SESI
CONSULTING ENGINEERS

Geotechnical
Environmental
Site Civil

959 Route 46E, Fl 3, Ste 300
Parsippany, NJ 07054
973.808.9050
www.sesi.org

REMEDIAL ACTION WORKPLAN

For

Former Printex Corporation Site
34 State Street
Block 2, Lot 17
Ossining, Westchester County, NY
BCP Site No. C360263

Prepared for:
WB 34 State LLC

SESI Project No:
13968

Date:
August 17, 2026

CERTIFICATIONS

"I, Fuad Dahan, PE, certify that I am currently a NYS registered professional engineer or Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Report 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 that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications."

NYS Professional Engineer (# 090531)	Date	Signature

It is a violation of Article 130 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 130, New York State Education Law

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LIST OF ACRONYMS

Acronym	Definition
ACM	Asbestos-containing Material
AWQS	Ambient Water Quality Standards
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
CAMP	Community Air Monitoring Plan
COC	Certificate of Completion
CPP	Citizens Participation Plan
CSM	Conceptual Site Model
CVOC	Chlorinated Volatile Organic Compound
cy	Cubic yard
DER	Division of Environmental Remediation
DER-10	NYSDEC Technical Guidance for Site Investigation & Remediation
ECs	Engineering Controls
EE	Environmental Easement
ESA	Environmental Site Assessment
FER	Final Engineering Report
ft-bgs	feet below ground surface
HASP	Health and Safety Plan
ICs	Institutional Controls
ISCO	In Situ Chemical Oxidation
LBP	Lead-based Paint
LNAPL	Light Non-Aqueous Phase Liquid
MW	Monitoring Well
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
ORC	Oxygen Releasing Compound
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PDI	Pre-Design Investigation
PFAS	Per and Polyfluoroalkyl Substances
PGSCO	Protection of Groundwater Soil Cleanup Objectives
PHC	Petroleum Hydrocarbon Compound

Acronym	Definition
PPE	Personal Protective Equipment
PRR	Periodic Review Report
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIWP	Remedial Investigation Work Plan
RSCO	Residential Soil Cleanup Objective
RRSCO	Restricted Residential Soil Cleanup Objectives
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objectives
SESI	SESI Consulting Engineers, DPC
SESC	Soil Erosion and Sediment Control
SMP	Site Management Plan
SOE	Support of Excavation
SoMP	Soil/Materials Management Plan
SSDS	Sub-slab Depressurization System
SWPPP	Stormwater Pollution Prevention Plan
SVOCs	Semi-Volatile Organic Compounds
TAL	Target Analyte List
TCE	Trichloroethene
TCL	Target Compound List
TOGS	Technical and Operations Guidance Series
UUSCO	Unrestricted Use Soil Cleanup Objectives
UST	Underground Storage Tank
VI	Vapor Intrusion
VOCs	Volatile Organic Compounds

1.0 INTRODUCTION

The NYSDEC entered into a Brownfield Cleanup Agreement (BCA) with WB 34 State LLC, a Volunteer, for the property known as Former Printex Corporation Site (BCP No. C360263) ("Site"), on December 10, 2025. A Site Location Map is presented as **Figure 1.1**.

This Remedial Action Work Plan (RAWP) presents the data and findings from the remedial investigation and includes an analysis of the potential remedial actions to address the contamination as determined during the Remedial Investigation. Based on the analysis of the remedial investigation data, a Track 1 remedy has been selected by the Volunteer as the preferred remedial alternative. This RAWP will detail the actions to achieve a Track 1 remedy.

Even though a Track 1 remedy has been selected by the Volunteer as the preferred remedial alternative, to the extent this most stringent remedy cannot be achieved, this RAWP will also include an analysis of a Track 2 remedy as a contingency if the Track 1 is not achieved.

1.1 SITE LOCATION AND DESCRIPTION

The Site consists of an approximately 4.53-acre area parcel and is located at 34 State Street, Ossining, Westchester County, New York (Site). The Site is identified as Block 2, Lot 17 as noted by the Town of Ossining and discussed in the BCP application. The Site is improved with an asphalt lot, former building foundations, demolition debris, one (1) large three (3) story residential historic house building, one (1) shed and wooded areas. These buildings are currently vacant and abandoned. The Site has been developed since prior to 1892 and historically has been residences, a community center (circa 1929), a printing company (Printex Corporation of America circa 1940-1981) and a woodworking facility (1981-2006). The Site has been vacant since 2006. A Site Plan is shown on **Figure 1.2**.

1.2 PROPOSED REDEVELOPMENT PLAN

The proposed Site redevelopment is anticipated to consist of two (2) primarily residential buildings, one for 100 affordable housing units and the other for 50 market rate apartments with commercial components on the ground floor. There will also be a public park created on the property in roughly the same area as the first historically segregated African American park in Westchester County. Conceptual redevelopment plans are provided in **Appendix A**.

1.3 SITE HISTORY

The Site has historically been occupied by residential and commercial occupants; specifically, a community center circa 1929, a printing company (Printex Corporation of America) circa 1940-1981 and Hudson River Inlay, Inc a/k/a Creative Designs circa 1981-2006.

The original historic estate building was erected in 1840 as a residential estate; two (2) additions were built in 1929 as a community center; and in 1940-1981 the footprints of the buildings were expanded to accommodate the Printex Corporation of America, which operated as a scarf printing and textile design facility. Another addition was constructed in 1968. The facility utilized a wastewater treatment lagoon at the southeast. The presence of the lagoon led to the listing of the property as a State Superfund program (Site ID No. 360002). However, the property was classified as a Class N No further action site based on comments from the Westchester County Department of Health (WCDOH) which indicated the lagoons were used for on-site wastewater treatment and not hazardous waste disposal associated with the former Printex operations. Furthermore, there were some laundry operations at the center of the Site circa 1911. Finally, the Hudson River Inlay woodworking company utilized USTs and its woodworking operation from approximately the1980s to 2006. The Site has been vacant since 2006.

The following environmental reports are attached in **Appendix B** and summarized below:

- Phase I ESA, 34 State Street, Ossining, NY, prepared by Team Environmental Consultants, Inc, date unknown
- Phase II ESA, 34 State Street, Ossining, NY, prepared by DT Consulting Services, dated May 31, 2005
- Phase I ESA, 34 State Street, 17-25 James Street & Hunter Street (Lots 17, 18 and 68), Ossining, NY, prepared by EBI Consulting, dated January 18, 2016
- Phase I Environmental Site Assessment, 34 State Street, Ossining, NY, prepared by SESI Consulting Engineers. (SESI), dated June 2025
- Phase II Environmental Site Assessment, 34 State Street, Ossining, NY, prepared by SESI Consulting Engineers. (SESI), dated June 2025

PHASE I ESA, TEAM ENVIRONMENTAL CONSULTANTS, INC.

The following is a summary review of the reports referenced in this Phase I as well as the conclusions therein:

- Phase I ESA, January 21, 1994, prepared by Dames & More
    - Closed in place 10,000-gallon UST at the western portion of the property. Backfilled and covered with concrete.
        - Noted that a previous Phase II by SSI advanced soil samples and identified total petroleum hydrocarbons (TPH) concentrations or 30-114 parts per million (ppm).
    - Closed in place two (2) other USTs after a ground penetrating radar sweep (1,000- and 3,000-gallon USTs with oil/water mix)
        - Centerline samples noted to be collected and reportedly did not indicate TPH
    - Waste treatment lagoon at the southeast was noted not to adversely impact the quality of the property.
- Phase I ESA, May 7, 2003, prepared by EES
    - Recommended ACM survey
    - Recommended identifying tanks, concrete storage lagoons and garage area in a Phase II
- Phase II ESA, May 16, 2003, prepared by EES
    - Nine (9) soil borings within the western area of the 10,000-gallon UST and storage garage areas
    - No samples were collected for laboratory analysis. Just screened with a photoionization detector (PID) and did not identify observable contamination.
    - No further investigations were recommended.

The above RECs are presented on **Figure 2.2**. Note: The 1994 Dames & Moore report and the two 2003 EES Phase I and Phase II ESA reports referred to in this undated Teams Phase I were not attached and could not be obtained by the current owner from the prior recalcitrant owner.

PHASE II ESA, DT CONSULTING SERVICES, MAY 31, 2005

The following is a summary review of this Phase II ESA as well as the conclusions therein:

- History: Original building erected in 1840 as residential; 2 additions built in 1929 as a community center; 1940-1981 it was the Printex Corporation of America as a clothing printing and textile design facility. Another additional constructed in 1968.
- Site is identified in CERCLIS and Petroleum Bulk Storage (PBS)
    - Known PBS in the north; three (3) USTs identified on figure
    - Waste treatment lagoon in the southeast corner
    - General equipment and storage at the west
- Seven (7) soil borings
    - Advanced eight (8) to 12 ft feet below ground surface (bgs)
    - Characterization: light brown sandy loam (fill) with traces of gravel - approximately 0 to four (4) feet bgs, underlain by fine-medium sand with clay and schist fragments.
    - Bedrock encountered between eight (8) and nine (9) feet bgs
    - Groundwater not encountered
    - No visual or olfactory or PID observations/ readings
- Soils from seven (7) borings were composited to form three (3) sample sets
    - VOCs and SVOCs and Priority Pollutant metals were detected at low concentrations not exceeding present-day SCOs.
- Determined no further investigation based on the results

<u>PHASE I ESA, EBI CONSULTING, JANUARY 18, 2016</u>

The following is a summary review of this Phase I ESA as well as the conclusions therein:

- <u>REC - USTs:</u>
    - The USTs documented by Creative Design, a former Tenant are as follows:
        - 1x 10,000-gallon UST, closed in place on September 1, 1986.
        - 1x 1,000-gallon UST, removed on December 1, 2003.
        - 1x 3,000-gallon UST, removed on December 1, 2003.
        - No LUST releases were reported. However, no closure reports were identified.
        - Identifying closure documents in a record review or a Phase II were recommended.

- ACM:
    - EBI conducted a preliminary screening of ACM in the building and identified some suspect ACM. This is out of scope of the Phase I ASTM, and is not considered a REC; however, a full ACM survey was recommended.

PHASE I ESA, SESI, JUNE 2025

In June 2025, SESI conducted a Phase I ESA and identified the following RECs and BERS:

- **REC 1 – Subject Property Historic Operations:** The original historic house estate building was erected in 1840 as residential estate; two (2) additions were built in 1929 as a community center; and in 1940-1981 the footprints of the buildings were expanded to accommodate the Printex Corporation of America, which operated as a scarf printing and textile design facility. Another addition was constructed in 1968. The facility utilized a wastewater treatment lagoon at the southeast. The presence of the lagoon led to the listing of the property as a State Superfund program (Site ID No. 360002). However, the property was classified as a Class N No further action site based on comments from the Westchester County Department of Health (WC DOH) which indicated the lagoons were used for on-site wastewater treatment and not hazardous waste disposal associated with the former Printex operations. Furthermore, there were some laundry operations at the center of the Site circa 1911. Finally, the Hudson River Inlay woodworking company utilized USTs and its woodworking operation from approximately the1980s to 2006 also could have resulted in contamination. **Based on this history observed from the Sanborn maps and previous reports, the historic operations from the textile, woodworking and laundry facilities may have adversely impacted the Site and warrant further investigation.**

- **REC 2 – Underground Storage Tanks:** The following USTs were identified to be either closed in place or removed: 1x 10,000-gallon UST, closed in place on September 1, 1986; 1x 1,000-gallon UST, removed or closed in place on December 1, 2003; and 1x 3,000-gallon UST, removed or closed in place on December 1, 2003. No leaking underground storage tank (LUST) releases were reported. **However, no closure reports were**

identified. Identifying closure documents in a record review or a Phase II is recommended.

