9.2.3.2 HEAVY EQUIPMENT OPERATION

Description of Tasks

Heavy equipment to be used for this task include, but are not limited to, excavators, dozers, dump trucks, and water sprayers (if required).

Hazard Identification

The most common type of accident that occurs in material handling operations is the “caught between” situation when a load is being handled and an object gets caught between two moving parts of the equipment. Operation of the heavy construction equipment may produce harmful noise.

Controls

Equipment Inspection – All vehicles in use shall be checked prior to operation to ensure that all parts, equipment, and accessories that affect safe operations are in proper operating condition and free from defects. All defects shall be corrected before the vehicle is placed in service.

Ground Guides – No personnel shall use any motor vehicle, earthmoving, or compacting equipment having an obstructed view to the rear, unless:

- The vehicle has a reverse signal alarm distinguishable from the surrounding noise level; or
- The vehicle is backed up only when an observer signals that it is safe to do so.

Blocking – Heavy machinery, equipment, or parts thereof that are suspended or held aloft shall be substantially blocked to prevent falling or shifting before employees are permitted to work under or between them.

Noise – Control measures for noise are addressed in Section 8.9.

Traffic – Control measures for traffic are addressed in Section 8.17.

9.2.3.3 DISTURBANCE/HANDLING OF CONTAMINATED MATERIAL

Description of Tasks

After the contaminated soil is excavated from below the Site's surface, the material will be stockpiled, dried, and either transported off Site or relocated and backfilled on Site.

Hazard Identification

The hazards associated with materials handling include contact of the contaminated material with project personnel, or cross contamination with other site soil.

Controls

Cross Contamination – Following excavation, contaminated soil stockpiles will be placed on a structure constructed to separate the material from the site soil and collect any groundwater leachate. The material shall be covered to prevent storm water erosion or migration of contaminants through storm water.

Air Monitoring – Air and particulate monitoring will be conducted during soil excavation activities to assess the potential for exposure to airborne COCs. If the results of air monitoring indicate the presence of organic vapors or particulates in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 5.1, Air Monitoring, for a description of air monitoring requirements and action levels. Air monitoring protocols are also presented in the

Community Air Monitoring Plan (Appendix G of this RAWP). A description of each level of personal protection is included in Section 4.0, Personal Protective Equipment.

Traffic – Control measures for traffic are addressed in Section 8.17.

9.2.4 DRILLING/SUBSURFACE INTRUSION ACTIVITIES

Description of Tasks

Site mobilization will include establishing excavation locations, determining the location of utilities and other installations, and establishing work areas. Mobilization will also include setting up equipment and establishing a temporary Site office. A break area will be set up outside of regulated work areas. Mobilization may involve clearing areas for the SZ and CRZ. During this initial phase, project personnel will walk the Site to confirm the existence of anticipated hazards and identify safety and health issues that may have arisen since the writing of this plan.

Hazard Identification

The primary physical hazards for this activity are associated with the use of soil boring and grouting equipment. The equipment is hydraulically powered and uses static force and dynamic percussion force to advance sampling and penetrating tubes.

Accidents can occur as a result of improperly placing the equipment on uneven or unstable terrain or failing to adequately secure the equipment prior to the start of operations. Overhead utility lines can create hazardous conditions if contacted by the equipment. Underground installations such as electrical lines, conduit, and product lines pose a significant hazard if contacted.

Controls

Geoprobe and Drill Rig Safety Procedures - The operator of the equipment must possess required state or local licenses to perform such work. All members of the crew shall receive Site-specific training prior to beginning work.

The operator is responsible for the safe operation of the rig, as well as the crew's adherence to the requirements of this HASP. The operator must ensure that all safety equipment is in proper condition and is properly used. The members of the crew must follow all instructions of the operator, wear all personal protective equipment, and be aware of all hazards and control procedures. The operator and crew must participate in the Daily Safety Meetings and be aware of all emergency procedures.

Equipment Inspection - Each day, prior to the start of work, the rig and associated equipment must be inspected by the operator. The following items must be inspected:

- Vehicle condition;
- Proper storage of equipment;

- Condition of all hydraulic lines;
- Fire extinguisher; and
- First aid kit.

Equipment Set Up - The drill rig must be properly blocked and leveled prior to raising the derrick. The wheels which remain on the ground must be chocked. The leveling jacks shall not be raised until the derrick is lowered. The rig shall be moved only after the derrick has been lowered.

All well sites will be inspected by the driller prior to the location of the rig to verify a stable surface exists. This is especially important in areas where soft, unstable terrain is common.

The drill rig must be properly blocked and leveled prior to raising the derrick. Blocking provides a more stable drilling structure by evenly distributing the weight of the rig. Proper blocking ensures that differential settling of the rig does not occur.

When the ground surface is soft or otherwise unstable, wooden blocks, at least 24" by 24" and 4" to 8" thick shall be placed between the jack swivels and the ground. The emergency brake shall be engaged, and the wheels that are on the ground shall be chocked.

Rules for Intrusive Activity - Before beginning any intrusive activity, the existence and location of underground pipe, conduit, electrical equipment, and other installations will be determined. This will be done, if possible, by contacting the appropriate client representative to mark the location of the lines. “Call Before You Dig” will verify the potential for encountering subsurface utilities. If the client’s knowledge of the area is incomplete, an appropriate device, such as a magnetometer, will be used to locate the line.

Combustible gas readings of the general work area will be made regularly in areas where and/or during operations when the presence of flammable vapors or gases is suspected, such as during intrusive activities (see Section 5.1). Operations must be suspended and corrective action taken if the airborne flammable concentration reaches 10% of the LEL in the immediate area (a one-foot radius) of the point of drilling, or near any other ignition sources.

Overhead Electrical Clearances - If equipment is operated in the vicinity of overhead power lines, the power to the lines must be shut off or the equipment must be positioned and blocked such that no part, including cables, can come within the minimum clearances as indicated on **Table 8.2** below:

Table 8.3– Voltage versus Required Clearance

Nominal System Voltage	Minimum Required Clearance
0-50kV	10 feet
51-100kV	12 feet
101-200kV	15 feet
201-300kV	20 feet
301-500kV	25 feet
501-750kV	35 feet
751-1,000kV	45 feet

When the drill rig is in transit, with the boom lowered and no load, the equipment clearance must be at least four (4) feet for voltages less than 50kV, 10 feet for voltages of 50 kV to 345 kV, and 16 feet for voltages above 345 kV.

Hoisting Operations - Drillers should never engage the rotary clutch without watching the rotary table, and ensuring it is clear of personnel and equipment.

Unless the drawworks is equipped with an automatic feed control, the brake should not be left unattended without first being tied down.

Drill pipe, auger strings or casing should be picked up slowly. Drill pipe should not be hoisted until the driller is sure that the pipe is latched in the elevator, or the derrickman has signaled that he may safely hoist the pipe.

During instances of unusual loading of the derrick or mast, such as when making an unusually hard pull, only the driller should be on the rig floor; no one else should be on the rig or derrick.

The brakes on the drawworks of the drill rig should be tested by the driller each day. The brakes should be thoroughly inspected by a competent individual each week.

A hoisting line with a load imposed should not be permitted to be in direct contact with any derrick member or stationary equipment, unless it has been specifically designed for line contact.

Workers should never stand near the borehole whenever any wire line device is being run.

Hoisting control stations should be kept clean and controls labeled as to their functions.

Catline Operations - Only experienced workers will be allowed to operate the cathead controls. The kill switch must be clearly labeled and operational prior to operation of the catline. The cathead area must be kept free of obstructions and entanglements.

The operator should not use more wraps than necessary to pick up the load. More than one layer of wrapping is not permitted.

Personnel should not stand near, step over, or go under a cable or catline which is under tension.

Employees rigging loads on catlines shall:

- Keep out from under the load;
- Keep fingers and feet where they will not be crushed;
- Be sure to signal clearly when the load is being picked;
- Use standard visual signals only and not depend on shouting to coworkers; and
- Make sure the load is properly rigged, since a sudden jerk in the catline will shift or drop the load.

Wire Rope - When two wires are broken or rust or corrosion is found adjacent to a socket or end fitting, the wire rope shall be removed from service or re-socketed. Special attention shall be given to the inspection of end fittings on boom support, pendants, and guy ropes.

Wire rope removed from service due to defects shall be cut up or plainly marked as being unfit for further use as rigging.

Wire rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope; the clip nuts shall be re-tightened immediately after initial load carrying use and at frequent intervals thereafter.

When a wedge socket fastening is used, the dead or short end of the wire rope shall have a clip attached to it or looped back and secured to itself by a clip; the clip shall not be attached directly to the live end.

Protruding ends of strands in splices on slings and bridles shall be covered or blunted.

Except for eye splices in the ends of wires and for endless wire rope slings, wire rope used in hoisting, lowering, or pulling loads, shall consist of one continuous piece without knot or splice.

An eye splice made in any wire rope shall have not less that five full tucks.

Wire rope shall not be secured by knots. Wire rope clips shall not be used to splice rope.

Eyes in wire rope bridles, slings, or bull wires shall not be formed by wire clips or knots.

Pipe/Auger Handling - Pipe and auger sections shall be transported by cart or carried by two persons. Individuals should not carry auger or pipe sections without assistance.

Workers should not be permitted on top of the load during loading, unloading, or transferring of pipe or rolling stock.

Employees should be instructed never to try to stop rolling pipe or casing; they should be instructed to stand clear of rolling pipe.

Slip handles should be used to lift and move slips. Employees are not permitted to kick slips into position.

When pipe is being hoisted, personnel should not stand where the bottom end of the pipe could whip and strike them.

Pipe and augers stored in racks, catwalks or on flatbed trucks should be secured to prevent rolling.

9.2.5 SUBSURFACE CHEMICAL SAMPLE/COLLECTION ANALYSIS

Description of Tasks

This sub-task consists of the collection of soil samples for subsequent field and laboratory analysis. The physical hazards of soil sampling are primarily associated with the sample collection methods, procedures utilized, and the environment itself.

Hazard Identification

Incidental contact with COCs is the primary hazard associated with sampling the stabilized material. This contact may occur through the manipulation of sample media and equipment, manual transfer of media into sample containers, and proximity of operations to the breathing zone. The primary hazards associated with these sampling procedures are not potentially serious; however, other operations in the area, or the conditions under which samples must be collected, may present chemical and physical hazards. The hazards directly associated with sampling procedures are generally limited to strains/sprains and potential eye hazards. Potential chemical hazards may include contact with media containing Site COCs and potential contact with chemicals used for equipment decontamination.

Controls

PPE – To control dermal exposure during sampling activities, a minimum of Level D protection will be worn. If necessary, based on field observations and site conditions, air monitoring may be conducted during sediment sampling activities. If the results of air monitoring indicate the presence of airborne contaminants in a concentration causing concern, personnel will upgrade to Level C protection. Refer to Section 5.1, Air Monitoring, for a description of air monitoring requirements and action levels. Air monitoring protocols are also presented in the Community Air Monitoring Plan (Appendix G of this RAWP). A description of each level of personal protection is included in Section 4.0, Personal Protective Equipment.

9.2.6 UST CLOSURE

9.2.6.1 WORKING IN CONFINED SPACES

Description of Tasks

The project may involve the closure of several underground storage tanks (USTs).

Hazard Identification

Closure activities may require the entrance into confined spaces to facilitate cleaning and removal of the USTs.

Controls

All personnel required to enter confined or enclosed spaces must be instructed as to the nature of the hazards involved, the necessary precautions to be taken, and in the use of required protective and emergency equipment. The PO shall comply with all specific regulations that apply to work in dangerous or potentially dangerous areas. All personnel entering the confined space will have achieved the appropriate OSHA training and the operation will be permitted, as necessary.

9.2.6.2 WORKING WITH COMPRESSED AIR

Description of Tasks

The proposed method of purging the USTs includes the injection of compressed gas into the tank and attached piping network.

Hazard Identification

Uncontrolled release of the highly pressured air can cause injury to FP during this task. Cylinders must also be properly managed to ensure they are not compromised during storage and/or use.

Controls

Pressure Regulation – Compressed air used for cleaning purposes shall be reduced to less than 30 pounds per square inch and then only with effective chip guarding and personal protective equipment.

Cylinder Storage – Valve protection caps shall be in place and secured when compressed gas cylinders are transported, moved, or stored. Cylinder valves shall be closed when work is finished and when cylinders are empty or are moved. Compressed gas cylinders shall be secured in an upright position at all times, except if necessary for short periods of time when cylinders are actually being hoisted or carried. Cylinders shall be placed in a location where they cannot become part of an electrical circuit.

9.2.7 DECONTAMINATION

All equipment will be decontaminated before leaving the Site. Personnel involved in decontamination activities may be inadvertently exposed to skin contact with contaminated materials and chemicals brought from the EZ. Personnel involved in decontamination activities must wear PPE that is, at a minimum, one level below the level worn by personnel working in the EZ.

9.2.8 DEMOBILIZATION

Demobilization involves the removal of all tools, equipment, supplies, and vehicles brought to the site. The hazards of this phase of activity are associated with heavy equipment operation and manual materials handling.

Manual materials handling may cause blisters, sore muscles, and joint and skeletal injuries; and may present eye, contusion, and laceration hazards. Heavy equipment operation presents noise and vibration hazards, and hot surfaces, to operators. Personnel in the vicinity of heavy equipment operation may be exposed to physical hazards resulting in fractures, contusions, and lacerations and may be exposed to high noise levels. The work area presents slip, trip, and fall hazards from scattered debris and irregular walking surfaces. Rainy weather may cause wet, muddy, slick walking surfaces, and unstable soil. Freezing weather hazards include frozen, slick, and irregular walking surfaces.

Environmental hazards include plants, such as poison ivy and poison oak; aggressive fauna, such as ticks, fleas, mosquitoes, wasps, spiders, and snakes; weather, such as sunburn, lightning, rain, and heat-or cold-related illnesses; and pathogens, such as rabies, Lyme disease, and blood-borne pathogens.

Control procedures for these hazards are discussed in Section 8.0, General Safety Practices.

9.3 CHEMICAL HAZARDS

The chemical hazards associated with Site operations are related to inhalation, ingestion, and skin exposure to Site COCs. Concentrations of airborne COCs during Site tasks may be measurable and will require air monitoring during certain operations. Air monitoring requirements for Site tasks are outlined in Section 5.1. Air monitoring protocols are also presented in the Community Air Monitoring Plan (Appendix E of the RIWP).

COCs at the Site include VOCs, SVOCs, pesticides, metals, and PFAS.

The potential for inhalation of site COCs is low. The potential for dermal contact with soils containing Site COCs during remedial operations is moderate. **Table 9.1** lists the primary contaminants that have been identified at the Site and the media in which they are present.

Table 9.1 – List of Primary Contaminants

Media: Soil		
Metals	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
Arsenic	17.4	Not Applicable
Barium	867	Not Applicable
Cadmium	2.8	Not Applicable
Chromium	48.5	Not Applicable
Copper	82.6	Not Applicable
Lead	777	Not Applicable
Mercury	0.71	Not Applicable
Nickel	75.5	Not Applicable
Zinc	279	Not Applicable
VOCs	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
Acetone	0.157	PID

SVOCs	Maximum Concentration (mg/kg)	Applicable Monitoring Instrument
Benzo(a)anthracene	1.9	PID
Benzo(a)pyrene	1.66	PID
Benzo(b)fluoranthene	1.81	PID
Benzo(g,h,i)perylene	13.6	PID
Benzo(k)fluoranthene	4.59	PID
Chrysene	2.55	PID
Dibenzo(a,h)anthracene	2.28	PID
ideno(1,2,3-cd)pyrene	1.02	PID
Phenanthrene	11.3	PID
Pesticides	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
Dieldrin	0.089	PID
4,4'-DDD	0.148	PID
4,4-DDE	0.0073	PID
4,4-DDT	0.019	PID

Media: Groundwater		
VOCs	**Maximum Concentration (ug/L)**	**Applicable Monitoring Instrument**
Trichlorofluoromethane	21.7	PID
SVOCs		

Media: Groundwater		
	Maximum Concentration (ug/L)	**Applicable Monitoring Instrument**
Pentachlorphenol	1.7	PID
Benzo(A)anthracene	40.3	PID
Benzo(A)pyrene	34.2	PID
Benzo(B)fluoranthene	37.5	PID
Benzo(K)fluoranthene	12.8	PID
Chrysene	40.5	PID
Ideno(1,2,3-Cd)pyrene	19.5	PID
Phenanthrene	27	PID
Pyrene	5.8	PID
Pesticides	**Maximum Concentration (ug/L)**	**Applicable Monitoring Instrument**
Dieldrin	0.002	PID
Metals	**Maximum Concentration (ug/L)**	**Applicable Monitoring Instrument**
Barium	2,130	PID
Cadmium	5.6	PID
Chromium	112	PID
Iron	106,000	PID
Magnesium	217,000	PID
Manganese	14,700	PID
Mercury	1.8	PID

Media: Groundwater		
Nickel	114	PID
Sodium	735,000	PID
PFAS	**Maximum Concentration (ng/L)**	**Applicable Monitoring Instrument**
PFOS	35.5	PID
PFOA	38.9	PID

Media: Soil Vapor		
Contaminants	**Maximum Concentration (ug/M3)**	**Applicable Monitoring Instrument**
Acetone	1,220	PID
Benzene	31	PID
1,3-butadiene	70.8	PID
cyclohexane	2,020	PID
Cis-1,2 Dichroloethene	8.7	PID
ethanol	1,430	PID
ethylbenzen	17	PID
heptane	497	PID
isopropyl alcohol	161	PID
methyl ethyl ketone	180	PID
propylene	1,370	PID
2,2,4-trimethlypentane	308	PID
tetrachloroethene	49	PID
trichloroethene	7	PID

Media: Soil Vapor		
Contaminants	**Maximum Concentration (ug/M3)**	**Applicable Monitoring Instrument**
trichlorofluoromethane	433	PID
xylenes	114.6	PID

10.0 EMERGENCY PROCEDURES

10.1 GENERAL

Prior to the start of operations, the work area will be evaluated for the potential for fire, contaminant release, or other catastrophic event. Unusual conditions or events, activities, chemicals, and conditions will be reported to the FS/SSO immediately.

The FS/SSO will establish evacuation routes and assembly areas for the Site. All personnel entering the Site will be informed of this route and the assembly area.

10.2 EMERGENCY RESPONSE

If an incident occurs, the following steps will be taken:

- The FS/SSO will evaluate the incident and assess the need for assistance and/or evacuation;
- The FS/SSO will call for outside assistance as needed;
- The FS/SSO will ensure the PM is notified promptly of the incident; and
- The FS/SSO will take appropriate measures to stabilize the incident scene.

10.2.1 FIRE

In the case of a fire at the Site, the FS/SSO will assess the situation and direct fire-fighting activities. The FS/SSO will ensure that the PM is immediately notified of any fires. Site personnel will attempt to extinguish the fire with available extinguishers, if safe to do so. In the event of a fire that Site personnel are unable to safely extinguish with one (1) fire extinguisher, the local fire department will be summoned.

10.2.2 CONTAMINANT RELEASE

In the event of a contaminant release, the following steps will be taken:

- Notify FS/SSO immediately;
- Evacuate immediate area of release;
- Conduct air monitoring to determine needed level of PPE; and
- Don required level of PPE and prepare to implement control procedures.

The FS/SSO has the authority to commit resources as needed to contain and control released material and to prevent its spread to off-Site areas.

10.3 MEDICAL EMERGENCY

All employee injuries must be promptly reported to the SSO/FS, who will:

- Ensure that the injured employee receives prompt first aid and medical attention;
- In emergency situations, the worker is to be transported by appropriate means to the nearest urgent care facility (normally a hospital emergency room); and
- If the injured person is a SESI employee, notify SESI at 973-808-9050.

10.3.1 EMERGENCY CARE STEPS

Survey the scene. Determine if it is safe to proceed. Try to determine if the conditions that caused the incident are still a threat. Protect yourself from exposure before attempting to rescue the victim.

- Do a primary survey of the victim. Check for airway obstruction, breathing, and pulse. Assess likely routes of chemical exposure by examining the eyes, mouth, nose, and skin of the victim for symptoms.
- Phone Emergency Medical Services (EMS). Give the location, telephone number used, caller's name, what happened, number of victims, victim's condition, and help being given.
- Maintain airway and perform rescue breathing as necessary.
- Perform CPR as necessary.
- Do a secondary survey of the victim. Check vital signs and do a head-to-toe exam.

Treat other conditions as necessary. If the victim can be moved, take him/her to a location away from the work area where EMS can gain access.

10.4 FIRST AID GENERAL

All persons must report any injury or illness to their immediate supervisor or the FS. Trained personnel will provide first aid. Injuries and illnesses requiring medical treatment must be documented. The FS and SSO must fill out an accident/incident report as soon as emergency conditions no longer exist and first aid and/or medical treatment has been ensured. The report must be completed and submitted to the PM within 24 hours after the incident.

If first-aid treatment is required, first aid kits are kept at the CRZ. If treatment beyond first aid is required, the injured person(s) should be transported to the medical facility. If the injured person is not ambulatory or shows any sign of not being in a comfortable and stable condition for transport, then an ambulance/paramedics should be summoned. If there is any doubt as to the injured worker's condition, it is best to let the local paramedic or ambulance service examine and transport the worker.

10.4.1 FIRST AID—INHALATION

Any employee complaining of symptoms of chemical overexposure as described in Section 4, General Site Safety Procedures, will be removed from the work area and transported to the designated medical facility for examination and treatment.

10.4.2 FIRST AID—INGESTION

Call EMS and consult a poison control center for advice. If available, refer to the MSDS for treatment information. If the victim is unconscious, keep them on their side and clear the airway if vomiting occurs.

10.4.3 FIRST AID—SKIN CONTACT

Project personnel who have had skin contact with contaminants will, unless the contact is severe, proceed through the CRZ, to the wash area. Personnel will remove any contaminated clothing, and then flush the affected area with water for at least 15 minutes. The worker should be transported to the medical facility if he/she shows any sign of skin reddening, irritation, or if he/she requests a medical examination.

10.4.4 FIRST AID—EYE CONTACT

Project personnel who have had contaminants splashed in their eyes or who have experienced eye irritation while in the EZ, must immediately proceed to the eyewash station in the CRZ. Do not decontaminate prior to using the eyewash. Remove whatever protective clothing is necessary to use the eyewash. Flush the eye with clean running water for at least 15 minutes. Arrange prompt transport to the designated medical facility.

10.5 REPORTING INJURIES, ILLNESSES, AND SAFETY INCIDENTS

Injuries and illnesses, however minor, will be reported to the FS immediately. The FS will complete an injury report and submit it to the HSM, and the PM by end of shift.

10.6 EMERGENCY INFORMATION

he means to summon local public response agencies such as police, fire, and ambulance will be reviewed in the daily safety meeting. These agencies are identified in **Table 10.1** below.

Table 10.1 – Emergency Contacts

Local Emergency Contacts	**Telephone No.**
EMERGENCY	911
White Plains Hospital	(914) 681-0600
Police Emergency	911
Fire Emergency	911
Rescue Squad	911
Ambulance	911
Miscellaneous Contacts	**Telephone No.**
N.Y. Poison Control Center	(800) 222-1222
National Response Center and Terrorist Hotline	(800) 424-8802
Center for Disease Control	(800) 311-3435
Utility Mark-Out	(800) 962-7962

10.6.1 DIRECTIONS TO HOSPITAL

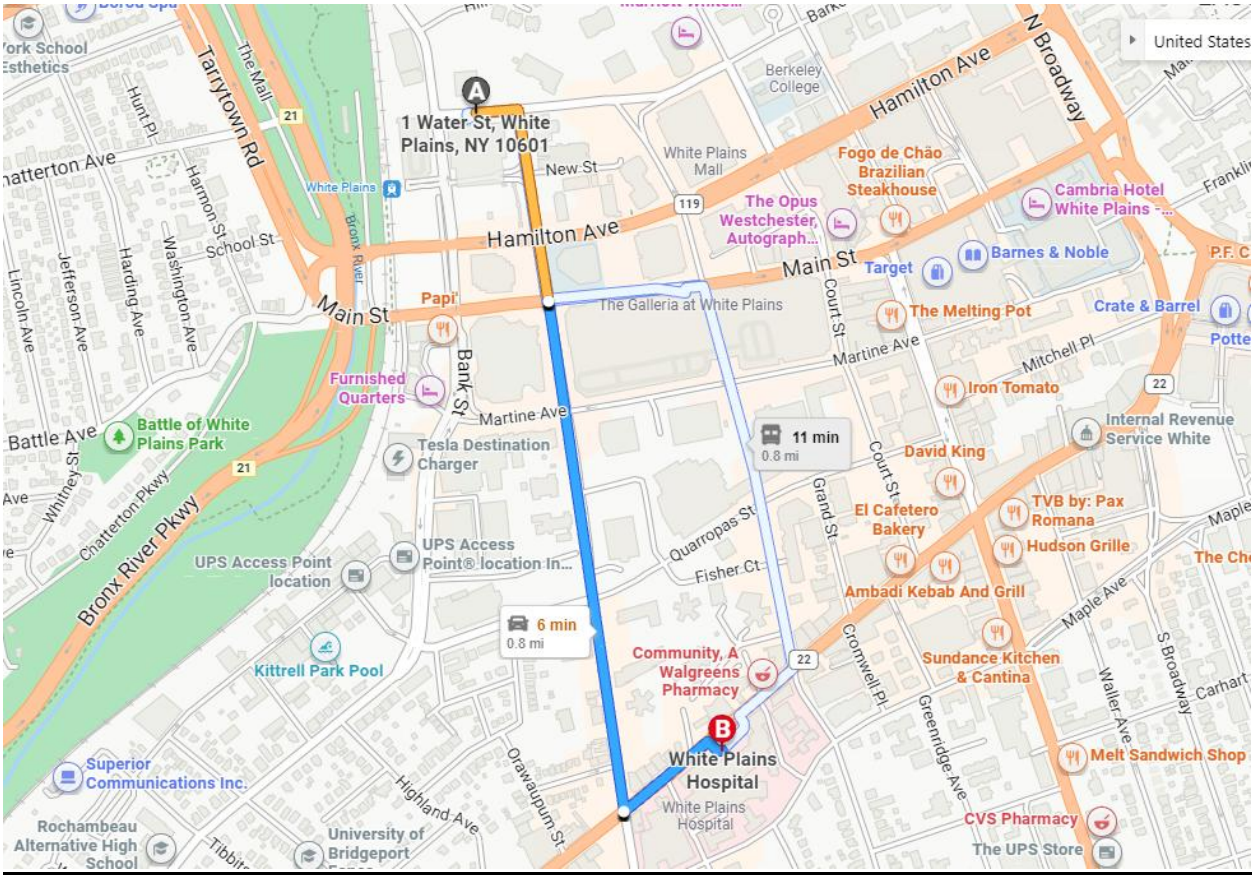
White Plains Hospital

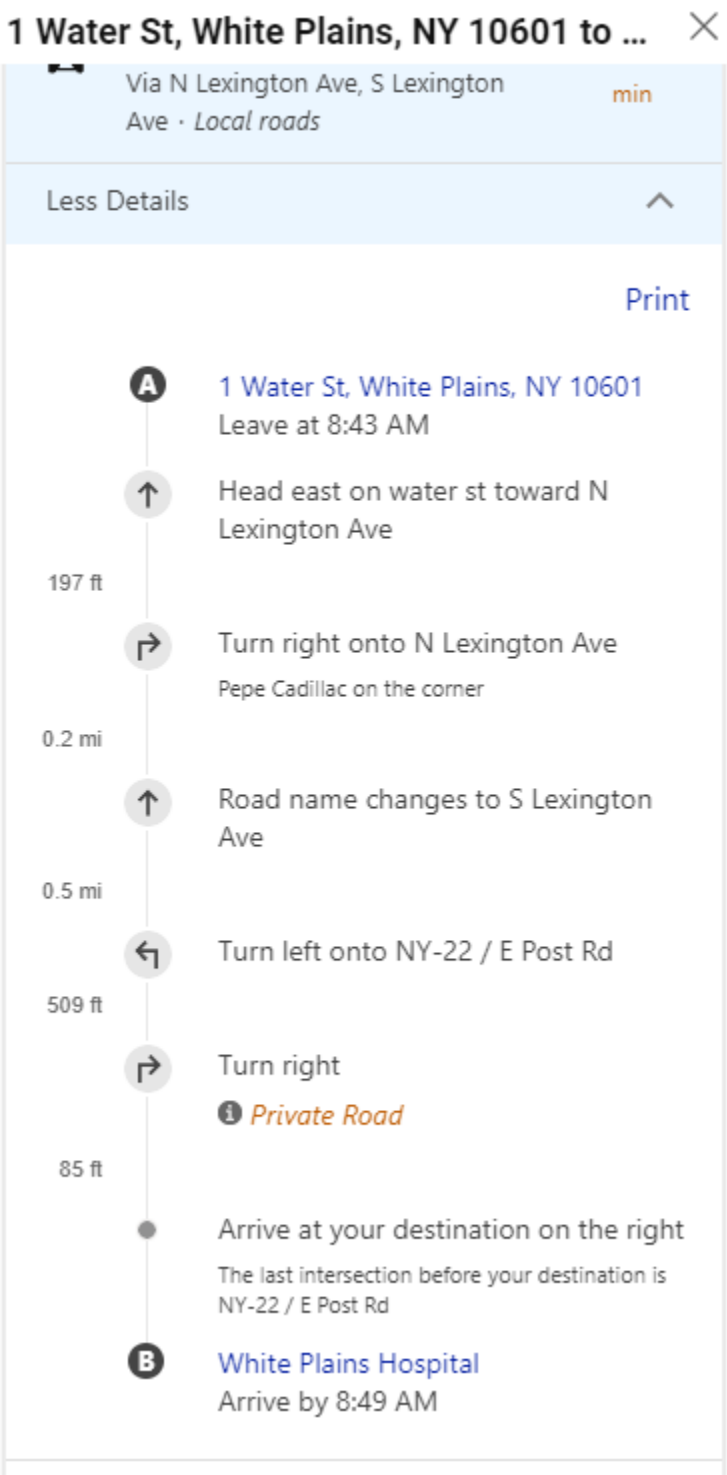
122 Maple Ave, White Plains, NY

(914) 681-0600

Directions to Hospital:

Figure10.1


United States
1 Water St, White Plains, NY 10601
A
B
Hamilton Ave
Main St
New St
Tarrytown Rd
The Mall
Hunt Pl
Harmon St
School St
Washington Ave
Harding Ave
Jefferson Ave
Lincoln Ave
Bronx River
White Plains
Bronx River Pkwy
Chatterton Pkwy
Whitney St
Battle Ave
Battle of White Plains Park
Furnished Quarters
Papi'
Bank St
Martine Ave
Tesla Destination Charger
UPS Access Point location
UPS Access Point® location In...
Kittrell Park Pool
Superior Communications Inc.
Rochambeau Alternative High School
University of Bridgeport
Highland Ave
Orawaupum St
Quarropas St
Fisher Ct
Grand St
Court St
Cromwell Pl
Greenridge Ave
Waller Ave
S Broadway
Maple Ave
Carhart
Mitchell Pl
Berkeley College
White Plains Mall
Fogo de Chão Brazilian Steakhouse
The Opus Westchester, Autograph...
Cambria Hotel White Plains -...
Barnes & Noble
Target
The Galleria at White Plains
The Melting Pot
Crate & Barrel
Iron Tomato
Internal Revenue Service White
David King
El Cafetero Bakery
TVB by: Pax Romana
Hudson Grille
Ambadi Kebab And Grill
Sundance Kitchen & Cantina
Community, A Walgreens Pharmacy
White Plains Hospital
CVS Pharmacy
The UPS Store
Melt Sandwich Shop
11 min
0.8 mi
6 min
0.8 mi
119
21
22



White Plains Hospital is depicted on **Figure 10.1**

11.0 LOGS, REPORTS, AND RECORDKEEPING

11.1 HASP AND FIELD CHANGE REPORT

The following is a summary of required health and safety logs, reports, and record keeping for the operations at the subject Site. The field change request form is presented as Attachment 3.

11.2 MEDICAL AND TRAINING RECORDS

The HSM must obtain and keep a log of personnel meeting appropriate training and medical qualifications for the site work. The log will be kept in the project file. Each company's Human Resources Department will maintain medical records, in accordance with 29 CFR 1910.1020.

11.3 EXPOSURE RECORDS

Any personnel monitoring results, laboratory reports, calculations, and air sampling data sheets are part of an employee exposure record. These records will be kept in accordance with 29 CFR 1910.1020. For SESI employees, the originals will be sent to the Human Resources Manager. For subcontractor employees, the original file will be sent to the subcontractor employer with a copy maintained in the SESI project file.

11.4 ACCIDENT/INCIDENT REPORT

Any accident/incident reports must be completed following procedures given in Section 10.5 of this HASP. The originals will be sent to the HSM for maintenance. A copy of the forms will be kept in the project file. (See Attachment 4).

11.5 OSHA FORM 200

An OSHA Form 200 (Log of Occupational Injuries and Illnesses) will be kept at the project Site. All recordable injuries or illnesses will be recorded on this form. At the end of the project, the original will be sent to the Human Resources Manager for maintenance. Subcontractor employees must also meet the requirements of maintaining an OSHA 200 Form. The accident/incident report meets the requirements of OSHA Form 101 (Supplemental Record), which must be maintained with the OSHA Form 200 for all recordable injuries or illnesses.

11.6 ON-SITE HEALTH AND SAFETY FIELD LOGBOOK

The HSM or designee will maintain an on-Site health and safety logbook in which daily Site conditions, activities, personnel, and significant events will be recorded. Calibration records and personnel monitoring results, if available, will also be recorded in the field logbook. The original logbook will be kept in the project file.

Whenever any personnel monitoring is conducted onsite, the monitoring results will be noted in the filed logbook. These will become part of the exposure records file and will be maintained by the HSM.

A signatory page is included (See Attachment 5) and is to be signed by those working on and/or visiting the Site.

11.7 MATERIAL DATA SAFETY SHEETS

Material Safety Data Sheets (MSDS) will be obtained and kept on file at the project site for each hazardous chemical brought to, use, or stored at the Site (See Attachment 6).

12.0 COVID RESPONSE ACTION PLAN

SESI is concerned with the safety and well-being of its employees, vendors, subcontractors, and others with access to its offices and job sites, with particular emphasis on the unique challenges posed by COVID-19.

SESI has established the following protocols in keeping with the recommendations of the CDC and other sources including State Governor Executive Orders for work taking place on construction sites.

We request that all SESI employees, vendors, and subcontractors help with our prevention efforts while at work.

In order to minimize the spread of COVID-19, we must all cooperate in doing the following:

- Frequently wash your hands with soap and water for at least 20 seconds. When soap and running water are unavailable, use an alcohol-based hand rub with at least 60% alcohol. Always wash hands that are visibly soiled.
- Cover your mouth and nose with a tissue when you cough or sneeze or use the inside of your elbow.
- Discourage handshaking, avoid touching your eyes, nose, or mouth with unwashed hands.
- Limit the sharing of tools, machinery, equipment, phones, desks, and computers.
- Wear cloth face coverings on all construction sites.
- Avoid close contact with people who are sick.
- Employees who have symptoms (i.e., fever, cough, or shortness of breath) should notify their supervisor and stay home—DO NOT GO TO WORK.
- Sick employees should follow CDC-recommended steps. Employees should not return to work until the criteria to discontinue home isolation are met, in consultation with healthcare providers and state and local health departments.

The following are the specific jobsite protocols and response actions to be taken in the event someone on Site has been in contact with, or has themselves, the COVID-19 virus:

OFFICE/JOBSITE PROTOCOL

- If an employee/worker exhibits COVID-19 symptoms, the employee/worker must remain at home until he or she is symptom free for 72 hours (three [3] full days) without the use

of fever-reducing or other symptom-altering medicines (e.g. acetaminophen, cough suppressants). SESI will similarly require an employee or worker that reports to work with symptoms to return home until they are symptom free for 72 hours (three [3] full days).
- Limit person to person contact, and when unavoidable, maintain CDC distancing guidelines.
- Avoid eating lunch in groups.
- Avoid in-person meetings if possible. If an in-person meeting is necessary, conduct it in a well-ventilated area with enough space for attendees to distance themselves from one another. Field jobsite meetings should be conducted in smaller group meetings (no more than five [5] persons when possible) versus one large meeting.
- Only workers necessary to the execution of the work should be at the jobsites. No non-essential visitors should be permitted at the worksite.

RESPONSE ACTION TRIGGER EVENTS:

- an employee/worker at work has tested positive for COVID-19
- an employee/worker at work has suspected, but unconfirmed, case of COVID-19
- an employee/worker self-reported that they came in contact with someone who had a presumptive positive case of COVID-19
- an employee/worker has been exposed to the virus but only found out after they have interacted with others

RESPONSE ACTIONS:

- Upon occurrence of any of the Trigger Events above, employees/subcontractors shall notify SESI Management about the suspected employee/worker infected with, or exposed to, COVID-19.
- SESI Management will investigate the incident to confirm the report is valid.
- Employees/Subcontractors shall investigate their respective infected employee(s) and report the following to SESI Management and HR:
    - Identify all individuals who worked in proximity (six feet) of the infected employee/worker,
    - Employee(s)/Worker(s) infected with the COVID-19 virus, and employee(s)/worker(s) that came in contact with the infected employee/worker shall be sent home for a period of 14 days,
    - Do not identify the infected employee/worker by name to avoid violation of privacy/confidentiality laws, and,
    - Keep SESI Management informed of progress and updates.

- If an infected person was in the office, SESI will clean and disinfect common areas and surfaces, in accordance with CDC recommendations.
- SESI Management will notify affected employees/workers of the Trigger Event and instruct them to take the response actions above.

- **SESI Management policy requires written documentation from a health care professional that confirmed infected employees can return to work.**

Except for circumstances in which SESI is legally required to report workplace occurrences of communicable disease, the confidentiality of all medical conditions will be maintained in accordance with applicable law and to the extent practical under the circumstances. When required, the number of persons who will be informed of an employee's/worker's condition will be kept at the minimum needed to appropriately notify other potentially affected employees/workers of Trigger Events and to attempt to minimize the potential for transmission of the virus.

Attachment 1:
Air Monitor Log

Air Monitoring: Sample Collection and Analysis

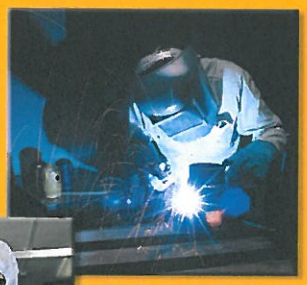
Date & Time of Monitoring	Task / Operation Being	Substance(s)/ Hazard(s) Being	Monitoring Location	Type/Method of Monitoring	Monitoring Results	Exposure Limits	Required Action

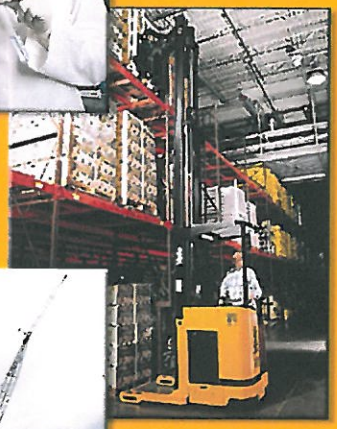
Attachment 2:
OSHA Poster

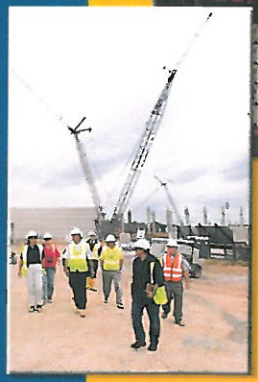
Job Safety and Health

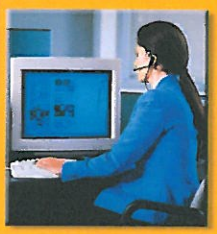
It's the law!

OSHA®
Occupational Safety and Health Administration
U.S. Department of Labor









EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

This free poster available from OSHA –
The Best Resource for Safety and Health

Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA (6742)
www.osha.gov

OSHA 3165-02 2012R

Attachment 3:
Field Change Request Form

HEALTH & SAFETY PLAN
CHANGE NOTICE

Pages _____ of _____

Project: H&S-CN

1) HASP VERSION: _____ SECTION: _____ PAGE (s): _____

RE: --- Change to existing HASP Anticipated Revision Date: _____
--- Addition to existing HASP
--- Other: _____
_____CONT._____

2) PROPOSED CHANGE: _____
_____
_____
_____

3) REASON FOR PROPOSED CHANGE(s):
--- Required by SPEC or Change Order --- Other: _____
--- Disposition of Deficiency _____CONT._____
--- Change in Regulatory or Other Requirements
--- Operational Experience

4) EXHIBITS ATTACHED ____ NO ____ YES (If YES, describe) _____
_____CONT._____

5) PMK APPROVALS PROJECT MANAGER: _____ Date: _____
SITE MANAGER: _____ Date: _____
H&S MANAGER: _____ Date: _____

Client Approval Required: ____ NO ____ YES (If YES, date submitted) _____

6) CLIENT APPROVAL _____ APPROVED _____ REMANDED _____ REJECTED

Comments: _____
_____
_____ CONT._____

Client Representative: _____Date: _____

7) DISTRIBUTION AFTER APPROVAL

X HASP UPDATE LIST --- OTHER: _____
X CLIENT _____
X PROJECT FILES _____

8) PREPARED BY: _____Date: _____
Title: _____

Attachment 4:
Injury Report Form

OSHA's Form 301
Injury and Illness Incident Report

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

This *Injury and Illness Incident Report* is one of the first forms you must fill out when a recordable work-related injury or illness has occurred. Together with the *Log of Work-Related Injuries and Illnesses* and the accompanying *Summary,* these forms help the employer and OSHA develop a picture of the extent and severity of work-related incidents.