- **REC 3 – Historic Fill:** Historic fill has reportedly been identified at the Site during geotechnical and environmental investigations. **Additional subsurface soil sampling is recommended to characterize fill material should special handling and/or disposal of disturbed soil be required during Site redevelopment.**

- **BER 1 – Historic Land Use:** The historic 2006 aerial imagery identified clearing of vegetation on Lot 68; however, this vegetation returned in 2011 per the next available aerial. It was unclear if this area had been regraded or there were former operations on this lot that may have adversely impacted the Site. **Further investigation is recommended into the use of Lot 68 and the reasoning for clearing. Additional soil investigation is recommended to determine if historic fill is present.**

- **BER 2 – Aboveground Storage Tank (AST):** SESI identified one (1) yellow steel aboveground storage tank adjacent to several unused items at the southwest of Lot 17. This tank appeared to not be in use and was intact, with no evidence of staining. **Therefore, no further investigation is warranted; however, proper disposal of this AST is recommended. No closure documentation is required.**

- **BER 3 – Drum:** There was one (1) plastic 55-gallon tote identified to the south of the northern shed. This tote appeared to contain soil and was unlabeled**. Therefore, SESI recommends proper removal/disposal of this tote.**

- **BER 4 – Stockpiles:** There were several stockpiles of building materials scattered throughout the Site, around building foudnations, and on the periphery of the vegetated area of Lot 68. These stockpiles were not observed to have exhibited petroleum impacts. **Therefore, SESI recommends the proper testing and disposal of these demolition debris prior to or during redevelopment.**

- **BER 5 – Hazardous Building Materials:** An asbestos containing material (ACM), lead-based paint (LBP), polychlorinated biphenyl (PCB) caulk and universal waste survey was not conducted as part of this Phase I Environmental Site Assessment. Based on the age of the structures located on the Site, the presence of these materials cannot be ruled out. **Therefore, a comprehensive hazardous material survey is recommended prior to demolition or redevelopment.**

2.3.5 PHASE II ESA, SESI, JUNE 2025

A total of ten (10) samples exhibited exceedances of the RRSCOs for polycyclic aromatic hydrocarbons (PAHs), metals and/or PCBs. Eight (8) samples exhibited exceedances of the PGWSCOs for PAHs, metals and/or VOCs from depths ranging from 0.5 to 14.0 ft-bgs. Other samples exhibited exceedances of the UUSCOs for VOCs, SVOCs, Metals, PCBs and Pesticides

Groundwater boreholes were advanced to bedrock which was encountered between 5.0 and 10.0 ft-bgs within the former building's footprint adjacent to the existing building as well as farther to the east near the shed. No overburden groundwater was detected. SESI then further advanced the borehole near the building and identified weathered bedrock from 10-15 ft-bgs and competent bedrock from 15-25 ft-bgs. After purging the well and allowing for a couple days of recharge, no groundwater was encountered at this temporary well. Therefore, no groundwater sampling was completed as part of this Phase II investigation.

A total of 33 VOCs were detected in the vapor samples; however, the sub slab soil vapor and indoor air samples were collected from inside a severely dilapidated building, the NYSDOH SVI Matrices are not fully usable for this environmental evaluation. An elevated concentration of carbon tetrachloride was detected in the indoor air and is likely due to an interior interferant. In addition, there was a relatively high level of tetrachloroethylene (PCE) in soil vapor in SV-1, located along the northern boundary of the Site in the location of the former Printex boiler house. As a result, due to the former uses of the property in this location, it was recommended that a more detailed investigation be completed prior to redevelopment to then determine the need for mitigation following redevelopment.

2.0 DESCRIPTION OF REMEDIAL INVESTIGATION FINDINGS

The remedial investigation at the Site was conducted to determine the nature and extent of on-Site contamination for all media and provide that data required to determine an appropriate remedial action for the Site.

2.1 SUMMARY OF SOIL REMEDIAL INVESTIGATION FINDINGS

Soil impacted with metals were detected at concentrations exceeding the NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOs) and/or Restricted Residential Soil Cleanup Objectives (RRSCOs) across the Site to depths of approximately 13 ft-bgs. Volatile organic compounds (VOCs) and semi volatile organic compounds (SVOCs) were detected at concentrations exceeding the UUSCOs and/or RRSCOs to depths of approximately 10.5 ft-bgs. Pesticides were detected at concentrations exceeding the UUSCOs to depths of approximately 7.5 ft-bgs across the Site. Polychlorinated biphenyls (PCBs) were detected at concentrations exceeding the UUSCOs to depths of approximately 4.5 ft-bgs. Per- and polyfluoroalkyl substances (PFAS), including PFOS and PFOA, were detected at concentrations exceeding the UUSCOs to depths of approximately 13 ft-bgs across the Site. The sampling location plan and contaminant distribution in soil are presented in **Figures 2.1** and **Figure 2.2,** respectively.

2.2 SUMMARY OF GROUNDWATER REMEDIAL INVESTIGATION FINDINGS

In May 2026, a total of five (5) bedrock monitoring wells (RI-MW-01 through RI-MW-05) were installed to depths ranging from 30.0 to 58.0 ft-bgs (95.6 to 147.9 ft-amsl) to investigate groundwater across the Site. In May and June 2026, the monitoring wells were sampled for TCL/TAL+30 (including VOCs, SVOCs, PCBs, pesticides, and metals), Dissolved Metals, PFAS, and 1,4-dioxane. Groundwater sampling indicated that groundwater at the Site is impacted by VOCs, metals, and PFOA and PFOS at concentrations exceeding the Ambient Water Quality Standards (AWQS). The groundwater sample locations and concentrations are presented on **Figure 2.3.**

2.3 SUMMARY OF SOIL VAPOR REMEDIAL INVESTIGATION FINDINGS

Numerous VOCs were detected in soil vapor across the Site. NYSDEC does not have standards for soil vapor. The soil vapor sample locations and concentrations are presented in **Figure 2.4.**

2.4 GEOLOGICAL AND HYDROGEOLOGICAL CONDITIONS

Regional surface topography slopes to the west. Based on the U.S. Geological Survey – 2019 Ossining/Haverstraw, New York, 7.5-minute Quadrangle map, the Property is approximately 161.83 feet above the North American Datum. Based on the 2026 RI, the subsurface stratigraphy across the Site generally consists of brown to gray, fine- to coarse-grained sand with trace amounts of silt and gravel, interpreted as glacial till, extending from ground surface to depths of approximately 13 feet below ground surface (ft-bgs). Fill material was observed intermixed within the glacial till and consisted primarily of brick, concrete, glass, and organic debris at depths ranging from approximately 0.5 to 13.0 ft-bgs. Fractured bedrock or drill refusal was encountered across the Site at depths ranging from approximately 3.5 to 13.0 ft-bgs.

Groundwater was encountered within the fractured bedrock during the 2026 RI at depths ranging from approximately 18.4 to 49.2 ft-bgs (101.5 to 160.0 ft-amsl). Based on groundwater elevation measurements collected from the monitoring well network, the interpreted bedrock groundwater flow direction is generally to the southwest. However, it should be noted that local variations in groundwater flow may occur due to heterogeneities within the fractured bedrock, variations in fracture connectivity, and the presence of subsurface features such as utilities, building foundations, and other engineered structures that may influence hydraulic gradients.

2.5 CONCEPTUAL SITE MODEL

The following subsections present the conceptual site model for the Site and discuss the potential sources of contamination, types of contaminants and affected media, potential contaminant pathways and actual/potential human and environmental receptors.

As reported in the 2025 Phase I and Phase II ESAs prepared for the Site, the suspected sources of discharge at the Site are primarily related to historical Site operations and presence of historic fill material. The Site's former use as textile, woodworking and laundry facilities are the sources of discharges at the Site. Finally, the former presence of ASTs, USTs on the Site also represent a potential source of contamination at the Site.

The overall depth of impacted soil extends to approximately 13 feet below ground surface (ft-bgs). Metals were detected at concentrations exceeding the NYSDEC Unrestricted Use Soil Cleanup

Objectives (UUSCOs) and/or Restricted Residential Soil Cleanup Objectives (RRSCOs) across the Site to depths of approximately 13 ft-bgs. Volatile organic compounds (VOCs) and semi volatile organic compounds (SVOCs) were detected at concentrations exceeding the UUSCOs and/or RRSCOs to depths of approximately 10.5 ft-bgs. Pesticides were detected at concentrations exceeding the UUSCOs to depths of approximately 7.5 ft-bgs across the Site. Polychlorinated biphenyls (PCBs) were detected at concentrations exceeding the UUSCOs to depths of approximately 4.5 ft-bgs. Per- and polyfluoroalkyl substances (PFAS), including PFOS and PFOA, were detected at concentrations exceeding the UUSCOs to depths of approximately 13 ft-bgs across the Site.

The applicable standards, criteria, and guidance (SCGs) for groundwater at the Site are the NYSDEC Ambient Water Quality Standards and Guidance Values (TOGS 1.1.1). Groundwater sampling conducted during the 2026 Remedial Investigation identified VOCs, metals, and PFAS (PFOA and PFOS) at concentrations exceeding the applicable NYSDEC Ambient Water Quality Standards (AWQS). The detected groundwater impacts are consistent with the historical commercial and industrial uses of the Site.

The groundwater investigation indicates that minor PCE impacts have been delineated within the limits of the investigation and are limited to monitoring well RI-MW-03. The occurrence of PCE in groundwater is consistent with historical solvent use associated with former commercial and industrial operations at the Site and appears to reflect localized migration through preferential fracture pathways within the bedrock aquifer rather than widespread leaching from impacted overburden soils. PFAS compounds (PFOS and PFOA) and dissolved metals were detected in multiple monitoring wells, and the lateral extent of these constituents will be further delineated at the bottom of the excavation after soil source removal. PFAS substances may have been used in the scarf textile manufacturing process since PFAS is present at levels higher than standard background levels that have come to be ubiquitous. PFAS exceedances in groundwater generally correspond to the presence of PFAS impacts in overburden soils and are consistent with the relatively high mobility and persistence of these compounds in groundwater, resulting in a broader distribution within the fractured bedrock aquifer. Bedrock groundwater will have to be resampled after the soil source removal remedial action to determine the impact of source removal on post soil remedy PFAS bedrock groundwater levels. Although dissolved magnesium and sodium

exceeded the applicable NYSDEC AWQS in groundwater in the filtered samples, these constituents either naturally occurring in the case of magnesium or present due to the use of road salt in the case of sodium.

Overall, the groundwater impacts are minor and consistent with the historical commercial and industrial use of the Site and the hydrogeologic characteristics of the fractured bedrock aquifer. The RAWP will discuss remedial measures to address the PFAS bedrock contamination if still present after soil source removal at levels that can be treated and mitigate the potential for off-site migration of PFAS. In addition, post source removal groundwater monitoring will be conducted to evaluate groundwater quality trends, assess remedy performance, and confirm the effectiveness of the remedial measures before issuance of the COC to determine if Track 1 has been achieved.

Groundwater was encountered within the fractured bedrock during the 2026 Remedial Investigation at depths ranging from approximately 18.4 to 49.2 ft-bgs (101.5 to 160.0 ft-amsl). Based on groundwater elevation measurements collected from the monitoring well network, the interpreted bedrock groundwater flow direction is generally to the southwest. Local variations in groundwater flow may occur due to heterogeneities within the fractured bedrock, variations in fracture connectivity, and the presence of subsurface features, such as utilities, building foundations, and other engineered structures, that may influence hydraulic gradients.

Potential exposure to impacted groundwater is limited to direct contact during subsurface excavation activities. Groundwater beneath the Site is not used as a potable water source, and therefore ingestion of Site groundwater is not considered a complete exposure pathway under current Site conditions. In addition, groundwater impacts are not expected to represent a significant ecological exposure pathway due to the developed nature of the Site and surrounding area.

Numerous chlorinated volatile organic compounds (CVOCs) and petroleum hydrocarbon (PHC) VOCs were detected in on-Site soil vapor but none of the detections were above the sub slab and soil vapor screening levels in the DOH Guidance matrices even though valid indoor air results could not be co-located inside the house since it is not enclosed and heated. These compounds

have the potential to migrate as vapor and may present a vapor intrusion pathway to existing or future occupied buildings. A vapor intrusion evaluation will be needed for this Site once the lowest unheated enclosed garage level is completed as these PHC VOCs and CVOCs may result in soil vapor intrusion into the future on-Site buildings. However, building construction mitigation measures are being incorporated into the building design to prevent soil vapor intrusion.