Within 7 calendar days after you receive information that a recordable work-related injury or illness has occurred, you must fill out this form or an equivalent. Some state workers' compensation, insurance, or other reports may be acceptable substitutes. To be considered an equivalent form, any substitute must contain all the information asked for on this form.

According to Public Law 91-596 and 29 CFR 1904, OSHA's recordkeeping rule, you must keep this form on file for 5 years following the year to which it pertains.

If you need additional copies of this form, you may photocopy and use as many as you need.

Completed by _____

Title _____

Phone (_____)_____-_____ Date ____/ ____/ ____

Information about the employee

1) Full name _____

2) Street _____

City _____ State _____ ZIP _____

3) Date of birth ____/____/____

4) Date hired ____/____/____

5) ☐ Male
☐ Female

Information about the physician or other health care professional

6) Name of physician or other health care professional _____

_____

7) If treatment was given away from the worksite, where was it given?

Facility _____

Street _____

City _____ State _____ ZIP _____

8) Was employee treated in an emergency room?
☐ Yes
☐ No

9) Was employee hospitalized overnight as an in-patient?
☐ Yes
☐ No

Information about the case

10) Case number from the *Log* _____ *(Transfer the case number from the Log after you record the case.)*

11) Date of injury or illness ____/____/____

12) Time employee began work _____ AM / PM

13) Time of event _____ AM / PM ☐ Check if time cannot be determined

14) ***What was the employee doing just before the incident occurred?*** Describe the activity, as well as the tools, equipment, or material the employee was using. Be specific. *Examples:* "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; "daily computer key-entry."

15) ***What happened?*** Tell us how the injury occurred. *Examples:* "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."

16) ***What was the injury or illness?*** Tell us the part of the body that was affected and how it was affected; be more specific than "hurt," "pain," or sore." *Examples:* "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."

17) ***What object or substance directly harmed the employee?*** *Examples:* "concrete floor"; "chlorine"; "radial arm saw." *If this question does not apply to the incident, leave it blank.*

18) ***If the employee died, when did death occur?*** Date of death ____/____/____

Public reporting burden for this collection of information is estimated to average 22 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Persons are not required to respond to the collection of information unless it displays a current valid OMB control number. If you have any comments about this estimate or any other aspects of this data collection, including suggestions for reducing this burden, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

OSHA's Form 300 (Rev. 01/2004)

Log of Work-Related Injuries and Illnesses

Attention: This form contains information relating to employee health and must be used in a manner that protects the confidentiality of employees to the extent possible while the information is being used for occupational safety and health purposes.

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

You must record information about every work-related death and about every work-related injury or illness that involves loss of consciousness, restricted work activity or job transfer, days away from work, or medical treatment beyond first aid. You must also record significant work-related injuries and illnesses that are diagnosed by a physician or licensed health care professional. You must also record work-related injuries and illnesses that meet any of the specific recording criteria listed in 29 CFR Part 1904.8 through 1904.12. Feel free to use two lines for a single case if you need to. You must complete an Injury and Illness Incident Report (OSHA Form 301) or equivalent form for each injury or illness recorded on this form. If you're not sure whether a case is recordable, call your local OSHA office for help.

Establishment name _____

City _____ State _____

Identify the person			Describe the case			Classify the case — CHECK ONLY ONE box for each case based on the most serious outcome for that case:				Enter the number of days the injured or ill worker was:		Check the "Injury" column or choose one type of illness:					
								Remained at Work						(M)					
(A) Case no.	(B) Employee's name	(C) Job title (*e.g., Welder*)	(D) Date of injury or onset of illness	(E) Where the event occurred (*e.g., Loading dock north end*)	(F) Describe injury or illness, parts of body affected, and object/substance that directly injured or made person ill (*e.g., Second degree burns on right forearm from acetylene torch*)	Death (G)	Days away from work (H)	Job transfer or restriction (I)	Other recordable cases (J)	Away from work (K)	On job transfer or restriction (L)	Injury (1)	Skin disorder (2)	Respiratory condition (3)	Poisoning (4)	Hearing loss (5)	All other illnesses (6)
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
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____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
____			__/__ month/day			☐	☐	☐	☐	____ days	____ days	☐	☐	☐	☐	☐	☐
Page totals ➤						____	____	____	____	____	____	____ Injury (1)	____ Skin disorder (2)	____ Respiratory condition (3)	____ Poisoning (4)	____ Hearing loss (5)	____ All other illnesses (6)

Public reporting burden for this collection of information is estimated to average 14 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

OSHA's Form 300A (Rev. 01/2004)

Summary of Work-Related Injuries and Illnesses

Year 20__ __

U.S. Department of Labor
Occupational Safety and Health Administration

Form approved OMB no. 1218-0176

All establishments covered by Part 1904 must complete this Summary page, even if no work-related injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete and accurate before completing this summary.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the Log. If you had no cases, write "0."

Employees, former employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR Part 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
_____	_____	_____	_____
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
_____	_____
(K)	(L)

Injury and Illness Types

Total number of . . .	(M)		
(1) Injuries	_____	(4) Poisonings	_____
		(5) Hearing loss	_____
(2) Skin disorders	_____	(6) All other illnesses	_____
(3) Respiratory conditions	_____		

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 58 minutes per response, including time to review the instructions, search and gather the data needed, and complete and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any other aspects of this data collection, contact: US Department of Labor, OSHA Office of Statistical Analysis, Room N-3644, 200 Constitution Avenue, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information

Your establishment name _____

Street _____

City _____ State _____ ZIP _____

Industry description (*e.g., Manufacture of motor truck trailers*)

_____

Standard Industrial Classification (SIC), if known (*e.g., 3715*)

__ __ __ __

OR

North American Industrial Classification (NAICS), if known (e.g., 336212)

__ __ __ __ __ __

Employment information *(If you don't have these figures, see the Worksheet on the back of this page to estimate.)*

Annual average number of employees _____

Total hours worked by all employees last year _____

Sign here

Knowingly falsifying this document may result in a fine.

I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.

_____ _____
Company executive Title

( ) - / /
Phone Date

Attachment 5:
Signatory Page

Attachment 5 – Site-Specific Health and Safety Orientation Signatory Page
HEALTH AND SAFETY PLAN

Title	Name	Signature
Project Manager:	TBD	
Health and Safety Manager:	TBD	

I have read the attached Health and Safety Plan (HASP) and have received site-specific information and orientation regarding the identified physical, chemical, and biological hazards anticipated at this site. My signature certifies that I understand the procedures, equipment, and restrictions applicable to this project site and agree to abide by them.

Signature	Printed Name	Company	Date

Attachment 5– Health and Safety Orientation Signatory Page (continued)

Signature	Printed Name	Company	Date

Attachment 6:

Safety Data Sheets

SAFETY DATA SHEET

Version 4.7
Revision Date 05/27/2016
Print Date 10/19/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 1,3-Butadiene

Product Number : 295035
Brand : Aldrich
Index-No. : 601-013-00-X

CAS-No. : 106-99-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable gases (Category 1), H220
Gases under pressure (Liquefied gas), H280
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1A), H350

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.
H340 May cause genetic defects.
H350 May cause cancer.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381	Eliminate all ignition sources if safe to do so.
P405	Store locked up.
P410 + P403	Protect from sunlight. Store in a well-ventilated place.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C_4H_6
Molecular weight	:	54.09 g/mol
CAS-No.	:	106-99-0
EC-No.	:	203-450-8
Index-No.	:	601-013-00-X

Hazardous components

Component	Classification	Concentration
1,3-Butadiene		
	Flam. Gas 1; Press. Gas Liquefied gas; Muta. 1B; Carc. 1A; H220, H280, H340, H350	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Clean up promptly by sweeping or vacuum.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 2 - 8 °C

Contents under pressure. Air sensitive. Light sensitive. Shock or heat may detonate May explode when heated. Handle and store under inert gas.
Storage class (TRGS 510): Gases

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Potential Occupational Carcinogen See Appendix A		
1,3-Butadiene	106-99-0	TWA	2 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Cancer Suspected human carcinogen		
		TWA	2.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Cancer Suspected human carcinogen		
		TWA	1 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Substance listed; for more information see OSHA document 29 CFR 1910.1051; 29 CFR 1910.19(1)		

		TWA	1.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Substance listed; for more information see OSHA document 29 CFR 1910.1051; 29 CFR 1910.19(1)		
		STEL	5.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Substance listed; for more information see OSHA document 29 CFR 1910.1051; 29 CFR 1910.19(1)		
		STEL	5 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Substance listed; for more information see OSHA document 29 CFR 1910.1051; 29 CFR 1910.19(1)		
		See 1910.1051		
		PEL	1.000000 ppm	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1051 This section applies to all occupational exposures to 1,3-Butadiene (BD), Chemical Abstracts Service Registry No. 106-99-0, except as provided in paragraph (a)(2) of this section. Except for the recordkeeping provisions in paragraph (m)(1) of this section, this section does not apply to the processing, use, or handling of products containing BD or to other work operations and streams in which BD is present where objective data are reasonably relied upon that demonstrate the work operation or the product or the group of products or operations to which it belongs may not reasonably be foreseen to release BD in airborne concentrations at or above the action level or in excess of the STEL under the expected conditions of processing, use, or handling that will cause the greatest possible release or in any plausible accident. This section also does not apply to work operations, products or streams where the only exposure to BD is from liquid mixtures containing 0.1% or less of BD by volume or the vapors released from such liquids, unless objective data become available that show that airborne concentrations generated by such mixtures can exceed the action level or STEL under reasonably predictable conditions of processing, use or handling that will cause the greatest possible release. Except for labeling requirements and requirements for emergency response, this section does not apply to the storage, transportation, distribution or sale of BD or liquid mixtures in intact containers or in transportation pipelines sealed in such a manner as to fully contain BD vapors or liquid. Where products or processes containing BD are exempted under paragraph (a)(2) of this section, the employer shall maintain records of the objective data supporting that exemption and the basis for the employer's reliance on the data, as provided in paragraph (m)(1) of this section 1,3-Butadiene means an organic compound with chemical formula CH2=CH-CH=CH2 that has a molecular weight of approximately 54.15 g/mole OSHA specifically regulated carcinogen		
		STEL	5.000000 ppm	OSHA Specifically Regulated Chemicals/Carcinogens
		1910.1051 This section applies to all occupational exposures to 1,3-Butadiene (BD), Chemical Abstracts Service Registry No. 106-99-0, except as provided in paragraph (a)(2) of this section. Except for the recordkeeping provisions in paragraph (m)(1) of this section, this section does not apply to the processing, use, or handling of		

		products containing BD or to other work operations and streams in which BD is present where objective data are reasonably relied upon that demonstrate the work operation or the product or the group of products or operations to which it belongs may not reasonably be foreseen to release BD in airborne concentrations at or above the action level or in excess of the STEL under the expected conditions of processing, use, or handling that will cause the greatest possible release or in any plausible accident. This section also does not apply to work operations, products or streams where the only exposure to BD is from liquid mixtures containing 0.1% or less of BD by volume or the vapors released from such liquids, unless objective data become available that show that airborne concentrations generated by such mixtures can exceed the action level or STEL under reasonably predictable conditions of processing, use or handling that will cause the greatest possible release. Except for labeling requirements and requirements for emergency response, this section does not apply to the storage, transportation, distribution or sale of BD or liquid mixtures in intact containers or in transportation pipelines sealed in such a manner as to fully contain BD vapors or liquid. Where products or processes containing BD are exempted under paragraph (a)(2) of this section, the employer shall maintain records of the objective data supporting that exemption and the basis for the employer's reliance on the data, as provided in paragraph (m)(1) of this section 1,3-Butadiene means an organic compound with chemical formula CH2=CH-CH=CH2 that has a molecular weight of approximately 54.15 g/mole OSHA specifically regulated carcinogen		
		PEL	1 ppm 2.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		see section 5201		
		STEL	5 ppm 11 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		see section 5201		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
1,3-Butadiene	106-99-0	1,2 Dihydroxy-4-(N-acetylcysteinyl)-butane	2.5000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			
		Mixture of N-1 and N-2(hydroxybutenyl)valine	2.5pmol/g	Hemoglobin (Hb) adducts in blood	ACGIH - Biological Exposure Indices (BEI)
		Not critical			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Liquefied gas
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -109 °C (-164 °F) - lit.
f)	Initial boiling point and boiling range	-4.5 °C (23.9 °F) - lit.
g)	Flash point	-76 °C (-105 °F) - closed cup - Tested according to Annex V of Directive 67/548/EEC.
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available

j)	Upper/lower flammability or explosive limits	Upper explosion limit: 16.3 %(V) Lower explosion limit: 1.4 %(V)
k)	Vapour pressure	ca.2,400 hPa (1,800 mmHg) at 20 °C (68 °F) 3,200 hPa (2,400 mmHg) at 30 °C (86 °F) 5,700 hPa (4,275 mmHg) at 50 °C (122 °F)
l)	Vapour density	No data available
m)	Relative density	0.62 g/cm3 at 20 °C (68 °F)
n)	Water solubility	0.5 g/l at 20 °C (68 °F) - Tested according to Annex V of Directive 67/548/EEC.
o)	Partition coefficient: n-octanol/water	log Pow: 1.85 at 23 °C (73 °F)
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Test for peroxide formation before using or discard after 3 months.
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Oxidizing agents, Oxygen, Copper, Copper alloys, Carbides, Halogens, Metal oxides, Metals

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 5,480 mg/kg

LC50 Inhalation - Rat - 4 h - 285 mg/l

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
In vivo tests showed mutagenic effects

Carcinogenicity

Carcinogenicity - Rat - Inhalation
Tumorigenic:Carcinogenic by RTECS criteria. Cardiac:Tumors. Lungs, Thorax, or Respiration:Tumors.

This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Human carcinogen.

IARC:	1 - Group 1: Carcinogenic to humans (1,3-Butadiene)
NTP:	Known to be human carcinogen (1,3-Butadiene)
OSHA:	OSHA specifically regulated carcinogen (1,3-Butadiene)

Reproductive toxicity
No data available

Reproductive toxicity - Mouse - Inhalation
Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

No data available

Developmental Toxicity - Rat - Inhalation
Specific Developmental Abnormalities: Musculoskeletal system.

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

Cholinesterase inhibitors can cause heavy salivation and secretion in the lungs, lachrymation, blurred vision, involuntary defecation, diarrhea, tremor, ataxia, sweating, hypothermia, lowered heart rate, and/or a fall in blood pressure as a result of their action at cholinergic nerve sites., narcosis, Headache, Nausea, Vomiting, Dizziness, Drowsiness, Confusion., Weakness, Muscle cramps/spasms., Change in pupil size., Tremors, Seizures., Incoordination., Convulsions, Coma

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - other fish - 71.5 mg/l - 24 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1010 Class: 2.1
Proper shipping name: Butadienes, stabilized
Reportable Quantity (RQ): 10 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1010 Class: 2.1 EMS-No: F-D, S-U
Proper shipping name: BUTADIENES, STABILIZED

IATA
UN number: 1010 Class: 2.1
Proper shipping name: Butadienes, stabilized
IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
1,3-Butadiene	106-99-0	1993-04-24

SARA 311/312 Hazards
Fire Hazard, Sudden Release of Pressure Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,3-Butadiene	106-99-0	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,3-Butadiene	106-99-0	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
1,3-Butadiene	106-99-0	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the	CAS-No.	Revision Date

State of California to cause cancer. 1,3-Butadiene	106-99-0	2007-09-28

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,3-Butadiene	CAS-No. 106-99-0	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Carc.	Carcinogenicity
Flam. Gas	Flammable gases
H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H340	May cause genetic defects.
H350	May cause cancer.
Muta.	Germ cell mutagenicity
Press. Gas	Gases under pressure

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	4
Physical Hazard	3

NFPA Rating

Health hazard:	0
Fire Hazard:	4
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.7 Revision Date: 05/27/2016 Print Date: 10/19/2018

SAFETY DATA SHEET

Version 5.7
Revision Date 06/13/2018
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 2,2,4-Trimethylpentane

Product Number : 360066
Brand : Sigma-Aldrich
Index-No. : 601-009-00-8

CAS-No. : 540-84-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.

P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a POISON CENTER/doctor if you feel unwell.
P321	Specific treatment (see supplemental first aid instructions on this label).
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Isooctane
Formula	:	C_8H_{18}
Molecular weight	:	114.23 g/mol
CAS-No.	:	540-84-1
EC-No.	:	208-759-1
Index-No.	:	601-009-00-8
Registration number	:	01-2119457965-22-XXXX

Hazardous components

Component	Classification	Concentration
2,2,4-Trimethylpentane		
	Flam. Liq. 2; Skin Irrit. 2; STOT SE 3; Asp. Tox. 1; Aquatic Acute 1; Aquatic Chronic 1; H225, H304, H315, H336, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
For small (incipient) fires, use media such as "alcohol" foam, dry chemica as far as possible. Use very large quantities (flooding) of water applied ineffective. Cool all affected containers with flooding quantities of wat

5.2 Special hazards arising from the substance or mixture
Flash back possible over considerable distance., Container explosion may occur under fire conditions.

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
2,2,4-Trimethylpentane	540-84-1	TWA	300 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 482 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 90 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -107 °C (-161 °F)
f)	Initial boiling point and boiling range	98 - 99 °C (208 - 210 °F)
g)	Flash point	-12 °C (10 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 6 %(V) Lower explosion limit: 1 %(V)
k)	Vapour pressure	55 hPa (41 mmHg) at 21 °C (70 °F) 117 hPa (88 mmHg) at 37.80 °C (100.04 °F)
l)	Vapour density	3.94 - (Air = 1.0)
m)	Relative density	0.692 g/mL at 25 °C (77 °F)
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: 4.6
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density	3.94 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Irritating to skin.
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity

Rat
Unscheduled DNA synthesis

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
The substance or mixture is known to cause human aspiration toxicity hazards or has to be regarded as if it causes a human aspiration toxicity hazard.

Additional Information
RTECS: SA3320000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Liver - Irregularities - Based on Human Evidence
Liver - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1262 Class: 3 Packing group: II
Proper shipping name: Octanes
Reportable Quantity (RQ): 1000 lbsMarine pollutant:yes
Poison Inhalation Hazard: No

IMDG
UN number: 1262 Class: 3 Packing group: II EMS-No: F-E, S-E
Proper shipping name: OCTANES
Marine pollutant:yes Marine pollutant: yes

IATA
UN number: 1262 Class: 3 Packing group: II
Proper shipping name: Octanes

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
2,2,4-Trimethylpentane	540-84-1	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
2,2,4-Trimethylpentane	540-84-1	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
2,2,4-Trimethylpentane	540-84-1	2007-03-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Skin Irrit.	Skin irritation

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.7 Revision Date: 06/13/2018 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 5.6
Revision Date 05/07/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 4,4′-DDT

Product Number : 31041
Brand : Sigma-Aldrich
Index-No. : 602-045-00-7

CAS-No. : 50-29-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Dermal (Category 3), H311
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Oral (Category 1), H372
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H301 + H311 Toxic if swallowed or in contact with skin.
H351 Suspected of causing cancer.
H372 Causes damage to organs through prolonged or repeated exposure if swallowed.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

	understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing.
P281	Use personal protective equipment as required.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P352 + P312	IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/ physician if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane 1,1-Bis(4-chlorophenyl)-2,2,2-trichloroethane
Formula	:	$C_{14}H_9Cl_5$
Molecular weight	:	354.49 g/mol
CAS-No.	:	50-29-3
EC-No.	:	200-024-3
Index-No.	:	602-045-00-7

Hazardous components

Component	Classification	Concentration
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane		
	Acute Tox. 3; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H301 + H311, H351, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	TWA	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Liver damage Confirmed animal carcinogen with unknown relevance to humans		

		TWA	0.5 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		PEL	1 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: solid

b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 107 - 110 °C (225 - 230 °F) - lit.
f)	Initial boiling point and boiling range	260.0 °C (500.0 °F)
g)	Flash point	72.0 - 77.0 °C (161.6 - 170.6 °F)
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	0.0000021 hPa (0.0000016 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.99 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 6.91
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxidizing agents, Iron and iron salts.

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 87.0 mg/kg

Inhalation: No data available

LD50 Dermal - Rabbit - 300.0 mg/kg
Remarks: Behavioral:Tremor. Behavioral:Muscle weakness. Behavioral:Ataxia.

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Ingestion - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: KJ3325000

CNS stimulation.

Pancreas. -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 0.01 mg/l - 96.0 h
	LC50 - Lepomis macrochirus (Bluegill) - 0.01 mg/l - 96.0 h
	LC50 - Oncorhynchus mykiss (rainbow trout) - 0.003400 mg/l - 96.0 h
	LOEC - Oncorhynchus mykiss (rainbow trout) - 150 mg/l - 3.0 d
	NOEC - Oncorhynchus mykiss (rainbow trout) - 113 mg/l - 3.0 d
Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - 0.00108 mg/l - 48 h
Toxicity to algae	LC100 - Scenedesmus quadricauda (Green algae) - > 20 mg/l - 7 d

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	Oncorhynchus mykiss (rainbow trout) - 20 d - 0.001 mg/l
	Bioconcentration factor (BCF): 46,670

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solids, organic, n.o.s. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
Reportable Quantity (RQ): 1 lbsMarine pollutant:yes
Poison Inhalation Hazard: No

IMDG

UN number: 2811 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
Marine pollutant:yes

IATA

UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solid, organic, n.o.s. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

New Jersey Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING! This product contains a chemical known to the State of California to cause cancer. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H301	Toxic if swallowed.
H301 + H311	Toxic if swallowed or in contact with skin.
H311	Toxic in contact with skin.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if swallowed.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	2
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 05/07/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 5.5
Revision Date 06/13/2014
Print Date 10/19/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 4,4′-DDD

Product Number : 49009
Brand : Supelco

CAS-No. : 72-54-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Dermal (Category 4), H312
Carcinogenicity (Category 2), H351
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H301 Toxic if swallowed.
H312 Harmful in contact with skin.
H351 Suspected of causing cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.

P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P322	Specific measures (see supplemental first aid instructions on this label).
P330	Rinse mouth.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 1,1-Dichloro-2,2-bis(4-chlorophenyl)ethane

Formula : $C_{14}H_{10}Cl_4$

Molecular Weight : 320.04 g/mol

CAS-No. : 72-54-8

EC-No. : 200-783-0

Hazardous components

Component	Classification	Concentration
2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane		
	Acute Tox. 3; Acute Tox. 4; Carc. 2; Aquatic Acute 1; Aquatic Chronic 1; H301, H312, H351, H410	-

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
no data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas
Nature of decomposition products not known.

5.3 Advice for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information
no data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.Normal measures for preventive fire protection.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	no data available
c)	Odour Threshold	no data available
d)	pH	no data available
e)	Melting point/freezing point	94.0 - 96.0 °C (201.2 - 204.8 °F)
f)	Initial boiling point and boiling range	193.0 °C (379.4 °F) at 1.3 hPa (1.0 mmHg)
g)	Flash point	no data available
h)	Evapouration rate	no data available
i)	Flammability (solid, gas)	no data available
j)	Upper/lower flammability or explosive limits	no data available
k)	Vapour pressure	< 0.00001 hPa (< 0.00001 mmHg) at 25.0 °C (77.0 °F)
l)	Vapour density	no data available
m)	Relative density	1.38 g/cm3
n)	Water solubility	no data available
o)	Partition coefficient: n-octanol/water	log Pow: 6.02
p)	Auto-ignition temperature	no data available
q)	Decomposition temperature	no data available
r)	Viscosity	no data available
s)	Explosive properties	no data available
t)	Oxidizing properties	no data available

9.2 Other safety information
no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
no data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
no data available

10.4 Conditions to avoid
no data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - no data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Hamster - > 5,000 mg/kg

TDLo Oral - Human - 428.5 mg/kg
Remarks: Endocrine:Adrenal cortex hypoplasia.

TDLo Oral - rat - 6,000 mg/kg
Remarks: Cardiac:Other changes. Gastrointestinal:Other changes. Kidney, Ureter, Bladder:Changes in both tubules and glomeruli.

TDLo Oral - rat - 14 mg/kg
Remarks: Liver:Changes in liver weight. Endocrine:Estrogenic. Musculoskeletal:Other changes.

TDLo Oral - rat - 2,100 mg/kg
Remarks: Behavioral:Altered sleep time (including change in righting reflex).

Inhalation: no data available

LD50 Dermal - rabbit - 1,200 mg/kg
Remarks: Behavioral:Excitement. Behavioral:Convulsions or effect on seizure threshold. Skin irritation

no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitisation
no data available

no data available

Germ cell mutagenicity
no data available

Carcinogenicity

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
no data available

no data available

Specific target organ toxicity - single exposure
no data available

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard
no data available

Additional Information
RTECS: KI0700000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - other fish - 1.18 - 9 mg/l - 96.0 h
	LC50 - Lepomis macrochirus (Bluegill) - 0.04 - 0.05 mg/l - 96.0 h
	LC50 - Oncorhynchus mykiss (rainbow trout) - 0.06 - 0.09 mg/l - 96.0 h
	LC50 - Pimephales promelas (fathead minnow) - 3.47 - 5.58 mg/l - 96.0 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia pulex (Water flea) - 0.01 mg/l - 48 h

12.2 Persistence and degradability
no data available

12.3 Bioaccumulative potential
Indication of bioaccumulation.

12.4 Mobility in soil
no data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solids, organic, n.o.s. (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)
Marine pollutant: No

Poison Inhalation Hazard: No

IMDG
UN number: 2811 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)
Marine pollutant: No

IATA
UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solid, organic, n.o.s. (2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane)

15. REGULATORY INFORMATION

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	72-54-8	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
2,2-bis(4-Chlorophenyl)-1,1-dichloro-ethane	72-54-8	1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H301	Toxic if swallowed.
H312	Harmful in contact with skin.
H351	Suspected of causing cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.5 Revision Date: 06/13/2014 Print Date: 10/19/2018

SAFETY DATA SHEET

Version 5.6
Revision Date 05/07/2018
Print Date 06/22/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : 4,4′-DDT

Product Number : 386340
Brand : Aldrich
Index-No. : 602-045-00-7

CAS-No. : 50-29-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Dermal (Category 3), H311
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Oral (Category 1), H372
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H301 + H311 Toxic if swallowed or in contact with skin.
H351 Suspected of causing cancer.
H372 Causes damage to organs through prolonged or repeated exposure if swallowed.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

	understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing.
P281	Use personal protective equipment as required.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P352 + P312	IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/ physician if you feel unwell.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P361	Remove/Take off immediately all contaminated clothing.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane 1,1-Bis(4-chlorophenyl)-2,2,2-trichloroethane
Formula	:	$C_{14}H_9Cl_5$
Molecular weight	:	354.49 g/mol
CAS-No.	:	50-29-3
EC-No.	:	200-024-3
Index-No.	:	602-045-00-7

Hazardous components

Component	Classification	Concentration
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane		
	Acute Tox. 3; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H301 + H311, H351, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	TWA	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Liver damage Confirmed animal carcinogen with unknown relevance to humans		

		TWA	0.5 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		PEL	1 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: solid

b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 107 - 110 °C (225 - 230 °F) - lit.
f)	Initial boiling point and boiling range	260.0 °C (500.0 °F)
g)	Flash point	72.0 - 77.0 °C (161.6 - 170.6 °F)
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	0.0000021 hPa (0.0000016 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.99 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 6.91
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxidizing agents, Iron and iron salts.

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 87.0 mg/kg

Inhalation: No data available

LD50 Dermal - Rabbit - 300.0 mg/kg
Remarks: Behavioral:Tremor. Behavioral:Muscle weakness. Behavioral:Ataxia.

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
IARC:	2A - Group 2A: Probably carcinogenic to humans (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Ingestion - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: KJ3325000

CNS stimulation.

Pancreas. -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 0.01 mg/l - 96.0 h
	LC50 - Lepomis macrochirus (Bluegill) - 0.01 mg/l - 96.0 h
	LC50 - Oncorhynchus mykiss (rainbow trout) - 0.003400 mg/l - 96.0 h
	LOEC - Oncorhynchus mykiss (rainbow trout) - 150 mg/l - 3.0 d
	NOEC - Oncorhynchus mykiss (rainbow trout) - 113 mg/l - 3.0 d
Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - 0.00108 mg/l - 48 h
Toxicity to algae	LC100 - Scenedesmus quadricauda (Green algae) - > 20 mg/l - 7 d

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	Oncorhynchus mykiss (rainbow trout) - 20 d - 0.001 mg/l
	Bioconcentration factor (BCF): 46,670

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solids, organic, n.o.s. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
Reportable Quantity (RQ): 1 lbsMarine pollutant:yes
Poison Inhalation Hazard: No

IMDG

UN number: 2811 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)
Marine pollutant:yes

IATA

UN number: 2811 Class: 6.1 Packing group: III
Proper shipping name: Toxic solid, organic, n.o.s. (1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane)

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

New Jersey Right To Know Components

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

	CAS-No.	Revision Date
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	1993-02-16

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING! This product contains a chemical known to the State of California to cause cancer. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	50-29-3	2008-06-17

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H301	Toxic if swallowed.
H301 + H311	Toxic if swallowed or in contact with skin.
H311	Toxic in contact with skin.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if swallowed.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	2
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 05/07/2018 Print Date: 06/22/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 05/28/2017
Print Date 06/29/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name	:	Acetone
Product Number	:	650501
Brand	:	SIGALD
Index-No.	:	606-001-00-8
CAS-No.	:	67-64-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich Inc. 3050 Spruce Street ST. LOUIS MO 63103 UNITED STATES
Telephone	:	+1 314 771-5765
Fax	:	+1 800 325-5052

1.4 Emergency telephone number

Emergency Phone #	:	+1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.

P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Repeated exposure may cause skin dryness or cracking.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C_3H_6O
Molecular weight	:	58.08 g/mol
CAS-No.	:	67-64-1
EC-No.	:	200-662-2
Index-No.	:	606-001-00-8

Hazardous components

Component	Classification	Concentration
Acetone		
	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319, H336	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Derived No Effect Level (DNEL)

Application Area	Exposure routes	Health effect	Value
Workers	Skin contact	Long-term systemic effects	186mg/kg BW/d
Consumers	Ingestion	Long-term systemic effects	62mg/kg BW/d
Consumers	Skin contact	Long-term systemic effects	62mg/kg BW/d
Workers	Inhalation	Acute systemic effects	2420 mg/m3
Workers	Inhalation	Long-term systemic effects	1210 mg/m3

Consumers	Inhalation	Long-term systemic effects	200 mg/m3

Predicted No Effect Concentration (PNEC)

Compartment	Value
Soil	33.3 mg/kg
Marine water	1.06 mg/l
Fresh water	10.6 mg/l
Marine sediment	3.04 mg/kg
Fresh water sediment	30.4 mg/kg
Onsite sewage treatment plant	100 mg/l

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industria situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engine protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available

d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -94 °C (-137 °F)
f)	Initial boiling point and boiling range	56 °C (133 °F) at 1013 hPa
g)	Flash point	-17.0 °C (1.4 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 13 %(V) Lower explosion limit: 2 %(V)
k)	Vapour pressure	533.3 hPa at 39.5 °C (103.1 °F) 245.3 hPa at 20.0 °C(68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.791 g/mL at 25 °C (77 °F)
n)	Water solubility	completely miscible
o)	Partition coefficient: n-octanol/water	log Pow: -0.24
p)	Auto-ignition temperature	465.0 °C (869.0 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	23.2 mN/m at 20.0 °C (68.0 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Bases, Oxidizing agents, Reducing agents, Acetone reacts violently with phosphorous oxychloride.

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 5,800 mg/kg(Acetone)
Remarks: Behavioral:Altered sleep time (including change in righting reflex). Behavioral:Tremor. Behavioral:Headache. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
LC50 Inhalation - Rat - 8 h - 50,100 mg/m3(Acetone)
Remarks: Drowsiness Dizziness Unconsciousness
LD50 Dermal - Guinea pig - 7,426 mg/kg(Acetone)
No data available(Acetone)

Skin corrosion/irritation
Skin - Rabbit(Acetone)
Result: Mild skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit(Acetone)
Result: Eye irritation - 24 h

Respiratory or skin sensitisation
- Guinea pig(Acetone)
Result: Does not cause skin sensitisation.

Germ cell mutagenicity

No data available(Acetone)

Carcinogenicity
This product is or contains a component that is not classifiable as to its classification.(Acetone)
(Acetone)
(Acetone)

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available(Acetone)

No data available(Acetone)

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.(Acetone)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available(Acetone)

Additional Information
RTECS: AL3150000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Acetone)

Kidney - Irregularities - Based on Human Evidence
Skin - Dermatitis - Based on Human Evidence

Kidney - Irregularities - Based on Human Evidence(Acetone)
Skin - Dermatitis - Based on Human Evidence(Acetone)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 5,540 mg/l - 96 h(Acetone)
Toxicity to daphnia and other aquatic invertebrates	LC50 - Daphnia magna (Water flea) - 8,800 mg/l - 48 h(Acetone)
Toxicity to algae	Remarks: No data available

12.2 Persistence and degradability

Biodegradability: Result: 91 % - Readily biodegradable.
(OECD Test Guideline 301B)

12.3 Bioaccumulative potential

Does not bioaccumulate.

12.4 Mobility in soil

No data available(Acetone)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1090 Class: 3 Packing group: II
Proper shipping name: Acetone
Reportable Quantity (RQ) : 5000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1090 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: ACETONE

IATA
UN number: 1090 Class: 3 Packing group: II
Proper shipping name: Acetone

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	

New Jersey Right To Know Components

	CAS-No.	Revision Date
Acetone	67-64-1	

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/29/2019

SAFETY DATA SHEET

Version 4.13
Revision Date 09/12/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Arsenic

Product Number : 202657
Brand : Aldrich
Index-No. : 033-001-00-X

CAS-No. : 7440-38-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Acute toxicity, Inhalation (Category 3), H331
Carcinogenicity (Category 1B), H350
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H302 Harmful if swallowed.
H331 Toxic if inhaled.
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P304 + P340 + P311	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	As
Molecular weight	:	74.92 g/mol
CAS-No.	:	7440-38-2
EC-No.	:	231-148-6
Index-No.	:	033-001-00-X

Hazardous components

Component	Classification	Concentration
Arsenic		
	Acute Tox. 4; Acute Tox. 3; Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H302, H331, H350, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.
Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Arsenic	7440-38-2	TWA	0.01 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Lung cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed human carcinogen		

		C	0.0020 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A 15 minute ceiling value		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	inorganic arsenic plus methylated metabolites	35µg As/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of the workweek (After four or five consecutive working days with exposure)			

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Colour: light grey, black
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 817 °C (1,503 °F) - lit.
f)	Initial boiling point and boiling range	613 °C (1,135 °F) - lit.
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	5.727 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Heat Exposure to air may affect product quality.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Arsenic oxides
Other decomposition products - No data available

In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 763 mg/kg
Remarks: Behavioral:Ataxia. Diarrhoea

LD50 Oral - Mouse - 145 mg/kg
Remarks: Behavioral:Ataxia. Diarrhoea

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity

Carcinogenicity

No data available

IARC:	1 - Group 1: Carcinogenic to humans (Arsenic)
NTP:	Known - Known to be human carcinogen (Arsenic)
OSHA:	OSHA specifically regulated carcinogen (Arsenic)

Reproductive toxicity

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: CG0525000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 9.9 mg/l - 96.0 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 3.8 mg/l - 48 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1558 Class: 6.1 Packing group: II
Proper shipping name: Arsenic
Reportable Quantity (RQ): 1 lbsReportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1558 Class: 6.1 Packing group: II EMS-No: F-A, S-A
Proper shipping name: ARSENIC
Marine pollutant:yes

IATA
UN number: 1558 Class: 6.1 Packing group: II
Proper shipping name: Arsenic

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Arsenic	7440-38-2	2015-11-23

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Reportable Quantity D004 lbs

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Arsenic	7440-38-2	2015-11-23

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Arsenic	7440-38-2	2015-11-23

	CAS-No.	Revision Date
Arsenic	7440-38-2	2015-11-23

New Jersey Right To Know Components

	CAS-No.	Revision Date
Arsenic	7440-38-2	2015-11-23

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Arsenic	7440-38-2	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H302	Harmful if swallowed.
H331	Toxic if inhaled.
H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.13 Revision Date: 09/12/2018 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 05/28/2017
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Barium

Product Number : 474711
Brand : Aldrich

CAS-No. : 7440-39-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Substances and mixtures, which in contact with water, emit flammable gases (Category 2), H261

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H261 In contact with water releases flammable gases.

Precautionary statement(s)
P223 Do not allow contact with water.
P231 + P232 Handle under inert gas. Protect from moisture.
P280 Wear protective gloves/ eye protection/ face protection.
P335 + P334 Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

P402 + P404	Store in a dry place. Store in a closed container.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Ba
Molecular weight	:	137.33 g/mol
CAS-No.	:	7440-39-3
EC-No.	:	231-149-1

Hazardous components

Component	Classification	Concentration
Barium		
	Water-react. 2; H261	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Dry powder

5.2 Special hazards arising from the substance or mixture
Barium oxide

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combu formation should be taken into consideration before additional processing
Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Never allow product to get in contact with water during storage.

Store under inert gas.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Barium	7440-39-3	TWA	0.500000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Eye, skin, & Gastrointestinal irritation Muscular stimulation Not classifiable as a human carcinogen		
		TWA	0.500000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.500000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Eye irritation Muscular stimulation Skin irritation Gastrointestinal irritation Not classifiable as a human carcinogen		
		TWA	0.500000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Eye irritation Muscular stimulation Skin irritation Gastrointestinal irritation Not classifiable as a human carcinogen		

		TWA	0.5 mg/m3	USA. NIOSH Recommended Exposure Limits

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industria situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Pieces Colour: grey
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 725 °C (1337 °F) - lit.
f)	Initial boiling point and boiling range	1,640 °C (2,984 °F) - lit.
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available

i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	3.6 g/cm3 at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Reacts violently with water.

10.4 Conditions to avoid
Exposure to moisture

10.5 Incompatible materials
Oxidizing agents, Water, acids, Oxygen, Chlorinated solvents, Carbon dioxide (CO2), Halogens, Halogenated hydrocarbon, Alcohols, Sulphur compounds, Hydrogen sulfide gas

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Barium oxide
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data availableBarium
Inhalation: No data available(Barium)
Dermal: No data available(Barium)
No data available(Barium)

Skin corrosion/irritation
No data available(Barium)

Serious eye damage/eye irritation
No data available(Barium)

Respiratory or skin sensitisation
No data available(Barium)

Germ cell mutagenicity

No data available(Barium)

Carcinogenicity
This product is or contains a component that is not classifiable as to its classification.(Barium)
(Barium)
(Barium)

Reproductive toxicity
No data available(Barium)

No data available(Barium)

Specific target organ toxicity - single exposure
No data available(Barium)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available(Barium)

Additional Information
RTECS: CQ8370000

Stomach/intestinal disorders, Nausea, Vomiting, Drowsiness, Dizziness, Gastrointestinal disturbance, Weakness, Tremors, Seizures.(Barium)
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Barium)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality NOEC - Cyprinodon variegatus (sheepshead minnow) - 500 mg/l - 96 h(Barium)
	LC50 - Cyprinodon variegatus (sheepshead minnow) - > 500 mg/l - 96 h(Barium)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Barium)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1400 Class: 4.3 Packing group: II
Proper shipping name: Barium
Reportable Quantity (RQ) : 1000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1400 Class: 4.3 Packing group: II EMS-No: F-G, S-O
Proper shipping name: BARIUM

IATA
UN number: 1400 Class: 4.3 Packing group: II
Proper shipping name: Barium

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

SARA 311/312 Hazards
Reactivity Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Barium	7440-39-3	2007-07-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H261 In contact with water releases flammable gases.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	3
Physical Hazard	1

NFPA Rating

Health hazard:	0
Fire Hazard:	3
Reactivity Hazard:	1
Special hazard.I:	W

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/28/2019

POCH Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH). Creation date / last update: *2002-10-15 / 2005-04-22*

1. Identification of the substance/preparation and of the company/undertaking

BENZENE

Catalogue Numbers: *99,9% standard for GC-162500320; pure-162500426; pure p. a.-162500110; for HPLC-162503155; Pochsolv-162505156;*

Use of the substance / preparation: analitical and chemical reagent for synthesis solvent

POCH SA
44-101 Gliwice, Sowinskiego Str. 11
tel.: +48 32 23-92-381; fax: +48 32 23-92-370; e-mail: export@poch.com.pl
Emergency telephone no: +48 606-659-006

2. Hazard identification

Highly flammable. May cause cancer. Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.

3. Composition/information on ingredients

CAS-No.: *71-43-2*

Molecular mass: *78.11*

Molecular formula: C_6H_6

WE Number: *200-753-7*

EC-Index No.: *601-020-00-8*

4. First aid measures

After eye contact: *rinse out with plenty of water with the eyelid held wide open. Call in ophtalmologist.*

After skin contact: *wash off with plenty of water. Remove contaminated clothing.*

After swallowing: *make victim drink plenty of water. Avoid vomiting (risk of aspiration). Laxative: paraffin oil (3 mg/kg), sodium sulfate (1 tablespoon 1/4 l water). Lavage of stomach only if necessary. Call in physician.*

After inhalation: *fresh air. If necessary, apply mouth- to- mouth resuscitation or mechanical ventilation.*

5. Fire-fighting measures

Suitable extinguishing media: *foam, powder*

Special risk: *combustible. Vapours heavier than air. Formation of explosive mixtures possible with air. Keep away from sources of fire. Take measures to prevent electrostatic charging. Development of hazardous gases or vapours possible in the event of fire.*

Special protective equipment for fire fighting:

Other information: *contain escaping vapoures with spray water. Do not stay in dangerous zone without self- contained breathing apparatus. Prevent fire- fighting water from entering surface water or groundwater*

Prevent fire-fighting water from entering surface water or groundwater. Cool container with spray water from a safe distance. Contain escaping vapours with water.

6. Accidental release measures

Do not inhale vapours/aerosols. Avoid substance contact. Ensure supply of fresh air in enclosed rooms. Take up with liquid- absorbent material. Forward for disposal. Clean up affected area. Do not allow to enter sewerage system (risk of explosion).

7. Handling and storage

Handling: *Use with adequate ventilation. Use of the basic principles of Industrial Hygiene. Use according to good industry practice. Work under hood. Do not inhale substance. Do not empty into sewerage system. Use protective equipment according to p.8. Avoid skin contact. Protect against electrostatic charges. Keep away from source od ignition.*

Storage: *tightly closed. Dry well-ventilated place. Protect from light. Keep away from sources of ignition and heat. At +15 to + 25 deg C.*

8. Exposure controls/personal protection

Specific control parameter:

Provide exhaust ventilation. Ensure the eye wash station and safety showers. Protective equipment should be selected for the working place, depending on concentration and quantity of the hazardous product handled. The resistance of the protective clothing to chemicals should be ascertained with respective supplier.

Personal protective equipment:

respiratory protection: *required when vapours/aerosols are generated - gas mask with specific absorber.*

eye protection: *required - safety goggles.*

hand protection: *required - protective clothing.*

body protection: *required - protective clothing.*

industrial hygiene: *immediately change contaminated clothing. Apply skin - protective barrier cream. Wash hands and face after working with substance.*

9. Physical and chemical properties

Form: *liquid*

Colour: *colourless*

Odour: *characteristic*

pH value: *not available*

Melting point: *5°C*

Boiling point: *80°C*

Autoignition temperature: *555°C*

Flash point: *-11°C*

Explosion limit:

lower: *1,4 Vol%*

upper: *8 Vol%*

dynamic viscosity: *(20°C): 0,66 mPa*s*

kinematical viscosity: *0,75 mm2/s*

Vapour pressure: *100 mbar (20°C)*

Density: *0,88 g/cm³ (20°C)*

Bulk density: *not applicable*

Solublity:

in water: *1,8 g/l (20°C)*

in organic solvents: *soluble*

log P(w/o): *2,65. Bioconcentration factor: 1,10.*

10. Stability and reactivity

Conditions to be avioded: *high temperature*

Substances to be avoided: *nonorganic acids, sulfur, halogen-halogen compounds, oxidizing agents, peroxide compounds, oxyhalogenic compounds, halogenic hydrocarbons, rubber.*

Hazardous decomposition products: *no information available*

Other information: *volatile in steam. Unsuitable workings materials: various plastics*

11. Toxicological information

Toxicological information: *LD50 (oral rat) 930 mg/kg, LC50 (inhalation rat) 10 000 ppm (vol.) /7h. Experience has shown this substance to be carcinogenic to man.*

Other information: *After skin contact: irritations, danger of absorption, Degreasing effect on the skin possibly followed by secondary inflammation; After swallowing: nausea and vomiting; After absorption: pain and dizziness, cardiac arrhythmia, drop in blood pressure, dyspnoea, spasms, narcosis, respiratory paralysis, death; After eye contact: irritations of mucous membranes. Carcinogenic class 1. This substance should be handled with particular care.*

12. Ecological information

Log P(w/o): 2,65. No appreciable bioaccumulation potential is to be expected. Toxicity: Fish: Onchorhynchus mykiss LC50: 5,3 mg/l/96h. C. auratus LC50: 34 mg/l/96h. Daphnia: Daphnia magma EC50: 200 mg/l/48h. Algea: Chlorella vulgaris: LC50: 530 mg/l/24h. Bacteria: Ps. putida EC10: 168 mg/l. Toxic effect on aquatic organisms. Biologic degradation: ThOD 3,1 g/g, B.O.D 10% ThOD, C.O.D. 19% ThOD. Hazard for drinking water supplies. Do not allow to enter waters, waste water or soil!

13. Disposal considerations

POCH product packaging must be disposed of in compliance with the country-specific regulations or must be passed to a packaging return system. Handle contaminated packing in the same way as the substrate itself. Always contact a permitted waste disposal to assure compliance with all current local, state and federal regulations.

14. Transport information

ADR Class and package group: *3,II*

UN Number: *1114*

Name (acc. to UN): *benzene*

15. Regulatory information

Labelling according to EC Directives.

Symbol: *F, T; Flammable. Toxic.*

R-phrases: *45-11-48/23/24/25; Highly flammable. May cause cancer. Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.*

S-phrases: *53-45; In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid exposure - obtain special instructions before use. Restricted to professional users.*

EC label.

16. Other information

Reason for alteration: general update.

Informations contained in this SDS while accurate to the best knowledge

POCH

SAFETY DATA SHEET

Version 5.8
Revision Date 02/02/2018
Print Date 10/19/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[*a*]pyrene

Product Number : 48564
Brand : Supelco
Index-No. : 601-032-00-3

CAS-No. : 50-32-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin sensitisation (Category 1), H317
Germ cell mutagenicity (Category 1B), H340
Carcinogenicity (Category 1B), H350
Reproductive toxicity (Category 1B), H360
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H317 May cause an allergic skin reaction.
H340 May cause genetic defects.
H350 May cause cancer.
H360 May damage fertility or the unborn child.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and

	understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : 3,4-Benzpyrene
3,4-Benzopyrene
Benzo[def]chrysene
benzo[pqr]tetraphene

Formula : $C_{20}H_{12}$
Molecular weight : 252.31 g/mol
CAS-No. : 50-32-8
EC-No. : 200-028-5
Index-No. : 601-032-00-3

Hazardous components

Component	Classification	Concentration
Benzo[a]pyrene		
	Skin Sens. 1; Muta. 1B; Carc. 1B; Repr. 1B; Aquatic Acute 1; Aquatic Chronic 1; H317, H340, H350, H360, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low		

		as possible. Suspected human carcinogen		
		Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen		
Benzo[a]pyrene	50-32-8	TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.100000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C See Appendix A		
		TWA	0.2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.1 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C See Appendix A		
		TWA	0.2 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological	Basis

				specimen	
	-	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance — Form: solid

b) Odour — No data available

c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 177 - 180 °C (351 - 356 °F)
f)	Initial boiling point and boiling range	495 °C (923 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.35 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 5.97
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

LD50 Subcutaneous - Rat - 50 mg/kg

Skin corrosion/irritation
Skin - Mouse
Result: Mild skin irritation

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
Chronic exposure may cause dermatitis.

Germ cell mutagenicity
May alter genetic material.
In vivo tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC:	1 - Group 1: Carcinogenic to humans (Benzo[a]pyrene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Benzo[a]pyrene)
OSHA:	OSHA specifically regulated carcinogen (Benzo[a]pyrene)

Reproductive toxicity
May cause congenital malformation in the fetus.
Presumed human reproductive toxicant

May cause reproductive disorders.

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 0.25 mg/l - 48 h
Toxicity to algae	EC50 - Pseudokirchneriella subcapitata (green algae) - 0.02 mg/l - 72 h

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	Lepomis macrochirus (Bluegill) - 48 h - 0.0005 mg/l
	Bioconcentration factor (BCF): 3,208

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Benzo[a]pyrene)
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benzo[a]pyrene)
Marine pollutant:yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[a]pyrene)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date

Benzo[a]pyrene	50-32-8	2007-03-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Benzo[a]pyrene	50-32-8	1990-01-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H317	May cause an allergic skin reaction.
H340	May cause genetic defects.
H350	May cause cancer.
H360	May damage fertility or the unborn child.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Muta.	Germ cell mutagenicity

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.8 Revision Date: 02/02/2018 Print Date: 10/19/2018

SAFETY DATA SHEET

Version 6.1
Revision Date 07/17/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[<I>b</>]fluoranthene

Product Number : 48490
Brand : Supelco
Index-No. : 601-034-00-4

CAS-No. : 205-99-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	3,4-Benzofluoranthene
Formula	:	C<SB>20</>H<SB>12</>
Molecular weight	:	252.31 g/mol
CAS-No.	:	205-99-2
EC-No.	:	205-911-9
Index-No.	:	601-034-00-4

Hazardous components

Component	Classification	Concentration
Benz[e]acephenanthrylene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 2 - 8 °C
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benz[e]acephenanthrylene	205-99-2	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 163 - 165 °C (325 - 329 °F) - lit.
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available

j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
TDLo Oral - Mouse - 7.57 mg/kg
Remarks: Liver:Changes in liver weight. Endocrine:Changes in thymus weight.
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Benz[e]acephenanthrylene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Benz[e]acephenanthrylene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - > 1.024 mg/l - 24 h(Benz[e]acephenanthrylene)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Benz[e]acephenanthrylene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benz[e]acephenanthrylene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[e]acephenanthrylene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benz[e]acephenanthrylene	205-99-2	2007-03-01

California Prop. 65 Components

, which is/are known to the State of California to cause cancer.	CAS-No.	Revision Date
For more information go to www.P65Warnings.ca.gov.	205-99-2	2007-09-28
Benz[e]acephenanthrylene		

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350 May cause cancer.

H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 07/17/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 07/16/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Benzo[<I>k</>]fluoranthene

Product Number : 48492
Brand : Supelco
Index-No. : 601-036-00-5

CAS-No. : 207-08-9

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C<SB>20</>H<SB>12</>
Molecular weight	:	252.31 g/mol
CAS-No.	:	207-08-9
EC-No.	:	205-916-6
Index-No.	:	601-036-00-5

Hazardous components

Component	Classification	Concentration
Benzo[k]fluoranthene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 2 - 8 °C
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benzo[k]fluoranthene	207-08-9	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
Personal protective equipment
Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: crystalline Colour: yellow
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 215 - 217 °C (419 - 423 °F) - lit.
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available

m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
Carcinogenicity- Rat- Implant

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benzo[k]fluoranthene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benzo[k]fluoranthene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: DF6350000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Benzo[k]fluoranthene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[k]fluoranthene)

Reportable Quantity (RQ) : 5000 lbs

no
Poison Inhalation Hazard: No

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benzo[k]fluoranthene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[k]fluoranthene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benzo[k]fluoranthene	207-08-9	1994-04-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzo[k]fluoranthene	207-08-9	1994-04-01

California Prop. 65 Components

, which is/are known to the State of California to cause cancer.	CAS-No.	Revision Date
For more information go to www.P65Warnings.ca.gov.	207-08-9	2007-09-28
Benzo[k]fluoranthene		

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 07/16/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 07/17/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name	:	Benz[*a*]anthracene
Product Number	:	48563
Brand	:	Supelco
Index-No.	:	601-033-00-9
CAS-No.	:	56-55-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich Inc. 3050 Spruce Street ST. LOUIS MO 63103 UNITED STATES
Telephone	:	+1 314 771-5765
Fax	:	+1 800 325-5052

1.4 Emergency telephone number

Emergency Phone #	:	(314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 1B), H350

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H350 May cause cancer.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	1,2-Benzanthracene Tetraphene
Formula	:	C<SB>18</>H<SB>12</>
Molecular weight	:	228.29 g/mol
CAS-No.	:	56-55-3
EC-No.	:	200-280-6
Index-No.	:	601-033-00-9

Hazardous components

Component	Classification	Concentration
Benz[a]anthracene		
	Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H350, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 157 - 159 °C (315 - 318 °F)
f)	Initial boiling point and boiling range	437.6 °C (819.7 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available

n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
LD50 Intravenous - Rat - > 200 mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.
Possible human carcinogen

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[a]anthracene)

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Benz[a]anthracene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benz[a]anthracene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Benz[a]anthracene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Benz[a]anthracene)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods
IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benz[a]anthracene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benz[a]anthracene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Benz[a]anthracene	56-55-3	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Benz[a]anthracene	CAS-No. 56-55-3	Revision Date 2007-09-28
WARNING! This product contains a chemical known to the State of California to cause cancer. Benz[a]anthracene	CAS-No. 56-55-3	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H350	May cause cancer.
H400	Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 07/17/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 6.0
Revision Date 02/08/2019
Print Date 06/29/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : BENZO(G,H,I)PERYLENE, 98%

Product Number : B9009
Brand : Aldrich
CAS-No. : 191-24-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P273 Avoid release to the environment.
P391 Collect spillage.

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P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms : 1,12-Benzoperylene

Formula : $C_{22}H_{12}$
Molecular weight : 276.33 g/mol
CAS-No. : 191-24-2
EC-No. : 205-883-8

Component	Classification	Concentration
Benzo[ghi]perylene Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)		
	Aquatic Acute 1; Aquatic Chronic 1; H400, H410 M-Factor - Aquatic Acute: 1,000 - Aquatic Chronic: 1,000	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

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Component	CAS-No.	Value	Control parameters	Basis
Benzo[ghi]perylene	191-24-2	PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
	Remarks	Coal tar pitch volatiles (benzene or cyclohexane-soluble fraction) include fused polycyclic hydrocarbons (some of which are known carcinogens) which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard.		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Benzo[ghi]perylene	191-24-2	1-Hydroxypyrene	2.5 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		3-hydroxybenzo(a)pyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

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data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 277 - 279 °C (531 - 534 °F) - lit.
f)	Initial boiling point and boiling range	> 500 °C > 932 °F - lit.
g)	Flash point	()No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: 6.22 at 25 °C (77 °F)

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p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity
No data available

Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 0.0002 mg/l - 48 h
Toxicity to algae	Growth rate EC10 - Pseudokirchneriella subcapitata (green algae) - > 0.0016 mg/l - 72 h

12.2 Persistence and degradability
Biodegradability — Result: - Not rapidly biodegradable
Remarks: No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Benzo[ghi]perylene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Benzo[ghi]perylene)
Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Benzo[ghi]perylene	191-24-2	2015-11-23

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Benzo[ghi]perylene	191-24-2	2015-11-23

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Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzo[ghi]perylene	191-24-2	2015-11-23

California Prop. 65 Components

	CAS-No.	Revision Date
, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.Benzo[ghi]perylene	191-24-2	2007-09-28

SECTION 16: Other information

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.0 Revision Date: 02/08/2019 Print Date: 06/29/2019

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

SAFETY DATA SHEET

Version 4.8
Revision Date 01/11/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Beryllium

Product Number : 378135
Brand : Aldrich

CAS-No. : 7440-41-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 3), H301
Acute toxicity, Inhalation (Category 2), H330
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Skin sensitisation (Category 1), H317
Carcinogenicity (Category 1B), H350
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Specific target organ toxicity - repeated exposure (Category 1), H372

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H301	Toxic if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H350	May cause cancer.
H372	Causes damage to organs through prolonged or repeated exposure.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Be
Molecular weight	:	9.01 g/mol
CAS-No.	:	7440-41-7
EC-No.	:	231-150-7

Hazardous components

Component	Classification	Concentration
Berylium foil		
	Acute Tox. 3; Acute Tox. 2; Skin Irrit. 2; Eye Irrit. 2A; Skin Sens. 1; Carc. 1B; STOT SE 3; STOT RE 1; H301, H315, H317, H319, H330, H335, H350, H372	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.
Storage class (TRGS 510): 4.1B: Flammable solid hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Berylium foil	7440-41-7	TWA	2.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		CEIL	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Peak	25.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	2.000000microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
	Remarks	Z27.29-1970		
		CEIL	5.000000microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		Peak	25.000000microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		TWA	0.000050 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Beryllium sensitization Chronic beryllium disease (berylliosis) Confirmed human carcinogen Danger of cutaneous absorption Sensitizer		
		C	0.000500 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		See Table Z-2		
		TWA	2.000000microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		TWA	2.000000microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		CEIL	5.000000microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		CEIL	5.000000microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		Peak	25.000000microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		Peak	25.000000microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		TWA	0.000050 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Beryllium sensitization Chronic beryllium disease (berylliosis)		

		Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) Confirmed human carcinogen Danger of cutaneous absorption Sensitizer		
		C	0.000500 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		See Table Z-2		
		TWA	2microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		CEIL	5microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		Peak	25microgram per cubic meter	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z27.29-1970		
		C	0.0005 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A		
		PEL	0.0002 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	0.025 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an

industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Colour: grey
b)	Odour	odourless
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 1,278 °C (2,332 °F) - lit.
f)	Initial boiling point and boiling range	2,970 °C (5,378 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.85 g/cm3 at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Alkali metals

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Beryllium oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

LD50 Intravenous - Rat - 0.496 mg/kg
Remarks: Liver:Hepatitis (hepatocellular necrosis), zonal.

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Hamster
Lungs
Result: negative

Carcinogenicity

Carcinogenicity - Rat - Intratracheal
Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Lungs, Thorax, or Respiration:Bronchiogenic carcinoma.

Carcinogenicity - Rabbit - Intravenous
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Musculoskeletal:Tumors.

Possible human carcinogen

IARC:	1 - Group 1: Carcinogenic to humans (Berylium foil)
NTP:	Known - Known to be human carcinogen (Berylium foil)
	Known - Known to be human carcinogenThe reference note has been added by TD based on the background information of the NTP. (Berylium foil)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: DS1750000

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1567 Class: 6.1 (4.1) Packing group: II
Proper shipping name: Beryllium, powder
Reportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1567 Class: 6.1 (4.1) Packing group: II EMS-No: F-G, S-G
Proper shipping name: BERYLLIUM POWDER

IATA
UN number: 1567 Class: 6.1 (4.1) Packing group: II
Proper shipping name: Beryllium powder

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Berylium foil	7440-41-7	1993-04-24

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Berylium foil	7440-41-7	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Berylium foil	7440-41-7	1993-04-24

	CAS-No.	Revision Date
Berylium foil	7440-41-7	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Berylium foil	7440-41-7	1993-04-24

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Berylium foil	7440-41-7	2008-10-10

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H301	Toxic if swallowed.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H350	May cause cancer.
H372	Causes damage to organs through prolonged or repeated exposure.
Skin Irrit.	Skin irritation
Skin Sens.	Skin sensitisation

HMIS Rating

Health hazard:	4
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	4
Fire Hazard:	3
Reactivity Hazard:	3

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.8 Revision Date: 01/11/2018 Print Date: 06/28/2019

Fisher Scientific

Part of Thermo Fisher Scientific

SAFETY DATA SHEET

Creation Date 13-Sep-2013 **Revision Date** 21-Jul-2015 **Revision Number** 2

1. Identification

Product Name **Chromium**

Cat No. : **C318-500**

Synonyms Chrome

Recommended Use Laboratory chemicals.

Uses advised against No Information available

Details of the supplier of the safety data sheet

Company
Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Specific target organ toxicity (single exposure) Target Organs - Respiratory system.	Category 3

Label Elements

Signal Word
Warning

Hazard Statements
May cause respiratory irritation

Precautionary Statements
Prevention
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area

Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Call a POISON CENTER or doctor/physician if you feel unwell
Storage
Store in a well-ventilated place. Keep container tightly closed
Store locked up
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Very toxic to aquatic life

3. Composition / information on ingredients

Component	CAS-No	Weight %
Chromium	7440-47-3	>95

4. First-aid measures

General Advice If symptoms persist, call a physician.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Inhalation Move to fresh air. If breathing is difficult, give oxygen. Obtain medical attention.

Ingestion Do not induce vomiting. Obtain medical attention.

Most important symptoms/effects None reasonably foreseeable.
Notes to Physician Treat symptomatically

5. Fire-fighting measures

Unsuitable Extinguishing Media Carbon dioxide (CO2)

Flash Point Not applicable
Method - No information available

Autoignition Temperature Not applicable
Explosion Limits
Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Dust can form an explosive mixture in air. Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous Combustion Products
Chromium oxide
Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	1	1	N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment. Avoid dust formation.

Environmental Precautions Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. See Section 12 for additional ecological information. Avoid release to the environment. Collect spillage.

Methods for Containment and Clean Up Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Avoid dust formation. Wear personal protective equipment. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Store under an inert atmosphere.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
Chromium	TWA: 0.5 mg/m³	(Vacated) TWA: 1 mg/m³ TWA: 1 mg/m³	IDLH: 250 mg/m³ TWA: 0.5 mg/m³

Component	Quebec	Mexico OEL (TWA)	Ontario TWAEV
Chromium	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³	TWA: 0.5 mg/m³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Powder
Appearance	Silver
Odor	Odorless
Odor Threshold	No information available
pH	No information available
Melting Point/Range	1857.2 °C / 3375 °F

Boiling Point/Range	2640 °C / 4784 °F
Flash Point	Not applicable
Evaporation Rate	Not applicable
Flammability (solid,gas)	No information available
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	Not applicable
Relative Density	7.2
Solubility	Insoluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	Not applicable
Decomposition Temperature	No information available
Viscosity	Not applicable
Molecular Formula	Cr
Molecular Weight	51.996

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Sensitive to air.

Conditions to Avoid Incompatible products. Excess heat. Avoid dust formation.

Incompatible Materials Strong oxidizing agents, Strong acids

Hazardous Decomposition Products Chromium oxide

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Component Information

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation May cause irritation of respiratory tract

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Chromium	7440-47-3	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects,both acute and delayed No information available

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated. See actual entry in RTECS for complete information.

12. Ecological information

Ecotoxicity

The product contains following substances which are hazardous for the environment. Very toxic to aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Chromium	Not listed	LC50: 14.3 mg/l/96 H (Pimephales promelas)	Not listed	EC50: 0.07 mg/l/48 H

Persistence and Degradability Insoluble in water

Bioaccumulation/ Accumulation No information available.

Mobility Is not likely mobile in the environment due its low water solubility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

- **UN-No** UN3077
- **Proper Shipping Name** ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.
- **Proper technical name** Chromium
- **Hazard Class** 9
- **Packing Group** III

TDG Not regulated

- **UN-No** UN3077
- **Proper Shipping Name** ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S.
- **Hazard Class** 9
- **Packing Group** III

IATA

- **UN-No** UN3077
- **Proper Shipping Name** Environmentally hazardous substance, solid, n.o.s
- **Hazard Class** 9
- **Packing Group** III

IMDG/IMO

- **UN-No** UN3077
- **Proper Shipping Name** Environmentally hazardous substance, solid, n.o.s
- **Hazard Class** 9
- **Packing Group** III

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Chromium	X	X	-	231-157-5	-		X	-	X	X	X

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Chromium	7440-47-3	>95	1.0

SARA 311/312 Hazardous Categorization

Acute Health Hazard	Yes
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Clean Water Act

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Chromium	-	-	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Chromium	X		-

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA
Not applicable

Component	Hazardous Substances RQs	CERCLA EHS RQs
Chromium	5000 lb 10 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals

State Right-to-Know

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Chromium	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR

WHMIS Hazard Class D2B Toxic materials

16. Other information

Prepared By
Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 13-Sep-2013
Revision Date 21-Jul-2015
Print Date 21-Jul-2015
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Disclaimer
The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

End of SDS

SAFETY DATA SHEET

Version 5.10
Revision Date 01/10/2018
Print Date 06/22/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : CHRYSENE, 98%

Product Number : 245186
Brand : Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Germ cell mutagenicity (Category 2), H341
Carcinogenicity (Category 1B), H350
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H341	Suspected of causing genetic defects.
H350	May cause cancer.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P273	Avoid release to the environment.
P281	Use personal protective equipment as required.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.

P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula : $C_{18}H_{12}$

Molecular weight : 228.29 g/mol

Hazardous components

Component	Classification	Concentration
Chrysene		
	Muta. 2; Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H341, H350, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	Cancer Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Polycyclic Aromatic Hydrocarbons (PAHs) Exposure by all routes should be carefully controlled to levels as low as possible. Confirmed animal carcinogen with unknown relevance to humans		
Chrysene	218-01-9	TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.100000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C		

		See Appendix A		
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: solid

		Colour: white, light yellow
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	253.0 °C (487.4 °F)
f)	Initial boiling point and boiling range	448.0 °C (838.4 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: 5.73
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

LD50 Intraperitoneal - Mouse - > 320 mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.
In vitro tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Chrysene)
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	OSHA specifically regulated carcinogen (Chrysene)

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 1.90 mg/l - 2 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Chrysene)
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Chrysene)
Marine pollutant:yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Chrysene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Chrysene	218-01-9	1994-04-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Chrysene	218-01-9	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.10 Revision Date: 01/10/2018 Print Date: 06/22/2019

SAFETY DATA SHEET

Version 4.4
Revision Date 12/01/2015
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : cis-Dichloroethylene

Product Number : 48597
Brand : Supelco
Index-No. : 602-026-00-3

CAS-No. : 156-59-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Acute toxicity, Inhalation (Category 4), H332
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H332 Harmful if inhaled.
H412 Harmful to aquatic life with long lasting effects.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.

P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a POISON CENTER or doctor/ physician if you feel unwell.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C2H2Cl2
Molecular weight	:	96.94 g/mol
CAS-No.	:	156-59-2
EC-No.	:	205-859-7
Index-No.	:	602-026-00-3

Hazardous components

Component	Classification	Concentration
cis-Dichloroethylene		
	Flam. Liq. 2; Acute Tox. 4; Aquatic Acute 3; Aquatic Chronic 3; H225, H332, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Recommended storage temperature 2 - 8 °C

Handle and store under inert gas. Air and moisture sensitive. Light sensitive.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
cis-Dichloroethylene	156-59-2	TWA	200 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Eye irritation		

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: light yellow
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-80.0 °C (-112.0 °F)
f)	Initial boiling point and boiling range	60.0 - 61.0 °C (140.0 - 141.8 °F)
g)	Flash point	6.0 °C (42.8 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.28 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available

p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks. Extremes of temperature and direct sunlight.

10.5 Incompatible materials
Oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LC50 Inhalation - Rat - 13700 ppm
Remarks: Behavioral:Somnolence (general depressed activity). Liver:Fatty liver degeneration.

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: KV9420000

narcosis, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene

Poison Inhalation Hazard: No

IMDG
UN number: 1150 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: 1,2-DICHLOROETHYLENE

IATA
UN number: 1150 Class: 3 Packing group: II
Proper shipping name: 1,2-Dichloroethylene

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
cis-Dichloroethylene	156-59-2	1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H332	Harmful if inhaled.
H402	Harmful to aquatic life.

HMIS Rating

Health hazard:	1
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	1

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.4 Revision Date: 12/01/2015 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 03/12/2019
Print Date 06/22/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Copper

Product Number : 31284
Brand : Aldrich
CAS-No. : 7440-50-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

Not a hazardous substance or mixture.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula : Cu
Molecular weight : 63.55 g/mol
CAS-No. : 7440-50-8
EC-No. : 231-159-6

Component	Classification	Concentration

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Copper,		
		<= 100 %

SECTION 4: First aid measures

4.1 Description of first aid measures

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration.

In case of skin contact
Wash off with soap and plenty of water.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Copper oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing vapours, mist or gas.
For personal protection see section 8.

6.2 Environmental precautions

No special environmental precautions required.

6.3 Methods and materials for containment and cleaning up

Sweep up and shovel. Keep in suitable, closed containers for disposal.

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6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store under inert gas. Air sensitive.
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Copper,	7440-50-8	TWA	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Irritation Gastrointestinal metal fume fever		
		TWA	0.2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Irritation Gastrointestinal metal fume fever		

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		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		PEL	0.1 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
General industrial hygiene practice.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

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Respiratory protection
Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
No special environmental precautions required.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Wire Colour: light red
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 1,083.4 °C (1,982.1 °F)
f)	Initial boiling point and boiling range	2,567 °C 4,653 °F
g)	Flash point	()No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	8.940 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

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SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong acids, Strong oxidizing agents, Acid chlorides, Halogens

10.6 Hazardous decomposition products
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Copper oxides
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
No data available
Inhalation: No data available
Dermal: No data available
LD50 Intraperitoneal - Mouse - 3.5 mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

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Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: GL5325000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity
No data available

12.2 Persistence and degradability
The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

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SECTION 15: Regulatory information

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16

Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16

New Jersey Right To Know Components

Copper,	CAS-No. 7440-50-8	Revision Date 1993-02-16

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16: Other information

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Version: 6.1 Revision Date: 03/12/2019 Print Date: 06/22/2019

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SAFETY DATA SHEET

Version 5.9
Revision Date 06/11/2018
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Cyclohexane

Product Number : 227048
Brand : Sigma-Aldrich
Index-No. : 601-017-00-1

CAS-No. : 110-82-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 1), H400

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.

P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C_6H_{12}
Molecular weight	:	84.16 g/mol
CAS-No.	:	110-82-7
EC-No.	:	203-806-2
Index-No.	:	601-017-00-1
Registration number	:	01-2119463273-41-XXXX

Hazardous components

Component	Classification	Concentration
Cyclohexane		
	Flam. Liq. 2; Skin Irrit. 2; STOT SE 3; Asp. Tox. 1; Aquatic Acute 1; H225, H304, H315, H336, H400	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store under inert gas.
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Cyclohexane	110-82-7	TWA	100 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment		
		TWA	300 ppm 1,050 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	300 ppm 1,050 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		PEL	300 ppm 1,050 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 35 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 4 - 7 °C (39 - 45 °F) - lit.
f)	Initial boiling point and boiling range	80.7 °C (177.3 °F) - lit.
g)	Flash point	-18.0 °C (-0.4 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 9 %(V) Lower explosion limit: 1 %(V)
k)	Vapour pressure	225.0 hPa (168.8 mmHg) at 37.7 °C (99.9 °F) 102.7 hPa (77.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.779 g/cm3 at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 3.44
p)	Auto-ignition temperature	260.0 °C (500.0 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 12,705 mg/kg

LC50 Inhalation - Rat - 4 h - 34,000 mg/l
(OECD Test Guideline 403)

LD50 Dermal - Rabbit - > 2,000 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
May be fatal if swallowed and enters airways.

Additional Information
RTECS: GU6300000

Central nervous system depression, Drowsiness, Irritability, Dizziness, Gastrointestinal disturbance, Lung irritation, chest pain, pulmonary edema

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Pimephales promelas (fathead minnow) - 4.53 mg/l - 96 h (OECD Test Guideline 203)
Toxicity to daphnia and other aquatic	Immobilization EC50 - Daphnia magna (Water flea) - 0.9 mg/l - 48 h (OECD Test Guideline 202)

invertebrates

Toxicity to algae	EC50 - Pseudokirchneriella subcapitata (green algae) - 3.4 mg/l - 72 h (OECD Test Guideline 201)

12.2 Persistence and degradability

Biodegradability	Result: - Readily biodegradable.

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1145 Class: 3 Packing group: II
Proper shipping name: Cyclohexane
Reportable Quantity (RQ): 1000 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1145 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: CYCLOHEXANE
Marine pollutant:yes

IATA
UN number: 1145 Class: 3 Packing group: II
Proper shipping name: Cyclohexane

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Cyclohexane	110-82-7	2007-07-01

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Cyclohexane	110-82-7	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Cyclohexane	110-82-7	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Cyclohexane	110-82-7	2007-07-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
Skin Irrit.	Skin irritation
STOT SE	Specific target organ toxicity - single exposure

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.9 Revision Date: 06/11/2018 Print Date: 11/10/2018

MATERIAL SAFETY DATA SHEET

Date Printed: 20.10.2018
Date Updated: 07.05.2009
Version 1.4

Section 1 - Product and Company Information

Product Name	1,2:5,6-DIBENZANTHRACENE, 97% (NO BULK ORDERS ALLOWED)
Product Number	D31400
Brand	ALDRICH
Company	Sigma-Aldrich
Address	3050 Spruce Street SAINT LOUIS MO 63103 US
Technical Phone:	800-325-5832
Fax:	800-325-5052
Emergency Phone:	314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
1,2:5,6-DIBENZANTHRACENE	53-70-3	Yes

Formula	C22H14
Synonyms	1,2:5,6-Benzanthracene * DB(a,h)A * 1,2,5,6-Dba * 1,2,5,6-Dibenzanthraceen (Dutch) * 1,2:5,6-Dibenzanthracene * 1,2:5,6-Dibenz(a)anthracene * Dibenzo(a,h)anthracene * 1,2:5,6-Dibenzoanthracene * RCRA waste number U063
RTECS Number:	HN2625000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Toxic. Dangerous for the environment.
May cause cancer. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Target organ(s): Lungs. Liver. Calif. Prop. 65 carcinogen.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 0
REACTIVITY: 0

NFPA RATING

HEALTH: 2
FLAMMABILITY: 0
REACTIVITY: 0

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE
If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

DERMAL EXPOSURE
In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE
In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT
N/A

AUTOIGNITION TEMP
N/A

FLAMMABILITY
N/A

EXTINGUISHING MEDIA
Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Wear disposable coveralls and discard them after use.

METHODS FOR CLEANING UP
Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING
User Exposure: Do not breathe dust. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	0.004 MG/M3
Poland		NDSCh	-
Poland		NDSP	-

Section 9 - Physical/Chemical Properties

Appearance: Physical State: Solid

Property	Value	At Temperature or Pressure
Molecular Weight	278,3500 AMU	
pH	N/A	
BP/BP Range	524,000 °C	760,000 mmHg
MP/MP Range	262,000 °C	
Freezing Point	N/A	
Vapor Pressure	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Surface Tension	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point	N/A	
Explosion Limits	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	

Solubility N/A

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE
Skin Contact: May cause skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: May cause eye irritation.
Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.
Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)
Lungs. Liver.

SIGNS AND SYMPTOMS OF EXPOSURE
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

CHRONIC EXPOSURE - CARCINOGEN
Result: This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Species: Rat
Route of Application: Intratracheal
Dose: 100 MG/KG
Result: Tumorigenic:Carcinogenic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors.

Species: Mouse
Route of Application: Oral
Dose: 4160 MG/KG
Exposure Time: 26W
Frequency: I
Result: Lungs, Thorax, or Respiration:Tumors. Tumorigenic:Carcinogenic by RTECS criteria.

Species: Mouse
Route of Application: Skin
Dose: 1200 MG/KG
Exposure Time: 50W
Frequency: I
Result: Tumorigenic:Tumors at site or application. Tumorigenic:Carcinogenic by RTECS criteria. Skin and Appendages: Other: Tumors.

Species: Mouse
Route of Application: Subcutaneous
Dose: 445 UG/KG
Result: Skin and Appendages: Other: Tumors.
Tumorigenic:Carcinogenic by RTECS criteria. Tumorigenic:Tumors
at site or application.

Species: Mouse
Route of Application: Intravenous
Dose: 40 MG/KG
Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax,
or Respiration:Tumors. Liver:Tumors.

Species: Mouse
Route of Application: Implant
Dose: 80 MG/KG
Result: Kidney, Ureter, Bladder:Tumors. Tumorigenic:Carcinogenic
by RTECS criteria.

Species: Mouse
Route of Application: Multiple
Dose: 40 MG/KG
Exposure Time: 12D
Frequency: I
Result: Tumorigenic:Tumors at site or application. Lungs,
Thorax, or Respiration:Tumors. Tumorigenic:Equivocal tumorigenic
agent by RTECS criteria.

Species: Guinea pig
Route of Application: Subcutaneous
Dose: 250 MG/KG
Exposure Time: 24D
Frequency: I
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS
criteria. Tumorigenic:Tumors at site or application. Lungs,
Thorax, or Respiration:Tumors.

Species: Guinea pig
Route of Application: Intravenous
Dose: 30 MG/KG
Result: Tumorigenic:Tumors at site or application. Lungs,
Thorax, or Respiration:Tumors. Tumorigenic:Equivocal tumorigenic
agent by RTECS criteria.

Species: Pigeon
Route of Application: Intramuscular
Dose: 6 MG/KG
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Liver:Tumors. Tumorigenic:Tumors at site or application.

Species: Frog
Route of Application: Intrarenal
Dose: 12 MG/KG
Result: Kidney, Ureter, Bladder:Kidney tumors. Lungs, Thorax, or
Respiration:Tumors. Tumorigenic:Neoplastic by RTECS criteria.

Species: Mouse
Route of Application: Implant
Dose: 14 MG/KG

Result: Tumorigenic:Neoplastic by RTECS criteria.
Tumorigenic:Tumors at site or application.

Species: Mouse
Route of Application: Subcutaneous
Dose: 78 UG/KG
Result: Tumorigenic:Neoplastic by RTECS criteria.
Tumorigenic:Tumors at site or application.

Species: Mouse
Route of Application: Oral
Dose: 4520 MG/KG
Exposure Time: 36W
Frequency: C
Result: Tumorigenic:Carcinogenic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Gastrointestinal:Tumors.

Species: Mouse
Route of Application: Implant
Dose: 200 MG/KG
Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Bronchiogenic carcinoma. Tumorigenic:Tumors at site or application.

Species: Mouse
Route of Application: Skin
Dose: 6 UG/KG
Result: Tumorigenic:Neoplastic by RTECS criteria. Skin and Appendages: Other: Tumors.

Species: Mouse
Route of Application: Subcutaneous
Dose: 6 MG/KG
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Tumorigenic:Tumors at site or application.

Species: Mouse
Route of Application: Skin
Dose: 400 MG/KG
Exposure Time: 40W
Frequency: I
Result: Tumorigenic:Neoplastic by RTECS criteria. Skin and Appendages: Other: Tumors.

Species: Mouse
Route of Application: Implant
Dose: 100 MG/KG
Result: Tumorigenic:Carcinogenic by RTECS criteria. Kidney, Ureter, Bladder:Tumors. Tumorigenic:Tumors at site or application.

Species: Rat
Route of Application: Subcutaneous
Dose: 135 MG/KG
Exposure Time: 9W
Frequency: I
Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Tumorigenic:Tumors at site or application.

Species: Mouse

Route of Application: Subcutaneous
Dose: 400 MG/KG
Exposure Time: 10W
Frequency: I
Result: Tumorigenic:Neoplastic by RTECS criteria.
Tumorigenic:Tumors at site or application.

IARC CARCINOGEN LIST

Rating: Group 2A

NTP CARCINOGEN LIST

Rating: Anticipated to be a carcinogen.

CHRONIC EXPOSURE - MUTAGEN
Result: Laboratory experiments have shown mutagenic effects.

Species: Human
Dose: 360 NMOL/L
Cell Type: Embryo
Mutation test: DNA

Species: Human
Dose: 100 UMOL/L
Cell Type: fibroblast
Mutation test: Unscheduled DNA synthesis

Species: Human
Dose: 10 MG/L
Cell Type: Other cell types
Mutation test: Unscheduled DNA synthesis

Species: Human
Dose: 100 NMOL/L
Cell Type: HeLa cell
Mutation test: Unscheduled DNA synthesis

Species: Human
Dose: 54 UG/L
Cell Type: lymphocyte
Mutation test: Mutation in mammalian somatic cells.

Species: Rat
Route: Intratracheal
Dose: 25500 UG/KG
Exposure Time: 16H
Mutation test: Micronucleus test

Species: Rat
Route: Oral
Dose: 200 MG/KG
Mutation test: Morphological transformation.

Species: Rat
Dose: 100 UG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Rat

Route: Intratracheal
Dose: 25560 UG/KG
Mutation test: DNA

Species: Rat
Route: Intratracheal
Dose: 51150 UG/KG
Mutation test: Sister chromatid exchange

Species: Mouse
Route: Intraperitoneal
Dose: 500 MG/KG
Mutation test: Micronucleus test

Species: Mouse
Dose: 4250 UG/L (+S9)
Cell Type: lymphocyte
Mutation test: Mutation in microorganisms

Species: Mouse
Dose: 500 UG/L
Cell Type: fibroblast
Mutation test: Morphological transformation.

Species: Mouse
Dose: 100 UG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Mouse
Dose: 6 UMOL/L
Cell Type: liver
Mutation test: DNA

Species: Mouse
Route: Skin
Dose: 40 UMOL/KG
Mutation test: DNA

Species: Mouse
Dose: 1 MG/L
Cell Type: Other cell types
Mutation test: DNA

Species: Mouse
Dose: 1 MG/L
Cell Type: Other cell types
Mutation test: Other mutation test systems

Species: Mouse
Dose: 510 NMOL/L
Cell Type: Embryo
Mutation test: DNA

Species: Mouse
Dose: 510 NMOL/L
Cell Type: Embryo
Mutation test: Other mutation test systems

Species: Hamster

Dose: 56400 NMOL/L (+S9)
Cell Type: lung
Mutation test: Mutation in microorganisms

Species: Hamster
Dose: 2500 UG/L
Cell Type: Embryo
Mutation test: Morphological transformation.

Species: Hamster
Dose: 25 UG/L
Cell Type: kidney
Mutation test: Morphological transformation.

Species: Hamster
Dose: 5 MG/L
Exposure Time: 24H
Cell Type: fibroblast
Mutation test: DNA damage

Species: Hamster
Dose: 360 NMOL/L
Cell Type: Embryo
Mutation test: DNA

Species: Hamster
Dose: 5 MG/L
Cell Type: kidney
Mutation test: DNA damage

Species: Hamster
Dose: 1 MG/L
Cell Type: lung
Mutation test: DNA

Species: Hamster
Dose: 1 MG/L
Cell Type: lung
Mutation test: Other mutation test systems

Species: Hamster
Dose: 1 MMOL/L
Cell Type: fibroblast
Mutation test: Cytogenetic analysis

Species: Hamster
Route: Intraperitoneal
Dose: 900 MG/KG
Exposure Time: 24H
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 500 UG/L
Cell Type: lung
Mutation test: Mutation in mammalian somatic cells.