2.6 IDENTIFICATION OF STANDARDS, CRITERIA AND GUIDANCE

The following standards and criteria typically will apply to Site Characterizations, Remedial Investigations, remedy selection, underground storage tank closures, remedial actions and Site management activities:

- DER-10 / Technical Guidance for Site Investigation and Remediation
- DER-13 / Strategy for Evaluating Soil Vapor Intrusion at Remedial Sites in New York State Department of Environmental Conservation
- 6 NYCRR Part 257 - Air Quality Standards
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response
- TOGS 1.1.1 - Ambient Water Quality Standards & Guidance Values and Groundwater Effluent Limitations (1998, Addenda 2000, 2004, 2023)
- Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (October 1994)
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (Final October 2006; amended May 2017; February 2024)
- 6 NYCRR Part 375 - Regulations Subparts 1, 3 and 6 applicable to the Brownfield Cleanup Program (Amended December 31, 2025)
- Citizen Participation in New York's Hazardous Waste Site Remediation Program: A Guidebook (June 1998)
- USEPA Office of Solid Waste and Emergency Response Directive 9355.047FS Presumptive Remedies: Policy and Procedures (September 1993)
- USEPA Office of Solid Waste and Emergency Response Directive 9355.048FS Presumptive Remedies
- Site Characterization and Technology Selection for CERCLA sites with Volatile Organic Compounds in Soils (September 1993)
- 6 NYCRR Part 612 - Registration of Petroleum Storage Facilities (February 1992)

- 6 NYCRR Part 613 - Handling and Storage of Petroleum (February 1992)
- 6 NYCRR Part 614 - Standards for New and Substantially Modified Petroleum Storage Tanks (February 1992)
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes (November 1998)
- 6 NYCRR Subpart 374-2 - Standards for the Management of Used Oil (November 1998)
- 6 NYCRR 375 Table 375-6.8(a) and Table 375-6.8(b) (Amended December 31, 2025)
- 6 NYCRR Parts 700-706 - Water Quality Standards (June 1998)
- 40 CFR Part 280 - Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks
- STARS #1 - Petroleum-Contaminated Soil Guidance Policy
- STARS #2 - Biocell and Biopile Designs for Small-Scale Petroleum-Contaminated Soil Projects
- SPOTS #14 - Site Assessments at Bulk Storage Facilities (August 1994)
- Spill Response Guidance Manual
- Permanent Closure of Petroleum Storage Tanks (July 1988)
- NYSDOH Environmental Health Manual CSFP-530 - “Individual Water Supplies - Activated Carbon Treatment Systems”
- 10 NYCRR Part 67 – Lead
- 12 NYCRR Part 56 - Industrial Code Rule 56 (Asbestos)
- 6 NYCRR Part 175 - Special Licenses and Permits--Definitions and Uniform Procedures
- 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes (November 1998)
- 6 NYCRR Part 372 - Hazardous Waste Manifest System and Related Standards for Generators, Transporters and Facilities (November 1998)
- 6 NYCRR Subpart 374-1 - Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities (November 1998)
- 6 NYCRR Subpart 374-3 - Standards for Universal Waste (November 1998)
- TAGM 4013 - Emergency Hazardous Waste Drum Removal/ Surficial Cleanup Procedures (March 1996)
- TAGM 4059 - Making Changes to Selected Remedies (May 1998)

- TOGS 1.3.8 - New Discharges to Publicly Owned Treatment Works
- OSWER Directive 9200.4-17 - Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (November 1997)
- CP-43: Groundwater Monitoring Well Decommissioning Policy (November 2009)
- NYSDEC Sampling, Analysis, and Assessment of Per-and-Polyfluoroalkyl Substances Guidance Document (latest draft April 2023).
- Green and Sustainable Remediation Guidance and DER 31: Green Remediation
- 6 NYCRR PART 375 - Environmental Remediation Programs (Effective December 31, 2025)

2.7 ENVIRONMENTAL AND PUBLIC HEALTH ASSESSMENTS

2.7.1 QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

This exposure assessment discusses potential migration routes by which chemicals 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 and addresses the following four (4) points:

- identifies areas of concern and chemicals of concern;
- evaluates actual or potential exposure pathways;
- characterizes the potentially exposed receptors (residents, workers, recreational users, etc.), and
- identifies how any unacceptable exposures might be eliminated/mitigated.

This exposure assessment discusses potential exposure pathways by which chemicals 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 and addresses the following four (4) points:

- identifies areas of concern and chemicals of concern;
- evaluates actual or potential exposure pathways;
- characterizes the potentially exposed receptors (residents, workers, recreational users, etc.), and
- identifies how any unacceptable exposures might be eliminated/mitigated.

2.7.1.1 AREAS OF CONCERN AND CHEMICALS OF CONCERN

Findings from the Remedial Investigation indicate:

- Site soils are impacted with VOCs, SVOCs, metals, pesticides, PCBs, and PFAS at concentrations exceeding applicable NYSDEC UUSCOs and/or Restricted Residential RRSCOs. Metals and PFAS impacts extend to depths of approximately 13.0 feet below ground surface (ft-bgs), VOC and SVOC impacts extend to approximately 10.5 ft-bgs, pesticide impacts extend to approximately 7.5 ft-bgs, and PCB impacts extend to approximately 4.5 ft-bgs.
- Groundwater within the fractured bedrock is impacted by VOCs, metals, and PFAS (PFOA and PFOS) at concentrations exceeding the NYSDEC AWQS. Groundwater impacts were identified in monitoring wells installed across the Site, indicating the presence of Site-related groundwater contamination within the bedrock aquifer.
- Numerous CVOCs and PHC VOCs were detected in on-site soil vapor. The detected soil vapor constituents indicate the potential for a vapor intrusion pathway to existing or future occupied buildings.

2.7.1.2 ACTUAL AND POTENTIAL EXPOSURE PATHWAYS

The five (5) elements that comprise an exposure pathway include:

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.

As noted in the CSM, the contaminant source is past operations, underground and aboveground storage tanks at the Site, and historic fill material. Transport mechanisms, exposure routes and contact points, and potential receptors for each medium are discussed below.

Soil

Impacted soils can potentially be transported from the Site through dust, surface water and sediment runoff, and leaching to the groundwater. Dust and direct contact create potential exposure points to human receptors through inhalation, ingestion and dermal contact during demolition and construction activities as well as unauthorized access to the Site. Surface water and sediment runoff create potential exposure to surface water and other ecological receptors, and leaching to groundwater creates a pathway to potential users of groundwater.

Groundwater

Contaminants present in the fractured bedrock groundwater may migrate through the bedrock aquifer along preferential fracture pathways. The primary potential human exposure pathways associated with impacted bedrock groundwater are incidental ingestion or dermal contact during deep subsurface excavation or bedrock construction activities where groundwater may be encountered. Groundwater beneath the Site is not used as a potable water source; therefore, ingestion of groundwater is not considered a complete exposure pathway under current Site conditions. Groundwater flow within the fractured bedrock aquifer is interpreted to be generally toward the southwest, in the direction of the Hudson River approximately 1,000 feet west of the Site. Given this potential pathway, bedrock groundwater contamination will be actively remediated through an in-situ remedial application. Post-remediation groundwater monitoring will be conducted to confirm attainment of applicable AWQS and to verify that contaminant concentrations do not pose a risk to the Hudson River as a downgradient ecological receptor. With implementation of the proposed remedial measures, the potential for Site-related PFAS impacts to downgradient ecological receptors is expected to be effectively controlled.

Surface Water and Sediment

Surface water is not present on the Site. Thus, this exposure pathway may be eliminated from further evaluation.

Soil Vapor and Indoor Air

The potential for vapor contamination to migrate exists whenever near contaminants volatize, and this is enhanced during intrusive activities such as demolition and excavation. The exposure route for soil vapor is through the inhalation of the contaminated soil vapor during intrusive

construction activities or when vapors intrude into the enclosed spaces of any planned Site development. After the Site is redeveloped, a potential that vapors could accumulate in enclosed areas of the proposed building, such as basements, crawl spaces, first floors, etc. create potential exposure points if not mitigated.

2.7.1.3 ELIMINATION OR MITIGATION OF UNACCEPTABLE EXPOSURES

The following sections set forth measures to be undertaken to eliminate or mitigate the potential risks of exposure for each medium. The remedies to be employed to reduce/eliminate the exposure risks are detailed in the following sections.

Soil

At present, potential exposure points have been eliminated by restricting public access to the exposure through fencing. 34 State Street is fenced off and public access is restricted. Additionally, the Site is presently vacant. During future construction activities, specifically disturbance of soils, the potential for exposures to soils would increase for on-Site workers, utility workers, visitors and trespassers, as well as disturbed soils migrating offsite. These risks will be mitigated by employing the proper personal protective equipment (PPE), implementing the HASP and CAMP, preventing dust generation and implementing Site security to restrict access and managing soil runoff by implementing stormwater control measures. Future exposure to soil contamination, impact to groundwater and soil vapors will be mitigated/eliminated due to the removal of impacted soil from the Site.

Groundwater

Groundwater has not been encountered in the overburden during Site investigation activities and is not expected to be encountered during onsite excavations. Dewatering is therefore not anticipated. Nonetheless, to mitigate exposure risks during remediation and construction, the proper PPE will be employed and in the unlikely event that groundwater is encountered during excavation, it will be dewatered and managed to minimize direct contact. Any groundwater removed from the excavations will be treated and disposed of properly off-Site either in the Village of Ossining sewer after treatment or shipped to an off-Site facility.

SESI performed a supplemental water well search using the NYSDEC Water Well Search Application for the Village of Ossining in Westchester County. Based on the search results, no water wells are present in the immediate vicinity of the Site. Additionally, pursuant to Chapter 873, Article VII of the Westchester County local ordinance law, the use of groundwater in Westchester County is prohibited. Therefore, the potential for exposure to impacted groundwater is further mitigated by the fact that groundwater in Ossining is not utilized for potable purposes.

Groundwater contamination at the Site is limited to bedrock, which is unrelated to the soil remediation. Consistent with the requirements of a Track 1 remedy, bedrock groundwater will be actively remediated through in-situ application of PlumeStop® or a similar compound to achieve the applicable AWQS.

If a Track 2 remedy is pursued, long-term institutional and/or engineering controls will be implemented to manage residual bedrock groundwater contamination following redevelopment. As part of this management approach, residual groundwater contamination, to the extent it remains, is expected to naturally attenuate over time, further reducing the potential for human health exposure.

Soil Vapor and Indoor Air

As with soil and groundwater, potential exposure to soil vapor during construction will be minimized through the use of proper PPE and continuous air monitoring to ensure acceptable levels of airborne contaminants and dust. The planned soil excavation and building design is expected to address future exposure risk to soil vapor and indoor air into the on-Site building because there are two (2) mechanically ventilated garage levels, which will further reduce the potential for soil vapor intrusion into occupied space. A vapor barrier retarder membrane will be installed under the foundation and up the side walls of 20 mil thickness, which will be sealed at the seams (with at least a 12 inch overlap) and penetrations to prevent off-site soil vapor intrusion and inspection of the installation of the vapor barrier will be performed before the foundation is poured. The elements of a sub-slab depressurization system (SSDS) will also be installed beneath the building foundation as a precautionary measure and will become an EC if a post-COC soil vapor intrusion evaluation determines that vapor mitigation is needed.

2.7.2 FISH AND WILDLIFE IMPACT ANALYSIS

The Fish and Wildlife Resources Impact Analysis Decision Key (NYSDEC, 2010; DER-10 Appendix 3C) was utilized to evaluate the Site for potential fish and wildlife impacts. The result of the assessment determined that the Site itself does not contain any ecologically sensitive resources. The nearest significant ecological receptor is the Hudson River, located approximately 1,000 feet west (downgradient) of the Site. Groundwater within the fractured bedrock aquifer is interpreted to flow generally toward the southwest, in the direction of the Hudson River. Given this potential pathway, bedrock groundwater contamination will be actively remediated through an in-situ remedial application. Post-remediation groundwater monitoring will be conducted to confirm attainment of applicable AWQS and to verify that contaminant concentrations do not pose a risk to the Hudson River as a downgradient ecological receptor. The completed Fish and Wildlife Resources Impact Analysis Decision Key is included with this report as **Appendix B**.

2.8 SIGNIFICANT THREAT

At the time of this report, the NYSDEC and NYSDOH have not made a significant threat determination for the Site.

2.9 REMEDIAL ACTION OBJECTIVES

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

2.9.1 GROUNDWATER

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

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

2.9.2 SOIL

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater contamination.

2.9.3 SOIL VAPOR

RAOs for Public Health Protection

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

2.10 GREEN SUSTAINABLE REMEDIATION

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. DEC’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:

- 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
- As noted across the LEED categories, resources other than energy that can be conserved include water, raw materials for materials consumed, topsoil, paper for reports, and landfill space. Conserving one resource typically conserves other resources and has other sustainability benefits. For example, recycling construction and demolition debris or metal will reduce consumption of landfill space and may also save energy and reduce air emissions by reducing material transportation. Another example is the use of waste-to energy plants for waste disposal rather than landfills in states where these plants are currently operating. This also reduces the consumption of landfill space and results in energy production from waste processing. Other examples of resource conservation include treated water reinjection, the reuse of treated soil onsite, and the beneficial reuse of sediments.
- The use of “green” construction and project management products and materials such as ecofriendly concrete or the use of native plants for site restoration also advances the sustainability objectives of the project. It is important to understand that green remediation implies minimizing the entire footprint of the remediation project, which includes the environmental impacts of products and materials associated with the project. For example, eco-friendly concrete generally refers to concrete that is produced with a certain percentage of fly-ash (a waste product from the coal-firing process). This type of “green” concrete takes a problematic substance out of the waste stream and reduces the cumulative amount of energy associated with the production of concrete. The use of native plants for site restoration helps to conserve water and eliminate the need for potentially harmful fertilizers and pesticides.

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).

2.11 CLIMATE CHANGE VULNERABILITY ASSESSMENT

The Climate Change Vulnerability Assessment considers the Site remedies climate resiliency and considers the proposed remedy's vulnerability to climate change. The first step is to conduct a climate screening.

- Climate screening is a high-level desktop review of the site and potential changes in climate hazards. If the screening identifies potential exposure to climate hazards, a Climate Vulnerability Assessment (CVA) will need to be conducted. A CVA will identify adaptation measures to account for projected climate hazard exposures.
- For sites susceptible to climate change, require a Climate Adaptation Plan, which will incorporate findings and recommendations from the Climate Vulnerability Assessment.

- Consideration of the Site Elevation, Clim AID Region, Remedial Stage/site classification, Contamination, Proposed/Current Remedy, proximity to any sensitive receptors, whether the Site is in a disadvantaged community (DAC) or potential environmental justice area and remediation timeframe; and
- The relevance to the Site and the Remedy of Precipitation, Extreme Heat or Cold, Sea Level Rise, Flooding, Storm Surge, Wildfire, Drought, Storm Severity, Landslides and other hazards.

Pursuant to DER-10, a Climate Change Vulnerability Assessment was conducted to evaluate the Site's susceptibility to climate-related hazards over the anticipated remedial timeframe and post-redevelopment use. This Climate Change Vulnerability Assessment considers the reliability of energy, potential for flooding and droughts, increased erosion potential, proximity to water bodies, and any other environmental factors subject to change.

- Energy Reliability: The proposed post-redevelopment use of the Site is residential, and long-term energy demand will be consistent with standard grid-supplied residential utility service. During remediation and construction activities, some power will be supplied by on-site generators, reducing reliance on the local utility grid. Given the temporary, generator-supported nature of remediation-phase and the Site's transition to standard residential grid service upon redevelopment, energy reliability is not anticipated to be a significant climate-related vulnerability for the Site.
- Flooding: Based on FEMA Flood Map data, the Site is not located within a designated floodplain. Regional topography slopes to the west, with storm water drainage patterns generally flowing toward the Hudson River. Given the Site's elevation (approximately 161.83 ft-amsl) and confirmed location outside the floodplain, the potential for flooding impacts to the Site is considered minimal.
- Drought: Given the Site's location within the Hudson Valley region and its proposed post-redevelopment use, drought conditions are not anticipated to affect the Site.
- Erosion: Regional surface topography slopes to the west, and soils in the sloped area west of the Site are mapped as CsD (Chatfield-Charlton Complex), characterized by 15 to 35 percent slopes and noted as very rocky. Given the presence of shallow, irregular bedrock

across the Site (encountered at depths as shallow as approximately 1.5 to 3.5 ft-bgs) and historic fill material, erosion control measures including but not limited to silt fencing, stabilized construction entrances, and temporary/permanent site stabilization will be implemented during remediation and construction activities to manage erosion potential, particularly in sloped areas.

- Proximity to Water Bodies: The Hudson River, located approximately 1,000 feet west of the Site, is the nearest significant surface water body. Bedrock groundwater flow beneath the Site is interpreted to be generally toward the southwest, in the direction of the Hudson River, consistent with the site's topographic gradient.

Based on this assessment, climate-related vulnerabilities affecting the Site are anticipated to be minimal, with erosion during construction identified as the primary factor requiring active management through standard erosion and sediment control measures. This assessment will be updated as necessary throughout the course of the environmental cleanup, consistent with DER-10 requirements.

3.0 DESCRIPTION OF REMEDIAL ACTION PLAN

3.1 EVALUATION OF REMEDIAL ALTERNATIVES

The objective of the remedy is to achieve a cleanup that is the most protective of human health and the environment and that does not rely on ECs or ICs. This objective will most likely be accomplished by a Track 1 remedy eliminating the source material and achieving the UUSCOs at the depth of the excavation. If the groundwater or soil vapor requires monitoring or ECs in certain areas of the Site after issuance of the Certificate of Completion (COC), then the remedy would be a conditional Track 2 to the extent that a Track 1 soil remedy has been achieved.

Track 1

A remedy pursuant to this track must achieve compliance with the UUSCOs set forth in 6 NYCRR Table 375-6.8(a).

In a Track 1 remedy, no institutional and engineering controls are allowed after the issuance of the COC. This alternative would involve the complete removal and/or remediation of the soil with exceedances of the UUSCOs, which were encountered during the RI to 13.0 ft-bgs across the Site. A feasible remedial technology that may be used to implement this alternative involves the excavation of the contaminated soil to 14.0 ft-bgs, which is the depth of contamination plus 1 foot, or bedrock and transportation to an approved off-Site facility for disposal. Post-excavation samples will be collected at the target excavation depth. If the confirmation samples result in exceedances of UUSCOs, the excavation will continue in that location until UUSCOs are achieved or until bedrock is encountered, whichever is encountered first. Therefore, the planned excavation should be sufficiently deep to fulfill Track 1 remedy requirements for soils and will achieve the Track 2 remedy as a contingency in the event that additional excavation that may be required for a Track 1 remedy is not feasible.

Based on the results of the remedial investigation groundwater sampling events, VOCs, metals and PFAS compounds (PFOS and PFOA) have been identified in groundwater above the AWQS. Consistent with the requirements of a Track 1 remedy, groundwater contamination will be actively remediated through in-situ treatment to achieve applicable AWQS without reliance on institutional or engineering controls.

PCE was the only VOC detected slightly above the AWQS and was limited to monitoring well RI-MW-03, indicating a minor localized impact within the fractured bedrock aquifer. PFOS and PFOA were detected above the applicable AWQS throughout the monitoring well network, indicating a broader distribution consistent with the mobility and persistence of PFAS in groundwater. Antimony, lead, magnesium, manganese, and sodium exceeded the applicable AWQS only in unfiltered samples. These exceedances are attributed to colloidal (suspended soil particulate) content rather than dissolved-phase groundwater conditions. Dissolved magnesium and sodium exceeded the applicable AWQS in one or more monitoring wells after filtration. Based on their occurrence, distribution, and groundwater geochemistry, these dissolved metals are not anticipated to require active remediation.

The proposed groundwater remediation will include the design and implementation of an in-situ treatment of the CVOC (PCE) in RI-MW-03 and PFAS contamination across the Site. The in-situ remediation will include injection of a PFAS treatment technique such as PlumeStop®, which will be installed along the downgradient western property boundary. PlumeStop® is a colloidal activated carbon amendment designed to adsorb PFAS and PCE within the treatment zone, thereby reducing dissolved-phase concentrations and limiting downgradient migration.

The detailed design of the treatment, which will include the location of the injection points, quantity of Plumestop® material to be injected and injection method, will be provided to NYSDEC and NYSDOH for review and approval prior to implementation. Following remediation, continued periodic monitoring of the contaminant levels in the Site groundwater monitoring wells will constitute an engineering and institutional control until the groundwater levels are below the standards or until they reach asymptotic levels that are accepted by the NYSDEC. If groundwater levels do not reach AWQSGVs or the asymptotic levels are not accepted by the NYSDEC or NYSDOH, then the remedy will be considered a Track 2 remedy as described below.

CVOCs and PHC 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 VOCs in the soil vapor. Since the proposed building will include two (2) levels of unheated, mechanically ventilated garages, the potential for a soil vapor intrusion issue on-Site is expected to be significantly reduced. The elements of a sub-slab depressurization system (SSDS) will be installed underneath

the building as the sub slab of the proposed building is not expected to be totally submerged under the water table during the seasonal low. A soil vapor intrusion evaluation will be completed and if mitigation is determined not to be needed, then the elements of SSDS will not be considered an EC. If the evaluation determines that mitigation is needed, then the air blower will be designed and added to the elements of the SSDS, which will become an EC. If, within the five-year period following issuance of the Certificate of Completion (COC), the VOC concentrations in the sub slab and indoor air drop to levels below the mitigate threshold requirements, a recommendation will be submitted to NYSDEC and NYSDOH for their review and approval to shut down the active SSDS. If the recommendation is approved and the SSDS shut down, it will no longer be considered an EC, and the condition on the Track 1 remedy will be removed.

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 the Track 2 residential or restricted residential soil cleanup objectives (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). There are two applicable track 2 SCOs – Residential (RSCOs) and Restricted Residential (RRSCOs). The Site remediation pursuant to Track 2 Residential would involve excavation and disposal of the contaminated soils to meet one of these two (2) SCOs. Institutional and engineering controls that limit Site use and on-Site groundwater use can be used without regard to duration.

The groundwater remediation would be as described under Track 1. If the active in situ treatment remedy is applied and groundwater concentrations do not meet the AWQSGVs or reach asymptotic levels accepted by the NYSDEC within five (5) years following issuance of the COC, then the groundwater monitoring and wells will be considered a long-term engineering control and the Track 2 Restricted Residential remedy will be the fallback contingency.

If the soil vapor levels do not reach the “no action” level as described in the matrices (May 2017) within five (5) years following issuance of the COC, then the SSDS will continue to act as a permanent EC and the remedy will be Track 2 Restricted Residential.

If the Track 2 cleanup only achieves the RRSCOs and applicable PGWSCOs, the Site requires a Site Management Plan (SMP) to ensure that any institutional and engineering controls are maintained, and material removed from the Site (post remedial action) is managed properly.

No Action 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, the Track 1 and Track 2 remedies would provide comparable levels of protection through different remedial approaches. The Track 1 remedy would achieve the State's most stringent SCOs and treat the remaining groundwater and soil vapor impacts. The Track 2 remedy would similarly be protective of human health and the environment by addressing soil, groundwater, and soil vapor impacts to applicable Track 2 cleanup objectives and incorporating appropriate engineering and institutional controls, where necessary, to manage any residual contamination. The Track 2 remedy may require short-term ongoing temporary institutional and engineering controls, as appropriate, with post-remedial monitoring and management under an SMP to verify continued effectiveness of the remedy. A Track 1 remedy would initially cost more and is less implementable than the Track 2 remedy. However, a Track 1 remedy can be implemented through the complete removal of all the contaminated soil, and implementation of an in-situ groundwater treatment remedy, which should facilitate the remediation of the remaining groundwater contamination more rapidly than from the other remedies.

Moreover, because a Track 1 remedy requires no long-term institutional or engineering controls, it is potentially less costly and more implementable in the long term than the Track 2 and 4 remedies, which rely on such controls for long-term effectiveness. Although Track 1 would generally reduce the need for long-term engineering and institutional controls, this does not result in a greater level of protectiveness relative to Track 2. Rather, both remedies would be designed to achieve the applicable remedial action objectives and provide adequate and effective protection of human health and the environment. A Track 2 remedy would 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 remedy achieves a more stringent set of standards than a Track 2 remedy.

Short-term effectiveness and impacts:

Generally, a Track 1 remedy provides the best short-term effectiveness because it promptly removes the most contaminant mass from the Site. A Track 2 remedy also accomplishes this, but to a lesser extent. Track 1 remedies are somewhat less favorable in terms of short-term impacts primarily because mass removal of the contaminated soils generates more truck trips than a Track 2 limited removal remedy. Excavation may result in a greater potential for migration of impacts from the open excavation (e.g. wind erosion, stormwater intrusion, etc.); however, implementation of the HASP, CAMP monitoring, and dust, odor, erosion and sediment controls will be implemented to minimize and control any migration. Thus, the preferrable long-term impacts from implementation of a Track 1remedy outweigh the favorable short-term impacts of a Track 2 remedy.

Long-term Effectiveness and Performance:

Because the Track 1 and 2 remedies would involve removal of the greatest amount of contaminated soil, they will provide the most long-term effectiveness but greater short-term impacts which can be managed via the HASP, CAMP monitoring, and dust, odor, erosion and sediment controls measures. As already discussed above, a Track 1 remedy 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 ongoing monitoring and maintenance to remain effective over the long-term). A restricted residential Track 2 remedy 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:

Because the same groundwater remedial approach would be implemented under both remedies, Track 1 and Track 2 are expected to achieve comparable reductions in the toxicity, mobility, and volume of contaminated groundwater.