Species: Mammal
Dose: 2 NMOL/L
Cell Type: lymphocyte
Mutation test: DNA damage

Section 12 - Ecological Information

No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations. (DN)Requires special label: "Contains a substance which is regulated by Dannish work environmental law due to the risk of carcinogenic properties."

Section 14 - Transport Information

DOT
Proper Shipping Name: Environmentally hazardous substances, solid, n.o.s.
UN#: 3077
Class: 9
Packing Group: Packing Group III
Hazard Label: Class 9
PIH: Not PIH

IATA
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s
IATA UN Number: 3077
Hazard Class: 9
Packing Group: III

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: T-N
Indication of Danger: Toxic. Dangerous for the environment.
R: 45-50/53
Risk Statements: May cause cancer. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
S: 53-45-60-61
Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Toxic. Dangerous for the environment.
Risk Statements: May cause cancer. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety Statements: Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Wear suitable protective clothing, gloves, and eye/face protection. This

material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.
US Statements: Target organ(s): Lungs. Liver. Calif. Prop. 65 carcinogen.

UNITED STATES REGULATORY INFORMATION
SARA LISTED: Yes
NOTES: This product is subject to SARA section 313 reporting requirements.
TSCA INVENTORY ITEM: Yes

UNITED STATES - STATE REGULATORY INFORMATION

CALIFORNIA PROP - 65
California Prop - 65: This product is or contains chemical(s) known to the state of California to cause cancer. This product is or contains chemical(s) known to the state of California to cause cancer.

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: No
NDSL: Yes

Section 16 - Other Information

DISCLAIMER
For R&D use only. Not for drug, household or other uses.

WARRANTY
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.
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SAFETY DATA SHEET

Version 6.0
Revision Date 03/14/2018
Print Date 07/18/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Dieldrin

Product Number : 33491
Brand : Sigma-Aldrich
Index-No. : 602-049-00-9

CAS-No. : 60-57-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 2), H300

Acute toxicity, Dermal (Category 1), H310

Carcinogenicity (Category 2), H351

Specific target organ toxicity - repeated exposure, Oral (Category 1), H372

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word	Danger
Hazard statement(s)	
H300 + H310	Fatal if swallowed or in contact with skin
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if swallowed.
H410	Very toxic to aquatic life with long lasting effects.
Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P262	Do not get in eyes, on skin, or on clothing.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P350 + P310	IF ON SKIN: Gently wash with plenty of soap and water. Immediately call a POISON CENTER or doctor/ physician.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	1,2,3,4,10,10-Hexachloro-1,4,4a,5,6,7,8,8a-octahydro-6,7-epoxy-1,4:5,8-dimethanonaphthalene
Formula	:	$C_{12}H_8Cl_6O$
Molecular weight	:	380.91 g/mol
CAS-No.	:	60-57-1
EC-No.	:	200-484-5
Index-No.	:	602-049-00-9

Hazardous components

Component	Classification	Concentration
Dieldrin		
	Acute Tox. 2; Acute Tox. 1; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H300 + H310, H351, H372, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Dieldrin	60-57-1	TWA	0.100000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Liver damage Reproductive effects Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		TWA	0.250000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A Potential for dermal absorption		
		TWA	0.250000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		TWA	0.1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Liver damage Reproductive effects Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		TWA	0.25 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen See Appendix A Potential for dermal absorption		
		TWA	0.25 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		TWA	0.25 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		
		PEL	0.25 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber

Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 143 - 144 °C (289 - 291 °F) - lit.
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available

q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 38.3 mg/kg
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.
Limited evidence of carcinogenicity in animal studies

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Ingestion - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: IO1750000

Discomfort, Headache, Nausea, Vomiting, Dizziness, Tremors, tonic convulsions, clonic spasms, Coma., respiratory failure, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Blood - Irregularities - Based on Human Evidence
Blood - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality LC50 - Carassius auratus (goldfish) - 1.6 µg/l - 96.0 h(Dieldrin)
Toxicity to daphnia and other aquatic invertebrates	Immobilization EC50 - Daphnia magna (Water flea) - 79.5 µg/l - 48 h(Dieldrin)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Dieldrin)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2811 Class: 6.1 Packing group: I
Proper shipping name: Toxic solids, organic, n.o.s. (Dieldrin)
Reportable Quantity (RQ) : 1 lbs

Marine pollutant: no no
Poison Inhalation Hazard: No

IMDG
UN number: 2811 Class: 6.1 Packing group: I EMS-No: F-A, S-A
Proper shipping name: TOXIC SOLID, ORGANIC, N.O.S. (Dieldrin)
Marine pollutant : yes

IATA
UN number: 2811 Class: 6.1 Packing group: I
Proper shipping name: Toxic solid, organic, n.o.s. (Dieldrin)
IATA Passenger: Not permitted for transport
A5

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Dieldrin	60-57-1	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Dieldrin	60-57-1	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Dieldrin	60-57-1	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Dieldrin	CAS-No. 60-57-1	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H300	Fatal if swallowed.
H300 + H310	Fatal if swallowed or in contact with skin
H310	Fatal in contact with skin.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure if swallowed.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	4
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	4
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.0 Revision Date: 03/14/2018 Print Date: 07/18/2019

ChemicalBook

Chemical Safety Data Sheet MSDS / SDS

Ethanol

Revision Date:2023-09-02 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name	: Ethanol
CBnumber	: CB2362508
CAS	: 64-17-5
EINECS Number	: 200-578-6
Synonyms	: ethanol,Ethyl alcohol

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	: For R&D use only. Not for medicinal, household or other use.
Uses advised against	: none

Company Identification

Company	: Chemicalbook
Address	: Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone	: 400-158-6606

SECTION 2: Hazards identification

GHS Label elements, including precautionary statements

Symbol(GHS)

Signal word Danger

Precautionary statements

P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continuerinsing.

P311 Call a POISON CENTER or doctor/physician.

P337+P313 IF eye irritation persists: Get medical advice/attention.

P370+P378 In case of fire: Use … for extinction.

P403+P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

Hazard statements

H225 Highly Flammable liquid and vapour

H226 Flammable liquid and vapour

H302 Harmful if swallowed

H313 May be harmful in contact with skin

H319 Causes serious eye irritation

H333 May be harmful if inhaled

H370 Causes damage to organs

H371 May cause damage to organs

H402 Harmful to aquatic life

H412 Harmful to aquatic life with long lasting effects

SECTION 3: Composition/information on ingredients

Substance

Product name	: Ethanol
Synonyms	: ethanol,Ethyl alcohol
CAS	: 64-17-5
EC number	: 200-578-6
MF	: C2H6O
MW	: 46.07

SECTION 4: First aid measures

Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media

Dry powder Dry sand

Unsuitable extinguishing media

Do NOT use water jet.

Special hazards arising from the substance or mixture

Carbon oxides Combustible.

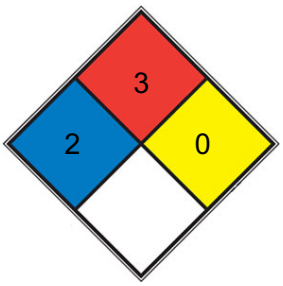
Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

Further information

Use water spray to cool unopened containers.

NFPA 704



■	HEALTH	2	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. diethyl ether, ammonium phosphate, iodine)
■	FIRE	3	Liquids and solids (including finely divided suspended solids) that can be ignited under almost all ambient temperature conditions . Liquids having a flash point below 22.8 °C (73 °F) and having a boiling point at or above 37.8 °C (100 °F) or having a flash point between 22.8 and 37.8 °C (73 and 100 °F). (e.g. gasoline, acetone)
■	REACT	0	Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium,N2)
□	SPEC. HAZ.		

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.

For precautions see section 2.2.

Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in cool place.

Hygroscopic.

Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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SECTION 8: Exposure controls/personal protection

control parameter

Hazard composition and occupational exposure limits

Does not contain substances with occupational exposure limits.

Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

Full contact

Material: butyl-rubber

Minimum layer thickness: 0,3 mm Break through time: 480 min

Material tested:Butoject? (KCL 897 / Aldrich Z677647, Size M)

Splash contact Material: Nitrile rubber

Minimum layer thickness: 0,2 mm Break through time: 38 min

Material tested:Dermatril? P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full- face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Exposure limits

TLV-TWA 1900 mg/m^3 (1000 ppm) (ACGIH).

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Appearance	Form: liquid Colour: colourless
Odour	pungent
Odour Threshold	0.52ppm
pH	7,0 at 10 g/l at 20 °C
Melting point/freezing point	Melting point/range: -114 °C
Initial boiling point and boiling range	78 °C
Flash point	13 °C - closed cup
Evaporation rate	No data available
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	Upper explosion limit: 13,5 %(V) Lower explosion limit: 2,5 %(V)
Vapour pressure	0,57 hPa at 19,6 °C
Vapour density	1,6
Relative density	0,789 g/mL at 25 °C

Water solubility	1.000 g/l at 20 °C - completely miscible
Partition coefficient: n-octanol/water	log Pow: -0,35 at 24 °C - Bioaccumulation is not expected.
Autoignition temperature	455 °C at 1.013 hPa - DIN 51794
Decomposition temperature	Distillable in an undecomposed state at normal pressure.
Viscosity	No data available
Explosive properties	No data available
Oxidizing properties	No data available
λmax	λ: 240 nm Amax: 0.40
	λ: 250 nm Amax: 0.30
	λ: 260 nm Amax: 0.30
	λ: 270 nm Amax: 0.10
	λ: 340 nm Amax: 0.10

Other safety information

Conductivity < 1 µS/cm

Surface tension 72,75 mN/m at 20 °C

Relative vapour density

1,6

SECTION 10: Stability and reactivity

Reactivity

No data available

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

Risk of explosion/exothermic reaction with:hydrogen peroxide, perchlorates, perchloric acid, Nitric acid, mercury(II) nitrate, permanganic acid, Nitriles, peroxi compounds, Strong oxidizing agents, nitrosyl compounds, Peroxides, sodium, Potassium, halogen oxides, calcium hypochlorite, nitrogen dioxide, metallic oxides, uranium hexafluoride, iodides, Chlorine, Alkali metals, Alkaline earth metals, alkali oxides, Ethylene oxidesilver, with, Nitric acidsilver compounds, with, Ammoniapotassium permanganate, with, conc. sulfuric acidRisk of ignition or formation of inflammable gases or vapours with:halogen-halogen compounds, chromium(VI) oxide, chromyl chloride, Fluorine, hydrides, Oxides of phosphorus, platinumNitric acid, with, potassium permanganate

Conditions to avoid

Warming.

Heat, flames and sparks.

Incompatible materials

rubber, various plastics

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides Other decomposition products - No data available

In the event of fire: see section 5

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - male and female - 10.470 mg/kg (OECD Test Guideline 401)

LC50 Inhalation - Rat - male and female - 4 h - 124,7 mg/l (OECD Test Guideline 403)

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 24 h (OECD Test Guideline 404)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Causes serious eye irritation. (OECD Test Guideline 405)

Respiratory or skin sensitisation

(OECD Test Guideline 406)

Remarks: (in analogy to similar products)

Germ cell mutagenicity

Ames test

Salmonella typhimurium Result: negative

In vitro mammalian cell gene mutation test mouse lymphoma cells

Result: negative

OECD Test Guideline 478 Mouse - male

Result: Positive results were obtained in some in vivo tests.

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

Repeated dose toxicity - Rat - male - Oral - No observed adverse effect level - 1.730 mg/kg

- Lowest observed adverse effect level - 3.200 mg/kg RTECS: KQ6300000

irritant effects, respiratory paralysis, Dizziness, narcosis, inebriation, euphoria, Nausea, Vomiting

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Toxicity

LD50 in young, old rats (g/kg): 10.6, 7.06 orally (Wiberg)

SECTION 12: Ecological information

Toxicity

Toxicity to fish

flow-through test LC50 - Pimephales promelas (fathead minnow) -

15.300 mg/l - 96 h (US-EPA)

Toxicity to daphnia and other aquatic invertebrates

static test LC50 - Ceriodaphnia dubia (water flea) - 5.012 mg/l - 48 h

Remarks: (ECHA)

Toxicity to algae

static test ErC50 - Chlorella vulgaris (Fresh water algae) - 275 mg/l

- 72 h

(OECD Test Guideline 201)

Toxicity to bacteria

static test IC50 - activated sludge - > 1.000 mg/l - 3 h (OECD Test Guideline 209)

Persistence and degradability

Biodegradability aerobic - Exposure time 15 d

Result: ca.95 % - Readily biodegradable. (OECD Test Guideline 301E)

Biochemical Oxygen Demand (BOD)

Theoretical oxygen demand

930 - 1.670 mg/g Remarks: (Lit.)

2.100 mg/g Remarks: (Lit.)

Bioaccumulative potential

Due to the distribution coefficient n-octanol/water, accumulation in organisms is not expected.

Mobility in soil

No data available

Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Other adverse effects

Additional ecological information

No data available

SECTION 13: Disposal considerations

Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Waste material must be disposed of in accordance with the Directive on waste 2008/98/EC as well as other national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

Incompatibilities

In acidic conditions, ethanol solutions may react vigorously with oxidizing materials. Mixtures with alkali may darken in color owing to a reaction with residual amounts of aldehyde. Organic salts or acacia may be precipitated from aqueous solutions or dispersions. Ethanol solutions are also incompatible with aluminum containers and may interact with some drugs.

Waste Disposal

Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

SECTION 14: Transport information

UN number

ADR/RID: 1170 IMDG: 1170

UN proper shipping name

ADR/RID: ETHANOL IMDG: ETHANOL IATA: Ethanol

Transport hazard class(es)

ADR/RID: 3 IMDG: 3 IATA: 3

Packaging group

ADR/RID: II IMDG: II IATA: II

Environmental hazards

ADR/RID: no IMDG Marine pollutant: no IATA: no

Special precautions for user

No data available

SECTION 15: Regulatory information

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

Regulations on the Safety Management of Hazardous Chemicals

China Catalog of Hazardous chemicals 2015:Listed. website: https://www.mem.gov.cn/

Measures for Environmental Management of New Chemical Substances

Chinese Chemical Inventory of Existing Chemical Substances (China IECSC):Listed. website: https://www.mee.gov.cn/

EC Inventory:Listed.

European Inventory of Existing Commercial Chemical Substances (EINECS):Listed. website: https://echa.europa.eu/

Korea Existing Chemicals List (KECL):Listed. website: http://ncis.nier.go.kr

New Zealand Inventory of Chemicals (NZIoC):Listed. website: https://www.epa.govt.nz/

Philippines Inventory of Chemicals and Chemical Substances (PICCS):Listed. website: https://emb.gov.ph/

United States Toxic Substances Control Act (TSCA) Inventory:Listed. website: https://www.epa.gov/

Vietnam National Chemical Inventory:Listed. website: https://chemicaldata.gov.vn/

SECTION 16: Other information

Abbreviations and acronyms

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

CAS: Chemical Abstracts Service

EC50: Effective Concentration 50%

IATA: International Air Transportation Association

IMDG: International Maritime Dangerous Goods

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

STEL: Short term exposure limit

TWA: Time Weighted Average

References

【1】CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

【2】ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

【3】ECHA - European Chemicals Agency, website: https://echa.europa.eu/

【4】eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

【5】ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

【6】Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

【7】HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

【8】IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

【9】IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

【10】Sigma-Aldrich, website: https://www.sigmaaldrich.com/

Other Information

Ethanol consumption during pregnancy may adversely affect the unborn child.Chronic ingestion of ethanol may cause liver cirrhosis and cancer.

Disclaimer:
The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.

SDS preview

ETHYLBENZENE

DANGER

100-41-4

by Fisher Scientific

Synonyms

Aethylbenzol [German], Benzene, ethyl-, CCRIS 916, Etilbenzene, Etylobenzen [Polish], Phenylethane, UNII-L5I45M5G0O, Aethylbenzol, AI3-09057, EC 202-849-4, Ethyl benzene, Ethylbenzeen, Ethylbenzeen [Dutch], Etilbenzene [Italian], Etylobenzen, HSDB 84, Ethylbenzene, Ethylbenzol, EB, EINECS 202-849-4, NCI-C56393, NSC 406903

Hazard statements

Harmful if inhaled
Highly flammable liquid and vapour
May be fatal if swallowed and enters airways
May cause damage to organs through prolonged or repeated exposure
May cause drowsiness or dizziness
May cause respiratory irritation
Suspected of causing cancer

Precautions

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Use only outdoors or in a well-ventilated area
Keep container tightly closed
Ground/bond container and receiving equipment
Use only non-sparking tools
Take precautionary measures against static discharge

Keep cool
Do NOT induce vomiting
Store locked up

Hazard category

Acute toxicity, inhalation, Aspiration hazard, Carcinogenicity, Flammable liquids, Specific target organ toxicity, repeated exposure, Specific target organ toxicity, single exposure; Narcotic effects, Specific target organ toxicity, single exposure; Respiratory tract irritation

200&view=GHSLabel&param1=ZmRwLjFfMDUyNjEwMDNORQ==&unique=1527865145)

The information contained herein is based on data compiled from the chemical components of the (M)SDS and may not accurately represent the safety hazards for the product. Only the manufacturer of the product can make actual representations about the hazard profile of a chemical product. No warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

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SAFETY DATA SHEET

Version 5.12
Revision Date 07/26/2018
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Heptane

Product Number : 246654
Brand : Sigma-Aldrich
Index-No. : 601-008-00-2

CAS-No. : 142-82-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Skin irritation (Category 2), H315
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.

P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	C_7H_{16}
Molecular weight	:	100.20 g/mol
CAS-No.	:	142-82-5
EC-No.	:	205-563-8
Index-No.	:	601-008-00-2
Registration number	:	01-2119457603-38-XXXX

Hazardous components

Component	Classification	Concentration
Heptane		
	Flam. Liq. 2; Skin Irrit. 2; STOT SE 3; Asp. Tox. 1; Aquatic Acute 1; Aquatic Chronic 1; H225, H304, H315, H336, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Dry powder Dry sand

Unsuitable extinguishing media
Do NOT use water jet.

5.2 Special hazards arising from the substance or mixture
Flash back possible over considerable distance.

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Store under inert gas. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Heptane	142-82-5	TWA	85 ppm 350 mg/m3	USA. NIOSH Recommended Exposure Limits
		C	440 ppm 1,800 mg/m3	USA. NIOSH Recommended Exposure Limits
	Remarks	15 minute ceiling value		
		TWA	500 ppm 2,000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		PEL	400 ppm 1,600 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		STEL	500 ppm 2,000 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		TWA	400 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation		
		STEL	500 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation		

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 65 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an

industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -91 °C (-132 °F)
f)	Initial boiling point and boiling range	98 °C (208 °F)
g)	Flash point	22 °C (72 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 7 %(V) Lower explosion limit: 1.1 %(V)
k)	Vapour pressure	110.7 hPa (83.0 mmHg) at 37.7 °C (99.9 °F) 53.3 hPa (40.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	0.684 g/mL at 25 °C (77 °F)
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: > 3.000
p)	Auto-ignition temperature	223.0 °C (433.4 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Carbon oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

LC50 Inhalation - Rat - 4 h - 103,000 mg/m3

Inhalation: Irritating to respiratory system.

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
May be fatal if swallowed and enters airways.

Additional Information
RTECS: MI7700000

Prolonged or repeated exposure to skin causes defatting and dermatitis., Central nervous system depression, narcosis, Damage to the lungs.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Carassius auratus (goldfish) - 4 mg/l - 24.0 h
	LC50 - Tilapia mossambica - 375 mg/l - 96.0 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 1.50 mg/l - 48 h

12.2 Persistence and degradability

Ratio BOD/ThBOD	3.5 %

12.3 Bioaccumulative potential
Indication of bioaccumulation.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
Very toxic to aquatic life with long lasting effects.
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Do not empty into drains. Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1206 Class: 3 Packing group: II
Proper shipping name: Heptanes
Reportable Quantity (RQ): Marine pollutant:yes
Poison Inhalation Hazard: No

IMDG
UN number: 1206 Class: 3 Packing group: II EMS-No: F-E, S-D

Proper shipping name: HEPTANES
Marine pollutant:yes Marine pollutant: yes

IATA
UN number: 1206 Class: 3 Packing group: II
Proper shipping name: Heptanes

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Heptane	142-82-5	1993-02-16

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Heptane	142-82-5	1993-02-16

	CAS-No.	Revision Date
Heptane	142-82-5	1993-02-16

New Jersey Right To Know Components

	CAS-No.	Revision Date
Heptane	142-82-5	1993-02-16

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Skin Irrit.	Skin irritation

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.12 Revision Date: 07/26/2018 Print Date: 11/10/2018

SAFETY DATA SHEET

Version 5.6
Revision Date 12/11/2017
Print Date 11/10/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Indeno[1,2,3-*cd*]pyrene

Product Number : 48499
Brand : Supelco

CAS-No. : 193-39-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Carcinogenicity (Category 2), H351

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)
H351 Suspected of causing cancer.

Precautionary statement(s)
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P281 Use personal protective equipment as required.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	$C_{22}H_{12}$
Molecular weight	:	276.33 g/mol
CAS-No.	:	193-39-5
EC-No.	:	205-893-2

Hazardous components

Component	Classification	Concentration
Indeno[1,2,3-cd]pyrene		
	Carc. 2; H351	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

No data available

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Store at room temperature.
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.
Hazardous components without workplace control parameters

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Indeno[1,2,3-cd]pyrene	193-39-5	1-Hydroxypyrene (1-HP)		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the

sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	163.6 °C (326.5 °F)
f)	Initial boiling point and boiling range	536.0 °C (996.8 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Indeno[1,2,3-cd]pyrene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Indeno[1,2,3-cd]pyrene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
Not dangerous goods

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Indeno[1,2,3-cd]pyrene	193-39-5	1993-04-24

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Indeno[1,2,3-cd]pyrene	CAS-No. 193-39-5	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Carc.	Carcinogenicity
H351	Suspected of causing cancer.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	1
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.6 Revision Date: 12/11/2017 Print Date: 11/10/2018

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006
Version 6.0 Revision Date 10.11.2016
Print Date 21.01.2019
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Iron Metal Clinical

Product Number : NIST937
Brand : Sigma-Aldrich
REACH No. : A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

2.2 Label elements

2.3 Other hazards - none

SECTION 3: Composition/information on ingredients

SECTION 4: First aid measures

4.1 Description of first aid measures

No data available

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media
No data available

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
No data available

5.4 Further information
No data available

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
For personal protection see section 8.

6.2 Environmental precautions
No data available

6.3 Methods and materials for containment and cleaning up
No data available

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
No data available

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

8.2 Exposure controls
No data available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	No data available
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	No data available
f)	Initial boiling point and boiling range	No data available
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available

j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
No data available

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Skin corrosion/irritation

Serious eye damage/eye irritation

Respiratory or skin sensitisation

Germ cell mutagenicity

Carcinogenicity

Reproductive toxicity

Specific target organ toxicity - single exposure

Specific target organ toxicity - repeated exposure

Aspiration hazard

Additional Information
RTECS: Not available

SECTION 12: Ecological information

12.1 Toxicity

12.2 Persistence and degradability

12.3 Bioaccumulative potential

12.4 Mobility in soil

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

SECTION 13: Disposal considerations

13.1 Waste treatment methods
No data available

SECTION 14: Transport information

14.1 UN number

ADR/RID: -	IMDG: -	IATA: -

14.2 UN proper shipping name

ADR/RID:	Not dangerous goods
IMDG:	Not dangerous goods
IATA:	Not dangerous goods

14.3 Transport hazard class(es)

ADR/RID: -	IMDG: -	IATA: -

14.4 Packaging group

ADR/RID: -	IMDG: -	IATA: -

14.5 Environmental hazards

ADR/RID: no	IMDG Marine pollutant: no	IATA: no

14.6 Special precautions for user
No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.2 Chemical safety assessment
For this product a chemical safety assessment was not carried out

SECTION 16: Other information

SAFETY DATA SHEET: ISOPROPYL ALCOHOL

IN CASE OF TRANSPORTATION EMERGENCY CONTACT:
CHEMTREC:(800) 424-9300

ALL OTHER INQUIRIES:
(770) 904-7042 // www.ciscochem.com
266 Rue Cezzan Lavonia, GA 30553

1. IDENTIFICATION

ISOPROPYL ALCOHOL

SYNONYMS: ISOPROPANOL, IPA

CAS - NO: 67-63-0

EINECS NO: 200-661-7

CHEMICAL FORMULA: C3-H8-O

2. HAZARDS IDENTIFICATION

OSHA/HCS status
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture
FLAMMABLE LIQUIDS - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3

GHS label elements
Signal word: DANGER!

Hazard Statements: Highly flammable liquid and vapor.
May displace oxygen and cause rapid suffocation.
Causes serious eye irritation.
May cause drowsiness and dizziness

Precautionary statements
General: Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand.

Prevention:
Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling. Use and store only outdoors or in a well ventilated place.

Response:
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue

rinsing. If eye irritation persists: Get medical attention.

Storage:
Store locked up. Store in a well-ventilated place. Keep Cool

Disposal
Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazards not otherwise classified
None Known

Potential Acute Health Effects:
Hazardous in case of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer, permeator).

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer). CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Development toxin [POSSIBLE]. The substance may be toxic to kidneys, liver, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

3. COMPOSITION

COMPOSITION

NAME	CAS #	% BY WEIGHT
Isopropyl Alcohol	67-63-0	100

4. FIRST AID MEASURES

□□□□□□□□□□□□□□Description of necessary first aid measures

EYE CONTACT
Immediately flush eyes with plenty of water,occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.

INHALATION
Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
□□□□□□□□□□□□□□

Most important symptoms/effects, acute and delayed
Potential acute health effects

EYE CONTACT: Causes serious eye irritation

INHALATION: Can cause central nervous system (CNS) depression. May cause drowsiness dizziness

SKIN CONTACT: No known significant effects or critical hazards

FROSTBITE: Try to warm up the frozen tissues and seek medical attention

INGESTION: Can cause central nervous system (CNS) depression. Irritating to mouth, throat and stomach

Over-exposure signs/symptoms

EYE CONTACT: Adverse symptoms may include the following:
pain OR irritation
redness
watering

INHALATION: Adverse symptoms may include the following:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

SKIN CONTACT: No specific data

INGESTION: No specific data

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific Treatments: No specific treatment

Protection of first-aiders: No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

5. FIRE FIGHTING MEASURES

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 399°C (750.2°F)

Flash Points: CLOSED CUP: 11.667°C (53°F) - 12.778 deg. C (55 deg. F) (TAG)

Flammable Limits: LOWER: 2% UPPER: 12.7%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks, of heat. Flammable in presence of oxidizing materials. Non- flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Explosive in presence of open flames and sparks, of heat.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog.

Special Remarks on Fire Hazards:
Vapor may travel considerable distance to source of ignition and flash back. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME. Hydrogen peroxide sharply reduces the autoignition temperature of Isopropyl alcohol. After a delay, Isopropyl alcohol ignites on contact with dioxgenyl tetrafluorborate, chromium trioxide, and potassium tert-butoxide. When heated to decomposition it emits acrid smoke and fumes.

Special Remarks on Explosion Hazards:
Secondary alcohols are readily autooxidized in contact with oxygen or air, forming ketones and hydrogen peroxide. It can become potentially explosive. It reacts with oxygen to form dangerously unstable peroxides which can concentrate and explode during distillation or evaporation. The presence of 2-butanone increases the reaction rate for peroxide formation. Explosive in the form of vapor when exposed to heat or flame. May form explosive mixtures with air. Isopropyl alcohol + phosgene forms isopropyl chloroformate and hydrogen chloride. In the presence of iron salts, thermal decompositon can occur, whicn in some cases can become explosive. A homogeneous mixture of concentrated peroxides + isopropyl alcohol are capable of detonation by shock or heat. Barium perchlorate + isopropyl alcohol gives the highly explosive alkyl perchlorates.forms explosive mixtures with trinitormethane and hydrogen peroxide. It produces a violent explosive reaction when heated with aluminum isopropoxide + crotonaldehyde. Mixtures of isopropyl alcohol + nitroform are explosive.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders
If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non- emergency personnel".

Environmental precaution
Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up
Small spill
Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill
Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. HANDLING AND STORAGE

Precautions for safe handling

Protective Measures

Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general :
occupational hygiene

Eating,drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage,:
Including any incompatibilities

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. EXPOSURE CONTROLS AND PERSONAL PROECTION

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:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

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:
TWA: 983 STEL: 1230 (mg/m3) [Australia] TWA: 200 STEL: 400 (ppm) from ACGIH (TLV) [United States] [1999] TWA: 980 STEL: 1225 (mg/m3) from NIOSH TWA: 400 STEL: 500 (ppm) from NIOSH TWA: 400 STEL: 500 (ppm) [United Kingdom (UK)] TWA: 999 STEL: 1259 (mg/m3) [United Kingdom (UK)] TWA: 400 STEL: 500 (ppm) from OSHA (PEL) [United States] TWA: 980 STEL: 1225 (mg/m3) from OSHA (PEL) [United States]Consult local authorities for acceptable exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: Liquid.

Odor: Pleasant. Odor resembling that of a mixture of ethanol and acetone.

Taste: Bitter. (Slight.)

Molecular Weight: 60.1 g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 82.5°C (180.5°F)

Melting Point: -88.5°C (-127.3°F)

Critical Temperature: 235°C (455°F)

Specific Gravity: 0.78505 (Water = 1)

Vapor Pressure: 4.4 kPa (@ 20°C)

Vapor Density: 2.07 (Air = 1)

Volatility: Not available.

Odor Threshold:
22 ppm (Sittig, 1991) 700 ppm for unadapted panelists (Verschuren, 1983).
Water/Oil Dist. Coeff.: The product is equally soluble in oil and water; log(oil/water) = 0.1

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, methanol, diethyl ether, n-octanol, acetone.

Solubility: Easily soluble in cold water, hot water, methanol, diethyl ether, n-octanol, acetone. Insoluble in salt solution. Soluble in benzene. Miscible with most organic solvents including alcohol, ethyl alcohol, chloroform.

10. STABILITY AND REACTIVITY

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, Ignition sources, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Reacts violently with hydrogen + palladium combination, nitroform, oleum, $COCl_2$, aluminum triisopropoxide, oxidants
Incompatible with acetaldehyde, chlorine, ethylene oxide, isocyanates, acids, alkaline earth, alkali metals, caustics, amines, crotonaldehyde, phosgene, ammonia. Isopropyl alcohol reacts with metallic aluminum at high temperatures. Isopropyl alcohol attacks some plastics, rubber, and coatings. Vigorous reaction with sodium dichromate + sulfuric acid.

Special Remarks on Corrosivity: May attack some forms of plastic, rubber and coating

Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

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

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 3600 mg/kg [Mouse]. Acute dermal toxicity (LD50): 12800 mg/kg [Rabbit]. Acute toxicity of the vapor (LC50): 16000 8 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC.
DEVELOPMENTAL TOXICITY: Classified Reproductive system/toxin/female, Development toxin [POSSIBLE]. May cause

damage to the following organs: kidneys, liver, skin, central nervous system (CNS).

Other Toxic Effects on Humans:
Hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant, sensitizer, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive/teratogenic effects (fertility, fetoxicity, developmental abnormalities (development toxin) based on animal studies. Detected in maternal milk in human.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects: Skin: May cause mild skin irritation, and sensitization. Eyes: Can cause eye irritation. Inhalation: Breathing in small amounts of this material during normal handling is not likely to cause harmful effects. However, breathing large amounts may be harmful and may affect the respiratory system and mucous membranes (irritation), behavior and brain (Central nervous system depression - headache, dizziness, drowsiness, stupor, incoordination, unconsciousness, coma and possible death), peripheral nerve and sensation, blood, urinary system, and liver. Ingestion: Swallowing small amounts during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. Swallowing large amounts may cause gastrointestinal tract irritation with nausea, vomiting and diarrhea, abdominal pain. It also may affect the urinary system, cardiovascular system, sense organs, behavior or central nervous system (somnolence, generally depressed activity, irritability, headache, dizziness, drowsiness), liver, and respiratory system (breathing difficulty). Chronic Potential Health Effects: May cause defatting of the skin and dermatitis and allergic reaction. May cause adverse reproductive effects based on animal data (studies).

12. ECOLOGICAL INFORMATION

Ecotoxicity: Ecotoxicity in water (LC50): 100000 mg/l 96 hours [Fathead Minnow]. 64000 mg/l 96 hours [Fathead Minnow].

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 product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

13. DISPOSAL CONSIDERATIONS

Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. TRANSPORT INFORMATION

DOT Classification: CLASS 3: Flammable liquid.

Identification: : Isopropyl Alcohol UNNA: 1219 PG: II

Special Provisions for Transport: Not available.

PROPER SHIPPING DOCUMENTATION:

UN 1219, ISOPROPYL ALCOHOL,3, PG II FLAMMABLE LIQUID

Special precautions for user
Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not available.

15. REGULATORY INFORMATION

Federal and State Regulations:
Connecticut hazardous material survey.: Isopropyl alcohol Illinois toxic substances disclosure to employee act: Isopropyl alcohol Rhode Island RTK hazardous substances: Isopropyl alcohol Pennsylvania RTK: Isopropyl alcohol Florida: Isopropyl alcohol Minnesota: Isopropyl alcohol Massachusetts RTK: Isopropyl alcohol New Jersey: Isopropyl alcohol New Jersey spill list: Isopropyl alcohol Director's list of Hazardous Substances: Isopropyl alcohol Tennesee: Isopropyl alcohol TSCA 8(b) inventory: Isopropyl alcohol TSCA 4(a) final testing order: Isopropyl alcohol TSCA 8(a) IUR: Isopropyl alcohol TSCA 8(d) Hand S data reporting: Isopropyl alcohol: Effective date: 12/15/86 Sunset Date: 12/15/96 TSCA 12(b) one time export: Isopropyl alcohol SARA 313 toxic chemical notification and release reporting: Isopropyl alcohol

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 B-2: Flammable liquid with a flash point lower than 37.8°C (100°F). CLASS D-2B: Material causing other toxic effects (TOXIC).

DSCL (EEC):
R11- Highly flammable. R36- Irritating to eyes. S7- Keep container tightly closed. S16- Keep away from sources of ignition - No smoking. S24/25- Avoid contact with skin and eyes. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
HMIS (U.S.A.):

Health Hazard: 2
Fire Hazard: 3 Reactivity: 0
Personal Protection: h
National Fire Protection Association (U.S.A.): Health: 1
Flammability: 3 Reactivity: 0
Specific hazard:

Protective Equipment:
Gloves. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

16. OTHER INFORMATION

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall CISCO be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if CISCO has been advised of the possibility of such damages.

Date Created: 5/11/2015
Date Updated: 2/4/2016

SAFETY DATA SHEET

Version 4.11
Revision Date 10/12/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Lead

Product Number : 391352
Brand : Aldrich

CAS-No. : 7439-92-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Carcinogenicity (Category 2), H351
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - repeated exposure (Category 2), H373
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)

H302	Harmful if swallowed.
H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.

P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Pb
Molecular weight	:	207.20 g/mol
CAS-No.	:	7439-92-1
EC-No.	:	231-100-4

Hazardous components

Component	Classification	Concentration
Lead		
	Acute Tox. 4; Carc. 2; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H302, H351, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Keep in a dry place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
	Remarks	See 1910.1025		
Lead	7439-92-1	TWA	0.05 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Confirmed animal carcinogen with unknown relevance to humans		
		TWA	0.05 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Hematologic effects Peripheral Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		

		TWA	0.05 mg/m3	USA. NIOSH Recommended Exposure Limits
		See Appendix C		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	Lead	200 µg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Not critical			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance — Form: powder

b) Odour — No data available

c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 327.4 °C (621.3 °F) - lit.
f)	Initial boiling point and boiling range	1,740 °C (3,164 °F) - lit.
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	No data available
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong acids

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Lead oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity

Rat
Cytogenetic analysis

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Lead)
NTP:	RAHC - Reasonably anticipated to be a human carcinogenThe reference note has been added by TD based on the background information of the NTP. (Lead)
OSHA:	OSHA specifically regulated carcinogen (Lead)

Reproductive toxicity

Reproductive toxicity - Rat - Inhalation
Effects on Newborn: Biochemical and metabolic.

Reproductive toxicity - Rat - Oral
Effects on Newborn: Behavioral.

Reproductive toxicity - Mouse - Oral
Effects on Fertility: Female fertility index (e.g., # females pregnant per females mated). Effects on Fertility: Pre-implantation mortality (e.g., reduction in numbe corpora lutea).

May damage fertility. May damage the unborn child.

Developmental Toxicity - Rat - Inhalation
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow).

Developmental Toxicity - Rat - Oral
Specific Developmental Abnormalities: Blood and lymphatic system (including spleen and marrow). Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Developmental Toxicity - Rat - Oral
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

Developmental Toxicity - Mouse - Oral
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Fetal death.

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: OF7525000

anemia

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality LOEC - Oncorhynchus mykiss (rainbow trout) - 1.19 mg/l - 96.0 h
	LC50 - Micropterus dolomieui - 2.2 mg/l - 96.0 h
	mortality NOEC - Salvelinus fontinalis - 1.7 mg/l - 10.0 d
Toxicity to daphnia and other aquatic invertebrates	mortality LOEC - Daphnia (water flea) - 0.17 mg/l - 24 h
	mortality NOEC - Daphnia (water flea) - 0.099 mg/l - 24 h
Toxicity to algae	mortality EC50 - Skeletonema costatum - 7.94 mg/l - 10 d

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential

Bioaccumulation	Oncorhynchus kisutch - 2 Weeks - 150 µg/l
	Bioconcentration factor (BCF): 12

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Lead)
Reportable Quantity (RQ): 10 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead)
Marine pollutant:yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Lead)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

New Jersey Right To Know Components

	CAS-No.	Revision Date
Lead	7439-92-1	2015-11-23

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Lead	7439-92-1	2009-02-01
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Lead	7439-92-1	2009-02-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
H302	Harmful if swallowed.
H351	Suspected of causing cancer.
H361	Suspected of damaging fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.11 Revision Date: 10/12/2018 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.0
Revision Date 01/31/2017
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Magnesium

Product Number : 200905
Brand : Sigma-Aldrich
Index-No. : 012-002-00-9

CAS-No. : 7439-95-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable solids (Category 1), H228
Self-heating substances and mixtures (Category 1), H251
Substances and mixtures, which in contact with water, emit flammable gases (Category 2), H261

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H228 Flammable solid.
H251 Self-heating: may catch fire.
H261 In contact with water releases flammable gases.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P223 Keep away from any possible contact with water, because of violent

	reaction and possible flash fire.
P231 + P232	Handle under inert gas. Protect from moisture.
P235 + P410	Keep cool. Protect from sunlight.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P280	Wear protective gloves/ eye protection/ face protection.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P402 + P404	Store in a dry place. Store in a closed container.
P407	Maintain air gap between stacks/ pallets.
P413	Store bulk masses greater than .? kg/ .? lbs at temperatures not exceeding .? °C/ .? °F.
P420	Store away from other materials.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Combustible dust

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Mg
Molecular weight	:	24.31 g/mol
CAS-No.	:	7439-95-4
EC-No.	:	231-104-6
Index-No.	:	012-002-00-9

Hazardous components

Component	Classification	Concentration
Magnesium (non pyrophoric)		
	Flam. Sol. 1; Self-heat. 1; Water-react. 2; H228, H251, H261	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Move out of dangerous area.Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Dry powder

5.2 Special hazards arising from the substance or mixture
Magnesium oxide

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combu formation should be taken into consideration before additional processing
Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Never allow product to get in contact with water during storage.

Store under inert gas. Air and moisture sensitive.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industria situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: Turnings
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 648 °C (1198 °F) - lit.
f)	Initial boiling point and boiling range	1,090 °C (1,994 °F) - lit.
g)	Flash point	()No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	May form combustible dust concentrations in air.
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	1 hPa at 621 °C (1150 °F)
l)	Vapour density	No data available
m)	Relative density	1.74 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available

o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	The substance or mixture is classified as self heating with the category 1.
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Reacts violently with water.

10.4 Conditions to avoid
Heat, flames and sparks. Exposure to moisture

10.5 Incompatible materials
Acids, Strong oxidizing agents, Acid chlorides, Halogens

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Magnesium oxide
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data availableMagnesium (non pyrophoric)
Inhalation: No data available(Magnesium (non pyrophoric))
Dermal: No data available(Magnesium (non pyrophoric))
No data available(Magnesium (non pyrophoric))

Skin corrosion/irritation
No data available(Magnesium (non pyrophoric))

Serious eye damage/eye irritation
No data available(Magnesium (non pyrophoric))

Respiratory or skin sensitisation
No data available(Magnesium (non pyrophoric))

Germ cell mutagenicity

No data available(Magnesium (non pyrophoric))

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available(Magnesium (non pyrophoric))

No data available(Magnesium (non pyrophoric))

Specific target organ toxicity - single exposure
No data available(Magnesium (non pyrophoric))

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available(Magnesium (non pyrophoric))

Additional Information
RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, chills, Fever, fatigue, muscle pain, joint pain, rash, Anorexia.(Magnesium (non pyrophoric))
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Magnesium (non pyrophoric))

Liver - Irregularities - Based on Human Evidence
Liver - Irregularities - Based on Human Evidence(Magnesium (non pyrophoric))

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Magnesium (non pyrophoric))

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1869 Class: 4.1 Packing group: III
Proper shipping name: Magnesium
Poison Inhalation Hazard: No

IMDG
UN number: 1869 Class: 4.1 Packing group: III EMS-No: F-G, S-G
Proper shipping name: MAGNESIUM

IATA
UN number: 1869 Class: 4.1 Packing group: III
Proper shipping name: Magnesium

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Reactivity Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Magnesium (non pyrophoric)	7439-95-4	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Magnesium (non pyrophoric)	7439-95-4	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Magnesium (non pyrophoric)	7439-95-4	1993-04-24

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H228	Flammable solid.
H251	Self-heating: may catch fire.
H261	In contact with water releases flammable gases.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	2

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	2

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.0 Revision Date: 01/31/2017 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 05/28/2017
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name	:	Manganese
Product Number	:	463728
Brand	:	Aldrich
CAS-No.	:	7439-96-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich Inc. 3050 Spruce Street ST. LOUIS MO 63103 UNITED STATES
Telephone	:	+1 314 771-5765
Fax	:	+1 800 325-5052

1.4 Emergency telephone number

Emergency Phone #	:	+1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Substances and mixtures, which in contact with water, emit flammable gases (Category 1), H260
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H260	In contact with water releases flammable gases which may ignite spontaneously.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s)

P223	Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P231 + P232	Handle under inert gas. Protect from moisture.