Constructability:

Track 1 and 2 remedies are implementable given the location and the planned use for the Site. While there are short-term potential impacts from each potential remedy, the Site is located in the middle of an urban area, and therefore disposal of the contaminated soil and truck access will not be a problem. Moreover, these 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, 2 or 4 remedies are implementable for this Site.

Cost Effectiveness:

The preferred alternative should provide optimal suitability for the eight (8) accompanying evaluation factors with minimal remedial cost. The contaminated soil extends from the surface to a depth of 13 ft-bgs. Removal of all soils containing VOCs, SVOC, pesticide, PCBs, metals, and PFAS to remove the exceedances of the UUSCOs to achieve Track 1 will be more costly than a removal of exceedances of the RSCOs or RRSCOs to achieve Track 2. However, this mass removal results in long-term savings by eliminating (or, in Track 2, significantly reducing) the need for long term ICs/ECs, and the associated ongoing monitoring and maintenance. In addition, a Track 1 or 2 remedy should eliminate any on-Site soil source that may be contributing to soil vapor issues at the Site. Therefore, a Track 1 or 2 remedy for the Site is cost effective.

Community Acceptance:

A community outreach program has been and will continue to be incorporated into all remedial alternatives, per NYSDEC Brownfield Program law and regulations and through the continued implementation of the Citizen Participation Plan (CPP). The community should accept any of the remedies; however, the Track 1 or 2 remedy would likely be preferable to the community since each of these remedies would remove the most soil contamination.

Land use:

Track 1 or 2 remedies would allow for the planned residential use of the Site, which is consistent with land uses in the area.

Zoning: All of the proposed remedies under each track will facilitate the Site to be utilized for a proposed residential development, which is consistent with applicable zoning laws 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 residential development, which is consistent with the 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.

Citizen Participation: Citizen Participation during implementation of a remedial program will proceed in accordance with the CPP included as **Appendix C** and as noted above will have minimal community impact. Any short-term impacts will be addressed by the CAMP and the 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 remedy 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 additional housing.

Accessibility to existing infrastructure: Some on-Site old 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: There are no surface water bodies or streams on or directly adjacent to the Site. SESI did not observe any areas suspected to be wetlands on the Site. Stormwater drainage patterns are generally consistent with the surrounding topography and primarily flow to the southwest, toward the Hudson River located approximately 1,000 feet west.

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 METHOD

The remedial alternatives analysis determined that a Track 1 (if achievable) remedy will be the goal for the Site. If Track 1 cannot be achieved due to remaining groundwater or soil vapor contamination conditions, a Track 2 remedy will be achieved.

3.3 SUMMARY OF SELECTED REMEDIAL ACTIONS

A summary of the selected Track 1 or 2 remedial actions to address the impacts identified are discussed below:

1. Removal of select concrete slab remnants and asphalt pavement as required and any remaining subsurface infrastructure that may be encountered.
2. Installation of a SOE system around the entire site will be installed to facilitate the removal of impacted soils to a maximum depth of 14.0 ft-bgs to support the planned excavation ranging from 4.5 to 14.0 ft-bgs (**Figure 2.2**). The SOE will extend to varying depths based on the requirements to excavate for remediation and construction. All required permits will be obtained prior to the start of work.
3. Excavation of all Site soils to achieve an UUSCO by removing the complete extents of contaminated fill/ soil.
4. Documentation of all 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. Collection of end point /documentation samples to demonstrate the UUSCOs were achieved at a rate of one sample per 900 square feet of excavation base and one sample per 30 linear feet of excavation sidewall (where feasible given presence of SOE).
6. Upon acceptance of documentation samples, the excavation will be backfilled to specified redevelopment construction design grades.
7. Import of backfill materials during redevelopment construction activities, to be used for backfilling and soil cover, if necessary, must be sampled in accordance with Section 5.4(e) of the DER-10 and be approved by the NYSDEC Project Manager.

8. In situ injection of Plumestop® to reduce the groundwater contamination levels below the AWQS and achieve significant reduction of the groundwater contaminant concentration to asymptotic levels that are accepted by the NYSDEC and NYSDOH, or reduce off-site migration.
9. Installation of the elements of an SSDS underneath the building foundation if the sub-slab of the proposed building is not under the water table during the seasonal low and SVE system around the building perimeter. A soil vapor intrusion evaluation will be conducted, when the construction of the proposed building is completed after the COC, to determine if the soil vapor (SV) levels constitute a vapor intrusion (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.
10. Repair and replacement as needed of monitoring wells for future groundwater monitoring (the current monitoring well network is shown on **Figure 2.1**). The monitoring well network will be considered an engineering control as long as it is required to monitor the groundwater conditions.
11. To the extent the AWQS or asymptotic levels are not achieved before the COC is issued, recording of an Environmental Easement (EE) for the entire Site for groundwater monitoring. The EE will remain effective until any required 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 groundwater and soil vapor contamination provided the vapor on Site is not emanating from an off-site source.
12. Preparation of an SMP, for the Track 2 alternative remedy, for short-term management of residual contamination as required by the Environmental Easement, particularly as they pertain to future phases of construction, including plans for: (1) Institutional and Engineering Controls, (2) groundwater and soil vapor monitoring, and (3) reporting. Additional groundwater treatment, such as injections, if needed, will be conducted under the SMP if groundwater levels did not achieve the AWQS or asymptotic levels that are accepted by the NYSDEC and NYSDOH.

13. Import of backfill materials, if needed, during redevelopment construction activities, to be used for backfilling and soil cover, if necessary, must be in compliance with: (1) chemical limits and other specifications included in NYCRR Sections 375-6.7(d) and 375-6.8 (b) and DER-10 (2) all Federal, State, local rules and regulations and site-specific approvals for handling/reuse and transport of material.
14. 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 and overseen and certified by the SESI Remedial Engineer of Record described below.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved RAWP. All deviations from the RAWP will be promptly reported to NYSDEC for approval and fully explained in the Final Engineering Report (FER).

4.0 REMEDIAL ACTION PROGRAM

4.1 GOVERNING DOCUMENTS

4.1.1 SITE-SPECIFIC HEALTH AND SAFETY PLAN

A copy of the SESI HASP is included as **Appendix D**. 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 Volunteer 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 HASP and for the appropriate performance of work according to that plan and applicable laws.

The HASP and requirements defined in this RAWP pertain to all remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

4.1.2 QUALITY ASSURANCE PROJECT PLAN (QAPP)

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

4.1.3 SOIL/MATERIALS MANAGEMENT PLAN (SoMP)

The SoMP is included in Section 5.12 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 ensure effective, nuisance-free performance in compliance with all applicable Federal, State and local laws and regulations.

4.1.4 SOIL EROSION AND SEDIMENT CONTROL (SESC) PLAN

The Soil Erosion and Sediment Control Plan (SESC) addresses requirements of the New York State Stormwater Management Regulations including physical methods to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soil, via wind or water. The SESC is provided as **Appendix F**.

4.1.5 COMMUNITY AIR MONITORING PLAN

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. A copy of the CAMP for the Site is included as **Appendix G**.

4.1.6 CITIZEN PARTICPATION PLAN

A certification of mailing will be sent by the Volunteer 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 CPP is included as **Appendix C**.

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

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

Ossining Public Library
Karen LaRocca-Fels, Director
53 Upper Croton Ave
Ossining, NY 10562
Hours:
Monday, Thursday 9a-9p
Tuesday, Friday 10a-6p
Wednesday 1p-9p
Saturday 9a-5p
Sunday 1p-5p

In addition, an electronic repository can be accessed via DECInfo Locator at the following link: https://extapps.dec.ny.gov/data/DecDocs/C360263/

4.2 GENERAL REMEDIAL CONSTRUCTION INFORMATION

4.2.1 PROJECT ORGANIZATION

WB 34 State LLC is the BCP Volunteer and developer of the Site. SESI is the environmental consultant for the Volunteer. A table summarizing the various personnel associated with the project is included as **Table 4.1** below.

Table 4.1 – Project Personnel

Name	Company	Project Position	Address	Phone Number
James Wendling	WB 34 State LLC	Volunteer Contacts	480 Bedford Road Chappaqua, NY 10514	(914) 610-3647
MaryKate Chorazak	SESI Consulting Engineers, P.C.	Environmental Consultant's Project Manager	959 Rt 46 East, Parsippany, NJ 07054	(973) 808-9050
Fuad Dahan, PE	SESI Consulting Engineers, P.C.	Remedial Engineer	959 Rt 46 East, Parsippany, NJ 07054	(973) 808-9050
Caroline Jalanti	NYSDEC	Project Manager	625 Broadway, Albany, NY 12233	(518) 402-9650

4.2.2 REMEDIAL ENGINEER

The Remedial Engineer for this project will be Fuad Dahan, PE. 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 Former Printex Corporation Site (BCP Site No. C360263). The Remedial Engineer will certify the FER that the remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the RAWP 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 FER.

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

4.2.3 REMEDIAL ACTION SCHEDULE

A remedial action schedule is included as **Table 4.2** below. The schedule includes estimates of time required to complete the activities associated with the remedial action. It is based on elapsed time from receipt of NYSDEC approval. Once NYSDEC approves this RAWP, an updated schedule showing actual dates will be provided to the NYSDEC as an addendum to this plan.

Table 4.2 – Remedial Action Schedule

Activity	Date
RIR submission	July 2026
RAWP submission	July 2026
Start of RAWP Public Comment period	September 2026
NYSDEC approves RAWP and issues decision document	October 2026
Site Prep and Remediation	December 2026 – April 2027
Submission of Environmental Easement	July 2027
Submission of SMP	July 2027
Submission of FER	August 2027
Certificate of Completion	December 2027

4.2.4 WORK HOURS

The hours for operation of remedial construction will conform to the Village of Ossining construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Applicant of any variances issued by the Department of Buildings.

4.2.5 SITE SECURITY

The Site will be secured with fences and locked gates.

4.2.6 AGENCY APPROVALS

Applicable SEQRA requirements for the Site will be addressed, as required, in coordination with the appropriate agencies. 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 Ossining Planning Department. A Certificate of Completion will not be issued for the project unless conformance with zoning designation is demonstrated.

Remedial and construction activities will be evaluated to determine the need for additional permits, approvals, or authorizations, including, as applicable, approvals associated with construction dewatering and management or discharge of recovered groundwater; stormwater management and coverage under the applicable State Pollutant Discharge Elimination System

(SPDES) General Permit, including preparation of a Stormwater Pollution Prevention Plan (SWPPP), if required; and other permits or approvals applicable to the proposed construction activities.

A complete list of all federal, state and local governmental permits, certificates or other approvals or authorizations required to perform the remedial and development work will be provided in the Final Engineering Report. This list includes a citation of the law, statute or code to be complied with, the originating agency, and a contact name and phone number in that agency. This list will be updated in the Final Engineering Report.

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.

4.2.7 PRE-CONSTRUCTION MEETING WITH NYSDEC

A pre-construction meeting will be held with NYSDEC prior to the start of major remedial construction activities.

4.2.8 EMERGENCY CONTACT INFORMATION

An emergency contact sheet with names and phone numbers is included in **Table 4.3** below. That document will define the specific project contacts for use by NYSDEC and NYSDOH in 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

* Note: Contact numbers subject to change and will be updated as necessary

4.3 SITE PREPARATION

4.3.1 MOBILIZATION

Mobilization tasks will include:

- Demolition of remaining structures, including remaining concrete foundation slabs and asphalt pavement;
- 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 WORKER TRAINING AND MONITORING

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

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.

4.3.3 TRAFFIC CONTROL

Traffic control shall be the responsibility of the Volunteer its contractors. Traffic control must comply with all local, state, and federal regulations including but not limited to the Village of Ossining Traffic Commission and the Manual on Uniform Traffic Control Devices.

4.3.4 UTILITY MARKER AND EASEMENTS LAYOUT

The Volunteer and its contractors will be 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 Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under this RAWP. The Volunteer and its contractors will 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.