P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P402 + P404	Store in a dry place. Store in a closed container.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Mn
Molecular weight	:	54.94 g/mol
CAS-No.	:	7439-96-5
EC-No.	:	231-105-1

Hazardous components

Component	Classification	Concentration
Manganese		
	Water-react. 1; Aquatic Acute 3; Aquatic Chronic 3; H260, H412	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Dry powder Carbon dioxide (CO2)

Unsuitable extinguishing media
Water

5.2 Special hazards arising from the substance or mixture
Manganese/manganese oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Never allow product to get in contact with water during storage.

Moisture sensitive. Keep in a dry place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Manganese	7439-96-5	TWA	0.200000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC)		
		C	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Ceiling limit is to be determined from breathing-zone air samples.		
		C	5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Ceiling limit is to be determined from breathing-zone air samples.		

		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		C	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Ceiling limit is to be determined from breathing-zone air samples.		
		TWA	1.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.200000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Adopted values or notations enclosed are those for which changes are proposed in the NIC See Notice of Intended Changes (NIC) varies		
		TWA	0.100000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment 2015 Adoption varies		
		TWA	0.020000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment 2015 Adoption varies		
		TWA	1 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	3 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	0.1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Not classifiable as a human carcinogen varies		
		TWA	0.02 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Not classifiable as a human carcinogen varies		

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Impervious clothing, Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Colour: grey
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 1,244 °C (2,271 °F) - lit.
f)	Initial boiling point and boiling range	1,962 °C (3,564 °F) - lit.
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	7.3 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Reacts violently with water.

10.4 Conditions to avoid
Exposure to moisture

10.5 Incompatible materials
acids, Halogens, Bases, Phosphorus, Sulphur oxides, Peroxides

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Manganese/manganese oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 9,000 mg/kg(Manganese)
Inhalation: No data available(Manganese)
Dermal: No data available(Manganese)
No data available(Manganese)

Skin corrosion/irritation
Skin - Rabbit(Manganese)
Result: Mild skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit(Manganese)
Result: Mild eye irritation - 24 h

Respiratory or skin sensitisation
No data available(Manganese)

Germ cell mutagenicity

No data available(Manganese)

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available(Manganese)

May cause reproductive disorders.(Manganese)

Specific target organ toxicity - single exposure
No data available(Manganese)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available(Manganese)

Additional Information
RTECS: OO9275000

Men exposed to manganese dusts showed a decrease in fertility. Chronic man system. Early symptoms include languor, sleepiness and weakness in the le disturbances such as uncontrollable laughter and a spastic gait with tend cases. High incidence of pneumonia has been found in workers exposed to t(Manganese)

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence(Manganese)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 40 mg/l - 48 h(Manganese)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Manganese)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life.

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3208 Class: 4.3 Packing group: I
Proper shipping name: Metallic substance, water-reactive, n.o.s. (Manganese)
Poison Inhalation Hazard: No

IMDG
UN number: 3208 Class: 4.3 Packing group: I EMS-No: F-G, S-N
Proper shipping name: METALLIC SUBSTANCE, WATER-REACTIVE, N.O.S. (Manganese)

IATA
UN number: 3208 Class: 4.3 Packing group: I
Proper shipping name: Metallic substance, water-reactive, n.o.s. (Manganese)
IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

SARA 311/312 Hazards
Reactivity Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Manganese	7439-96-5	2007-07-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H260	In contact with water releases flammable gases which may ignite spontaneously.
H402	Harmful to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	2

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	2
Special hazard.I:	W

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling

or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.0
Revision Date 03/14/2018
Print Date 01/21/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Methyl Ethyl Ketone, United States Pharmacopeia (USP) Reference Standard

Product Number : 1430101
Brand : US Pharmacopeia

CAS-No. : 78-93-3

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225

Eye irritation (Category 2A), H319

Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Molecular weight : 72.11 g/mol
CAS-No. : 78-93-3

Hazardous components

Component	Classification	Concentration
Ethyl methyl ketone		
	Flam. Liq. 2; Eye Irrit. 2A; STOT SE 3; H225, H319, H336	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Dry powder Dry sand

Unsuitable extinguishing media
Do NOT use water jet.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Use explosion-proof equipment.Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection

Impervious clothing, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-87 °C (-125 °F)
f)	Initial boiling point and boiling range	79 - 80 °C (174 - 176 °F)
g)	Flash point	-3 °C (27 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 10.1 %(V) Lower explosion limit: 1.8 %(V)
k)	Vapour pressure	95 hPa at 20 °C (68 °F)
l)	Vapour density	2.49 - (Air = 1.0)
m)	Relative density	0.805 g/cm3
n)	Water solubility	soluble
o)	Partition coefficient: n-octanol/water	log Pow: 0.29
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	24.6 mN/m at 20 °C (68 °F)
Relative vapour density	2.49 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Oxidizing agents, Strong reducing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 2,737 mg/kg
LC50 Inhalation - Mouse - 4 h - 32,000 mg/m3
LC50 Inhalation - Mammal - 38,000 mg/m3
LD50 Dermal - Rabbit - 6,480 mg/kg
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Irritating to eyes.
(OECD Test Guideline 405)

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

Central nervous system depression, Gastrointestinal disturbance, narcosis

Liver - Irregularities - Based on Human Evidence
Liver - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality NOEC - Cyprinodon variegatus (sheepshead minnow) - 400 mg/l - 96 h(Ethyl methyl ketone)
	LC50 - Pimephales promelas (fathead minnow) - 3,130 - 3,320 mg/l - 96 h(Ethyl methyl ketone)
Toxicity to daphnia and other aquatic invertebrates	LC50 - Daphnia magna (Water flea) - > 520 mg/l - 48 h(Ethyl methyl ketone)
	EC50 - Daphnia magna (Water flea) - 7,060 mg/l - 24 h(Ethyl methyl ketone)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available(Ethyl methyl ketone)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Contact a licensed professional waste disposal service to dispose of this material. Offer surplus and non-recyclable solutions to a licensed disposal company. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1193 Class: 3 Packing group: II
Proper shipping name: Ethyl methyl ketone
Reportable Quantity (RQ) : 5000 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1193 Class: 3 Packing group: II EMS-No: F-E, S-D
Proper shipping name: ETHYL METHYL KETONE

IATA
UN number: 1193 Class: 3 Packing group: II
Proper shipping name: Ethyl methyl ketone

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Ethyl methyl ketone	78-93-3	

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Ethyl methyl ketone	78-93-3	

	CAS-No.	Revision Date
Ethyl methyl ketone	78-93-3	

New Jersey Right To Know Components

	CAS-No.	Revision Date
Ethyl methyl ketone	78-93-3	

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H225	Highly flammable liquid and vapour.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	3
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	3
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.0 Revision Date: 03/14/2018 Print Date: 01/21/2019

SAFETY DATA SHEET

Version 3.15
Revision Date 03/05/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Mercury

Product Number : 215457
Brand : Sigma-Aldrich
Index-No. : 080-001-00-0

CAS-No. : 7439-97-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Inhalation (Category 2), H330
Reproductive toxicity (Category 1B), H360
Specific target organ toxicity - repeated exposure (Category 1), H372
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H330	Fatal if inhaled.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Hg
Molecular weight	:	200.59 g/mol
CAS-No.	:	7439-97-6
EC-No.	:	231-106-7
Index-No.	:	080-001-00-0

Hazardous components

Component	Classification	Concentration
Mercury		
	Acute Tox. 2; Repr. 1B; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H330, H360, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal. In some instances, a mercury spill kit may be used. Please consult with your site EHS representative to determine the most appropriate clean up method.Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store under inert gas.
Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Mercury	7439-97-6	C	0.1 mg/m3	USA. NIOSH Recommended Exposure Limits
	Remarks	Potential for dermal absorption		
		CEIL	1.0mg/10m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	0.05 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		

		TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Kidney damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen Danger of cutaneous absorption		
		TWA	0.05 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: silver, white

b)	Odour	odourless
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -38.87 °C (-37.97 °F) - lit.
f)	Initial boiling point and boiling range	356.6 °C (673.9 °F) - lit.
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	< 0.01 hPa (< 0.01 mmHg) at 20 °C (68 °F) 1 hPa (1 mmHg) at 126 °C (259 °F)
l)	Vapour density	6.93 - (Air = 1.0)
m)	Relative density	13.55 g/cm3 at 25 °C (77 °F)
n)	Water solubility	0.00006 g/l at 25 °C (77 °F)
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density	6.93 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Ammonia, Azides, Nitrates, Chlorates, Copper

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Mercury/mercury oxides.
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

LC50 Inhalation - Rat - male - 2 h - < 27 mg/m3

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
Presumed human reproductive toxicant

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: OV4550000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality LC50 - Cyprinus carpio (Carp) - 0.160 mg/l - 96 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential

Bioaccumulation	Carassius auratus (goldfish) - 1,789 d - 0.25 µg/l

Bioconcentration factor (BCF): 155,986

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2809 Class: 8 (6.1) Packing group: III
Proper shipping name: A. W. Mercury
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

IATA
UN number: 2809 Class: 8 (6.1) Packing group: III
Proper shipping name: Mercury

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

New Jersey Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Mercury	CAS-No. 7439-97-6	Revision Date 2013-12-20

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
H330	Fatal if inhaled.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Repr.	Reproductive toxicity

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.15 Revision Date: 03/05/2018 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 3.15
Revision Date 03/05/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Mercury

Product Number : 215457
Brand : Sigma-Aldrich
Index-No. : 080-001-00-0

CAS-No. : 7439-97-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Inhalation (Category 2), H330
Reproductive toxicity (Category 1B), H360
Specific target organ toxicity - repeated exposure (Category 1), H372
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H330	Fatal if inhaled.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.

P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Hg
Molecular weight	:	200.59 g/mol
CAS-No.	:	7439-97-6
EC-No.	:	231-106-7
Index-No.	:	080-001-00-0

Hazardous components

Component	Classification	Concentration
Mercury		
	Acute Tox. 2; Repr. 1B; STOT RE 1; Aquatic Acute 1; Aquatic Chronic 1; H330, H360, H372, H410	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal. In some instances, a mercury spill kit may be used. Please consult with your site EHS representative to determine the most appropriate clean up method.Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store under inert gas.
Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Mercury	7439-97-6	C	0.1 mg/m3	USA. NIOSH Recommended Exposure Limits
	Remarks	Potential for dermal absorption		
		CEIL	1.0mg/10m3	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	0.05 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		Skin notation		

		TWA	0.025 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Kidney damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen Danger of cutaneous absorption		
		TWA	0.05 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		

8.2 Exposure controls

Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid Colour: silver, white

b)	Odour	odourless
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -38.87 °C (-37.97 °F) - lit.
f)	Initial boiling point and boiling range	356.6 °C (673.9 °F) - lit.
g)	Flash point	Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	< 0.01 hPa (< 0.01 mmHg) at 20 °C (68 °F) 1 hPa (1 mmHg) at 126 °C (259 °F)
l)	Vapour density	6.93 - (Air = 1.0)
m)	Relative density	13.55 g/cm3 at 25 °C (77 °F)
n)	Water solubility	0.00006 g/l at 25 °C (77 °F)
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density	6.93 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Ammonia, Azides, Nitrates, Chlorates, Copper

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Mercury/mercury oxides.
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

LC50 Inhalation - Rat - male - 2 h - < 27 mg/m3

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
Presumed human reproductive toxicant

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
No data available

Additional Information
RTECS: OV4550000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	mortality LC50 - Cyprinus carpio (Carp) - 0.160 mg/l - 96 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential

Bioaccumulation	Carassius auratus (goldfish) - 1,789 d - 0.25 µg/l

Bioconcentration factor (BCF): 155,986

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 2809 Class: 8 (6.1) Packing group: III
Proper shipping name: A. W. Mercury
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG

IATA
UN number: 2809 Class: 8 (6.1) Packing group: III
Proper shipping name: Mercury

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

New Jersey Right To Know Components

	CAS-No.	Revision Date
Mercury	7439-97-6	2015-11-23

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Mercury	CAS-No. 7439-97-6	Revision Date 2013-12-20

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
H330	Fatal if inhaled.
H360	May damage fertility or the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
Repr.	Reproductive toxicity

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.15 Revision Date: 03/05/2018 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.0
Revision Date 05/26/2018
Print Date 06/22/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Pentachlorophenol

Product Number : P2604
Brand : Aldrich
Index-No. : 604-002-00-8

CAS-No. : 87-86-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 3), H301

Acute toxicity, Inhalation (Category 2), H330

Acute toxicity, Dermal (Category 3), H311

Skin irritation (Category 2), H315

Eye irritation (Category 2A), H319

Carcinogenicity (Category 2), H351

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word — Danger

Hazard statement(s)

H301 + H311	Toxic if swallowed or in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284	Wear respiratory protection.
P301 + P310 + P330	IF SWALLOWED: Immediately call a POISON CENTER/doctor. Rinse mouth.
P302 + P352 + P312	IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/ physician if you feel unwell.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Molecular weight	:	266.34 g/mol
CAS-No.	:	87-86-5
EC-No.	:	201-778-6
Index-No.	:	604-002-00-8

Hazardous components

Component	Classification	Concentration
Pentachlorophenol		
	Acute Tox. 3; Acute Tox. 2;	<= 100 %

	Acute Tox. 3; Skin Irrit. 2; Eye Irrit. 2A; Carc. 2; STOT SE 3; Aquatic Acute 1; Aquatic Chronic 2; H301 + H311, H315, H319, H330, H335, H351, H400, H411	

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen chloride gas

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1B: Non-combustible, acute toxic Cat. 1 and 2 / very toxic hazardous materials

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Pentachlorophenol	87-86-5	TWA	0.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Cardiac impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		STEL	1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Cardiac impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption		
		TWA	0.5 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential for dermal absorption		
		TWA	0.5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		PEL	0.5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Pentachlorophenol	87-86-5	pentachlorophenol		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Prior to last shift of workweek			

8.2 Exposure controls

Appropriate engineering controls

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 120 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: crystalline Colour: light red
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 165 - 180 °C (329 - 356 °F)
f)	Initial boiling point and boiling range	310 °C (590 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	53.3 hPa at 211.2 °C (412.2 °F)

l)	Vapour density	No data available
m)	Relative density	1.978 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 5.12
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Strong bases

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 27 mg/kg
Remarks: Vascular:BP elevation not charactertized in autonomic section. Endocrine:Hyperglycemia. Nutritional and Gross Metabolic:Changes in:Body temperature increase.
LC50 Inhalation - Rat - 355 mg/m3
Remarks: Behavioral:Excitement. Behavioral:Muscle contraction or spasticity. Lungs, Thorax, or Respiration:Dyspnea.
LD50 Dermal - Rat - 96.0 mg/kg
Remarks: Behavioral:Excitement. Behavioral:Muscle contraction or spasticity. Lungs, Thorax, or Respiration:Dyspnea.
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Open irritation test - 24.00 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation - 24.00 h

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
The evidence for carcinogenicity of pentachlorophenol (PCP) is based on assays that utilized less than pure PCP. Contaminants of PCP include: tri- or tetra- chlorophenol, hexachlorobenzene, polychlorinated dibenzo-p-dioxins, or polychlorinated dibenzofurans. Indications are that positive evidence for carcinogenicity is from the contaminant(s) and not the PCP. This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.
Limited evidence of carcinogenicity in animal studies

IARC:	1 - Group 1: Carcinogenic to humans (Pentachlorophenol)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Pentachlorophenol)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Specific target organ toxicity - single exposure
May cause respiratory irritation.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

Convulsions

Kidney -

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Cyprinodon variegatus (sheepshead minnow) - 0.16 - 0.5 mg/l - 96.0 h(Pentachlorophenol)
	LC50 - Carassius auratus (goldfish) - 0.16 - 0.38 mg/l - 96.0 h(Pentachlorophenol)
	LC50 - Oncorhynchus mykiss (rainbow trout) - 0.075 mg/l - 96.0 h(Pentachlorophenol)
	NOEC - other fish - 0.01 mg/l - 24.0 h(Pentachlorophenol)
	LOEC - other fish - 0.1 mg/l - 24.0 h(Pentachlorophenol)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 0.30 - 1.30 mg/l - 48 h(Pentachlorophenol)
Toxicity to algae	EC50 - No information available. - 0.36 mg/l - 10 d(Pentachlorophenol)
	EC50 - Chlorella vulgaris (Fresh water algae) - 10.30 mg/l - 96 h(Pentachlorophenol)
	Growth inhibition EC50 - Scenedesmus quadricauda (Green algae) - 0.08 mg/l - 96 h(Pentachlorophenol)

12.2 Persistence and degradability

Biodegradability Result: 99 % - Biodegradable

12.3 Bioaccumulative potential

Bioaccumulation Oncorhynchus mykiss (rainbow trout) - 144 h
- 0.0912 mg/l(Pentachlorophenol)

Bioconcentration factor (BCF): 482

12.4 Mobility in soil

No data available(Pentachlorophenol)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3155 Class: 6.1 Packing group: II
Proper shipping name: Pentachlorophenol
Reportable Quantity (RQ) : 10 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 3155 Class: 6.1 Packing group: II EMS-No: F-A, S-A
Proper shipping name: PENTACHLOROPHENOL
Marine pollutant : yes

IATA

UN number: 3155 Class: 6.1 Packing group: II
Proper shipping name: Pentachlorophenol

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Pentachlorophenol	87-86-5	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Pentachlorophenol	87-86-5	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Pentachlorophenol	87-86-5	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer. Pentachlorophenol	CAS-No. 87-86-5	Revision Date 2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H301	Toxic if swallowed.
H301 + H311	Toxic if swallowed or in contact with skin.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H351	Suspected of causing cancer.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	1

NFPA Rating

Health hazard:	4
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.0 Revision Date: 05/26/2018 Print Date: 06/22/2019

SAFETY DATA SHEET

Version 3.4
Revision Date 06/27/2014
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Heptadecafluorooctanesulfonic acid solution

Product Number : 77283
Brand : Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302
Acute toxicity, Inhalation (Category 3), H331
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Carcinogenicity (Category 2), H351
Reproductive toxicity (Category 1B), H360
Effects on or via lactation, H362
Specific target organ toxicity - repeated exposure (Category 1), H372
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H331 Toxic if inhaled.
H351 Suspected of causing cancer.
H360 May damage fertility or the unborn child.
H362 May cause harm to breast-fed children.
H372 Causes damage to organs through prolonged or repeated exposure.

H411	Toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P263	Avoid contact during pregnancy/ while nursing.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/ physician.
P321	Specific treatment (see supplemental first aid instructions on this label).
P363	Wash contaminated clothing before reuse.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : $C_8HF_{17}O_3S$

Molecular Weight : 500.13 g/mol

Hazardous components

Component		Classification	Concentration
Heptadecafluorooctane-1-sulphonic acid			
CAS-No. EC-No. Index-No.	1763-23-1 217-179-8 607-624-00-8	Acute Tox. 4; Skin Corr. 1B; Eye Dam. 1; Carc. 2; Repr. 1B; Lact. ; STOT RE 1; Aquatic Acute 2; Aquatic Chronic 2; H302 + H332, H314, H351, H360, H362, H372, H411	30 - 60 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
no data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Sulphur oxides, Hydrogen fluoride

5.3 Advice for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information
no data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: clear, liquid Colour: light red
b)	Odour	no data available
c)	Odour Threshold	no data available
d)	pH	no data available
e)	Melting point/freezing point	no data available
f)	Initial boiling point and boiling range	no data available
g)	Flash point	no data available
h)	Evapouration rate	no data available
i)	Flammability (solid, gas)	no data available
j)	Upper/lower flammability or explosive limits	no data available
k)	Vapour pressure	no data available
l)	Vapour density	no data available
m)	Relative density	1.250 g/cm3
n)	Water solubility	no data available
o)	Partition coefficient: n-octanol/water	no data available
p)	Auto-ignition temperature	no data available

q)	Decomposition temperature	no data available
r)	Viscosity	no data available
s)	Explosive properties	no data available
t)	Oxidizing properties	no data available

9.2 Other safety information
no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
no data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
no data available

10.4 Conditions to avoid
no data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - no data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
no data available

Inhalation: no data available

Dermal: no data available

no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitisation
no data available

Germ cell mutagenicity

no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a

carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
no data available
no data available

Specific target organ toxicity - single exposure
no data available

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard
no data available

Additional Information
RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
no data available

12.2 Persistence and degradability
no data available

12.3 Bioaccumulative potential
no data available

12.4 Mobility in soil
no data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3265 Class: 8 Packing group: II
Proper shipping name: Corrosive liquid, acidic, organic, n.o.s. (Heptadecafluorooctane-1-sulphonic acid)
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 3265 Class: 8 Packing group: II EMS-No: F-A, S-B
Proper shipping name: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Heptadecafluorooctane-1-sulphonic acid)
Marine pollutant: No

IATA
UN number: 3265 Class: 8 Packing group: II
Proper shipping name: Corrosive liquid, acidic, organic, n.o.s. (Heptadecafluorooctane-1-sulphonic acid)

15. REGULATORY INFORMATION

SARA 302 Components
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Water	7732-18-5	
Heptadecafluorooctane-1-sulphonic acid	1763-23-1	2009-07-17

New Jersey Right To Know Components

	CAS-No.	Revision Date
Water	7732-18-5	
Heptadecafluorooctane-1-sulphonic acid	1763-23-1	2009-07-17

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Eye Dam.	Serious eye damage
H302	Harmful if swallowed.
H302 + H332	Harmful if swallowed or if inhaled
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H362	May cause harm to breast-fed children.
H372	Causes damage to organs through prolonged or repeated exposure.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
Lact.	Effects on or via lactation

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	3
Fire Hazard:	0

Reactivity Hazard: 0

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.4 Revision Date: 06/27/2014 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.1
Revision Date 03/12/2019
Print Date 06/28/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Perfluorooctanoic acid

Product Number : 171468
Brand : Aldrich
CAS-No. : 335-67-1

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 4), H302
Acute toxicity, Inhalation (Category 4), H332
Serious eye damage (Category 1), H318
Carcinogenicity (Category 2), H351
Reproductive toxicity (Category 1B), H360
Effects on or via lactation, H362
Specific target organ toxicity - repeated exposure (Category 1), Liver, H372

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

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Hazard statement(s)	
H302 + H332	Harmful if swallowed or if inhaled.
H318	Causes serious eye damage.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H362	May cause harm to breast-fed children.
H372	Causes damage to organs (Liver) through prolonged or repeated exposure.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P263	Avoid contact during pregnancy/ while nursing.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Synonyms	:	Pentadecafluorooctanoic acid Perfluorocaprylic acid Perfluorooctanoic acid
Formula	:	$C_8HF_{15}O_2$
Molecular weight	:	414.07 g/mol
CAS-No.	:	335-67-1
EC-No.	:	206-397-9

Component	Classification	Concentration
Pentadecafluorooctanoic acid		
	Acute Tox. 4; Eye Dam. 1; Carc. 2; Repr. 1B; Lact. ; STOT RE 1; H302, H332, H318, H351, H360, H362, H372	<= 100 %

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For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice
Move out of dangerous area.Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Continue rinsing eyes during transport to hospital.Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Hydrogen fluoride

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Components with workplace control parameters
Contains no substances with occupational exposure limit values.
Hazardous components without workplace control parameters

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

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Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: > 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: > 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: flakes Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	2.6 at 1 g/l
e)	Melting point/freezing point	Melting point/range: 55 - 56 °C (131 - 133 °F) - lit.
f)	Initial boiling point and boiling range	189 °C 372 °F at 981 hPa - lit.

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g)	Flash point	()No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	0.69 hPa at 25 °C (77 °F)
l)	Vapour density	No data available
m)	Relative density	0.900 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Bases, Oxidizing agents, Reducing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen fluoride
Other decomposition products - No data available
In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Inhalation: No data available
Dermal: No data available
LD50 Intraperitoneal - Rat - 189 mg/kg

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity

Rat
DNA damage

Rat
DNA damage

Carcinogenicity
Suspected human carcinogens

IARC:	2B - Group 2B: Possibly carcinogenic to humans (Pentadecafluorooctanoic acid)
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
Effects on or via lactation
Presumed human reproductive toxicant
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure. - Liver

Aspiration hazard
No data available

Additional Information
RTECS: RH0781000

Cough, Shortness of breath, Headache, Nausea, Vomiting

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

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SECTION 12: Ecological information

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
UN number: 3261 Class: 8 Packing group: III
Proper shipping name: Corrosive solid, acidic, organic, n.o.s. (Pentadecafluorooctanoic acid)
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 3261 Class: 8 Packing group: III EMS-No: F-A, S-B
Proper shipping name: CORROSIVE SOLID, ACIDIC, ORGANIC, N.O.S. (Pentadecafluorooctanoic acid)

IATA
UN number: 3261 Class: 8 Packing group: III
Proper shipping name: Corrosive solid, acidic, organic, n.o.s. (Pentadecafluorooctanoic acid)

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

SECTION 15: Regulatory information

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Pentadecafluorooctanoic acid	CAS-No. 335-67-1	Revision Date

Pentadecafluorooctanoic acid	CAS-No. 335-67-1	Revision Date

New Jersey Right To Know Components

Pentadecafluorooctanoic acid	CAS-No. 335-67-1	Revision Date

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16: Other information

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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SAFETY DATA SHEET

Version 6.2
Revision Date 05/25/2018
Print Date 06/29/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Phenanthrene

Product Number : P11409
Brand : Aldrich

CAS-No. : 85-01-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 4), H302

Acute aquatic toxicity (Category 1), H400

Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)
H302 Harmful if swallowed.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P264 Wash skin thoroughly after handling.

P270	Do not eat, drink or smoke when using this product.
P273	Avoid release to the environment.
P301 + P312 + P330	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P391	Collect spillage.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Photosensitizer.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Molecular weight	:	178.23 g/mol
CAS-No.	:	85-01-8
EC-No.	:	201-581-5

Hazardous components

Component	Classification	Concentration
Phenanthrene		
	Acute Tox. 4; Aquatic Acute 1; Aquatic Chronic 1; H302, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Carbon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

Handle and store under inert gas.
Storage class (TRGS 510): 13: Non Combustible Solids

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Phenanthrene	85-01-8	TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	Remarks	1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.100000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C		

		See Appendix A		
		PEL	0.2 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Coal tar pitch volatiles (benzene or cyclohexane-soluble fraction) include fused polycyclic hydrocarbons (some of which are known carcinogens) which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard.		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Phenanthrene	85-01-8	1-Hydroxypyrene		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator.For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 98 - 100 °C (208 - 212 °F)
f)	Initial boiling point and boiling range	340 °C (644 °F)
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.063 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 4.46
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

No data available

10.5 Incompatible materials

Oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Mouse - 700.0 mg/kg
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
Causes photosensitivity. Exposure to light can result in allergic reactions resulting in dermatologic lesions, which can vary from sunburnlike responses to edematous, vesiculated lesions, or bullae

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 3.2 mg/l - 96.0 h(Phenanthrene)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia pulex (Water flea) - 0.35 mg/l - 48 h(Phenanthrene)

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation Pimephales promelas (fathead minnow) - 28 d
- 0.00255 mg/l(Phenanthrene)

Bioconcentration factor (BCF): 5,100

12.4 Mobility in soil

No data available(Phenanthrene)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Phenanthrene)
Reportable Quantity (RQ) : 5000 lbs

no
Poison Inhalation Hazard: No

IMDG

UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Phenanthrene)
Marine pollutant : yes

IATA

UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Phenanthrene)

Further information

EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Phenanthrene	85-01-8	2007-07-01

SARA 311/312 Hazards

Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date

Phenanthrene	85-01-8	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Phenanthrene	85-01-8	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Phenanthrene	85-01-8	2007-07-01

California Prop. 65 Components

WARNING! This product contains a chemical known to the State of California to cause cancer.	CAS-No.	Revision Date
Phenanthrene	85-01-8	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H302	Harmful if swallowed.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	1
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	1
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.2 Revision Date: 05/25/2018 Print Date: 06/29/2019

Chemical Safety Data Sheet MSDS / SDS

PROPYLENE

Revision Date:2023-04-30 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name	: PROPYLENE
CBnumber	: CB3750579
CAS	: 115-07-1
EINECS Number	: 204-062-1
Synonyms	: Propylene,propene

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	: For R&D use only. Not for medicinal, household or other use.
Uses advised against	: none

Company Identification

Company	: Chemicalbook
Address	: Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone	: 400-158-6606

SECTION 2: Hazards identification

Classification of the substance or mixture

Gases under pressure: Compressed gas

Flammable gases, Category 1A, Flammable gas

Label elements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H220 Extremely flammable gas

H280 Contains gas under pressure; may explode if heated

Precautionary statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 Eliminate all ignition sources if safe to do so.

P410+P403 Protect from sunlight. Store in a well-ventilated place.

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 In case of leakage, eliminate all ignition sources.

Storage

P410+P403 Protect from sunlight. Store in a well-ventilated place.

P403 Store in a well-ventilated place.

Disposal

none

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: PROPYLENE
Synonyms	: Propylene,propene
CAS	: 115-07-1
EC number	: 204-062-1
MF	: C3H6
MW	: 42.08

SECTION 4: First aid measures

Description of first aid measures

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

Following skin contact

ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms and effects, both acute and delayed

Moderate concentration in air causes dizziness, drowsiness, and unconsciousness. Contact with liquefied propylene will cause ``freezing burn.'' (USCG, 1999)

Indication of any immediate medical attention and special treatment needed

If splashes of liquid propylene cause freezing of the skin, never rinse the affected area with hot or tepid water. If liquid propylene contacts the eyes flush eyes with water for 15 minutes.

SECTION 5: Firefighting measures

Extinguishing media

Do not extinguish fire unless flow can be stopped. If possible use foam, carbon dioxide, or dry chemical to extinguish fire. If none of these compounds are available use water in flooding quantities as a fog, being sure to cool all affected containers. Apply water from as far a distance as possible, and do not use solid streams of water since they may be ineffective. Keep material out of water sources and sewers and build dikes as necessary to contain flow. Wear self contained breathing apparatus, boots, protective gloves and goggles and be sure to wash away any material which may have contacted the body with copious amounts of water or soap and water. Do not handle damaged packages without protective equipment. If fire becomes uncontrollable or a container is exposed to direct flame, evacuate for a radius of 2500 feet. If material leaking (and is not on fire), downwind evacuation must be considered.

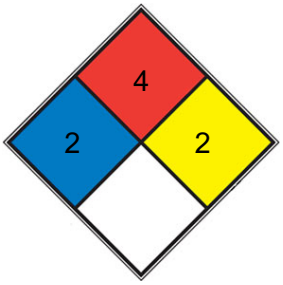
Specific Hazards Arising from the Chemical

Behavior in Fire: Containers may explode. Vapor is heavier than air and may travel considerable distance to a source of ignition and flash back. (USCG, 1999)

Advice for firefighters

Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out. In other cases extinguish with powder, carbon dioxide. In case of fire: keep cylinder cool by spraying with water. NO direct contact with water. Combat fire from a sheltered position.

NFPA 704



■	HEALTH	2	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. diethyl ether, ammonium phosphate, iodine)
■	FIRE	4	Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily. Includes pyrophoric substances. Flash point below room temperature at 22.8 °C (73 °F). (e.g. acetylene, propane, hydrogen gas)
■	REACT	2	Undergoes violent chemical change at elevated temperatures and pressures, reacts violently with water, or may form explosive mixtures with water (e.g. white phosphorus, potassium, sodium)
□	SPEC. HAZ.		

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Ventilation. Remove all ignition sources. NEVER direct water jet on liquid. Personal protection: chemical protection suit including self-contained breathing apparatus.

Environmental precautions

Evacuate danger area! Consult an expert! Ventilation. Remove all ignition sources. NEVER direct water jet on liquid. Personal protection: chemical protection suit including self-contained breathing apparatus.

Methods and materials for containment and cleaning up

Spills in Water: Contain contaminated water if possible by using natural barriers or oil spill control booms to limit spreading. A universal gelling agent may be applied to solidify trapped mass and to increase effectiveness of the booms. If solubilized, application of activated carbon at 10% spill amount over region occupied by 10 mg/L or greater concentrations is recommended. Spills on Land: Contain if possible by forming mechanical and/or chemical barriers to prevent spreading. Apply universal gelling agent to immobilize spill or use fly ash or cement powder to absorb the liquid. Leaking containers should be removed to an isolated well-ventilated area and if possible, the contents transferred to other suitable containers. Safety goggles, impervious clothing and positive pressure self-contained breathing apparatus should be worn. Plastic or neoprene-coated canvas gloves should be worn when liquid propylene is handled.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding) if in liquid state. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Fireproof. Cool.Protect cylinder against physical damage and from excessive temperature rise by storing away from sources of heat. No part of a cylinder should be subjected to a temperature above 52 deg C. Store cylinders in an upright position and firmly secured. Segregate full and empty cylinders. Isolate from oxygen and other oxidizers. Avoid exposure to areas where salt or other corrosive chemicals are present. Ground and bond all lines and equipment used with propylene. Do not use near sparking motors or other non explosion proof equipment.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 500 ppm as TWA; A4 (not classifiable as a human carcinogen)

Biological limit values

no data available

Exposure controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures

Eye/face protection

Wear safety goggles or face shield.

Skin protection

Cold-insulating gloves.

Respiratory protection

Use ventilation.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	Colorless gas
Colour	Colorless gas
Odour	Aromatic
Melting point/freezing point	-185°C(lit.)
Boiling point or initial boiling point and boiling range	-47.7°C(lit.)
Flammability	Extremely flammable.
Lower and upper explosion limit/flammability limit	11.1%
Flash point	-108°C
Auto-ignition temperature	851° F (USCG, 1999)
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	83.4 micropoises at 16.7 deg C
Solubility	44.6 mL/100 mL (NTP, 1992)
Partition coefficient n-octanol/water	log Kow = 1.77
Vapour pressure	15.4 atm (37.7 °C)
Density and/or relative density	1.49
Relative vapour density	1.48 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

Reacts violently with oxidants. This generates fire and explosion hazard.

Chemical stability

no data available

Possibility of hazardous reactions

DANGEROUS FIRE RISK.The gas is heavier than air and may travel along the ground; distant ignition possible. The gas is heavier than air and may accumulate in lowered spaces causing a deficiency of oxygen. As a result of flow, agitation, etc., electrostatic charges can be generated.During an experiment to produce lactic acid by oxidizing PROPYLENE with nitrogen peroxide, a violent explosion occurred. These mixtures (olefins and nitrogen peroxide) form extremely unstable nitrosates or nitrosites (Comp. Rend. 116:756 1893). Contact of very cold liquid propylene with water may result in vigorous or violent boiling of the product and extremely rapid vaporization due to the large temperature differences involved. If the water is hot, there is the possibility that a liquid "superheat" explosion may occur. Pressures may build to dangerous levels if liquid propylene contacts water in a closed container.

Conditions to avoid

no data available

Incompatible materials

Propylene reacts vigorously with oxidizing materials and with nitrogen dioxide (NO_2), dinitrogen tetraoxide (N_2O_4), and dinitrogen oxide (N_2O). Furthermore, liquid propylene will explode on contact with water at 42-75 deg C.

Hazardous decomposition products

Combustion products of propylene ... include carbon dioxide and carbon monoxide.

SECTION 11: Toxicological information

Acute toxicity

- Oral: no data available
- Inhalation: LC50 Rat inhalation 570,000 ppm/15 min Conditions of bioassay not specified in source examined
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Evaluation: There is inadequate evidence in humans for the carcinogenicity of propylene. There is inadequate evidence in experimental animals for the carcinogenicity of propylene. Overall evaluation: Propylene is not classifiable as to its carcinogenicity to humans (Group 3).

Reproductive toxicity

no data available

STOT-single exposure

Rapid evaporation of the liquid may cause frostbite. The substance may cause effects on the central nervous system. Exposure could cause lowering of consciousness. See Notes.

STOT-repeated exposure

no data available

Aspiration hazard

On loss of containment this substance can cause suffocation by lowering the oxygen content of the air in confined areas.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

In water bodies, propylene is readily degraded by microorganisms and is therefore not expected to bioaccumulate or bioconcentrate in organisms and food chains.

Bioaccumulative potential

An estimated BCF of 5 was calculated for propylene(SRC), using a log Kow of 1.77(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

Mobility in soil

The Koc of propylene is estimated as 220(SRC), using a log Kow of 1.77(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that propylene is expected to have moderate mobility in soil.

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible

for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN1077 (For reference only, please check.)

IMDG: UN1077 (For reference only, please check.)

IATA: UN1077 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: PROPYLENE (For reference only, please check.)

IMDG: PROPYLENE (For reference only, please check.)

IATA: PROPYLENE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 2.1 (For reference only, please check.)

IMDG: 2.1 (For reference only, please check.)

IATA: 2.1 (For reference only, please check.)

Packing group, if applicable

ADR/RID: (For reference only, please check.)

IMDG: (For reference only, please check.)

IATA: (For reference only, please check.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

PICCS

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Other Information

High concentrations in the air cause a deficiency of oxygen with the risk of unconsciousness or death.Check oxygen content before entering area.Turn leaking cylinder with the leak up to prevent escape of gas in liquid state.

Disclaimer:
The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.

SAFETY DATA SHEET

Version 6.1
Revision Date 05/28/2017
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Pyrene

Product Number : 185515
Brand : Aldrich

CAS-No. : 129-00-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P273 Avoid release to the environment.
P391 Collect spillage.
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Rapidly absorbed through skin.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : Benzo[<I>def</>]phenanthrene

Formula : $C_{16}H_{10}$
Molecular weight : 202.25 g/mol
CAS-No. : 129-00-0
EC-No. : 204-927-3

Hazardous components

Component	Classification	Concentration
Pyrene		
	Aquatic Acute 1; Aquatic Chronic 1; H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Carbon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combu formation should be taken into consideration before additional processing
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Pyrene	129-00-0	TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.200000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	Remarks	1910.1002 As used in §1910.1000 (Table Z-1), coal tar pitch volatiles include the fused polycyclic hydrocarbons which volatilize from the distillation residues of coal, petroleum (excluding asphalt), wood, and other organic matter. Asphalt (CAS 8052-42-4, and CAS 64742-93-4) is not covered under the 'coal tar pitch volatiles' standard OSHA specifically regulated carcinogen		
		TWA	0.100000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products. cyclohexane-extractable fraction See Appendix C See Appendix A		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Pyrene	129-00-0	1-Hydroxypyrene (1-HP)		Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 30 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industria situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Respiratory protection is not required. Where protection from nuisance le (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: crystalline Colour: yellow
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 145 - 148 °C (293 - 298 °F) - lit.
f)	Initial boiling point and boiling range	390.0 - 395.0 °C (734.0 - 743.0 °F)
g)	Flash point	> 200.0 °C (> 392.0 °F)
h)	Evaporation rate	No data available

i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	1.21 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 4.88
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Bulk density	650 kg/m3

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Risk of dust explosion.

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
Dermal: No data available(Pyrene)
No data available(Pyrene)

Skin corrosion/irritation

Serious eye damage/eye irritation

Respiratory or skin sensitisation
No data available(Pyrene)

Germ cell mutagenicity

No data available(Pyrene)

Carcinogenicity
No data available(Pyrene)
(Pyrene)

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: OSHA specifically regulated carcinogen (Pyrene)

Reproductive toxicity
No data available(Pyrene)

No data available(Pyrene)

Specific target organ toxicity - single exposure
No data available(Pyrene)

Specific target organ toxicity - repeated exposure

Aspiration hazard
No data available(Pyrene)

Additional Information
RTECS: UR2450000

Inhalation studies in animals have caused:, Liver toxicity, pulmonary pathologies, intragastric pathologies, neutropenia, leukopenia, anemia, Contact with skin can cause:, hyperemia, weight loss, hematopoietic changes, Dermatitis, Chronic effects, leukocytosis(Pyrene)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - > 2 mg/l - 96.0 h(Pyrene)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 0.002 - 0.003 mg/l - 48 h(Pyrene)

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	other fish - 48 h - 0.056 mg/l(Pyrene)
	Bioconcentration factor (BCF): 4,810

12.4 Mobility in soil

No data available(Pyrene)

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substances, solid, n.o.s. (Pyrene)
Reportable Quantity (RQ) : 5000 lbs

no
Poison Inhalation Hazard: No

IMDG
UN number: 3077 Class: 9 Packing group: III EMS-No: F-A, S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Pyrene)
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s. (Pyrene)

Further information
EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

SARA 302 Components
The following components are subject to reporting levels established by SARA Title III, Section 302:

	CAS-No.	Revision Date
Pyrene	129-00-0	2008-11-03

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Pyrene	129-00-0	2008-11-03

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Pyrene	129-00-0	2008-11-03

New Jersey Right To Know Components

	CAS-No.	Revision Date
Pyrene	129-00-0	2008-11-03

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer.	129-00-0	2007-09-28

Pyrene

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	0
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.2
Revision Date 05/28/2017
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Sodium

Product Number : 483745
Brand : Aldrich

CAS-No. : 7440-23-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Substances and mixtures, which in contact with water, emit flammable gases (Category 1), H260
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Carcinogenicity (Category 1A), H350

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)
H260 In contact with water releases flammable gases which may ignite spontaneously.
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H350 May cause cancer.

Precautionary statement(s)

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P223	Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P231 + P232	Handle under inert gas. Protect from moisture.
P260	Do not breathe dust or mist.
P264	Wash skin thoroughly after handling.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P281	Use personal protective equipment as required.
P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353	IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P310	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/ physician.
P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P363	Wash contaminated clothing before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P402 + P404	Store in a dry place. Store in a closed container.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Reacts violently with water.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Formula : Na
Molecular weight : 22.99 g/mol

Hazardous components

Component		Classification	Concentration
Sodium			
CAS-No. EC-No. Index-No.	7440-23-5 231-132-9 011-001-00-0	Water-react. 1; Skin Corr. 1B; Eye Dam. 1; H260, H314	>= 90 - <= 100 %
Paraffin oils			
CAS-No. EC-No.	8012-95-1 232-384-2	Asp. Tox. 1; H304, H304	>= 90 - <= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.Continue rinsing eyes during transport to hospital.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Dry powder

5.2 Special hazards arising from the substance or mixture
Carbon oxides, Sodium oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid formation of dust and aerosols.Further processing of solid materials may result in the formation of combu formation should be taken into consideration before additional processing
Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.
Never allow product to get in contact with water during storage.

Handle and store under inert gas. Air sensitive.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Paraffin oils	8012-95-1	STEL	10.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		TWA	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	10.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract irritation 2015 Adoption Not classifiable as a human carcinogen		
		Upper Respiratory Tract irritation 2015 Adoption Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen		
		TWA	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Upper Respiratory Tract irritation Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen		
		TWA	5.000000 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Not classifiable as a human carcinogen		
		TWA	5.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	10.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		Upper Respiratory Tract irritation Exposure by all routes should be carefully controlled to levels as low as possible. Suspected human carcinogen		

		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Not classifiable as a human carcinogen		
		TWA	5 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	10 mg/m3	USA. NIOSH Recommended Exposure Limits

Hazardous components without workplace control parameters

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industria situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Complete suit protecting against chemicals, Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: Pieces

b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 97.8 °C (208.0 °F) - lit.
f)	Initial boiling point and boiling range	883 °C (1621 °F) - lit.
g)	Flash point	82 °C (180 °F)
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	No data available
l)	Vapour density	No data available
m)	Relative density	0.97 g/cm3
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Reacts violently with water.

10.4 Conditions to avoid
Air Do not allow water to enter container.
Exposure to moisture

10.5 Incompatible materials
Oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Sodium oxides
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Aspiration may lead to:, lipid pneumonia, Effects due to ingestion may include:, laxative effect, Gastrointestinal disturbance, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chem scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1428 Class: 4.3 Packing group: I
Proper shipping name: Sodium
Reportable Quantity (RQ) : 10 lbs

Poison Inhalation Hazard: No

IMDG
UN number: 1428 Class: 4.3 Packing group: I EMS-No: F-G, S-N
Proper shipping name: SODIUM

IATA
UN number: 1428 Class: 4.3 Packing group: I
Proper shipping name: Sodium
IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Reactivity Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Sodium	7440-23-5	1993-04-24
Paraffin oils	8012-95-1	2007-03-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Sodium	7440-23-5	1993-04-24
Paraffin oils	8012-95-1	2007-03-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Sodium	7440-23-5	1993-04-24
Paraffin oils	8012-95-1	2007-03-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Asp. Tox.	Aspiration hazard
Eye Dam.	Serious eye damage
H260	In contact with water releases flammable gases which may ignite spontaneously.
H304	May be fatal if swallowed and enters airways.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H350	May cause cancer.
Skin Corr.	Skin corrosion
Water-react.	Substances and mixtures, which in contact with water, emit flammable gases

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	4
Physical Hazard	2

NFPA Rating

Health hazard:	3
Fire Hazard:	4
Reactivity Hazard:	2
Special hazard.I:	W

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.2 Revision Date: 05/28/2017 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 4.11
Revision Date 06/28/2017
Print Date 06/22/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Tetrachloroethylene

Product Number : 371696
Brand : Sigma-Aldrich
Index-No. : 602-028-00-4

CAS-No. : 127-18-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Skin sensitisation (Category 1), H317
Carcinogenicity (Category 2), H351
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Acute aquatic toxicity (Category 2), H401
Chronic aquatic toxicity (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P391	Collect spillage.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Perchloroethylene PCE
Formula	:	C_2Cl_4
Molecular weight	:	165.83 g/mol
CAS-No.	:	127-18-4
EC-No.	:	204-825-9
Index-No.	:	602-028-00-4

Hazardous components

Component	Classification	Concentration
Tetrachloroethylene		
	Skin Irrit. 2; Eye Irrit. 2A; Skin Sens. 1; Carc. 2; STOT SE 3; Aquatic Acute 2; Aquatic Chronic 2; H315, H317, H319, H336, H351, H411	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Tetrachloroethylene	127-18-4	TWA	25.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		STEL	100.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		Potential Occupational Carcinogen Minimize workplace exposure concentrations. See Appendix A		
		See Table Z-2		
		TWA	100.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		CEIL	200.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Peak	300.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	25 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		STEL	100 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Confirmed animal carcinogen with unknown relevance to humans		
		Potential Occupational Carcinogen Minimize workplace exposure concentrations. See Appendix A		
		See Table Z-2		

		TWA	100 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		CEIL	200 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Peak	300 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		TWA	25 ppm 170 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
		STEL	100 ppm 685 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	300 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	25 ppm 170 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
Tetrachloroethylene	127-18-4	Tetrachloroethylene	3ppm	In end-exhaled air	ACGIH - Biological Exposure Indices (BEI)
	Remarks	Prior to shift (16 hours after exposure ceases)			
		Tetrachloroethylene	0.5000 mg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
		Prior to shift (16 hours after exposure ceases)			
		Tetrachloroethylene	3ppm	In end-exhaled air	ACGIH - Biological Exposure Indices (BEI)
		Prior to shift (16 hours after exposure ceases)			
		Tetrachloroethylene	0.5 mg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
		Prior to shift (16 hours after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm

Break through time: 49 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -22 °C (-8 °F) - lit.
f)	Initial boiling point and boiling range	121 °C (250 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	25.3 hPa (19.0 mmHg) at 25.0 °C (77.0 °F) 17.3 hPa (13.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	1.623 g/cm3 at 25 °C (77 °F)
n)	Water solubility	0.15 g/l at 25 °C (77 °F)
o)	Partition coefficient: n-octanol/water	log Pow: 2.53 at 23 °C (73 °F)
p)	Auto-ignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available

t) Oxidizing properties No data available

9.2 Other safety information

Surface tension 32.1 mN/m at 20 °C (68 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Strong bases

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - female - 3,385 mg/kg
(OECD Test Guideline 401)

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Mild eye irritation - 24 h

Respiratory or skin sensitisation
- Mouse
Result: May cause sensitisation by skin contact.
(OECD Test Guideline 429)

Germ cell mutagenicity
Hamster
ovary
Result: negative

OECD Test Guideline 474
Mouse - male
Result: negative

Carcinogenicity

Limited evidence of carcinogenicity in animal studies

IARC: 2A - Group 2A: Probably carcinogenic to humans (Tetrachloroethylene)

NTP: RAHC - Reasonably anticipated to be a human carcinogen (Tetrachloroethylene)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
May cause drowsiness or dizziness.

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information

Repeated dose toxicity	Mouse - female - Oral - LOAEL : 390 mg/kg

RTECS: KX3850000

narcosis, Liver injury may occur., Kidney injury may occur.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Oncorhynchus mykiss (rainbow trout) - 5 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 7.50 mg/l - 48 h
Toxicity to algae	static test EC50 - Skeletonema costatum - > 16 mg/l - 7 h

12.2 Persistence and degradability

Biodegradability	aerobic - Exposure time 28 d Result: 11 % - Not readily biodegradable. (OECD Test Guideline 301C)

12.3 Bioaccumulative potential

Bioaccumulation	Lepomis macrochirus (Bluegill) - 21 d - 0.00343 mg/l Bioconcentration factor (BCF): 49

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1897 Class: 6.1 Packing group: III
Proper shipping name: Tetrachloroethylene
Reportable Quantity (RQ): 100 lbsReportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1897 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TETRACHLOROETHYLENE
Marine pollutant: yes

IATA
UN number: 1897 Class: 6.1 Packing group: III
Proper shipping name: Tetrachloroethylene

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

:

Reportable Quantity D039 lbs

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Tetrachloroethylene	127-18-4	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Tetrachloroethylene	127-18-4	2007-09-28

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity

Eye Irrit.	Eye irritation
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	3
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.11 Revision Date: 06/28/2017 Print Date: 06/22/2019

SAFETY DATA SHEET

Version 4.10
Revision Date 01/04/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Trichloroethylene

Product Number : 251402
Brand : Sigma-Aldrich
Index-No. : 602-027-00-9

CAS-No. : 79-01-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319
Germ cell mutagenicity (Category 2), H341
Carcinogenicity (Category 1B), H350
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336
Acute aquatic toxicity (Category 3), H402
Chronic aquatic toxicity (Category 3), H412

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H412	Harmful to aquatic life with long lasting effects.

Precautionary statement(s)	
P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P261	Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear eye protection/ face protection.
P280	Wear protective gloves.
P281	Use personal protective equipment as required.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	TCE Trichloroethene
Formula	:	C_2HCl_3
Molecular weight	:	131.39 g/mol
CAS-No.	:	79-01-6
EC-No.	:	201-167-4
Index-No.	:	602-027-00-9

Hazardous components

Component	Classification	Concentration
Trichloroethylene		
	Skin Irrit. 2; Eye Irrit. 2A; Muta. 2; Carc. 1B; STOT SE 3; Aquatic Acute 3; Aquatic Chronic 3; H315, H319, H336, H341, H350, H412	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Light sensitive. Handle and store under inert gas.
Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Trichloroethylene	79-01-6	TWA	10.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Central Nervous System impairment cognitive decrement Renal toxicity Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Suspected human carcinogen		
		STEL	25.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment cognitive decrement Renal toxicity Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Suspected human carcinogen		
		Potential Occupational Carcinogen See Appendix C See Appendix A		
		See Table Z-2		
		TWA	100.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		CEIL	200.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		Peak	300.000000 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		TWA	100 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		CEIL	200 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		
		Peak	300 ppm	USA. Occupational Exposure Limits (OSHA) - Table Z-2
		Z37.19-1967		

		STEL	100 ppm 537 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	300 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	25 ppm 135 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	Trichloroacetic acid	15.0000 mg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		Trichloroethanol	0.5000 mg/l	In blood	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			
		Trichloroethylene		In blood	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			
		Trichloroethylene		In end-exhaled air	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: -84.8 °C (-120.6 °F) - lit.
f)	Initial boiling point and boiling range	86.7 °C (188.1 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 10.5 %(V) Lower explosion limit: 8 %(V)
k)	Vapour pressure	81.3 hPa (61.0 mmHg) at 20.0 °C (68.0 °F)
l)	Vapour density	No data available
m)	Relative density	1.463 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 2.29log Pow: 5
p)	Auto-ignition temperature	410.0 °C (770.0 °F)
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Oxidizing agents, Strong bases, Magnesium

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - 4,920 mg/kg

LC50 Inhalation - Mouse - 4 h - 8450 ppm

LD50 Dermal - Rabbit - > 20,000 mg/kg

No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Severe skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Eye irritation - 24 h

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.
In vitro tests showed mutagenic effects

Carcinogenicity

This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Possible human carcinogen

IARC:	1 - Group 1: Carcinogenic to humans (Trichloroethylene)
NTP:	RAHC - Reasonably anticipated to be a human carcinogen (Trichloroethylene)
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: KX4550000

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting, Exposure to and/or consumption of alcohol may increase toxic effects., Gastrointestinal disturbance, Kidney injury may occur., narcosis
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Pimephales promelas (fathead minnow) - 41 mg/l - 96.0 h
	LOEC - other fish - 11 mg/l - 10.0 d
	NOEC - Oryzias latipes - 40 mg/l - 10.0 d
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 18.00 mg/l - 48 h
Toxicity to algae	IC50 - Pseudokirchneriella subcapitata (green algae) - 175.00 mg/l - 96 h

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
Does not bioaccumulate.

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Harmful to aquatic life with long lasting effects.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1710 Class: 6.1 Packing group: III
Proper shipping name: Trichloroethylene
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1710 Class: 6.1 Packing group: III EMS-No: F-A, S-A
Proper shipping name: TRICHLOROETHYLENE

IATA
UN number: 1710 Class: 6.1 Packing group: III

Proper shipping name: Trichloroethylene

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Trichloroethylene	79-01-6	2007-07-01

California Prop. 65 Components

	CAS-No.	Revision Date
WARNING! This product contains a chemical known to the State of California to cause cancer. Trichloroethylene	79-01-6	2011-09-01
WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Trichloroethylene	79-01-6	2011-09-01

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Aquatic Acute	Acute aquatic toxicity
Aquatic Chronic	Chronic aquatic toxicity
Carc.	Carcinogenicity
Eye Irrit.	Eye irritation
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H341	Suspected of causing genetic defects.
H350	May cause cancer.
H402	Harmful to aquatic life.

HMIS Rating

Health hazard:	2
Chronic Health Hazard:	*
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	2
Fire Hazard:	0
Reactivity Hazard:	0

Further information

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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.10 Revision Date: 01/04/2018 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 4.20
Revision Date 09/23/2016
Print Date 06/22/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Trichlorofluoromethane

Product Number : 254991
Brand : Aldrich

CAS-No. : 75-69-4

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Dermal (Category 4), H312

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning

Hazard statement(s)
H312 Harmful in contact with skin.

Precautionary statement(s)
P280 Wear protective gloves/ protective clothing.
P302 + P352 + P312 IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or doctor/ physician if you feel unwell.
P363 Wash contaminated clothing before reuse.
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : Fluorotrichloromethane

CFC-11

Formula	:	CCl_3FCCl_3F
Molecular weight	:	137.37 g/mol
CAS-No.	:	75-69-4
EC-No.	:	200-892-3

Hazardous components

Component	Classification	Concentration
Trichlorofluoromethane		
	Acute Tox. 4; H312	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

Recommended storage temperature 2 - 8 °C

Contents under pressure.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Trichlorofluoromethane	75-69-4	C	1,000.000000 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Cardiac sensitization Not classifiable as a human carcinogen		
		C	1,000.000000 ppm 5,600.000000 mg/m3	USA. NIOSH Recommended Exposure Limits
		TWA	1,000.000000 ppm 5,600.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		The value in mg/m3 is approximate.		
		C	1,000 ppm 5,600 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 480 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 30 min
Material tested:Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Do not let product enter drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-110.99 - -109.99 °C (-167.78 - -165.98 °F)
f)	Initial boiling point and boiling range	23.7 °C (74.7 °F) - lit.
g)	Flash point	No data available
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	885.7 hPa (664.3 mmHg) at 20.0 °C (68.0 °F) 2,701.2 hPa (2,026.1 mmHg) at 55.0 °C (131.0 °F)
l)	Vapour density	No data available
m)	Relative density	1.494 g/cm3 at 25 °C (77 °F)
n)	Water solubility	1 g/l
o)	Partition coefficient: n-octanol/water	log Pow: 2.53
p)	Auto-ignition temperature	No data available
q)	Decomposition	No data available

temperature

r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Surface tension	18.0 mN/m at 25.0 °C (77.0 °F)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
No data available

10.5 Incompatible materials
Strong oxidizing agents, Sodium/sodium oxides, Potassium, Magnesium, Aluminum, Zinc

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas, Hydrogen fluoride
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - > 15,000 mg/kg

LC50 Inhalation - Rat - 0.3 h - 130000 ppm
Remarks: Behavioral:Tremor. Behavioral:Convulsions or effect on seizure threshold. Respiratory disorder

No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitisation
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC:	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
RTECS: PB6125000

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated., Nausea, Dizziness, Headache, Vomiting, Diarrhoea, Abdominal pain, Weakness, Unconsciousness

Liver -

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 3082 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Trichlorofluoromethane)
Reportable Quantity (RQ): 5000 lbs

Poison Inhalation Hazard: No

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Trichlorofluoromethane	75-69-4	2007-07-01

SARA 311/312 Hazards
Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Trichlorofluoromethane	75-69-4	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Trichlorofluoromethane	75-69-4	2007-07-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
Trichlorofluoromethane	75-69-4	2007-07-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
H312	Harmful in contact with skin.

HMIS Rating

Health hazard:	1
Chronic Health Hazard:	
Flammability:	0
Physical Hazard	0

NFPA Rating

Health hazard:	1
Fire Hazard:	0
Reactivity Hazard:	0

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 4.20 Revision Date: 09/23/2016 Print Date: 06/22/2019

SAFETY DATA SHEET

Version 5.10
Revision Date 08/06/2018
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Xylenes

Product Number : 214736
Brand : Aldrich
Index-No. : 601-022-00-9

CAS-No. : 1330-20-7

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832
Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 3), H226
Acute toxicity, Inhalation (Category 4), H332
Skin irritation (Category 2), H315
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Central nervous system, Liver, Kidney, H373
Aspiration hazard (Category 1), H304
Acute aquatic toxicity (Category 2), H401

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H373	May cause damage to organs (Central nervous system, Liver, Kidney) through prolonged or repeated exposure if inhaled.
H401	Toxic to aquatic life.

Precautionary statement(s)	
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P241	Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P264	Wash skin thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P314	Get medical advice/ attention if you feel unwell.
P331	Do NOT induce vomiting.
P332 + P313	If skin irritation occurs: Get medical advice/ attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms	:	Xylene mixture of isomers
Formula	:	C_8H_{10}
Molecular weight	:	106.17 g/mol
CAS-No.	:	1330-20-7
EC-No.	:	215-535-7
Index-No.	:	601-022-00-9
Registration number	:	01-2119488216-32-XXXX

Hazardous components

Component	Classification	Concentration
Xylene		
	Flam. Liq. 3; Acute Tox. 4; Skin Irrit. 2; STOT SE 3; STOT RE 2; Asp. Tox. 1; Aquatic Acute 2; H226, H304, H315, H332, H335, H373, H401	90 - 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
No data available

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Xylene	1330-20-7	STEL	150 ppm 655 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		C	300 ppm	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		PEL	100 ppm 435 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		TWA	100 ppm 435 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	Remarks	The value in mg/m3 is approximate.		
		TWA	100 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		
		STEL	150 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Central Nervous System impairment Upper Respiratory Tract irritation Eye irritation Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
	-	Methylhippuric acids	1.5g/g creatinine	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift (As soon as possible after exposure ceases)			

8.2 Exposure controls

Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Fluorinated rubber

Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Vitoject® (KCL 890 / Aldrich Z677698, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 35 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
Complete suit protecting against chemicals, Flame retardant antistatic protective clothing., The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: clear, liquid Colour: colourless
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	< 0 °C (< 32 °F)
f)	Initial boiling point and boiling range	137 - 140 °C (279 - 284 °F) - lit.
g)	Flash point	25 °C (77 °F) - closed cup
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 7 %(V) Lower explosion limit: 1.1 %(V)
k)	Vapour pressure	24 hPa (18 mmHg) at 37.70 °C (99.86 °F)
l)	Vapour density	3.67 - (Air = 1.0)
m)	Relative density	0.86 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	No data available
p)	Auto-ignition	No data available

temperature

q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information

Relative vapour density 3.67 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Vapours may form explosive mixture with air.

10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male - 3,523 mg/kg
Remarks: (ECHA)

Skin corrosion/irritation
Skin - Rabbit
Result: Irritations
Remarks: (IUCLID)

Drying-out effect resulting in rough and chapped skin. After long-term exposure to the chemical: Dermatitis

Serious eye damage/eye irritation
Respiratory or skin sensitisation
In animal experiments: - Mouse
Result: Does not cause skin sensitisation.
(OECD Test Guideline 429)

Germ cell mutagenicity
Mutagenicity (mammal cell test): chromosome aberration.
Result: negative
(National Toxicology Program)

Ames test
Salmonella typhimurium
Result: negative

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

Reproductive toxicity

Specific target organ toxicity - single exposure
May cause respiratory irritation. - Respiratory system
Acute oral toxicity - Gastrointestinal disturbance
Acute inhalation toxicity - mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract, Inhalation may lead to the formation of oedemas in the respiratory tract.

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure. - Central nervous system, Liver, Kidney

Aspiration hazard
Aspiration hazard, Aspiration may cause pulmonary oedema and pneumonitis.

Additional Information
RTECS: Not available

Blurred vision, Incoordination., Headache, Nausea, Vomiting, Dizziness, Weakness, anemia, Prolonged or repeated exposure to skin causes defatting and dermatitis.
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After absorption:
Systemic effects:
Headache, somnolence, Dizziness, euphoria, agitation, spasms, respiratory paralysis, Unconsciousness, narcosis, inebriation
Effect potentiated by: ethanol
Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity

12.2 Persistence and degradability

12.3 Bioaccumulative potential

12.4 Mobility in soil

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1307 Class: 3 Packing group: III
Proper shipping name: Xylenes
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 1307 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: XYLENES

IATA
UN number: 1307 Class: 3 Packing group: III
Proper shipping name: Xylenes

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Xylene	1330-20-7	1993-04-24

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox.	Acute toxicity
Aquatic Acute	Acute aquatic toxicity
Asp. Tox.	Aspiration hazard
Flam. Liq.	Flammable liquids
H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H373	May cause damage to organs (/$/*_2ORG_REP_INH/$/) through prolonged or repeated exposure if inhaled.
H401	Toxic to aquatic life.
Skin Irrit.	Skin irritation

Further information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the

product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 5.10 Revision Date: 08/06/2018 Print Date: 06/28/2019

SAFETY DATA SHEET

Version 6.0
Revision Date 05/28/2017
Print Date 06/28/2019

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name	:	Zinc
Product Number	:	324930
Brand	:	Aldrich
Index-No.	:	030-001-00-1
CAS-No.	:	7440-66-6

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich Inc. 3050 Spruce Street ST. LOUIS MO 63103 UNITED STATES
Telephone	:	+1 314 771-5765
Fax	:	+1 800 325-5052

1.4 Emergency telephone number

Emergency Phone #	:	+1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Pyrophoric solids (Category 1), H250
Self-heating substances and mixtures (Category 1), H251
Substances and mixtures, which in contact with water, emit flammable gases (Category 1), H260
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Danger

Hazard statement(s)

H250	Catches fire spontaneously if exposed to air.
H251	Self-heating: may catch fire.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P222	Do not allow contact with air.
P223	Do not allow contact with water.
P231 + P232	Handle under inert gas. Protect from moisture.
P235 + P410	Keep cool. Protect from sunlight.
P273	Avoid release to the environment.
P280	Wear protective gloves/ eye protection/ face protection.
P335 + P334	Brush off loose particles from skin. Immerse in cool water/ wrap in wet bandages.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391	Collect spillage.
P402 + P404	Store in a dry place. Store in a closed container.
P407	Maintain air gap between stacks/ pallets.
P413	Store bulk masses greater than .? kg/ .? lbs at temperatures not exceeding .? °C/ .? °F.
P420	Store away from other materials.
P422	Store contents under inert gas.
P501	Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Combustible dust

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Formula	:	Zn
Molecular weight	:	65.39 g/mol
CAS-No.	:	7440-66-6
EC-No.	:	231-175-3
Index-No.	:	030-001-00-1

Hazardous components

Component	Classification	Concentration
Zinc powder (pyrophoric)		
	Pyr. Sol. 1; Self-heat. 1; Water-react. 1; Aquatic Acute 1; Aquatic Chronic 1; H250, H251, H260, H410	<= 100 %

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Dry powder

5.2 Special hazards arising from the substance or mixture
Zinc/zinc oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Do not flush with water. Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Further processing of solid materials may result in the formation of combu formation should be taken into consideration before additional processing
Provide appropriate exhaust ventilation at places where dust is formed.Keep away from sources of ignition - No smoking.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Never allow product to get in contact with water during storage.

Keep in a dry place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.
Hazardous components without workplace control parameters

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection

Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Protective gloves against thermal risks

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industria situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection

Flame retardant protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use (EN 143) respirator cartridges as a backup to engineering controls. If th full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Colour: grey
b)	Odour	No data available
c)	Odour Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 420 °C (788 °F) - lit.
f)	Initial boiling point and boiling range	907 °C (1665 °F) - lit.
g)	Flash point	()No data available
h)	Evaporation rate	No data available

i)	Flammability (solid, gas)	May form combustible dust concentrations in air.
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapour pressure	1 hPa at 487 °C (909 °F)
l)	Vapour density	No data available
m)	Relative density	7.133 g/mL at 25 °C (77 °F)
n)	Water solubility	No data available
o)	Partition coefficient: n-octanol/water	log Pow: 5
p)	Auto-ignition temperature	The substance or mixture is classified as self heating with the category 1., The substance or mixture is pyrophoric with the category 1.
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	No data available

9.2 Other safety information
No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
Reacts violently with water.

10.4 Conditions to avoid
Exposure to moisture

10.5 Incompatible materials
Strong acids and oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Zinc/zinc oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
No data availableZinc powder (pyrophoric)
Inhalation: No data available(Zinc powder (pyrophoric))
Dermal: No data available(Zinc powder (pyrophoric))
No data available(Zinc powder (pyrophoric))

Skin corrosion/irritation
No data available(Zinc powder (pyrophoric))

Serious eye damage/eye irritation
No data available(Zinc powder (pyrophoric))

Respiratory or skin sensitisation
Did not cause sensitisation on laboratory animals.(Zinc powder (pyrophoric))

Germ cell mutagenicity

No data available(Zinc powder (pyrophoric))

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available(Zinc powder (pyrophoric))

No data available(Zinc powder (pyrophoric))

Specific target organ toxicity - single exposure
No data available(Zinc powder (pyrophoric))

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available(Zinc powder (pyrophoric))

Additional Information
RTECS: ZG8600000

chills, dry throat, sweet taste, Fever, Cough, Nausea, Vomiting, Weakness(Zinc powder (pyrophoric))
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.(Zinc powder (pyrophoric))

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish	LC50 - Cyprinus carpio (Carp) - 450.0 µg/l - 96.0 h(Zinc powder (pyrophoric))
Toxicity to daphnia and other aquatic invertebrates	LC50 - Daphnia magna (Water flea) - 0.068 mg/l - 48 h(Zinc powder (pyrophoric))
	mortality NOEC - Daphnia (water flea) - 0.101 - 0.14 mg/l - 7 d(Zinc powder (pyrophoric))

12.2 Persistence and degradability

12.3 Bioaccumulative potential

Bioaccumulation	Algae - 7 d at 16 °C - 5 µg/l(Zinc powder (pyrophoric))
	Bioconcentration factor (BCF): 466

12.4 Mobility in soil
No data available(Zinc powder (pyrophoric))

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Burn in a chemical incinerator equipped with an afterburner and scrubber b highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 1436 Class: 4.3 (4.2) Packing group: II
Proper shipping name: Zinc powder
Reportable Quantity (RQ) : 1000 lbs

Poison Inhalation Hazard: No

IMDG

UN number: 1436 Class: 4.3 (4.2) Packing group: II EMS-No: F-G, S-O
Proper shipping name: ZINC POWDER
Marine pollutant : yes

IATA

UN number: 1436 Class: 4.3 (4.2) Packing group: II
Proper shipping name: Zinc powder

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
Zinc powder (pyrophoric)	7440-66-6	1993-04-24

SARA 311/312 Hazards

Reactivity Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
Zinc powder (pyrophoric)	7440-66-6	1993-04-24

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Zinc powder (pyrophoric)	7440-66-6	1993-04-24

New Jersey Right To Know Components

	CAS-No.	Revision Date
Zinc powder (pyrophoric)	7440-66-6	1993-04-24

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H250	Catches fire spontaneously if exposed to air.
H251	Self-heating: may catch fire.
H260	In contact with water releases flammable gases which may ignite spontaneously.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.

HMIS Rating

Health hazard:	0
Chronic Health Hazard:	
Flammability:	3
Physical Hazard	1

NFPA Rating

Health hazard:	0
Fire Hazard:	3
Reactivity Hazard:	1
Special hazard.I:	W

Further information

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Preparation Information

Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.0 Revision Date: 05/28/2017 Print Date: 06/28/2019

Appendix F:

Quality Assurance Project Plan

SESI
CONSULTING ENGINEERS

Geotechnical
Environmental
Site Civil

959 Route 46E, Fl 3, Ste 300
Parsippany, NJ 07054
973.808.9050
www.sesi.org

QUALITY ASSURANCE PROJECT PLAN

For

One Water Street Blacksmith and Wheelwright Site
1 Water Street
White Plains, Westchester County, NY

Prepared for:
1 Water Street, L.L.C.

December 2025

SESI Project No:
14077

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TABLE 7.2 QUANTITATION LEVELS AND ANALYTICAL METHODS FOR PFAS

LIST OF ACRONYMS

Acronym	Definition
AAS	Absorption Spectroscopy
ASP	Analytical Service Protocol
BCP	Brownfield Cleanup Program
DUSR	Data Usability Summary Report
ELAP	Environmental Laboratory Accreditation Program
GC/MS	Gas Chromatography/Mass Spectrometry
HAS	Hollow-stem Auger
HDPE	High-Density Polyethylene
LDPE	Low-density Polyethylene
LFPS	Low Flow Purging Sampling
MDL	Method Detection Limit
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PCB	Polychlorinated Biphenyls
PFAS	Per- and polyfluoroalkyl substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PPE	Personal Protective Equipment
PTFE	Polytetrafluoroethylene
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RIWP	Remedial Investigation Work Plan
SESI	SESI Consulting Engineers, Inc.
TIC	Tentatively Identified Compound
TCL	Target Compound List
VOC	Volatile Organic Compound
USEPA	United States Environmental Protection Agency

1.0 PROJECT DESCRIPTION

This document presents the Quality Assurance Project Plan (QAPP) for the Remedial Investigation Work Plan (RIWP) for the Brownfield Cleanup Program project (BCP No. C360235) known as the One Water Street Blacksmith and Wheelwright Site, (the "Site"). The Site consists of a 1.178-acre area vacant parcel and is located at 1 Water Street, Westchester County, White Plains, New York. The Site is identified as a portion of parcel 125.66.2-1.11 on the Westchester County tax map.

The Site is bound to the east by a public parking lot. The Site is bound to the south by Water Street, a City of White Plains bus terminal, and a parking garage beyond, to the west by Ferris Avenue, the White Plains Fire Station and a municipal building and to the north by a public parking lot and Hillside Terrace beyond.

SESI Consulting Engineers (SESI) prepared the RIWP for 1 Water Street, White Plains, New York, dated November 2023, which describes the investigation activities to be conducted at the Site, as part of the Site's planned remedial investigation and remediation.

2.0 PROJECT ORGANIZATION

The RIWP activities will be conducted by SESI and their qualified subcontractors, on behalf of 1 Water Street, LLC. The organization of SESI's key project management and field staff, and respective areas of responsibility, is presented below **(Table 2.1)** along with the names of subcontractors.

Table 2.1—SESI Personnel and Subcontractors

Role	Name	Telephone No.
Project Principal	Fuad Dahan, P.E., PhD	973-808-9050 x249
Project Manager	Steven Gustems, PG	973-808-9050 x282
Principal Engineer	Fuad Dahan, P.E., PhD	973-808-9050 x249
Field Team Leader	Chris Malvicini	973-808-9050 x273
Quality Assurance Officer	Chris Malvicini	973-808-9050 x267
Field Personnel	Tracey McMeekin	573-518-8056
Analytical Laboratory	SGS North America	609-664-8613
Data Validator	Hanibal Tayeh	413-875-5049
Driller	Coastal Environmental Solutions	631-942-9209

2.1 PROJECT PRINCIPAL

Provides technical and administrative oversight and guidance throughout the project, assist in securing company resources, participate in technical review of deliverables, and attend key meetings as needed.

2.2 PRINCIPAL ENGINEER

Provides technical guidance and review of reports, analytical data. Will have key involvement in screening and development of remedial alternatives.

2.3 PROJECT MANAGER

Responsible for maintaining the day-to-day schedule for completing the fieldwork and deliverables according to Brownfield Cleanup Program (BCP) requirements and client expectations.

2.4 FIELD TEAM LEADER

Responsible for overseeing field work during the implementation of the RIWP, including observing subcontractors, maintaining field notes, and collecting samples of various environmental media.

2.5 QUALITY ASSURANCE OFFICER

Responsible for reviewing sampling procedures and certify that the data was collected and analyzed using the appropriate procedures.

3.0 QA/QC OBJECTIVES FOR MEASUREMENT OF DATA

In cases where NYSDOH ELAP Certification exists for a specific group or category of parameters, the laboratory performing analysis in connection with this project will have appropriate New York State Department of Health (NYSDOH) ELAP Certification. SGS North America, Dayton, New Jersey, an ELAP-certified lab, will be performing the sample analyses for the project. Analytical Service Protocol (ASP, June 2000) Category B deliverables are required for all samples. All data will be sent to a third party, Hanibal Tayeh a data validator, for validation in accordance with NYSDEC BCP requirements.

Detection limits set by New York State Department of Environmental Conservation (NYSDEC) ASP will be used for all sample analyses unless otherwise noted. If NYSDEC-ASP-dictated detection limits prove insufficient to assess project goals (i.e., comparison to drinking water standards or attainment of Applicable or Relevant and Appropriate Requirements [ARARs]), then ASP Special Analytical Services (SAS) or other appropriate methods will be utilized.

The quality assurance/quality control (QA/QC) objectives for all measurement data include completeness, representativeness, comparability, precision, and accuracy.

3.1 COMPLETENESS

The analyses performed must be appropriate and inclusive. The parameters selected for analysis are chosen to meet the objectives of the study.

Completeness of the analyses will be assessed by comparing the number of parameters intended to be analyzed with the number of parameters successfully determined and validated. Data must meet QC acceptance criteria for 100 percent or more of requested determinations.

3.2 REPRESENTATIVENESS

Samples must be taken of the population and, where appropriate, the population will be characterized statistically to express the degree to which the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process, or environmental condition.

Non-dedicated sampling devices will be cleaned between sampling points by washing and rinsing with pesticide-grade methanol, followed by a thorough rinse with distilled water. Specific cleaning techniques are described in the Field Sampling Procedure. Two types of blank samples will accompany each sample set where Target Compound List (TCL) volatiles are to be analyzed (water matrix only). A trip blank, consisting of a 40 ml VOA vial of organic-free water prepared by the laboratory, will accompany each set of sample bottles from the laboratory to the field and back. This bottle will remain sealed throughout the shipment and sampling process. This blank will be analyzed for TCL volatile organic compounds (VOCs) along with the groundwater samples to ensure that contamination with TCL volatile compounds has not occurred during the bottle preparation, shipment and sampling phase of the project. In order to check for contaminant carryover when non-dedicated sampling equipment is used, a rinsate blank will be submitted to the laboratory. This blank will also be analyzed for TCL volatile organic compounds. The TCL compounds are identified in the United States Environmental Protection Agency (USEPA) Contract Laboratory Program dated 10/2016 or as periodically updated.

The analysis results obtained from the determination of identical parameters in field duplicate samples can be used to further assess the representativeness of the sample data.

3.3 COMPARABILITY

Consistency in the acquisition, preparation, handling and analysis of samples is necessary in order for the results to be compared where appropriate. Additionally, the results obtained from analyses of the samples will be compared with the results obtained in previous studies, if available.

To ensure the comparability of analytical results with those obtained in previous or future testing, all samples will be analyzed by NYSDEC-approved methods. The NYSDEC-ASP mandated holding times for various analyses will be strictly adhered to.

3.4 PRECISION AND ACCURACY

The validity of the data produced will be assessed for precision and accuracy. Analytical methods which will be used include gas chromatography/mass spectrometry (GC/MS), gas chromatography, colorimetry, atomic spectroscopy, gravimetric and titrametric techniques. The following outlines the procedures for evaluating precision and accuracy, routine monitoring procedures, and corrective actions to maintain analytical quality control. All data evaluations will be consistent with NYSDEC-ASP procedures. Data will be 100 percent compliant with NYSDEC-ASP requirements. Matrix spike and matrix spike duplicates will be collected to confirm accuracy and precision at a rate of one (1) per 20 soil and/or groundwater samples taken.

The number of duplicate, spiked and blank samples analyzed will be a minimum of one (1) duplicate for every 20 samples per each medium of groundwater and soil. The inclusion and frequency of analysis of field blanks will be on the order of one (1) per every 20 samples (soil). For the aqueous matrix field blanks will be collected at a frequency of one (1) per day. Samples to be analyzed for volatile organic compounds will be accompanied by a trip blank for each shipment and field blanks (water matrix) or field blanks (soil). An equipment blank for Per- and polyfluoroalkyl substances (PFAS) will be collected once per day per matrix, regardless of whether equipment being used is disposable, at a frequency of one (1) per 20 samples taken for both soil and groundwater.

Quality assurance audit samples will be prepared and submitted by the laboratory QA manager for each analytical procedure used. The degree of accuracy and the recovery of analyte to be expected for the analysis of QA samples and spiked samples is dependent upon the matrix, method of analysis, and compound or element being determined. The concentration of the analyte relative to the detection limit is also a major factor in determining the accuracy of the measurement. The lower end of the analytical range for most analyses is generally accepted to be five (5) times the detection limit. At or above this level, the determination and spike recoveries for metals in water samples will be expected to range from 75 to 125 percent. The recovery of organic surrogate compounds and matrix spiking compounds determined by GC/MS will be compared to the guidelines for recovery of individual compounds as established by the United States Environmental Protection Agency Contract Laboratory Program dated 7/85 or as periodically updated.

The quality of results obtained for inorganic ion and demand parameters will be assessed by comparison of QC data with laboratory control charts for each test.

4.0 SAMPLING PROCEDURES

4.1 SAMPLING PROGRAM

The sampling program for this project will include soil, groundwater and soil vapor. Soil samples will be collected from split spoon sampling or macrocore devices retrieved from soil borings. Groundwater samples will be collected from groundwater monitoring wells using low flow purging techniques. A description of this method is shown on **Table 4.1**. Soil vapor samples will be collected from vapor points screened in the vadose zone using Summa Canisters. A summary of the sample containers, bottle types, preservatives and holding times is shown on **Table 4.2.**

4.1.1 DRILLING/SAMPLING PROCEDURES

Soil and groundwater samples will be collected by means of a soil boring program. Soil borings shall be completed using the hollow stem auger drilling methods, direct push methods, or rotary drilling methods, whichever methods are determined to be best suited to site conditions by the SESI project manager and SESI field team leader.

Soil samples will be collected from soil borings and analyzed in accordance with the NYSDEC-approved Work Plan. Monitoring wells for groundwater sample collection will be installed in select completed soil borings. Either hollow stem auger (HSA) or direct push drilling methods may be utilized for monitoring well completion.

Soil samples shall be collected continuously during drilling so that a complete soil profile is examined and described by the SESI field engineer or geologist. The sampling method employed shall be ASTM D-1586/Split Barrel Sampling using a standard 2-foot long, 2-inch outside diameter split- spoon sampler with a 140-pound hammer, in cases where HSA methods are used. Upon retrieval of the sampling barrel, the collected sample shall be placed in glass jars and labeled, stored on site (on ice in a cooler if necessary), and transmitted to the appropriate testing laboratory or storage facility. Chain-of-custody procedures will be practiced following Section 15, EPA-600/4-82-029, Handbook for Sampling and Sample Preservation of Water and Waste Waters.

A geologist or engineer will be on Site during the drilling operations to fully describe each soil sample, following the New York State Soil Description Procedure, and to retain representative portions of each sample.

The drilling contractor will be responsible for obtaining accurate and representative samples, informing the SESI field engineer or geologist of changes in drilling pressure, keeping a separate general log of soils encountered including blow counts [i.e., the number of blows from a soil sampling drive weight (140 pounds)] required to drive the split-spoon sampler in 6-inch increments and installing monitoring wells to levels directed by the supervising engineer or geologist following specifications further outlined in this protocol.

4.1.2 MONITORING WELL COMPLETION

Monitoring wells will be constructed of 0.010-inch slot size PVC well screen and riser casing. Other materials utilized for completion will be washed silica sand (Q-Rock No. 4 or approved equivalent) bentonite grout, Portland cement, and a protective steel locking well casing and cap with locks. The depth of the wells will be determined based on the depth to water, type of contaminant and field conditions encountered.

The monitoring well installation method for wells installed within unconsolidated sediments shall be to place the screen and riser assembly into the casing once the screen interval has been selected. At that time, a washed silica sand pack will be placed around the well screen if required to prevent screen plugging. If a sand pack is not warranted, the auger string will be pulled back to allow the native aquifer material to collapse 2 to 3 feet above the top of the screen. Bentonite pellets will then be added to the annulus between the casing and the inside auger to insure proper sealing. Cement/bentonite grout will continue to be added during the extraction of the augers until the entire aquifer thickness has been sufficiently sealed off from horizontal and/or vertical flow above the screened interval. During placement of sand and bentonite pellets, frequent measurements will be made to check the height of the sand pack and thickness of bentonite layers by a weighted drop tape measure.