4.3.5 SUPPORT OF EXCAVATION

Installation of an SOE system to a maximum depth of 14.0 ft-bgs will be required to provide structural stability of the 14 ft-bgs remedial soil excavation and to protect surrounding buildings, sidewalks and roadways. The SOE will act as a support for the excavation during the remediation of contaminated soil on Site and will be designed to prevent off-Site migration by installing a vapor barrier up the side walls of the SOE. Contaminated soil will be disturbed during the installation of the SOE measures. Based on the observed depth to bedrock across the Site, limited rock removal may be required to support attainment of Track 1 standards. The depth to bedrock has been observed to be approximately 3.5 to 13.0 ft-bgs, based on geotechnical investigations. The SOE design is expected to include soldier piles and lagging along the street frontage, as well as a secant pile or tangent pile wall along the adjacent properties, with depths varying depending on location and adjacent building load. The SOE will be equipped with an impermeable membrane to prevent off-site migration of soil vapor.

The impermeable membrane is anticipated to consist of a continuous, chemically resistant vapor barrier system installed along the interior face of the SOE. The membrane will be selected based on its low permeability to VOCs and durability under anticipated site conditions, including exposure to moisture, soil pressure, and potential construction impacts. Seams between membrane sections will be sealed using heat welding or compatible adhesive systems to maintain continuity and prevent vapor intrusion pathways. Installation will follow manufacturer specifications and applicable industry standards.

4.3.6 SITE PREPARATION DEMOLITION

Site preparation, including partial demolition of remaining on-Site foundation structures and pavement removal, will take place prior to the start of the soil excavation. Demolition of the concrete foundation slabs and asphalt pavement is required to obtain access to the surface and subsurface sufficient to remediate the Site.

Continuous air monitoring was conducted for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures, and as a best practice during any demolition. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells proposed.

The Final Engineering Report (FER) will include a section to document that building demolition was completed in accordance with all applicable regulations. It will include documentation of asbestos/lead surveys, abatement and proper disposal of identified asbestos-containing materials, lead based paint abatement (as applicable), local demolition permitting, and proper off-site disposal of all materials.

4.3.7 DEWATERING

Groundwater was not encountered in the overburden during the RI. Therefore, dewatering associated with remedial excavation is not anticipated. In the unlikely event that groundwater or stormwater is encountered during excavation and requires removal to facilitate the work, temporary dewatering will be performed as necessary to facilitate the work and to prevent direct contact with the groundwater. The water will be properly contained, treated and disposed off-Site

either in the public owned treatment works sewer or shipped to an approved off-Site treatment facility depending on contamination levels and permit requirements.

Bedrock groundwater remediation will aim to mitigate bedrock groundwater concerns and try to reduce contamination to levels below the AWQSs or to asymptotic levels through implementation of the in-situ treatment remedy. Any groundwater generated during implementation of the bedrock groundwater remedy that requires discharge will be discharged after treatment to the Village of Ossining sewer system in accordance with the Approval to Temporarily Discharge Groundwater into Sewers Dewatering Permit Guidelines.

4.3.8 EQUIPMENT AND MATERIAL STAGING

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

4.3.9 DECONTAMINATION AREA

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

4.3.10 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.

4.3.11 DEMOBILIZATION

Demobilization will include the following:

- 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; and
- General refuse disposal.

4.4 REPORTING

4.4.1 DAILY REPORTS

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers within two (2) business days of 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;
- A summary of any and all complaints with relevant details (names, phone numbers);
- A summary of CAMP findings, 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 in 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 Green Sustainable Remediation (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.

Any exceedance of the CAMP levels will be reported to the NYSDEC and NYSDOH within 24 hours of its occurrence.

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 Climate Vulnerability Assessment (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

5.1 CLEANUP OBJECTIVES

The SCOs for this Site are the Track 1 UUSCOs.

- The groundwater cleanup objectives will be the NYSDEC TOGS AWQS.
- The soil vapor objectives will be the most recent NYSDOH Guideline Values and Decision Matrices for the specific contaminants of concern including in the matrices therein.

5.2 SOIL REMEDIAL ACTION

Removal of all contaminated soil under the Remedial Action for the Site will be implemented in accordance with the Site-specific QAPP (**Appendix E**). Soil exceeding the UUSCOs extends to a depth of 13.0 ft-bgs based on the RI. A plan depicting the locations where the remedial excavation activities will be carried out to planned depths ranging from 4.5 to 14.0 ft-bgs is included as **Figure 2.2**. The depth was determined based on the deepest exceedance of the UUSCOs documented during prior investigations and remedial investigations, plus a foot of additional depth. The estimated excavation volume is approximately 50,000 to 60,000 cubic yards (CY) of remedial excavation. This estimate includes an additional 20% estimated to account for the use of 2:1 benching in shallow excavations located adjacent to deeper excavations and is designed to ensure full compliance with applicable OSHA safety standards. If the excavation of soils exceeding UUSCOs cannot be accomplished due to Site restrictions, the remaining soils will be compared to RSCOs and RRSCOs for a Track 2 contingency remedy.

5.3 GROUNDWATER REMEDIAL ACTION

Soil exceeding the UUSCOs will be excavated and removed from the Site to eliminate any source of groundwater contamination from overburden. Groundwater was not encountered in the overburden during the RI, and based on the anticipated excavation depths, dewatering is not expected to be required during soil remediation activities. However, if groundwater or accumulated water is unexpectedly encountered during excavation and requires removal to facilitate remedial activities, the water will be containerized for off-Site disposal at a permitted treatment facility or treated on-Site and discharged to the Village of Ossining sewer system in accordance with the Approval to Temporarily Discharge Groundwater into Sewers Dewatering Permit Guidelines. Any water proposed for discharge will be sampled in accordance with the

applicable permit requirements, and discharge will occur only if analytical results demonstrate compliance with the permit-specified discharge limits.

Groundwater contamination will be addressed through in-situ injection of a colloidal activated carbon amendment (e.g., PlumeStop®) targeting the CVOC (PCE) impact at monitoring well RI-MW-03 and the PFAS impacts identified across the Site. The treatment barrier will be installed along the downgradient western property boundary to intercept and treat the dissolved-phase plume, and supplemental injection points will be installed at RI-MW-03 to address the localized PCE impact. The design details of the in-situ treatment program, including proposed injection point locations, amendment dosing and quantities, and injection methodology, will be submitted to the NYSDEC and the NYSDOH for review and approval prior to implementation.

Following completion of the injection program, post-injection groundwater monitoring will be conducted at the Site monitoring well network to evaluate remedy performance and confirm attainment of remedial objectives. If post-injection monitoring results indicate that remedial objectives have not been achieved, supplemental in-situ treatment may be implemented, subject to NYSDEC review and approval.

It is anticipated that groundwater analytical results will meet the applicable AWQS or will reach asymptotic conditions acceptable to the Department by the time the COC is issued, or, if not, within five (5) years following issuance of the COC. In the event that AWQSGVs are not achieved and asymptotic conditions are not accepted by NYSDEC or NYSDOH within this timeframe, the remedy will transition to a Track 2 remedy.

5.4 SOIL VAPOR REMEDIAL ACTION

Although it is expected that the removal of impacted soils and remediation of elevated groundwater concentrations will significantly reduce the potential for vapor intrusion in connection with the future redevelopment of the property, the building designs will provide additional measures to mitigate this potential. The redevelopment will include two proposed buildings with parking garage areas incorporated into the building designs. The garage ventilation designs are currently being coordinated by the project architect. Based on preliminary information, the garages are anticipated to require mechanical ventilation rather than qualifying as open (naturally

ventilated) parking structures. In addition, a soil vapor barrier will be incorporated into the foundation system of each proposed building to reduce the potential for soil vapor intrusion into occupied portions of the buildings. A 20-mil sealing vapor barrier will be installed beneath the basement slabs of the proposed buildings and up the adjoining side walls.

The elements of an SSDS will be installed beneath the building foundation, and an SVE system will be installed around the building perimeter, as a precautionary measure. Following completion of building construction and issuance of the COC, a soil vapor intrusion evaluation will be conducted to determine whether SV levels constitute a VI risk. If the evaluation determines that vapor mitigation is needed, the SSDS elements will be activated and will constitute an EC.

5.5 REMEDIAL PERFORMANCE EVALUATION

5.5.1 END-POINT SAMPLING FREQUENCY

For all excavations, post-excavation soil samples will be collected in accordance with Section 5.4 of DER-10 for analysis of TCL+30/TAL, PFAS, and/or 1,4-dioxane depending on the contaminants of concern identified in each grid. All impacted Site soils will be removed down to depths up to 14.0 ft-bgs within the final SOE boundary as required to achieve the Track 1 remediation. Endpoint verification sampling will be implemented on an approximately 30 x 30-foot grid, or every 900 square feet (SF) at the base of the excavation and documented by field personnel. Proposed end point sampling locations are presented as **Figure 5.1**.

End-point samples will be collected manually from the top six (6) inches of soil from the bottom of the excavation. In addition to each end-point sample, two additional samples will be collected from 1.0-1.5 and 2.0-2.5 feet below the initial sample and will be placed on hold. If the initial end-point sample exceeds the UUSCOs, the contingent samples will be analyzed to achieve compliance. The soil will then be excavated to the required depth determined by the contingency samples. If the results of the contingent samples exceed the UUSCO standards, the process will continue until the analytical results are compliant or bedrock is encountered, whichever occurs first or a decision will be made to revert to a Track 2 remedy. Regardless of the depth of the over excavation, confirmation samples will be collected for every one foot of additional excavation depth. These samples will be held and run as needed to ensure that an accurate account of the volume of excavated impacted soils can be derived. Confirmatory sampling locations will be

surveyed, and the location and elevation will also be recorded and presented on the final soil removal maps. Documentation will be presented in the FER.

5.5.2 GROUNDWATER SAMPLING

The remedy will include mass source removal during remedial excavation and, if encountered, dewatering to remove contaminated groundwater during construction. Groundwater contamination will additionally be addressed through in-situ injection of a colloidal activated carbon amendment (e.g., PlumeStop®) targeting the CVOC (PCE) impact at monitoring well RI-MW-03 and the PFAS impacts identified across the Site, including installation of a treatment barrier along the downgradient western property boundary, as described in Section 5.3.

One (1) round of post-injection groundwater sampling will be conducted following completion of the in-situ injection program to verify whether the remedy is effective in treating groundwater or whether further treatment is required. The goal of the groundwater remedy is to achieve the TOGS AWQS standards or to reach asymptotic levels.

Residual groundwater contamination will be monitored following remediation from the well locations established during the RIR. If wells are destroyed or decommissioned during soil excavation, replacement wells will be installed at the same RIR locations to the extent possible. The current well locations are depicted on **Figure 2.1**. A typical well construction diagram is provided in **Appendix H**.

5.5.3 VI MITIGATION

The building foundation is not anticipated to be located below the water table, and the proposed building will include two (2) levels of unheated garages requiring mechanical ventilation, which will further reduce the potential for soil vapor intrusion into occupied space. Because the sub-slab is not anticipated to be submerged beneath the water table during the seasonal low, the elements of a sub-slab depressurization system (SSDS) will be installed beneath the building foundation, and an SVE system will be installed around the building perimeter, as precautionary measures.

A vapor barrier comprised of 20-mil thickness high- or low-density polyethylene (H/LDPE), or an approved equal, will be installed beneath the slab and up the side walls to prevent potential

migration of residual off-Site soil vapor. All utility penetrations through the slab will be sealed. An inspection of the soil vapor barrier installation will be performed prior to pouring the slab.

Following completion of building construction and issuance of the COC, a soil vapor intrusion evaluation will be conducted to determine whether soil vapor (SV) levels constitute a vapor intrusion (VI) risk. If the evaluation determines that vapor mitigation is needed, the elements of the SSDS will be activated and will constitute an EC.

5.6 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.

5.7 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™.

5.8 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 E**. Field blanks, trip blanks and duplicate samples associated with daily sampling activities will be collected as a part of the QA/QC practices.

5.9 DATA USABILITY SUMMARY REPORT (DUSR)

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.

5.10 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 UUSCOs and AWQS.

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.

Analytical laboratories used for all end-point sample analysis and contingency sample analysis will be NYSDOH ELAP certified.

End point sampling, including bottom and side-wall sampling where needed, will be performed in accordance with DER-10 sample frequency requirements at a rate of one for every 900 square feet. A post-excavation sampling plan is shown in **Figure 5.1** where the grids are 30 by 30 feet. Post excavation samples will be collected from center of each grid as the excavation proceeds. In addition, although not depicted on the plan, sidewall samples will be collected within the Site in accordance with DER-10 where adjacent grids are excavated to different depths (greater than 2-foot variance). The results will be shared with the NYSDEC in the weekly report. The FER will provide a tabular and map summary of all end-point sample results and exceedances of SCOs.