A bolt-down protective curb box will be installed, flush with the ground, or steel “stick-up” protective casing and secured by a Portland cement seal. The cement seal shall extend laterally at least 1 foot in all directions from the protective casing and shall slope gently away to drain water away from the well.

4.1.3 WELL DEVELOPMENT

All monitoring wells will be developed or cleared of all fine-grained materials and sediments that have settled in or around the well during installation so that the screen is transmitting representative portions of the groundwater. The development will be by one (1) of two (2) methods, pumping or bailing groundwater from the well until it yields relatively sediment-free water.

A decontaminated pump or bailer will be used and subsequently decontaminated after each use following procedures outlined in the Decontamination Protocol. Pumping or bailing will cease when the turbidity falls below 50 NTUs or until specific conductivity, pH, and temperature are stable (i.e., consecutive readings are within 10 percent with no overall upward or downward trends in measurements). Well development water will be disposed of on the ground surface at each well location.

4.1.4 DECONTAMINATION

All drilling equipment and associated tools including augers, drill rods, sampling equipment, wrenches and any other equipment or tools that have come in contact with contaminated

materials will be decontaminated before any drilling on Site begins, between each well, and prior to removing any equipment from the Site. The preferred decontamination procedure will be to scrape the equipment from any residual soils and then rinse with water and Alconox®. Every effort will be made to minimize the generation of contaminated water. Any contaminated water generated will be drummed. The contaminated water drums will be disposed of at an appropriate facility after approval and sampling in accordance with the specific facility requirements.

4.1.5 PFAS SAMPLING CONSIDERATIONS

This section contains the materials limitations for Per- and polyfluoroalkyl substances sampling in accordance with the Draft NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (April 2023).

The groundwater samples will be analyzed for PFAS using Modified USEPA Method 1633. Reporting limits for PFOA and PFOS will not exceed 2 nanograms per liter (ng/L). Category B deliverables and an electronic data deliverable will be completed.

PFAS are very persistent in the environment and in the human body. Due to their presence in a variety of products, persistence in the environment and very low drinking water standards, care must be used when groundwater sampling for PFAS to avoid cross contamination from the sampling equipment and personal protective equipment (PPE).

No fabric softener will be used on clothing to be worn in field. Cosmetics, moisturizers, hand cream, unauthorized sunscreen, insect repellent or other related products will not be used the morning of sampling. The field samplers will wear powder-free nitrile gloves while filling and sealing the sample bottles. The sampling equipment components and sample containers will not come in contact with material that may potentially contain PFAS such as aluminum foil, low density polyethylene (LDPE), glass or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials will be avoided. Food and drink packaging materials will be avoided, as well.

Sampling will be performed using certified PFAS-free sampling materials such as stainless steel, high density polyethylene (HDPE), PVC, silicone, acetate or polypropylene pump and tubing. Rinse water must be laboratory-provided certified PFAS-free distilled or de-ionized water. Standard two step decontamination using Alconox® detergent and clean certified PFAS-free water rinse will be performed for equipment that does come in contact with PFAS materials.

No waterproof field books, plastic clipboards, binders, or spiral hard cover will be used for PFAS containers. No adhesives (i.e. Post-It® Notes), sharpies, or permanent markers will be used for PFAS containers. The PFAS containers will be labeled with ballpoint pens. PFAS samples will be stored in separate cooler filled with regular ice only with no chemical (blue) ice packs.

Pre-cleaned sample bottles with closures, coolers, sample labels and a chain of custody form will be provided by the laboratory.

4.2 GROUNDWATER SAMPLING PROGRAM

4.2.1 WELL EVACUATION

Prior to sampling a monitoring well, the static water level will be recorded. All well data will be recorded on a field sampling record. The wells will be sampled in accordance with the USEPA guidelines for the Low Flow Purging Sampling (LFPS). The purpose of LFPS is to collect groundwater samples from monitoring wells that are representative of ambient groundwater conditions in the aquifer. The LFPS method reduces turbidity which is needed particularly when sampling for metals.

4.2.2 SAMPLING PROCEDURE

The wells will be sampled using the USEPA LFPS technique. A flow rate of 100 ml to 250 ml per minute is used to purge the wells. Drawdown should not exceed 0.3 feet. The pump intake is lowered to the mid-point of the water column or as subsurface features such as bedrock fractures or more permeable zones warrant. At the initiation of low flow purging a water level is recorded as well as field parameters. Field parameters are then monitored every five (5) minutes during low flow purging using a flow through cell. When three (3) consecutive measurements of pH differ by 0.1 units or less, with ORP within 10 mv or less, turbidity varies 10 percent or less, conductivity differs by 3 percent or less and dissolved oxygen by 10 percent or less, sampling may begin. Flow through cells are used so continuous real time readings are made. When the parameters stabilize the flow through cell is disconnected and sample bottles are filled directly from the tubing. Low-flow sampling procedures are summarized on **Table 4.1.**

4.3 SOIL VAPOR SAMPLING

Soil vapor sampling will be conducted in accordance with NYSDOH Guidance for Evaluating Soil Vapor Intrusion in New York State (October 2006 and the subsequent May 2017 updates to the Soil Vapor/Indoor Air Decision Matrices). Soil vapor samples will be collected in the vadose zone from shallow (five [5] feet) vapor points. Each vapor point will be installed in a shallow boring drilled either by hand-operated equipment (e.g. hand auger or percussion hammer drill), or by a small truck-mounted drill rig. Drilling equipment used shall be based on soil conditions, and the method that provides the most practical approach.

Each vapor point will consist of an inert sampling tube (polyethylene, stainless steel, or Teflon®) with a six (6)-inch screened section at the bottom through which soil vapors can be sampled. The screen slot size will be 0.0075 inches. A sampling zone will be created around the screened section by backfilling with one (1) to two (2) feet of porous coarse sand or glass beads, and at least three (3) feet of bentonite will be placed above the porous sampling zone to form a seal from the surface. Native clean soil will be packed around the remaining annulus to the ground surface.

The regulator will be set to collect a soil vapor sample at a flow rate of less than 0.2 liters per minute. After the summa canister is filled, the valve will be closed.

Each canister will be listed according to a specific sample I.D. on a chain of custody form. Sample canisters will be delivered to the laboratory within 24 hours and analyzed for VOCs by method TO-15. The detection limit for VOCs will be 1 µg/m3 or less

.

The soil vapor sampling effort will include the use of inert helium tracer gas to verify that the soil vapor samples are not diluted by ambient air. The atmosphere around the sampling tube will be enriched with the tracer gas, and the soil vapor sample will be collected in the presence of the enriched tracer atmosphere. This will be accomplished by placing an inverted plastic pail over the sampling point and filling the pail with the tracer gas via a small tube penetrating the site of the pail. Refer to NYSDOH Guidance for Evaluating Indoor Air Intrusion in New York State (October 2006).

4.4 SAMPLE PRESERVATION AND SHIPMENT

Since all bottles will contain the necessary preservatives as shown in **Table 4.2**, they need only be filled. The 40 ml VOA vials must be filled brim full with no air bubbles. The other bottles should be filled to within about one (1) inch from the top.

The bottles will be sent from the laboratory in coolers which will be organized on a per site basis. Following sample collection, the bottles should be placed on ice in the shipping cooler. The samples will be cooled to 4°C, but not frozen.

Final packing and shipment of coolers will be performed in accordance with guidelines outlined in the ASP.

5.0 SAMPLE CUSTODY

The program for sample custody and sample transfer is in compliance with the NYSDEC-ASP, as periodically updated. If samples may be needed for legal purposes, chain-of-custody procedures, as defined by NEIC Policies and Procedures (USEPA-330/9-78-001-R, Revised June 1988) will be used. Sample chain-of-custody is initiated by the laboratory with selection and preparation of the sample containers. To reduce the chance for error, the number of personnel handling the samples should be minimized.

5.1 FIELD SAMPLE CUSTODY

A chain-of-custody record accompanies the samples from initial sample container selection and preparation at the laboratory, shipment to the field for sample containment and preservation, and return to the laboratory. Two (2) copies of this record follow the samples to the laboratory. The laboratory maintains one (1) file copy and the completed original is returned to the site inspection team. Individual sample containers provided by the laboratory are used for shipping samples.

The shipping containers are insulated and ice is used to maintain samples at approximately 4°C until samples are returned and in the custody of the laboratory. All sample bottles within each shipping container are individually labeled and controlled. Samples are to be shipped to the laboratory within 24 to 48 hours of the day of collection depending on parameter holding times.

Each sample shipping container is assigned a unique identification number by the laboratory. This number is recorded on the chain-of-custody record and is marked with indelible ink on the outside of the shipping container. The field sampler will indicate the sample designation/location number in the space provided on the appropriate chain-of-custody form for each sample collected. The shipping container is closed and a seal provided by the laboratory is affixed to the latch. This seal must be broken to open the container, and this indicates possible tampering if the seal is broken before receipt at the laboratory. The laboratory will contact the site investigation team leader and the sample will not be analyzed if tampering is apparent.

5.2 LABORATORY SAMPLE CUSTODY

The site investigation team leader or Project Quality Assurance Officer notifies the laboratory of upcoming field sampling activities and the subsequent transfer of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

The laboratory sample program meets the following criteria:

- The laboratory has designated a sample custodian who is responsible for maintaining custody of the samples and for maintaining all associated records documenting that custody.
- Upon receipt of the samples, the custodian will check the original chain-of-custody documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian signs the chain-of-custody record and records the date and time received.
- Care is exercised to annotate any labeling or descriptive errors. In the event of discrepant documentation, the laboratory will immediately contact the site investigation team leader as part of the corrective action process. A qualitative assessment of each sample container is performed to note any anomalies, such as broken or leaking bottles.

This assessment is recorded as part of the incoming chain-of-custody procedure:

1. The samples are stored in a secured area at a temperature of approximately 4°C until analyses are to commence.
2. A laboratory chain-of-custody record accompanies the sample or sample fraction through final analysis for control.

3. A copy of the chain-of-custody form will accompany the laboratory report and will become a permanent part of the project records.

5.3 FINAL EVIDENCE FILES

Final evidence files include all originals of laboratory reports and are maintained under documented control in a secure area.

A sample or an evidence file is under custody if:

- It is in your possession; it is in your view, after being in your possession.
- It was in your possession and you placed it in a secure area.
- It is in a designated secure area.

6.0 CALIBRATION PROCEDURES

Instruments and equipment used to gather, generate or measure environmental data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility of results are consistent with the appropriate manufacturer's specifications or project specific requirements. The procedures for instrument calibration, calibration verification, and the frequency of calibrations are described in the ASP. The calibration of instruments used for the determination of metals will be as described in the appropriate CLP standard operating procedures.

Calibration of other instruments required for measurements associated with these analyses will be in accordance with the manufacturer's recommendations and the standard operating procedures of the laboratory.

7.0 ANALYTICAL PROCEDURES

Analytical procedures shall conform to the most recent revision of the NYSDEC-ASP (June 2005) and are summarized on **Tables 7.1** and **7.2.** In the absence of USEPA or NYSDEC guidelines, appropriate procedures shall be submitted for approval by NYSDEC prior to use.

The procedures for the sample preparation and analysis for organic compounds are as specified in the NYSDEC-ASP. Analytical cleanups are mandatory where matrix interferences are noted. No sample shall be diluted any more than a factor of five. The sample shall be either re-extracted, re-sonicated, re-stream distilled, etc. or be subjected to any one analytical cleanup noted in SW846 or a combination thereof. The analytical laboratory shall expend such effort and discretion to demonstrate good laboratory practice and demonstrate an attempt to best achieve the method detection limit.

7.1 VOLATILE ORGANICS

For the analysis of water samples for Target Compound List VOCs, no sample preparation is required. The analytical procedure for volatiles is detailed in NYSDEC-ASP (Volume I, Section D-I). A measured portion of the sample is placed in the purge and trap apparatus and the sample analysis is performed by gas chromatography/mass spectrometry for the first round. USEPA Method 8260 will be used, plus tentatively identified compounds (TICs). USEPA Methods 8010 or 8020 (gas chromatography with different detectors) will be used if subsequent rounds with lower limits of detection are warranted.

7.2 SEMI-VOLATILE ORGANIC COMPUNDS

The extraction and analytical procedures used for preparation of water, soil and sediment samples for the analysis of the TCL semi-volatile organic compounds are described in NYSDEC-ASP Volume I, Section D-III. USEPA Method 8270 will be used, plus TICs.

Instrument calibration, compound identification, and quantitation are performed as described in Section 6 of this document and in the NYSDEC-ASP.

7.3 PESTICDE AND PCB COMPOUNDS

The sample preservation procedures for gas chromatography for pesticides and polychlorinated biphenyls (PCBs) will be as described in the NYSDEC-ASP methods (Section D-IV). The analysis of standard mixes, blanks and spiked samples will be performed at the prescribed frequency with adherence to the 72-hour requirement described in the method.

7.4 METALS

Water, soil and waste samples will be analyzed for the metals listed in Table 7.1. The detection limits for these metals are as specified in the NYSDEC-ASP, Section D-V. The instrument detection limits will be determined using calibration standards and procedures specified in the NYSDEC-ASP. The detection limits for individual samples may be higher due to the sample matrix. The procedures for these analyses will be as described in the NYSDEC-ASP.

The analyses for metals will be performed by atomic absorption spectroscopy (AAS) or inductively-coupled plasma emission spectroscopy (ICPES), as specified in the ASP with regard to AAS flame analysis.

7.5 PER- AND POLYFLUOROALKYL SUBSTANCES

The NYSDEC has developed a list of 40 PFAS Analytes List on Table 7.2 for remedial programs. These are:

- Perfluorobutanesulfonic acid
- Perfluoropentanesulfonic acid

- Perfluorohexanesulfonic acid
- Perfluoroheptanesulfonic acid
- Perfluorooctanesulfonic acid
- Perfluorononanesulfonic acid
- Perfluorodecanesulfonic acid
- Perfluorododecanesulfonic acid
- Perfluorobutanoic acid
- Perfluoropentanoic acid
- Perfluorohexanoic acid
- Perfluoroheptanoic acid
- Perfluorooctanoic acid
- Perfluorononanoic acid
- Perfluorodecanoic acid
- Perfluoroundecanoic acid
- Perfluorododecanoic acid
- Perfluorotridecanoic acid
- Perfluorotetradecanoic acid
- Perfluorohexadecanoic acid
- Hexafluoropropylene oxide dimer acid
- 4,8-Dioxa-3H-perfluorononanoic acid
- Perfluoro-3-methoxypropanoic acid
- Perfluoro-4-methoxybutanoic acid
- Nonafluoro-3,6-dioxaheptanoic acid
- 4:2 Fluorotelomer sulfonic acid
- 6:2 Fluorotelomer sulfonate
- 8:2 Fluorotelomer sulfonate
- 3:3 Fluorotelomer carboxylic acid
- 5:3 Fluorotelomer carboxylic acid
- 7:3 Fluorotelomer carboxylic acid
- Perfluroroctane sulfonamide
- N-methylperfluorooctane sulfonamide

- N-ethylperfluorooctane sulfonamide
- N-methyl perfluorooctanesulfonamidoacetic acid
- N-ethyl perfluorooctanesulfonamidoacetic acid
- N-methylperfluorooctane sulfonamidoethanol
- N-ethylperfluorooctane sulfonamidoethanol
- 9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major)
- 11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)
- Perfluoro(2-ethoxyethane) sulfonic acid

Currently, ELAP does not offer certification for PFAS compounds in matrices other than finished drinking water. Per the NYSDEC April 2023 memo on emergent contaminant sampling, the analytical procedure for soil and groundwater sampling of PFAS is EPA Method 1633. The reporting limit for PFAS in soil samples is 0.5 ug/kg. Reporting limits for perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) in groundwater should not exceed 2 ng/L.

The laboratory standard operating procedures are included in **Attachment C**. The laboratory method detection limits (MDLs) for PFAS compounds are included in **Attachment D**.

7.6 SITE SPECIFICITY OF ANALYSES

Work plans prepared for remedial actions for sites contain recommendations for the chemical parameters to be determined for each site. Thus, some or all of the referenced methods will apply to the analysis of samples collected at the individual waste sites. Analyses of TCL analytes will be performed on all samples.

To ensure that the field sampling and laboratory analytical practices are acceptable, the data associated with the samples will be validated by a third party (in accordance with requirements of DER-10). The validation approach and results will be presented in a data usability summary report (DUSR) to be included in the Report.

TABLES

TABLE 4.1--SAMPLING PROCEDURE FOR MONITORING WELLS USING LOW-STESS (LOW-FLOW) METHODS

Step	Description	Details
1	Record initial static water level.	**Device:** electric contact probe accurate to the nearest 0.1 foot.
2	Lower sampling device into well. Slowly lower the pump, safety cable, tubing and electrical lines into the well to the depth specified for that well.	Pump intake must be no less than 2 feet from the bottom of the well to prevent disturbance and resuspension of sediments which may be at the bottom of the well.
3	Measure water level again: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.	
4	Purge Well	Start pumping the well at 200 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every five minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 ft or less). Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. As noted above, care should be taken to maintain pump suction and to avoid entrainment of air in the tubing.

Step	Description	Details
5	Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.	
6	Monitor Indicator Parameters	1. During purging of the well, monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, Eh, and DO) approximately every five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows (Puls and Barcelona, 1996): a. 0.1 for pH b. 3% for specific conductance (conductivity) c. 10 mv for redox potential d. 10% for DO and turbidity
7	The pump must not be removed from the well between purging and sampling.	Dissolved oxygen and turbidity usually require the longest time to achieve stabilization.
8	Collect Samples	Collect samples at a flow rate between 100 and 250 ml/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 ft. VOC samples must be collected first and directly into sample containers. All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the

Step	Description	Details
		tubing gently down the inside of the container.
9	Ground water samples to be analyzed for volatile organic compounds (VOCs) require pH adjustment. The appropriate EPA Program Guidance should be consulted to determine whether pH adjustment is necessary.	If pH adjustment is necessary for VOC sample preservation, the amount of acid to be added to each sample vial prior to sampling should be determined, drop by drop, on a separate and equal volume of water (e.g., 40 ml). Groundwater purged from the well prior to sampling can be used for this purpose.
10	Remove Pump and Tubing	After collection of the samples, the tubing, unless permanently installed, must be properly discarded or dedicated to the well for resampling by hanging the tubing inside the well.
11	Measure and record well depth.	
12	Close and lock the well.	
13	Samples are capped, labeled and placed in laboratory coolers with ice packs or bagged ice.	
14	All equipment is cleaned with successive rinses of pesticide-grade methanol and distilled water.	Dedicated line is disposed of or left at well site.
15	Equipment/wash blanks are collected when non-dedicated sampling equipment is used.	

Step	Description	Details
16	Chain-of-custody forms are completed in triplicate.	The original and one carbon copy are put into a zip-lock bag and placed into the cooler. The original will be returned following sample analysis. A second carbon copy is kept on file.
17	Cooler is sealed with strapping tape and chain-of-custody seals to assure integrity and to prevent tampering of sample.	

TABLE 4.2--SAMPLE CONTAINERIZATION

PARAMETER & ANALYTICAL METHOD	NO.	BOTTLE TYPE	PRESERVATIVE[1]	HOLDING TIME
Aqueous Samples				
VOCs – USEPA 8260C	3	40 mL, glass vial with septum cap	Hydrochloric Acid to pH <2 Ice to 4°C	14 days
SVOCs (BNAs) and 1,4-Dioxane – USEPA 8270 SIM	2	1-liter amber glass bottle	Ice to 4°C	7 days (until extraction) 40 days (extracted)
Pesticides – USEPA 8081B	2	1-liter amber glass bottle	Ice to 4°C	7 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082A	2	1-liter amber glass bottle	Ice to 4°C	7 days (until extraction) 40 days (extracted)
Metals[2]	1	1-liter, plastic bottle	Nitric acid to pH <2 NaOH for cyanide Ice to 4°C	180 days Cyanide: 14 days Mercury: 28 days
Cyanide – USEPA 9010C/9012B	1	1-liter, plastic	Sodium Hydroxide to pH >12 Ice to 4°C	14 days
PFAS Compounds – USEPA Method 1633	2	500 ml HDPE or Polypropylene with non-Teflon lid	None	14 days
Soil, Sediment, Solid Waste Samples:				
VOCs – USEPA 8260C	3	5-gram EnCore samplers	Chilled to 0 - 6°C	14 days

PARAMETER & ANALYTICAL METHOD	NO.	BOTTLE TYPE	PRESERVATIVE(1)	HOLDING TIME
SVOCs (BNAs) and 1,4-Dioxane – USEPA 8270D SIM if RL cannot be reached	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	14 days (until extraction, 40 days extracted)
Pesticides – USEPA 8081B	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	14 days (until extraction) 40 days (extracted)
PCBs – USEPA 8082A	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	None
Metals(3)	1	4-oz. glass jar with Teflon lid	Chilled to 0 - 6°C	180 days Cyanide: 14 days Mercury: 28 days
PFAS Compounds – USEPA Method 1633	2	500 ml HDPE or Polypropylene with non-Teflon lid	None	28 days
Soil Vapor / Indoor Air Samples:				
VOCs – USEPA TO-15	1	Summa Canister	None	30 days

(1) All samples will be preserved with ice during collection and shipment.

(2) Metals refers to the 24 metals and cyanide in the Target Compound List (NYSDEC-CLP 11/87). Metals will be analyzed by Method 6020B, 7470A for mercury, and 9010C/9012B for cyanide

(3) Metals refers to the 24 metals and cyanide in the Target Compound List (NYSDEC-CLP 11/87). Metals will be analyzed by Method 6010D, 7471B for mercury, and 9010C/9012B for cyanide

(4) A complete list of compounds is provided on Table 7.1.

Table 7.1 PFAS Compound List and Reporting and Method Detection Limits for Soil and Groundwater

Method: EPA 1633 by LC-MS/MS			
	PFAS	**Reporting Limit — Groundwater (ng/l)**	**Method Detection Limit — Groundwater (ng/l)**
1	Perfluorobutanesulfonic acid (PFBS)	1.6	0.245
2	Perfluoropentanesulfonic acid (PFPeS)	1.6	0.204
3	Perfluorohexanesulfonic acid (PFHxS)	1.6	0.217
4	Perfluoroheptanesulfonic acid (PFHpS)	1.6	0.137
5	Perfluorooctanesulfonic acid (PFOS)	1.6	0.327
6	Perfluorononanesulfonic acid (PFNS)	1.6	0.303
7	Perfluorodecanesulfonic acid (PFDS)	1.6	0.334
8	Perfluorododecanesulfonic acid (PFDoS)	1.6	0.179
9	Perfluorobutanoic acid (PFBA)	6.4	0.330
10	Perfluoropentanoic acid (PFPeA)	3.2	0.196
11	Perfluorohexanoic acid (PFHxA)	1.6	0.318
12	Perfluoroheptanoic acid (PFHpA)	1.6	0.221
13	Perfluorooctanoic acid (PFOA)	1.6	0.302
14	Perfluorononanoic acid (PFNA)	1.6	0.221
15	Perfluorodecanoic acid (PFDA)	1.6	0.333
16	Perfluoroundecanoic acid (PFUnA)	1.6	0.264
17	Perfluorododecanoic acid (PFDoA)	1.6	0.379
18	Perfluorotridecanoic acid (PFTrDA)	1.6	0.238
19	Perfluorotetradecanoic acid (PFTeDA)	1.6	0.264

Method: EPA 1633 by LC-MS/MS			
20	Hexafluoropropylene oxide dimer acid (HFPO-DA)	6.4	0.406
21	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6.4	0.779
22	Perfluoro-3-methoxypropanoic acid (PFMPA)	3.2	0.177
23	Perfluoro-4-methoxybutanoic acid (PFMBA)	3.2	0.117
24	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	3.2	1.384
25	4:2 Fluorotelomer sulfonic acid (4:2-FTS)	6.4	2.281
26	6:2 Fluorotelomer sulfonic acid (6:2-FTS)	6.4	3.973
27	8:2 Fluorotelomer sulfonic acid (8:2-FTS)	6.4	1.566
28	3:3 Fluorotelomer carboxylic acid (3:3 FTCA)	8.0	0.721
29	5:3 Fluorotelomer carboxylic acid (5:3 FTCA)	40	5.066
30	7:3 Fluorotelomer carboxylic acid (7:3 FTCA)	40	5.942
31	Perfluorooctane sulfonamide (PFOSA)	1.6	0.227
32	N-methylperfluorooctane sulfonamide (NMeFOSA)	1.6	0.196
33	N-ethylperfluorooctane sulfonamide (NEtFOSA)	1.6	0.585
34	N-methylperfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	1.6	0.586
35	N-ethylperfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	1.6	0.324
36	N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	16	1.191
37	N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	16	1.022
38	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major) (9CL-PF3ONS)	6.4	0.871
39	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor) (11CL-PF3OUDS)	6.4	0.819
40	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)	3.2	0.137

Method: EPA 1633 by LC-MS/MS			
41	Perfluorohexadecanoic acid (PFHxDA)[1]	~	~
	1,4-dioxane		

Method: EPA 1633 by LC-MS/MS			
	PFAS	**Reporting Limit — Soil (ng/g)**	**Method Detection Limit — Soil (ng/g)**
1	Perfluorobutanesulfonic acid (PFBS)	0.2	0.014
2	Perfluoropentanesulfonic acid (PFPeS)	0.2	0.015
3	Perfluorohexanesulfonic acid (PFHxS)	0.2	0.018
4	Perfluoroheptanesulfonic acid (PFHpS)	0.2	0.057
5	Perfluorooctanesulfonic acid (PFOS)	0.2	0.067
6	Perfluorononanesulfonic acid (PFNS)	0.2	0.046
7	Perfluorodecanesulfonic acid (PFDS)	0.2	0.040
8	Perfluorododecanesulfonic acid (PFDoS)	0.2	0.038
9	Perfluorobutanoic acid (PFBA)	0.8	0.401
10	Perfluoropentanoic acid (PFPeA)	0.4	0.021
11	Perfluorohexanoic acid (PFHxA)	0.2	0.020
12	Perfluoroheptanoic acid (PFHpA)	0.2	0.029
13	Perfluorooctanoic acid (PFOA)	0.2	0.037
14	Perfluorononanoic acid (PFNA)	0.2	0.086
15	Perfluorodecanoic acid (PFDA)	0.2	0.031
16	Perfluoroundecanoic acid (PFUnA)	0.2	0.033
17	Perfluorododecanoic acid (PFDoA)	0.2	0.059

Method: EPA 1633 by LC-MS/MS			
18	Perfluorotridecanoic acid (PFTrDA)	0.2	0.038
19	Perfluorotetradecanoic acid (PFTeDA)	0.2	0.032
20	Hexafluoropropylene oxide dimer acid (HFPO-DA)	0.8	0.136
21	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.8	0.057
22	Perfluoro-3-methoxypropanoic acid (PFMPA)	0.4	0.033
23	Perfluoro-4-methoxybutanoic acid (PFMBA)	0.4	0.029
24	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.4	0.084
25	4:2 Fluorotelomer sulfonic acid (4:2-FTS)	0.8	0.282
26	6:2 Fluorotelomer sulfonic acid (6:2-FTS)	0.8	0.116
27	8:2 Fluorotelomer sulfonic acid (8:2-FTS)	0.8	0.225
28	3:3 Fluorotelomer carboxylic acid (3:3 FTCA)	1.0	0.060
29	5:3 Fluorotelomer carboxylic acid (5:3 FTCA)	5.0	0.363
30	7:3 Fluorotelomer carboxylic acid (7:3 FTCA)	5.0	0.308
31	Perfluorooctane sulfonamide (PFOSA)	0.2	0.068
32	N-methylperfluorooctane sulfonamide (NMeFOSA)	0.2	0.049
33	N-ethylperfluorooctane sulfonamide (NEtFOSA)	0.2	0.038
34	N-methylperfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	0.2	0.030
35	N-ethylperfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	0.2	0.044
36	N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	2.0	0.203
37	N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	2.0	0.247
38	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major) (9CL-PF3ONS)	0.8	0.038

Method: EPA 1633 by LC-MS/MS			
39	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor) (11CL-PF3OUdS)	0.8	0.071
40	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)	0.4	0.018
41	Perfluorohexadecanoic acid (PFHxDA)[1]	~	~

Source: EPA Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS, Second Draft Method 1633, November 2022

Data for this table are derived from the single-laboratory validation study and are only provided as examples for this draft method. The data will be updated to reflect the interlaboratory study results in a subsequent revision. Therefore, these criteria will change after interlaboratory validation.

[1] This compound was not listed in the EPA Method 1633 2nd draft and currently no known values exist

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples

	Volatile Analyte	CAS Number	Trace Water By SIM (µg/L)	Trace Level Water (µg/L)	Low Level Water (µg/L)
1.	Dichlorodifluoromethane	75-71-8		0.50	5.0
2.	Chloromethane	74-87-3		0.50	5.0
3.	Vinyl Chloride	75-01-4		0.50	5.0
4.	Bromomethane	74-83-9		0.50	5.0
5.	Chloroethane	75-00-3		0.50	5.0
6.	Trichlorofluoromethane	75-69-4		0.50	5.0
7.	1,1-Dichloroethene	75-35-4		0.50	5.0
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1		0.50	5.0
9.	Acetone	67-64-1		5.0	10.0
10.	Carbon Disulfide	75-15-0		0.50	5.0
11.	Methyl Acetate	79-20-9		0.50	5.0
12.	Methylene chloride	75-09-2		0.50	5.0
13.	trans-1,2-Dichloroethene	156-60-5		0.50	5.0
14.	Methyl tert-Butyl Ether	1634-04-4		0.50	5.0
15.	1,1-Dichloroethane	75-34-3		0.50	5.0
16.	cis-1,2-Dichloroethene	156-59-2		0.50	5.0
17.	2-Butanone	78-93-3		5.0	10.0
18.	Bromochloromethane	74-97-5		0.50	5.0
19.	Chloroform	67-66-3		0.50	5.0
20.	1,1,1-Trichloroethane	71-55-6		0.50	5.0
21.	Cyclohexane	110-82-7		0.50	5.0
22.	Carbon tetrachloride	56-23-5		0.50	5.0
23.	Benzene	71-43-2		0.50	5.0
24.	1,2-Dichloroethane	107-06-2		0.50	5.0
25.	1,4-Dioxane	123-91-1	1.0	25	125
26.	Trichloroethane	79-01-6		0.50	5.0

Source
NYSDEC ASP Exhibit C

Table 7.1

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples (Continued)

	Volatile Analyte	CAS Number	Trace Water By SIM (µg/L)	Trace Level Water (µg/L)	Low Level Water (µg/L)
27.	Methylcyclohexane	108-87-2		0.50	5.0
28.	1,2-Dichloropropane	78-87-5		0.50	5.0
29.	Bromodichloromethane	75-27-4		0.50	5.0
30.	cis-1,3-Dichloropropene	10061-01-5		0.50	5.0
31.	4-methyl-2-pentanone	108-10-1		5.0	10.0
32.	Toluene	108-88-3		0.50	5.0
33.	Trans-1,3-Dichloropropene	10061-02-6		0.50	5.0
34.	1,1,2-Trichloroethane	79-00-5		0.50	5.0
35.	Tetrachloroethene	127-18-4		0.50	5.0
36.	2-Hexanone	591-78-6		5.0	10.0
37.	Dibromochloromethane	124-48-1		0.50	5.0
38.	1,2-Dibromoethane	106-93-4	0.05	0.50	5.0
39.	Chlorobenzene	108-90-7		0.50	5.0
40.	Ethylbenzene	100-41-4		0.50	5.0
41.	Xylenes (Total)	1330-20-7		0.50	5.0
42.	Styrene	100-42-5		0.50	5.0
43.	Bromoform	75-25-2		0.50	5.0
44.	Isopropylbenzene	98-82-8		0.50	5.0
45.	1,1,2,2-Tetrachloroethane	79-34-5		0.50	5.0
46.	1,3-Dichlorobenzene	541-73-1		0.50	5.0
47.	1,4-Dichlorobenzene	106-46-7		0.50	5.0
48.	1,2-Dichlorobenzene	95-50-1		0.50	5.0
49.	1,2-Dibromo-3-chloropropane	96-12-8	0.05	0.50	5.0
50.	1,2,4-Trichlorobenzene	120-82-1		0.50	5.0
51.	1,2,3-Trichlorobenzene	87-61-6		0.50	5.0

Table 7.1

Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples

	Volatile Analyte	CAS Number	Low Level Soil (µg/Kg)	Med. Level Soil (µg/Kg)
1.	Dichlorodifluoromethane	75-71-8	5.0	500
2.	Chloromethane	74-87-3	5.0	500
3.	Vinyl Chloride	75-01-4	5.0	500
4.	Bromomethane	74-83-9	5.0	500
5.	Chloroethane	75-00-3	5.0	500
6.	Trichlorofluoromethane	75-69-4	5.0	500
7.	1,1-Dichloroethene	75-35-4	5.0	500
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	5.0	500
9.	Acetone	67-64-1	10.0	1000
10.	Carbon Disulfide	75-15-0	5.0	500
11.	Methyl Acetate	79-20-9	5.0	500
12.	Methylene chloride	75-09-2	5.0	500
13.	trans-1,2-Dichloroethene	156-60-5	5.0	500
14.	Methyl tert-Butyl Ether	1634-04-4	5.0	500
15.	1,1-Dichloroethane	75-34-3	5.0	500
16.	cis-1,2-Dichloroethene	156-59-2	5.0	500
17.	2-Butanone	78-93-3	10.0	1000
18.	Bromochloromethane	74-97-5	5.0	500
19.	Chloroform	67-66-3	5.0	500
20.	1,1,1-Trichloroethane	71-55-6	5.0	500
21.	Cyclohexane	110-82-7	5.0	500
22.	Carbon tetrachloride	56-23-5	5.0	500
23.	Benzene	71-43-2	5.0	500
24.	1,2-Dichloroethane	107-06-2	5.0	500
25.	1,4-Dioxane	123-91-1	125	12500
26.	Trichloroethane	79-01-6	5.0	500
27.	Methylcyclohexane	108-87-2	5.0	500
28.	1,2-Dichloropropane	78-87-5	5.0	500

Source
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Volatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples (Continued)

	Volatile Analyte	CAS Number	Low Level Soil (µg/Kg)	Med. Level Soil (µg/Kg)
29.	Bromodichloromethane	75-27-4	5.0	500
30.	cis-1,3-Dichloropropene	10061-01-5	5.0	500
31.	4-methyl-2-pentanone	108-10-1	10.0	1000
32.	Toluene	108-88-3	5.0	500
33.	Trans-1,3-Dichloropropene	10061-02-6	5.0	500
34.	1,1,2-Trichloroethane	79-00-5	5.0	500
35.	Tetrachloroethene	127-18-4	5.0	500
36.	2-Hexanone	591-78-6	10.0	1000
37.	Dibromochloromethane	124-48-1	5.0	500
38.	1,2-Dibromoethane	106-93-4	5.0	500
39.	Chlorobenzene	108-90-7	5.0	500
40.	Ethylbenzene	100-41-4	5.0	500
41.	Xylenes (Total)	1330-20-7	5.0	500
42.	Styrene	100-42-5	5.0	500
43	Bromoform	75-25-2	5.0	500
44.	Isopropylbenzene	98-82-8	5.0	500
45.	1,1,2,2-Tetrachloroethane	79-34-5	5.0	500
46.	1,3-Dichlorobenzene	541-73-1	5.0	500
47.	1,4-Dichlorobenzene	106-46-7	5.0	500
48.	1,2-Dichlorobenzene	95-50-1	5.0	500
49.	1,2-Dibromo-3-chloropropane	96-12-8	5.0	500
50.	1,2,4-Trichlorobenzene	120-82-1	5.0	500
51.	1,2,3-Trichlorobenzene	87-61-6	5.0	500

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples

	Semivolatile Analyte	CAS Number	Low Water By SIM[1] (µg/L)	Water (µg/L)
1.	Benzaldehyde	100-52-7		5.0
2.	Phenol	108-95-2	0.10	5.0
3.	Bis-(2-chlorothyl) ether	111-44-4		5.0
4.	2-Chlorophenol	95-57-8	0.10	5.0
5.	2-Methylphenol	95-48-7	0.10	5.0
6.	2,2'-Oxybis (1-chloropropane)[3]	108-60-1		5.0
7.	Acetophenone	98-86-2		5.0
8.	4-Methylphenol	106-44-5	0.10	5.0
9.	N-Nitroso-di-n-propylamine	621-64-7		5.0
10.	Hexachloroethane	67-72-1		5.0
11.	Nitrobenzene	98-95-3		5.0
12.	Isophorone	78-59-1		5.0
13.	2-Nitrophenol	88-75-5	0.10	5.0
14.	2,4-Dimethylphenol	105-67-9	0.10	5.0
15.	Bis (2-chloroethoxy) methane	111-91-1		5.0
16.	2,4-Dichlorophenol	120-83-2	0.10	5.0
17.	Naphthalene	91-20-3	0.10	5.0
18.	4-Chloroaniline	106-47-8		5.0
19.	Hexachlorobutadiene	87-68-3		5.0
20.	Caprolactam	105-60-2		5.0
21.	4-Chloro-3-methylphenol	59-50-7	0.10	5.0
22.	2-Methylnaphthalene	91-57-6		5.0
23.	Hexachlorocyclopentadiene	77-47-4		5.0
24.	2,4,6-Trichlorophenol	88-06-2	0.10	5.0
25.	2,4,5-Trichlorophenol[4]	95-95-4	0.20	10.0
26.	1,1'-Biphenyl	92-52-4		5.0
27.	2-Chloronaphthalene	91-58-7		5.0

Source

Table 7.1

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples (Continued)

	Semivolatile Analyte	CAS Number	Low Water By SIM[1] (µg/L)	Water (µg/L)
28.	2-Nitroaniline[4]	88-74-4		10.0
29.	Dimethylphthalate	131-11-3		5.0
30.	2,6-Dinitrotoluene	606-20-2		5.0
31.	Acenaphthylene	208-96-8	0.10	5.0
32.	3-Nitroaniline[4]	99-09-2		10.0
33.	Acenaphthene	83-32-9	0.10	5.0
34.	2,4-Dinitrophenol[4]	51-28-5	0.20	10.0
35.	4-Nitrophenol[4]	100-02-7	0.20	10.0
36.	Dibenzofuran	132-64-9		5.0
37.	2,4-Dinitrotoluene	121-14-2		5.0
38.	Diethylphthalate	84-66-2		5.0
39.	Fluorene	86-73-7	0.10	5.0
40.	4-Chlorophenyl-phenyl ether	7005-72-3		5.0
41.	4-Nitroaniline[4]	100-01-6		10.0
42.	4,6-Dinitro-2-methylphenol[4]	534-52-1	0.20	10.0
43.	N-Nitrosodiphenylamine	86-30-6		5.0
44.	1,2,4,5-Tetrachlorobenzene	95-34-3		5.0
45.	4-Bromophenyl-phenylether	101-55-3		5.0
46.	Hexachlorobenzene	100-52-7		5.0
47.	Atrazine	108-95-2	0.10	5.0
48.	Pentachlorophenol	111-44-4	0.20	10.0
49.	Phenanthrene	95-57-8	0.10	5.0
50.	Anthracene	95-48-7	0.10	5.0
51.	Carbazole	108-60-1		5.0
52.	Di-n-butylphthalate	98-86-2		5.0

Table 7.1

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Aqueous Samples (Continued)

	Semivolatile Analyte	CAS Number	Low Water By SIM[1] (µg/L)	Water (µg/L)
53.	Fluoroanthene	106-44-5	0.10	5.0
54.	Pyrene	621-64-7		5.0
55.	Butylbenzylphthalate	67-72-1		5.0
56.	3,3'-Dichlorobenzidine	98-95-3		5.0
57.	Benzo (a) anthracene	78-59-1		5.0
58.	Chrysene	88-75-5	0.10	5.0
59.	Bis (2-ethylhexyl) phthalate	105-67-9	0.10	5.0
60.	Di-n-octylphthalate	111-91-1		5.0
61.	Benzo (b) fluoranthene	120-83-2	0.10	5.0
62.	Benzo (k) fluoranthene	91-20-3	0.10	5.0
63.	Benzo (a) pyrene	106-47-8		5.0
64.	Indeno (1,2,3-cd) pyrene	87-68-3		5.0
65.	Benzo (a,h) anthracene	105-60-2		5.0
66.	Benzo (g,h,i) perylene	59-50-7	0.10	5.0

Source

Table 7.1

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples

	Semivolatile Analyte	CAS Number	Low Level By SIM[1] (µg/Kg)	Low Level Solids[2] (µg/Kg)	Med. Level Solids[2] (µg/Kg)
1.	Benzaldehyde	100-52-7		170	50000
2.	Phenol	108-95-2	3.3	170	50000
3.	Bis-(2-chlorothyl) ether	111-44-4		170	50000
4.	2-Chlorophenol	95-57-8	3.3	170	50000
5.	2-Methylphenol	95-48-7	3.3	170	50000
6.	2,2'-Oxybis (1-chloropropane)[3]	108-60-1		170	50000
7.	Acetophenone	98-86-2		170	50000
8.	4-Methylphenol	106-44-5	3.3	170	50000
9.	N-Nitroso-di-n-propylamine	621-64-7		170	50000
10.	Hexachloroethane	67-72-1		170	50000
11.	Nitrobenzene	98-95-3		170	50000
12.	Isophorone	78-59-1		170	50000
13.	2-Nitrophenol	88-75-5	3.3	170	50000
14.	2,4-Dimethylphenol	105-67-9	3.3	170	50000
15.	Bis (2-chloroethoxy) methane	111-91-1		170	50000
16.	2,4-Dichlorophenol	120-83-2	3.3	170	50000
17.	Naphthalene	91-20-3	3.3	170	50000
18.	4-Chloroaniline	106-47-8		170	50000
19.	Hexachlorobutadiene	87-68-3		170	50000
20.	Caprolactam	105-60-2		170	50000
21.	4-Chloro-3-methylphenol	59-50-7	3.3	170	50000
22.	2-Methylnaphthalene	91-57-6		170	50000
23.	Hexachlorocyclopentadiene	77-47-4		170	50000
24.	2,4,6-Trichlorophenol	88-06-2	3.3	170	50000

Table 7.1

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples (Continued)

	Semivolatile Analyte	CAS Number	Low Level By SIM[1] (µg/Kg)	Low Level Solids[2] (µg/Kg)	Med. Level Solids[2] (µg/Kg)
25.	2,4,5-Trichlorophenol[4]	95-95-4	6.7	330	100000
26.	1,1'-Biphenyl	92-52-4		170	50000
27.	2-Chloronaphthalene	91-58-7		170	50000
28.	2-Nitroaniline[4]	88-74-4		330	100000
29.	Dimethylphthalate	131-11-3		170	50000
30.	2,6-Dinitrotoluene	606-20-2		170	50000
31.	Acenaphthylene	208-96-8	3.3	170	50000
32.	3-Nitroaniline[4]	99-09-2		330	100000
33.	Acenaphthene	83-32-9	3.3	170	50000
34.	2,4-Dinitrophenol[4]	51-28-5	6.7	330	100000
35.	4-Nitrophenol[4]	100-02-7	6.7	330	100000
36.	Dibenzofuran	132-64-9		170	50000
37.	2,4-Dinitrotoluene	121-14-2		170	50000
38.	Diethylphthalate	84-66-2		170	50000
39.	Fluorene	86-73-7	3.3	170	50000
40.	4-Chlorophenyl-phenyl ether	7005-72-3		170	50000
41.	4-Nitroaniline[4]	100-01-6		330	100000
42.	4,6-Dinitro-2-methylphenol[4]	534-52-1	6.7	330	100000
43.	N-Nitrosodiphenylamine	86-30-6		170	50000
44.	1,2,4,5-Tetrachlorobenzene	95-34-3		170	50000
45.	4-Bromophenyl-phenylether	101-55-3		170	50000
46.	Hexachlorobenzene	118-74-1		170	10000
47.	Atrazine	1912-24-9		170	50000
48.	Pentachlorophenol	87-86-5	6.7	330	100000

Source

Table 7.1

Semivolatiles Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) for Solid Samples (Continued)

	Semivolatile Analyte	CAS Number	Low Level By SIM[1] (µg/Kg)	Low Level Solids[2] (µg/Kg)	Med. Level Solids[2] (µg/Kg)
49.	Phenanthrene	85-01-8	3.3	170	50000
50.	Anthracene	120-12-7	3.3	170	50000
51.	Carbazole	86-74-8		170	50000
52.	Di-n-butylphthalate	84-74-2		170	50000
53.	Fluoroanthene	206-44-0	3.3	170	50000
54.	Pyrene	129-00-0	3.3	170	50000
55.	Butylbenzylphthalate	85-68-7		170	50000
56.	3,3'-Dichlorobenzidine	91-94-1		170	50000
57.	Benzo (a) anthracene	56-55-3	3.3	170	50000
58.	Chrysene	218-01-9	3.3	170	50000
59.	Bis (2-ethylhexyl) phthalate	117-81-7		170	50000
60.	Di-n-octylphthalate	117-84-0		170	50000
61.	Benzo (b) fluoranthene	205-99-2	3.3	170	50000
62.	Benzo (k) fluoranthene	207-08-9	3.3	170	50000
63.	Benzo (a) pyrene	50-32-8	3.3	170	50000
64.	Indeno (1,2,3-cd) pyrene	193-39-5	3.3	170	50000
65.	Benzo (a,h) anthracene	53-70-3	3.3	170	50000
66.	Benzo (g,h,i) perylene	191-24-2	3.3	170	50000

Source

Table 7.1

Pesticide Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) For Aqueous and Solid Samples

	Pesticide Analyte	CAS Number	Water (µg/L)	Solids[1] (µg/Kg)
1.	alpha-BHC	319-84-6	0.050	1.7
2.	beta-BHC	319-85-7	0.050	1.7
3.	delta-BHC	319-86-8	0.050	1.7
4.	gamma-BHC (Lindane)	58-89-9	0.050	1.7
5.	Heptachlor	76-44-8	0.050	1.7
6.	Aldrin	309-00-2	0.050	1.7
7.	Heptachlor epoxide[2]	1024-57-3	0.050	1.7
8.	Endosulfan I	959-98-8	0.050	1.7
9.	Dieldrin	60-57-1	0.10	3.3
10.	4,4'-DDE	72-55-9	0.10	3.3
11.	Endrin	72-20-8	0.10	3.3
12.	Endosulfan II	33213-65-9	0.10	3.3
13.	4,4'-DDD	72-54-8	0.10	3.3
14.	Endosulfan sulfate	1031-07-8	0.10	3.3
15.	4,4'-DDT	50-29-3	0.10	3.3
16.	Methoxychlor	72-43-5	0.10	3.3
17.	Endrin ketone	53494-70-5	0.10	3.3
18.	Endrin aldehyde	7421-93-4	0.10	3.3
19.	alpha-Chlordane	5103-71-9	0.050	1.7
20.	gamma-Chlordane	5103-74-2	0.050	1.7
21.	Toxaphene	8001-35-2	5.0	34

Pesticide Notes

[1] There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of pesticides.