5.11 ESTIMATED MATERIAL REMOVAL QUANTITIES

Source removal excavation activities will be implemented during the course of the remediation activities throughout the footprint of the Site. Based on the RI, the depth of contaminated fill/ soil ranges from 1.0 to 13.0 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 approximately 50,000 to 60,000 CY. Required excavation depths are varied based upon contaminant depths determined during the Prior Investigations and remedial investigation work. A plan depicting the proposed excavation depths is included as **Figure 2.2**. The depth was determined based on the vertical delineations

determined during the RI. The actual excavated volume will be reported in the FER as a tally of the manifests and tickets of the soils disposed of off-site.

5.12 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 Part 375-6.8(d) and the requirements for emerging contaminants sampling per the April 2023 NYSDEC Guidance Document, *Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS)*, or subsequent revisions thereto.

5.12.1 SOIL SCREENING METHODS

Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional during all remedial and development excavations into known or potentially contaminated material (Residual Contamination Zone). 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 foundation and utility work, prior to issuance of the Certificate of Completion.

All primary contaminant sources identified during 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 (i.e. those representing the Remedial Engineer) of invasive work for unknown contaminant sources during remediation and development work.

5.12.2 STOCKPILE METHODS FOR CONTAMINATED SOILS

Stockpiles of contaminated materials, if needed, 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.

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

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

5.12.3 MATERIALS EXCAVATION AND LOAD-OUT

The Remediation 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 during the remedial investigation work. It has been determined that no risk or impediment to the planned work under this RAWP 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 New York State Department of Transportation requirements (and all other applicable transportation requirements).

A truck wash associated with construction activities will be operational during construction. A truck wash is always required for large soil excavation projects such as this. The Remediation Engineer will be responsible for ensuring that all outbound trucks are not causing any off-site tracking of the contaminated soil.

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

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

The Volunteer 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 RAWP.

5.12.4 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 included in the SOP. All trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes.

Proposed inbound and outbound 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; (f) overall safety in transport; and (g) community input, which was sought and obtained during the local land use approval process.
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-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

A stabilized tracking pad will be installed at the Site egress to minimize the tracking of Site-derived soil and other materials onto adjacent roadways. If the tracking pad is insufficient to prevent tracking of Site-derived materials, truck tires will be washed as necessary prior to leaving the Site. Truck wash waters will be collected and disposed of off-Site in an appropriate manner.

5.12.5 MATERIALS DISPOSAL OFF-SITE

Approval from appropriate disposal facilities will be received prior to start of work. The total quantity of material expected to be disposed of off-Site is approximately 50,000 to 60,000 CY, including as estimated 20%.

All contaminated soil/fill/solid waste excavated and removed from the Site will be disposed of 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 will be made to NYSDEC's Project Manager. Unregulated off-Site management of materials from this Site will not be undertaken 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 360-16 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 Volunteer 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 soil taken off-Site will be handled, at minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2.

Historical fill and contaminated soils from the Site are prohibited from being disposed of at Part 360-16 Registration Facilities (also known as Soil Recycling Facilities).

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, if any, 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 will be performed for off-Site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the FER. All data available for soil/material to be disposed of at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

5.12.6 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. If any liquids need to be discharged into the sewer system, then approval by local utility authority and NYSDEC will be sought prior to the discharge. Dewatered fluids will not be recharged back to the land surface or subsurface of the Site without NYSDEC approval.

Water generated during remedial construction will not be discharged to surface waters (i.e. a local pond, stream or river) without a state pollutant discharge elimination system permit.

5.12.7 BACKFILL FROM OFF-SITE SOURCES

Backfilling is expected to be needed in certain of areas on the Site as part of the 2.0-foot cover system for protectiveness of human health and the environment. The imported material, if needed, will be sampled in accordance with DER-10 Section 5.4 (e) Table 5.4 (e)10 and paragraph 10. The samples will be analyzed for TCL VOCs, TCL SVOCs, pesticides, PCBs, and TAL metals, including cyanide. The soil may be used as cover material provided that all parameters meet the UUSCOs, 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 meet the UUSCOs, will be approved by the Remedial Engineer, and will be in compliance with provisions in this RAWP prior to receiving receipt at the Site. A “Soil Reuse/Import” form will be submitted to the NYSDEC for pre-approval prior to importing any soils on -Site. Bills of Lading or equivalent documentation will be obtained to track the amount of soil arriving onto the Site and verify the source of soil being imported.

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

The Final Engineering Report 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. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved Remedial Action Work Plan or its approval by NYSDEC will be construed as an approval for this purpose.

Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, 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 Remedial Action Work Plan will be construed as an approval for this purpose.

Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soil will be securely covered with tight fitting covers.

5.12.8 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.

5.12.8.1 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 Volunteer 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 is not anticipated to be required for this Site. 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 on-Site 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.

5.12.9 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 provided in **Appendix G**.

5.12.10 ODOR, DUST, AND NUISANCE CONTROL PLAN

Odor, dust, and nuisance control will be in accordance with the site-specific Health and Safety Plan and the CAMP as specified in Section 5.12.9 of this RAWP. 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."

Odor Control Plan

This odor control plan is designed to control emissions of nuisance odors off-Site. 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 Remediation Engineer, who is responsible for certifying the Final Engineering Report.

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. 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 deodorants 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, as appropriate, by a combination

of, applying odor suppressants and when necessary if the odor suppressants are not working, sheltering the excavation and handling areas under tented containment structures equipped with appropriate air venting/filtering systems.

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 for road wetting. The truck will be equipped with a water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Clearing and grubbing 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 truck sprinkling.

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 local noise control standards.

6.0 RESIDUAL CONTAMINATION TO REMAIN ON-SITE

Since residual contaminated groundwater and soil vapor could potentially remain beneath the Site after the remedy is complete, Engineering and Institutional Controls (ECs and ICs) could potentially 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, if required, will be executed under a Site-specific SMP that will be developed and included in the FER. The elements of a SSDS will be installed beneath the building foundation as a precautionary measure and, together with an SVE system installed around the building perimeter, may become an engineering control for soil vapor if a post-COC soil vapor intrusion evaluation determines that vapor mitigation is needed. The building design further reduces the potential for soil vapor intrusion through the inclusion of two (2) levels of unheated garages requiring mechanical ventilation beneath the residential living spaces. The potential for residual off-site vapor intrusion will be mitigated via the soil vapor barrier under the foundation and up the side walls to prevent any off-site migration.

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 presentations of exceedances of both Track 1 and Track 2 sites.

7.0 ENGINEERING CONTROLS

7.1 GROUNDWATER MONITORING SYSTEM AND CRITERIA FOR COMPLETION

The goal of the groundwater remedy is to achieve the TOGS AWQS standards or to reach asymptotic levels since it may not be possible to achieve the TOGS AWQS standards for every contaminant, particularly naturally occurring metals, given the surrounding urban environment in the Village of Ossining and area-wide groundwater contamination conditions. Post-remediation groundwater sampling will be conducted in order to demonstrate that no additional groundwater remediation is required because the conditions have reached asymptotic levels. The current groundwater monitoring well network is presented in **Figure 2.1**. Wells that are damaged or lost during the remediation will be replaced or repaired for post-remediation sampling.

7.2 VAPOR BARRIER

Based on the proposed Track 1 soil source removal effort and groundwater concentrations, and the planned construction of the building with two (2) levels of unheated garages requiring mechanical ventilation, the potential for soil vapor intrusion on-Site is expected to be significantly reduced. A vapor barrier is being installed to prevent any potential for off-site migration of residual soil vapor, and the elements of an SSDS will be installed as a precautionary measure and evaluated for activation as an EC following the post-COC soil vapor intrusion evaluation described in Section 5.4.

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. The Environmental Easement renders the Site a Controlled Property, and if required, will be recorded with the Westchester County Clerk before the Certificate of Completion is issued by NYSDEC.

The Environmental Easement renders the Site a Controlled Property. The Environmental Easement must be recorded with the Westchester County Clerk's Office 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(s) 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 groups are closely integrated with the SMP, which provides all 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;
- 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, soil vapor probes, must be protected and replaced as necessary to ensure proper functioning in the manner specified in the SMP; and,
- 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 [restricted residential] 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 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 for the Remedial Action. Since an SMP will likely be needed because of remaining groundwater monitoring likely to be required and the need for a soil vapor evaluation, it will be submitted for approval prior to the approval of the FER. Site Management will not be discontinued unless prior written approval is granted by the NYSDEC and NYSDOH. The property owner is responsible for ensuring that all Site Management responsibilities defined in the Environmental Easement and the Site Management Plan are performed.

The SMP is intended to provide a detailed description of the procedures required to manage the Site until an unconditional Track 1 unrestricted use is achieved. This includes: (1) development, implementation, and management of all Engineering and Institutional Controls; (2) development and implementation of a Monitoring Plan and SVI Evaluation; (3) submittal of Site Management Reports, performance of inspections and certification of results, and demonstration of proper communication of Site information to NYSDEC; and (4) defining criteria for termination of monitoring. The SMP for this Site, if needed, will not require the development of a plan to operate and maintain treatment, collection, containment, or recovery systems because the only proposed ongoing remedy will be monitoring the wells and evaluating soil vapor intrusion.

To address these needs, this SMP will include three (3) plans as applicable: (1) an Engineering and Institutional Control Plan for implementation and management of EC/ICs; (2) a Monitoring Plan for implementation of Site groundwater monitoring; and (3) 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 Draft DER-10 Technical Guidance for Site Investigation and Remediation, dated December 2002, and the guidelines provided by NYSDEC.

Site management activities, reporting, and EC/IC certification will be scheduled on a certification period basis. A Periodic Review Report (PRR) will be submitted to the NYSDEC beginning 16 months after the Certificate of Completion is issued. After the initial PRR, the next PRR will be submitted annually to the NYSDEC.

The SMP and the FER will include a monitoring plan for groundwater at the upgradient and the downgradient Site perimeter to evaluate Site-wide performance of the remedy. Groundwater monitoring wells will be installed immediately downgradient of all remediation areas to monitor the natural attenuation. If the contaminants in groundwater do not attenuate below the Class GA AWQS concentrations or reach an asymptotic level that is accepted by the NYSDEC, an active treatment (e.g. oxidant injection) will be proposed and designed based on the monitoring data.

No exclusions for handling of remaining contaminated soils will be provided in the Site SMP. All handling of remaining contaminated material, to the extent a Track 1 soil remedy is not achieved, will be subject to Excavation Work Plan provisions contained in the SMP.

9.0 FINAL ENGINEERING REPORT

A FER and Site Management Plan will be submitted to NYSDEC following implementation of the Remedial Action defined in this RAWP. The FER provides 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 FER will include as-built drawings for all constructed elements, certifications, manifests, bills of landing as well as the complete Site Management Plan. The FER will provide a description of the changes in the Remedial Action from the elements provided in the RAWP and associated design documents, including the remedy for PFAS. 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. Applicable analytical data collected under this RAWP will be accompanied by DUSRs in the FER. The FER will document that all applicable analytical data was submitted to and accepted by the Department in the Department's approved Electronic Data Deliverable format. The FER will be prepared in conformance with DER-10.

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.

Residual contamination includes exceedances of the Track 1 UUSCOs in 6 NYCRR Part 375-6.8(a), and/or asymptotic levels cannot be demonstrated by the time the FER is submitted, the FER will provide a thorough summary of all residual contamination left on the Site after the remedy is complete. A table that shows exceedances of Track 1 UUSCOs for all soil/fill remaining at the Site after the Remedial Action will be included in the FER. A map that shows the location and summarizes exceedances of Track 1 UUSCOs 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 groundwater contamination that exceeds the AWQS to the extent remaining, and if asymptotic levels have not been achieved. A table that shows residual groundwater contamination in excess of Site AWQS will be included in the FER. The FER will also include the results of the pre-COC soil vapor evaluation.

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.

Before approval of a FER and issuance of a Certificate of Completion, 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 certification will be signed by the Remedial Engineer, Fuad Dahan, who is a Professional Engineer registered in New York State. This certification will be appropriately signed and stamped. The certification will include the following statements:

I _____certify that I am currently a NYS registered professional engineer, I had primary direct responsibility for the implementation of the subject construction program, and I certify that the Remedial Work Plan was implemented and that all construction activities were completed in substantial conformance with the DER-approved Remedial Work Plan.

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 to ECL 71-3605 and that any 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 any engineering controls employed at the site including the

proper maintenance of any remaining monitoring wells, and that such plan has been approved by DER.