[2] Only the exo-epoxy isomer (isomer B) of heptachlor epoxide is reported on the data reporting forms (Exhibit B).

Table 7.1

PCB Aroclor Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) For Aqueous and Solid Samples

	Aroclor Analyte	CAS Number	Water (µg/L)	Solids[1] (µg/Kg)
1.	Arochlor-1016	12674-11-2	1.0	33
2.	Arochlor-1221	11104-28-2	1.0	33
3.	Arochlor-1232	11141-16-5	1.0	33
4.	Arochlor-1242	53469-21-9	1.0	33
5.	Arochlor-1248	12672-29-6	1.0	33
6.	Arochlor-1254	11097-69-1	1.0	33
7.	Arochlor-1260	11096-82-5	1.0	33
8.	Arochlor-1262	37324-23-5	1.0	33
9.	Arochlor-1268	11100-14-4	1.0	33

Aroclor PCB Notes

[1] There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of Aroclor PCBs.

Table 7.1

PCB Congeners Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) For Aqueous and Solid Samples

	Congener Analyte	IUPAC Number	CAS Number	Water (pg/L)	Solids[1] (ng/Kg)
1.	2-MoCB	1	2051-60-7	20	2.0
2.	4-MoCB	3	2051-62-9	20	2.0
3.	2,2'-DiCB	4	13029-08-8	20	2.0
4.	4,4'-DiCB	15	2050-68-2	20	2.0
5.	2,2',6'-TrCB	19	38444-73-4	20	2.0
6.	3,4,4'-TrCB	37	38444-90-5	20	2.0
7.	2,2',6,6'-TeCB	54	15968-05-5	20	2.0
8.	3,3',4,4'-TeCB	77	32598-13-3	20	2.0
9.	3,4,4',5-TeCB	81	70362-50-4	20	2.0
10.	2,2',4,6,6'-PeCB	104	56558-16-8	20	2.0
11.	2,3,3',4,4'-PeCB	105	32598-14-4	20	2.0
12.	2,3,4,4',5-PeCB	114	74472-37-0	20	2.0
13.	2,3',4,4',5-PeCB	118	31508-00-6	20	2.0
14.	2',3,4,4',5-PeCB	123	65510-44-3	20	2.0
15.	3,3',4,4',5-PeCB	126	57465-28-8	20	2.0
16.	2,2',4,4',6,6'-HxCB	155	33979-03-2	20	2.0
17.	2,3,3',4,4',5-HxCB	156	38380-08-4	20	2.0
18.	2,3,3',4,4',5'-HxCB	157	69782-90-7	20	2.0
19.	2,3',4,4',5,5'-HxCB	167	52663-72-6	20	2.0
20.	3,3',4,4',5,5'-HxCB	169	32774-16-6	20	2.0
21.	2,2',3,4',5,6,6'-HpCB	188	74487-85-7	20	2.0
22.	2,2',3,4',5,6,6'-HpCB	189	39635-31-9	20	2.0
23.	2,2',3,3',5,5',6,6'-OcCB	202	2136-99-4	20	2.0
24.	2,3,3',4,4',5,5',6-OcCB	205	74472-53-0	20	2.0
25.	2,2',3,3',4,4',5,5',6-NoCB	206	40186-72-9	20	2.0

Source

PCB Congeners Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) For Aqueous and Solid Samples (Continued)

	Congener Analyte	IUPAC Number	CAS Number	Water (pg/L)	Solids[1] (ng/Kg)
26.	2,2',3,3',4,5,5',6,6'-NoCB	208	52663-77-1	20	2.0
27.	DeCB	209	2051-24-3	20	2.0

Congener PCB Notes

[1]There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of congener PCBs.

Table 7.1

PCDD/F Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL) For Aqueous and Solid Samples

	PCDD/F Analyte	CAS Number	Water (pg/L)	Solids[1] (ng/Kg)
1.	2,3,7,8-TCDD	1746-01-6	10	1.0
2.	1,2,3,7,8-PeCDD	40321-76-4	50	5.0
3.	1,2,3,6,7,8-HxCDD	57653-85-7	50	5.0
4.	1,2,3,4,7,8-HxCDD	39227-28-6	50	5.0
5.	1,2,3,7,8,9-HxCDD	19408-74-3	50	5.0
6.	1,2,3,4,6,7,8-HpCDD	35822-46-9	50	5.0
7.	OCDD	3268-87-9	100	10
8.	2,3,7,8-TCDF	51207-31-9	10	1.0
9.	1,2,3,7,8-PeCDF	57117-41-6	50	5.0
10.	2,3,4,7,8-PeCDF	57117-31-4	50	5.0
11.	1,2,3,6,7,8-HxCDD	57117-44-9	50	5.0
12.	1,2,3,7,8,9-HxCDD	72918-21-9	50	5.0
13.	1,2,3,4,7,8-HxCDD	70648-26-9	50	5.0
14.	2,3,4,6,7,8-HxCDD	60851-34-5	50	5.0
15.	1,2,3,4,6,7,8-HpCDD	67562-39-4	50	5.0
16.	1,2,3,4,7,8,9-HpCDD	55673-89-7	50	5.0
17.	OCDF	39001-02-0	100	10

PCDD/F Notes

[1] There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of PCDDs and PCDFs.

Source

Table 7.1

Inorganic Target Compound List (TCL) and Contract Required Quantitation Limits (CRQLs) For Aqueous and Solid Samples

	Analyte	CAS Number	ICP-AES[1] CRQL for Water (µg/L)	ICP-AES[1] CRQL for Solids (mg/Kg)	ICP-MS[1] for Water (µg/L)
1.	Aluminum	7429-90-5	200	40	30
2.	Antimony	7440-36-0	60	12	2
3.	Arsenic	7440-38-2	15	3	1
4.	Barium	7440-39-3	200	40	10
5.	Beryllium	7440-41-7	5	1	1
6.	Cadmium	7440-43-9	5	1	1
7	Calcium	7440-70-2	5000	1000	--
8.	Chromium	7440-47-3	10	2	2
9.	Cobalt	7440-48-4	50	10	0.5
10.	Copper	7440-50-8	25	5	2
11.	Iron	7439-89-6	100	20	--
12.	Lead	7439-92-1	10	2	1
13.	Magnesium	7439-95-4	5000	1000	--
14.	Manganese	7439-96-5	15	3	0.5
15.	Mercury[2]	7439-97-6	0.2	0.1	--
16.	Nickel	7440-02-0	40	8	1
17.	Potassium	7440-09-7	5000	1000	--
18.	Selenium	7782-49-2	35	7	5
19.	Silver	7440-22-4	10	2	1
20.	Sodium	7440-23-5	5000	1000	--
21.	Thallium	7440-28-0	25	5	1
22.	Vanadium	7440-62-2	50	10	1
23.	Zinc	7440-66-6	60	12	1
24.	Cyanide[2]	57-12-5	10	1	--

Appendix G:

Community Air Monitoring Plan

SESI
CONSULTING ENGINEERS

Geotechnical
Environmental
Site Civil

959 Route 46E, Fl 3, Ste 300
Parsippany, NJ 07054
973.808.9050
www.sesi.org

Community Air Monitoring Plan
For

One Water Street Blacksmith and Wheelwright Site
1 Water Street
White Plains, Westchester County, New York

Prepared for:
1 Water Street, L.L.C.

December 2025

SESI Project No:
12392

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LIST OF ACRONYMS

Acronym	Definition
CAMP	Community Air Monitoring Plan
IRM	Interim Remedial Measure
mcg/m^3	micrograms per cubic meter
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PID	Photoionization Detector
PM-10	Less than 10 micrometers
ppm	Parts Per Million
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This document presents a Community Air Monitoring Plan (CAMP) for the remedial investigation (RI) for the proposed development at 1 Water Street, White Plains, New York (the "Site").

The Site, which is the subject of this Remedial Investigation Work Plan (RIWP), for the Brownfield Cleanup Program project (BCP No. C360235) known as the One Water Street Blacksmith and Wheelwright Site proposed development at 1 Water Street, White Plains, New York (the "Site"). The Site consists of a 1.17823-acre area vacant parcel and is located at 1 Water Street, Westchester County, White Plains, New York. The Site is identified as a portion of parcel 125.66.2-1.11 on the Westchester County tax map.

The Site is bound to the east by a public parking lot. The Site is bound to the south by Water Street, a City of White Plains bus terminal, and a parking garage beyond, to the west by Ferris Avenue, the White Plains Fire Station and a municipal building and to the north by a public parking lot and Hillside Terrace beyond.

Most recently, the Site was improved with a four-story commercial office building that was reportedly built in the early 1980s and contains a footprint of approximately 11,500 square feet, which yields a total floor area of approximately 46,000 square feet. The building was razed in 2021. Review of historical Sanborn maps identified the Site historical uses included single-family dwellings on the northern portion of the Site in 1889. From 1894 to 1900 there is also a wagon storage, sheds, a carport, and a dwelling on the southern portion of the Site. In 1905 a previously existing and unlabeled building in the central portion of the Site is labeled G.F. Coombs House Mover. In 1911 a blacksmith is depicted on the southwestern portion of the Site and an auto shed on the southeastern portion of the Site. In 1930 there are two residential apartment buildings (Flats), the blacksmith has been razed, the structure on the southern portion of the Site is labeled Old Machines, and a new structure labeled BL SM Wheelwright appears. In 1950 most of the structures in the southern portion of the Site were razed, along with the former Wheelwright and machine storage. From 1987 to 2004 the Site is depicted with the former commercial office building.

2.0 OBJECTIVES

The objective of the CAMP is to provide a measure of protection for the downwind community from potential airborne contaminant releases that may arise during all ground intrusive activities, and potentially contaminated soil and material handling and staging. In addition, the CAMP is intended to ensure that dust and contaminants are not leaving the work zone**.**

3.0 METHODS

The CAMP will include continuous monitoring for particulate matter (e.g. airborne "dust") and volatile organic compounds (VOCs) during the planned remedial excavation and construction activities. Any CAMP exceedances will be reported to the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH) on the same business day and as soon as possible. Notification of the exceedance will be sent

via email along with the reason for the exceedance, the measure(s) taken to address the exceedance, and if the exceedance was resolved.

3.1 CONTINUOUS MONITORING

Continuous monitoring for particulates and VOCs will be conducted during all ground intrusive activities including soil borings, monitoring well installations, and archaeological excavations

3.2 PERIODIC MONITORING

Periodic monitoring for VOCs will be conducted 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 consists 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.

4.0 VOC MONITORING, RESPONSE LEVELS, AND ACTIONS

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. The monitoring work will be performed using a photoionization detector (PID) equipped with a 10.6 ev lamp. The equipment will 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.

- 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 the15-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.
- 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.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shut down.
- All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

5.0 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.

- 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.
- 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.

All readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review.

6.0 SPECIAL REQUIREMENTS FOR WORK WITHIN 20 FEET OF POTENTIALLY EXPOSED INDIVIDUAL STRUCTURES

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work

activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed one (1) ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m^3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m^3 or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

Appendix H:

CPP

NEW YORK STATE | Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
One Water Street Blacksmith & Wheelwright Site

October 2023

Site # C360235
1 Water Street, White Plains, New York 10601
County of Westchester, NY

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* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site's investigation and cleanup process.

Applicant: **1 Water Street L.L.C. ("Applicant")**
Site Name: **One Water Street Blacksmith & Wheelwright Site ("Site")**
Site Address: **1 Water Street, White Plains, New York 10601**
Site County: **Westchester**
Site Number: **C360235**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants who conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at:
http://www.dec.ny.gov/chemical/8450.html .

2. Citizen Participation Activities

Why NYSDEC Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social well-being. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interested in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process

- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process

- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community

- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to whom the public should address questions or request information about the site's investigation and cleanup program. The public's suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the site's investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

Site Contact List

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.
The site contact list includes, at a minimum:

- chief executive officer and planning board chairperson of each county, city, town and village in which the site is located;
- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- location(s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

Note: The first site fact sheet (usually related to the draft Remedial Investigation Work Plan) is distributed both by paper mailing through the postal service and through DEC Delivers, its email listserv service. The fact sheet includes instructions for signing up with the appropriate county listserv to receive future notifications about the site. See http://www.dec.ny.gov/chemical/61092.html .

Subsequent fact sheets about the site will be distributed exclusively through the listserv, except for households without internet access that have indicated the need to continue to receive site information in paper form. Please advise the NYSDEC site project manager identified in Appendix A if that is the case. Paper mailings may continue during the investigation and cleanup process for some sites, based on public interest and need.

CP Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the site's investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a site's investigation and cleanup.

The public is encouraged to contact project staff at any time during the site's investigation and cleanup process with questions, comments, or requests for information.

This CP Plan may be revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities. Modifications may include additions to the site contact list and changes in planned citizen participation activities.

Technical Assistance Grant

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

As of the date the declaration (page 2) was signed by the NYSDEC project manager, the significant threat determination for the site had not yet been made.

To verify the significant threat status of the site, the interested public may contact the NYSDEC project manager identified in Appendix A.

For more information about TAGs, go online at
http://www.dec.ny.gov/regulations/2590.html

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

Citizen Participation Activities	Timing of CP Activity(ies)
Application Process:	
• Prepare site contact list • Establish document repository(ies)	At time of preparation of application to participate in the BCP.
• Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement (BCA):	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation **Note:** Applicant must submit CP Plan to NYSDEC for review and approval within 20 days of the effective date of the BCA.
Before NYSDEC Approves Remedial Investigation (RI) Work Plan:	
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes Remedial Investigation:	
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves Remedial Work Plan (RWP):	
• Distribute fact sheet to site contact list about draft RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts Cleanup Action:	
• Distribute fact sheet to site contact list that describes upcoming cleanup action	Before the start of cleanup action.
After Applicant Completes Cleanup Action:	
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that NYSDEC is reviewing the Final Engineering Report • Distribute fact sheet to site contact list announcing NYSDEC approval of Final Engineering Report and issuance of Certificate of Completion (COC)	At the time the cleanup action has been completed. **Note:** The two fact sheets are combined when possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern that relate to the site. Additional major issues of public concern may be identified during the course of the site's investigation and cleanup process.

There will be areas on the Site where soil excavation is necessary. Therefore, once the remediation commences, there may be concerns regarding odors, noise or truck traffic coming from the site. However, these impacts will be mitigated through implementation of a Health and Safety Plan and Soil Management Plan approved by NYSDEC, which will be designed to minimize these impacts. A Community Air Monitoring Plan will also be implemented to monitor dust and vapors to ensure the community is not impacted. CAMP implementation involves the placement of air monitoring stations upwind and downwind of where work is occurring to capture both dust and vapor emissions. If dust or emissions exceed a set threshold established by NYSDEC and the New York State Department of Health (NYSDOH), then work must cease and the cause of the issue must be corrected before work can proceed.

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

Location: 1 Water Street, White Plains, New York 10810; County of Westchester

Setting: Urban

Site Size: 1.178 Acres

Adjacent Properties: Commercial; Car dealership and service facility; Bus Terminal; Municipal Parking; Municipal building and Fire House

History of Site Use, Investigation, and Cleanup

The historical use of the Site as blacksmith and wheelwright is believed to have caused semi-volatile organic compounds (SVOCs) (e.g. ash residue) and metals contamination in the soil and other contamination in groundwater and soil vapor since this use was present for many years. A wheelwright repairs wheels and this prior operation, which extended into the 1940s, may have used solvents to clean equipment. The wheelwright operation may have also used historic fill containing ash on the site and a buried transformer was identified. In addition, in 1911 Standard Oil and in 1930, The Texas Co., which operated an Oil Storage warehouse, fronted the Site. In 1950, Westchester Asphalt Company fronted the Site and its operations including storage of asphalt and gasoline tanks were present. Contaminated historic fill material containing varying amounts of brick, concrete, asphalt, and ash was also identified at the Site during a 2018 geotechnical investigation and later during 2021 and 2022 subsurface

investigations. There are two abandoned underground water holding tanks of unknown capacity that may have been utilized at the Site for the old sprinkler system, which may not pose an environmental risk, but will need to be removed. An earlier 1997 investigation report also revealed that underground storage tanks were historically present at the adjacent Fire House Station site, which may have leaked and lead to some on-Site contamination. There were four historic spills at the adjacent Fire House Station Site and a total of four underground storage tanks (USTs) were removed by April 1991. This Fire Station may have also led to some of the Per- and Polyfluoroalkyl Substances (PFAS) (chemicals that are present in fire fighting foam), groundwater contamination. Trichlorofluoromethane (Freon-11) such as refrigerants, aerosol propellant, foam-blowing agent) was also detected throughout the Site, indicating a potential Freon-11 release.

There have been three (3) Investigations conducted to date as follows:

#	Consultant	Investigation Report Title	Date	Site Owner
1	Enviroprobe Services Inc.	Geophysical Investigation Report	February 2018	1 Water Street L.L.C.
2	SESI Consulting Engineers	Phase I Environmental Site Assessment Report	March 2018	1 Water Street L.L.C.
3	SESI Consulting Engineers	Phase II Environmental Site Assessment Report	September 2022	1 Water Street L.L.C.

Based on three investigations conducted to date, the primary contaminants of concern are: semi-volatile organic compounds (SVOCs) including ash and metals in soil; volatile organic compounds (VOCs) such as acetone, SVOCs, one pesticide, Per- and Polyfluoroalkyl Substances (PFAS) and metals in groundwater; and multiple types of VOCs in soil vapor. In soil, the SVOCs contamination may have been caused by the former wheelwright operations. The heavy metals present include arsenic and lead. In groundwater there is one chlorinated solvent (i.e. chemical compounds that contain chlorine used for industrial purposes) VOC, SVOCs that may have originated from the wheelwright operations and metals including lead, one Pesticide; and some PFAS substances, which are man-made chemicals included in products such as cleaners, paints, fire-fighting foams and wire insulation. The soil vapor gas included petroleum-related and chlorinated solvents related VOCs as well as freon, which may have originated from aerosol sprays, paints, solvents, stored fuel and automotive products. Therefore, all three environmental media - soil, groundwater and soil vapor - have been impacted.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a **Participant**. This means that the Applicant was the owner of the site at the time of the disposal or discharge of contaminants or was otherwise liable for the disposal or discharge of the contaminants. The Participant must fully characterize the

nature and extent of contamination onsite, as well as the nature and extent of contamination that has migrated from the site. The Participant also must conduct a "qualitative exposure assessment," a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for unrestricted use or restricted residential use.

To achieve this goal, the Applicant will conduct additional investigation and then cleanup activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant will conduct an investigation of the site officially called a "remedial investigation" (RI). This investigation will be performed with NYSDEC oversight. The Applicant must develop a remedial investigation workplan, which is subject to public comment.

The site investigation has several goals:

1) define the nature and extent of contamination in soil, surface water, groundwater and any other parts of the environment that may be affected;
2) identify the source(s) of the contamination;
3) assess the impact of the contamination on public health and the environment; and
4) provide information to support the development of a proposed remedy to address the contamination or the determination that cleanup is not necessary.

The Applicant submits a draft "Remedial Investigation Work Plan" to NYSDEC for review and approval. NYSDEC makes the draft plan available to the public review during a 30-day public comment period.

When the investigation is complete, the Applicant will prepare and submit a report that summarizes the results. This report also will recommend whether cleanup action is needed to address site-related contamination. The investigation report is subject to review and approval by NYSDEC.

NYSDEC will use the information in the investigation report to determine if the site poses a significant threat to public health or the environment. If the site is a "significant threat," it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Interim Remedial Measures

An Interim Remedial Measure (IRM) is an action that can be undertaken at a site when a source of contamination or exposure pathway can be effectively addressed before the site investigation and analysis of alternatives are completed. If an IRM is likely to represent all or a significant part of the final remedy, NYSDEC will require a 30-day public comment period.

Remedy Selection

When the investigation of the site has been determined to be complete, the project likely would proceed in one of two directions:

1. The Applicant may recommend in its investigation report that no action is necessary at the site. In this case, NYSDEC would make the investigation report available for public comment for 45 days. NYSDEC then would complete its review, make any necessary revisions, and, if appropriate, approve the investigation report. NYSDEC would then issue a "Certificate of Completion" (described below) to the Applicant.

or

2. The Applicant may recommend in its investigation report that action needs to be taken to address site contamination. After NYSDEC approves the investigation report, the Applicant may then develop a cleanup plan, officially called a "Remedial Work Plan". The Remedial Work Plan describes the Applicant's proposed remedy for addressing contamination related to the site.

When the Applicant submits a draft Remedial Work Plan for approval, NYSDEC would announce the availability of the draft plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft cleanup plan if necessary, before approving the proposed remedy. The New York State Department of Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy. The selected remedy is formalized in the site Decision Document.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH oversee the activities. When the Applicant completes cleanup activities, it will prepare a final engineering report that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

Certificate of Completion

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

Site Management

The purpose of site management is to ensure the safe reuse of the property if contamination will remain in place. Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An *institutional control* is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An *engineering control* is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that pumps and treats groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A -
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

NYSDEC – Project Manager

Oliver Wolfe
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233
oliver.wolfe@dec.ny.gov

New York State Department of Health

Sarita Wagh
Project Manager
NYSDOH, Bureau of Environmental Exposure Investigation
Empire State Plaza
Corning Tower, Room 1787
Albany, NY 12237
(518) 402-7860
BEEI@health.ny.gov

Citizen Participation Specialist NYSDEC

Stephanie Mossey
Citizen Participation Specialist
NYSDEC
21 S Putt Corners Rd
New Paltz, NY
(845) 256-3154

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

PUBLIC LIBRARY	
Galina Chernykh Harrison Public Library, West Harrison Branch, Director 2 Madison Street West Harrison, NY 10604 (914) 948-2092 https://www.harrisonpl.org/west-harrison-branch	HOURS: Sunday,..... Closed Monday, ... Closed Tuesday, ... 10:00am-5:00pm Wednesday, ... 10:00am-7:00pm Thursday, ... 10:00am-5:00pm Friday,..... 10:00am-5:00pm Saturday,..... 10:00am-5:00pm

Appendix B - Site Contact List

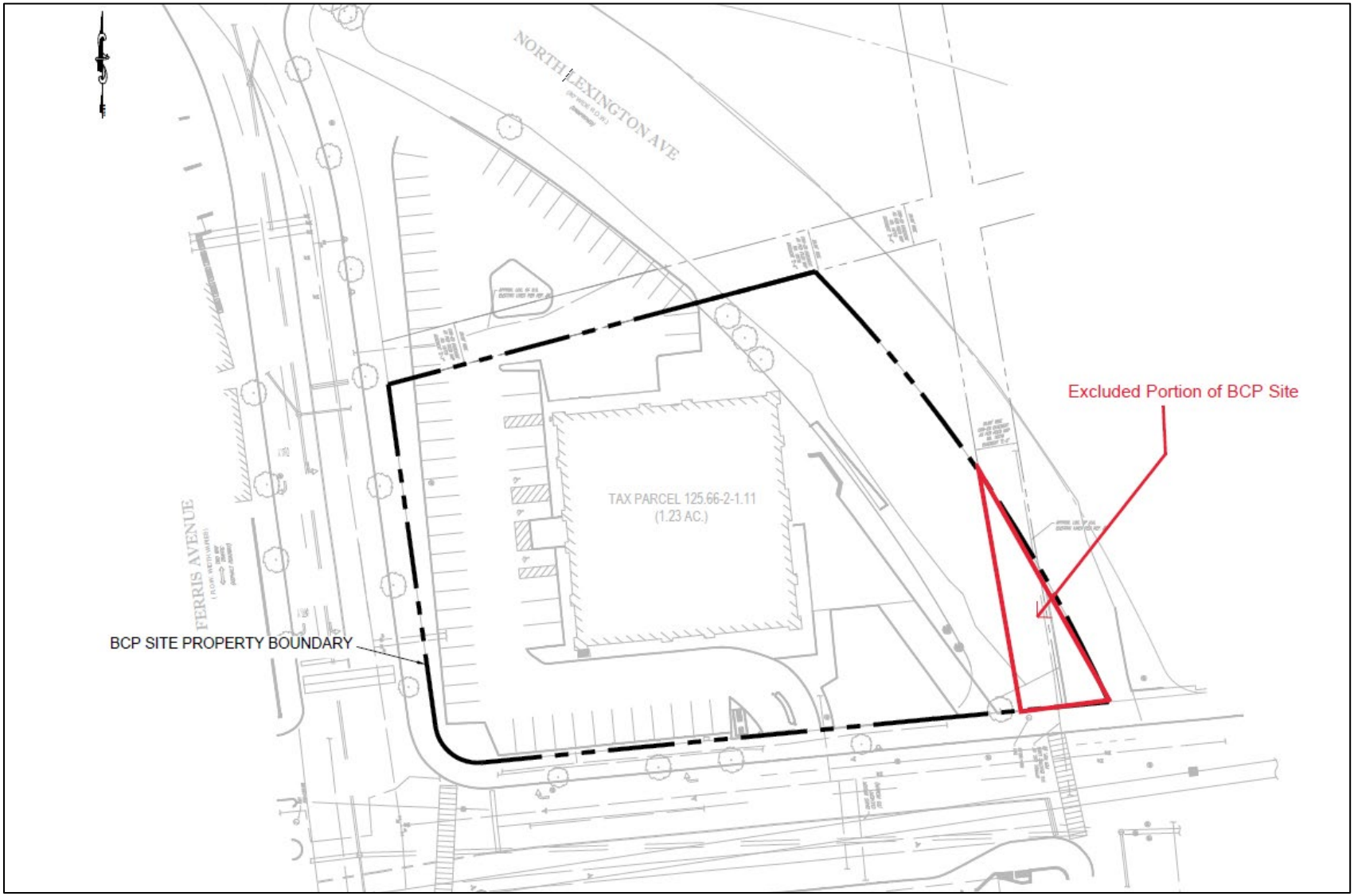
SITE CONTACT LIST

GOVERNMENT / MUNICIPALITIES		
Charles Schumer U.S. Senator Leo O'Brien Building, Room 827 Albany, NY 12207	Kirsten Gillibrand U.S. Senator Leo O'Brien Building, Room 821 Albany, NY 12207	Mondaire Jones U.S. House of Representatives, 17th District 222 Mamaroneck Avenue, Suite 213 White Plains, NY 10605
Andrea Stewart-Cousins New York State Senator. 35th District 28 Wells Avenue, Building #3, 5th Floor Yonkers, NY 10701	Chris Burdick NYS Assemblymember 93rd District 100 S. Bedford Road, Suite 150 Mount Kisco, NY 10549	George Latimer Westchester County Executive 148 Martine Avenue White Plains, NY 10601
Richard Hyman Westchester County Planning Board, Chair 148 Martine Avenue White Plains, NY 10601	Timothy C. Idoni Westchester County Clerk 110 Dr. Martin Luther King Jr. Blvd. White Plains, NY 10601	Thomas Toach Mayor of White Plains 255 Main Street White Plains, NY 10601
John Ioris White Plains Planning Board, Chair 225 Main Street White Plains, NY 10601		
UTILITIES / PUBLIC WATER AUTHORITIES		
Stefania A. Mignone White Plains Department of Public Works, Commissioner 225 Main Street White Plains, NY 10601	Bureau of Water & Wastewater City of White Plains Public Water Supplier 255 Main Street White Plains, NY 10601	
MEDIA		
The Journal News Media 1133 Westchester Avenue, Suite N110 White Plains, NY 10605		
LIBRARIES / COMMUNITY CENTERS		
Galina Chernykh Harrison Public Library, West Harrison Branch, Director 2 Madison Street West Harrison, NY 10604		
SCHOOLS / DAYCARE CENTERS		
Patricia Simone Lee F. Jackson School, Principal 2 Saratoga Road White Plains, NY 10607	Kim Ross Mohawk Country Day School, School Director 200 Old Tarr ytown Road White Plains, NY 10603	Myra Castillo Church Street School, Principal 295 Church Street White Plains, NY 10603

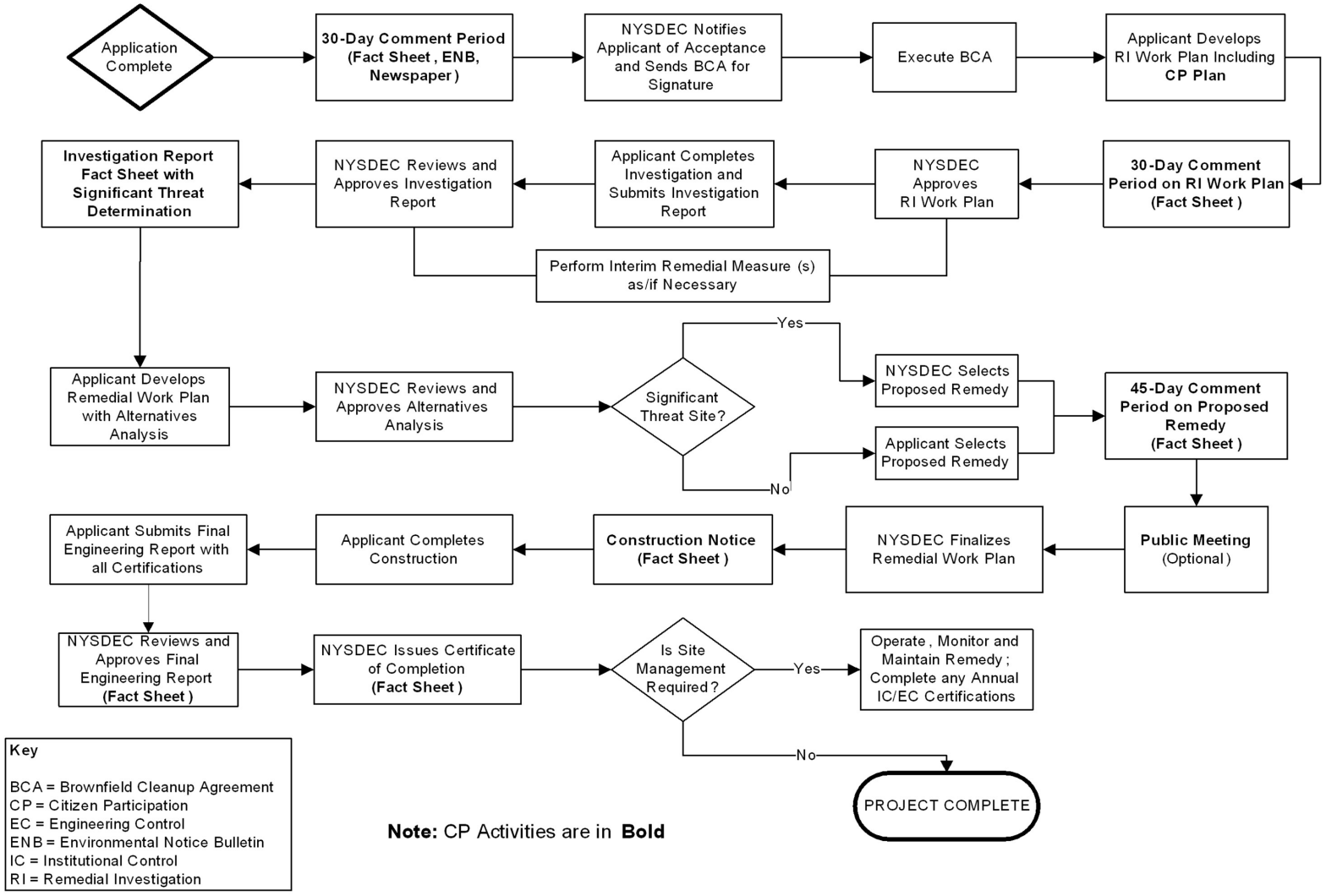
SITE CONTACT LIST

Shqype Rraci Richard J. Bailey School, Principal 33 West Hillside Avenue White Plains, NY 10607	Paul M. Pizzutello Reach Academy 45 Gainsborg Avenue East West Harrison, NY 10604	Leroy Dixon Eastview Campus - Middle School, Principal 350 Main Street White Plains, NY 10601
Laura Mungin George Washington School, Principal 100 Orchard Street White Plains, NY 10604	Timothy Dwyer School Choice International, CEO 150 Grand Street White Plains, NY 10601	Dennis Kortright S.J. Preston Elementary 50 Taylor Avenue West Harrison, NY 10604
Ryan Monk Fusion Academy Westchester, Campus Director 1 N Broadway, Suite 120 White Plains, NY 10601	Josefa A Estrella Estrella's Child Care LLC 91 Russell Street White Plains, NY 10606	Anatolia Torres Westchester Sunny Daycare 52 W Prospect Avenue White Plains, NY 10607
Gary Mastrangelo Highview Elementary School 200 N Central Avenue Hartsdale, NY 10530	Delia Reyes Pilar's Day Care 62 Lincoln Avenue White Plains, NY 10606	Hope Pierce Lil Explorers Preschool 39 Trenton Avenue White Plains, NY 10606
Patricia Patricia's Day Care 58 Lincoln Avenue White Plains, NY 10606	Adagui G. Marchena Mini City Daycare 66 Concord Avenue White Plains, NY 10606	Anthony Ross Children's Corner Learning Center 120 Bloomingdale Road White Plains, NY 10605
ADJACENT PROPERTY OWNERS		
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**

Appendix C - Site Location Map



Appendix D - Brownfield Cleanup Program Process



Note: CP Activities are in **Bold**

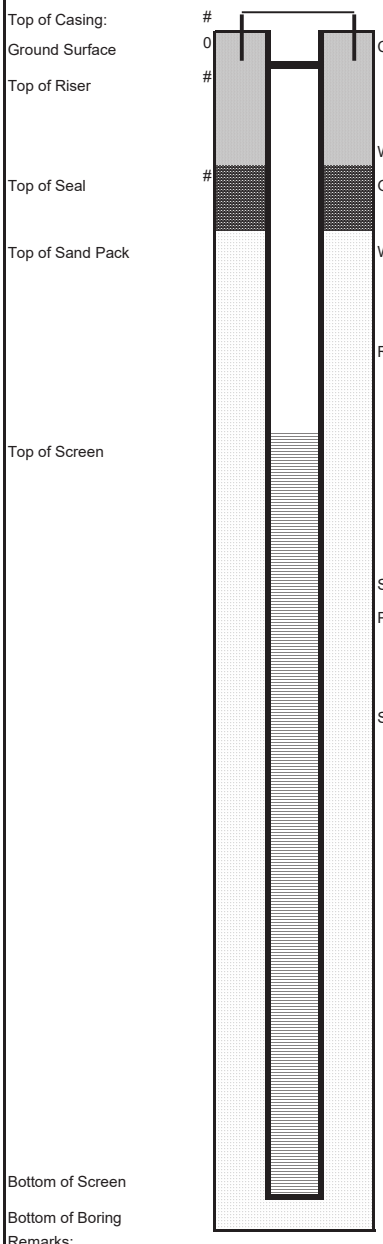
Appendix I:

Typical Well Construction Diagram

SESI CONSULTING ENGINEERS	PROJECT NAME:		MONITORING WELL NO.	
	PROJECT LOCATION:		JOB NO.	
			GROUND ELEVATION:	

BORING BY:	DATE STARTED		DEVELOPMENT PERIOD		INSIDE CASING DIAMETER (in)	
INSPECTOR:	DATE COMPLETED		DEVELOPMENT METHOD		BOREHOLE DIAMETER (in)	
NJ DEP PERMIT NO.:	DATE DEVELOPED		DEVELOPMENT RATE	# gpm	INITIAL WATER LEVEL (ft):	

WELL CONSTRUCTION	DEPTH (ft)	Sample	Blows on Spoon 0/6	6/12	12/18	18/24	REC (in)	SOIL DESCRIPTION AND STRATIFICATION	P.I.D.
	0								



Approximate Change in Strata: _____ Inferred Change in Strata: _ _ _ _ _ _ _ _ _ _ _ _

The subsurface information shown hereon was obtained for the design and estimating purposes for our client. It is made available to authorized users only that they may have access to the same information available to our client. It is presented in good faith, but it is not intended as a substitute for investigations, interpretations or judgment of such authorized users. Information on the logs should not be relied upon without the geotechnical engineers recommendations contained in the report from which these logs were extracted. Soil descriptions represent a field identification after D. M. Burmister unless otherwise noted.

FIGURE #