FIGURES



REFERENCE:

UNITED STATES GEOLOGICAL SURVEY (USGS)
OSSINING, NY USGS QUADRANGLE - 2023

LEGEND:

BCP BOUNDARY

SCALE: 1" = 2,000'

0 1,000 2,000 4,000 FEET

34 STATE STREET
BLOCK 2, LOT 17, 18, AND 68
OSSINING, WESTCHESTER, NY

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:	KBV
CHECKED BY:	CM
SCALE:	AS NOTED
DATE:	12/22/2025
JOB NO:	13968

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NYS Education Law

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REFERENCE:
APPROXIMATE BCP BOUNDARY TAKEN FROM "BROWNFIELD CLEANUP PROGRAM AREA MAP", PREPARED BY INSITE ENGINEERING, SURVEYING, AND LANDSCAPE ARCHITECTURE FOR WBP DEVELOPMENT LLC. PUBLIC TAX PARCELS TAKEN FROM NYS OFFICE OF INFORMATION TECHNOLOGY SERVICES - GIS PROGRAM OFFICE, NYS DEPT OF TAXATION AND FINANCE'S OFFICE OF REAL PROPERTY TAX SERVICES. AERIAL IMAGERY: NY STATE, MICROSOFT, VANTOR.

LEGEND:
- APPROXIMATE BCP BOUNDARY
- NY TAX PARCELS

SCALE: 1" = 40'
0 20 40 80 120 160 FEET

rev	date	description	by

dwg by: KBV
chk by: CM
scale: AS NOTED
date: 12/22/2025

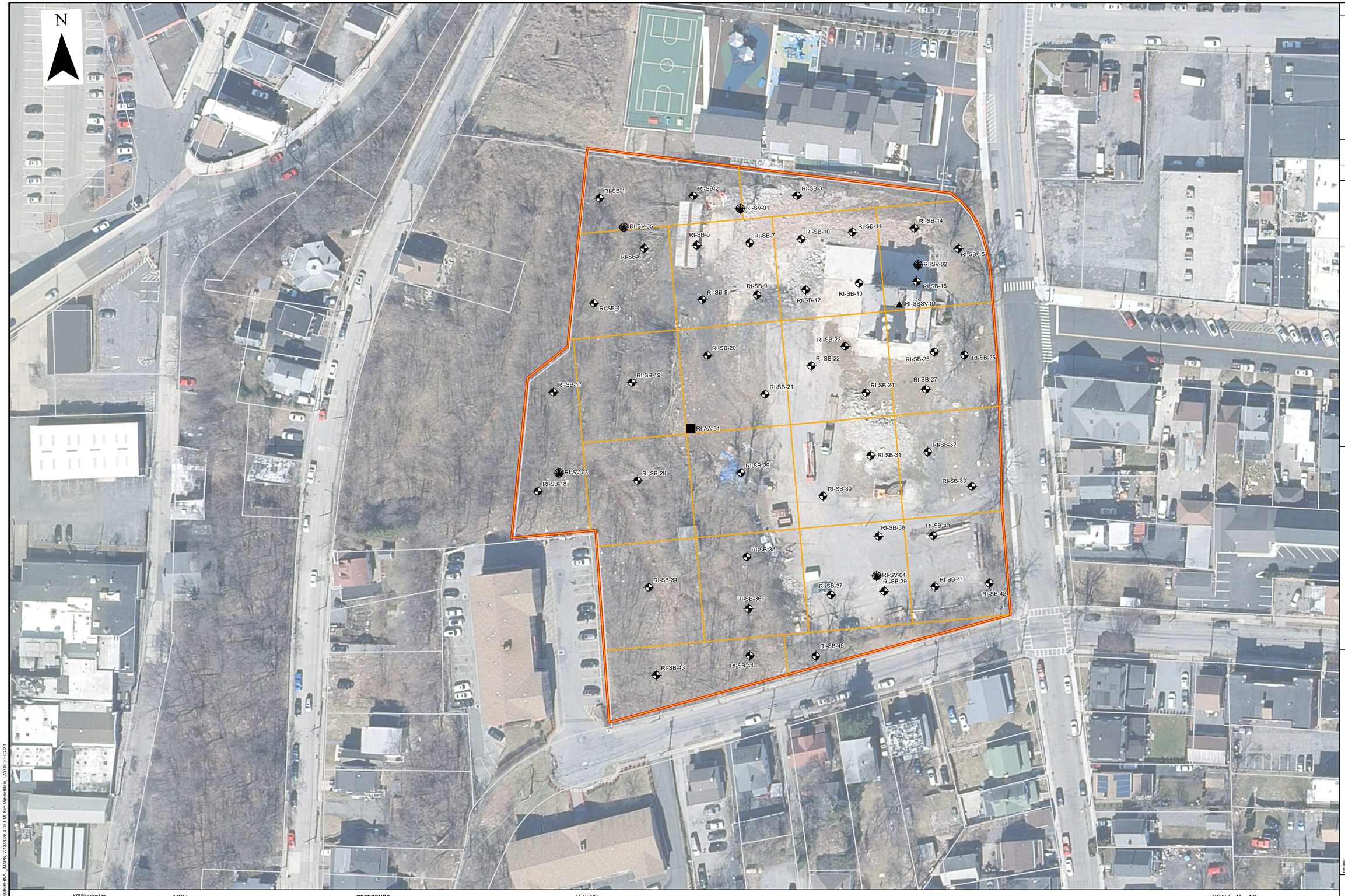
CERT. OF AUTH. #24GA02784700
SESI CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 route 46e, 3rd floor, parsippany, nj 07054 ph: 973.808.9050

project:
BLOCK 2, LOT 17, 18, AND 68
34 STATE STREET
OSSINING, WESTCHESTER, NY

title:
SITE PLAN

job no.: 13968
drawing no:
Fig-1.2

Y:\GIS\Project_Numbers\13968\FINAL_MAPS, 12/22/2025 2:28 PM, Kim Vanderkam, LAYOUT: FIG-



NYS Education Law

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NOTE:

1. THIS PLAN IS FOR LOCATING SAMPLE LOCATIONS ONLY. OTHER SITE WORK SHOWN HERE NOT INTENDED FOR CONSTRUCTION.

REFERENCE:

APPROXIMATE BCP BOUNDARY TAKEN FROM "BROWNFIELD CLEANUP PROGRAM AREA MAP", PREPARED BY INSITE ENGINEERING, SURVEYING, AND LANDSCAPE ARCHITECTURE FOR WBP DEVELOPMENT LLC. PUBLIC TAX PARCELS TAKEN FROM NYS OFFICE OF INFORMATION TECHNOLOGY SERVICES - GIS PROGRAM OFFICE, NYS DEPT OF TAXATION AND FINANCE'S OFFICE OF REAL PROPERTY TAX SERVICES. AERIAL IMAGERY TAKEN FROM NEW YORK STATE, MICROSOFT, VANTOR

LEGEND:

- AMBIENT AIR SAMPLE NO. AND APPROX. LOCATION
- MONITORING WELL NO. AND APPROX. LOCATION
- SOIL BORING NO. AND APPROX. LOCATION
- SOIL VAPOR SAMPLE NO. AND APPROX. LOCATION
- APPROXIMATE BCP BOUNDARY
- TAX PARCELS

SCALE: 1" = 40'

0 20 40 80 120 160 FEET

rev	date	description	by

dwg by: KBV
chk by: CM
scale: AS NOTED
date: 7/13/2026

SESI CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 route 46e, 3rd floor, parsippany, nj 07054 ph: 973.808.9050

project:
BLOCK 2, LOT 17, 18, AND 68
34 & 36 STATE STREET
OSSINING, WESTCHESTER, NY

title:
RI SAMPLE LOCATION PLAN

job no.: 13968
drawing no:
FIG-2.1

Y:\GIS\Project_Numbers\13968\FINAL_MAPS, 7/13/2026 4:08 PM, Kim Vanderklein, LAYOUT FIG-2.1

N

SOIL BORING	RI-SB-6		
Sample Name	RI-SB-6 (0-2)	RI-SB-6 (2-5)	RI-SB-6 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	5.5-6.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	68	4	3
Zinc	145	24.0	20.3
Mercury	0.224	ND	ND

SOIL BORING	RI-SB-1	
Sample Name	RI-SB-1 (0-2)	RI-SB-1 (2-5)
Sample Depth	1.0-1.5	4.0-4.5
Sampling Date	5/19/2026	5/19/2026
Compound	Result	Result
PESTICIDES		
4,4'-DDT	ND	0.00405
Dieldrin	ND	0.0114
METALS		
Chromium	26	38
Copper	26.8	58.1
Lead	67	169
Zinc	100	263
PCBs		
Total PCBs	ND	0.142

SOIL BORING	RI-SB-8			
Sample Name	RI-SB-8 (0-2)	RI-SB-8 (2-5)	RI-SB-8 (5-10)	RI-SB-8 (10-15)
Sample Depth	1.0-1.5	4.5-5.0	5.0-5.5	10.0-10.5
Sampling Date	5/14/2026	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result	Result
SVOCs				
Benzo(a)anthracene	ND	ND	0.7880	1.74
Benzo(a)pyrene	ND	ND	0.7340	1.27
Benzo(b)fluoranthene	ND	ND	0.8870	1.40
Benzo(g,h,i)perylene	ND	ND	0.4920	1.33
Benzo(k)fluoranthene	ND	ND	0.4940	1.42
Chrysene	ND	ND	0.8320	2.06
Dibenzo(a,h)anthracene	ND	ND	0.1450	0.456
Indeno(1,2,3-cd)pyrene	ND	ND	0.3690	1.10
Phenanthrene	ND	ND	0.9260	2.38
METALS				
Lead	300	8	269	47
Zinc	261	42.0	232	67.2
Mercury	0.255	ND	0.284	0.036

SOIL BORING	RI-SB-20				
Sample Name	RI-SB-20 (0-2)	RI-SB-20 (2-5)	RI-SB-20 (5-10)	RI-2026-DUP4	RI-SB-20 (10-15)
Sample Depth	1.0-1.5	4.5-5.0	6.5-7.0	6.5-7.0	10.0-10.5
Sampling Date	5/14/2026	5/14/2026	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result	Result	Result
VOCs					
Acetone	0.00650	0.01100	0.062	0.00740	0.060
SVOCs					
Benzo(a)anthracene	0.5400	2.43	0.0340	0.5310	1.80
Benzo(a)pyrene	0.5720	2.12	ND	0.5360	2.01
Benzo(b)fluoranthene	0.5580	2.14	ND	0.6080	2.21
Benzo(g,h,i)perylene	0.3360	1.81	ND	0.3320	1.15
Benzo(k)fluoranthene	0.4580	1.77	ND	0.6150	1.46
Chrysene	0.5100	2.82	ND	0.6720	2.16
Dibenzo(a,h)anthracene	0.1030	0.66	ND	0.1080	0.44
Indeno(1,2,3-cd)pyrene	0.3860	1.81	ND	0.2790	1.08
Phenanthrene	0.4580	2.99	0.0377	0.5500	2.01
METALS					
Copper	59.4	152.0	22.0	22.2	55.0
Lead	168	33	7	15	61
Zinc	157.0	68.4	32.7	44.2	80.4
PFAS					
PFOS	7.14	7.80	0.634	6.13	4.89
PFOA	0.729	0.549	3.49	0.213	1.73

SOIL BORING	RI-SB-4		
Sample Name	RI-SB-4 (0-2)	RI-SB-4 (2-5)	RI-SB-4 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	6.0-6.5
Sampling Date	5/19/2026	5/19/2026	5/19/2026
Compound	Result	Result	Result
METALS			
Chromium	23	36	6
Copper	16	26	88

SOIL BORING	RI-SB-17		
Sample Name	RI-SB-17 (0-2)	RI-SB-17 (2-5)	RI2026-DUP5
Sample Depth	0.5-1.0	3.0-3.5	3.0-3.5
Sampling Date	5/19/2026	5/19/2026	5/19/2026
Compound	Result	Result	Result
SVOCs			
Indeno(1,2,3-cd)pyrene	0.5110	ND	0.0934
METALS			
Lead	80	40	173
Zinc	117	74.1	250
Mercury	0.212	0.190	0.29

SOIL BORING	RI-SB-19	
Sample Name	RI-SB-19 (0-2)	RI-SB-19 (2-5)
Sample Depth	1.0-1.5	3.0-3.5
Sampling Date	5/19/2026	5/19/2026
NO EXCEEDANCES DETECTED		

SOIL BORING	RI-SB-21		
Sample Name	RI-SB-21 (0-2)	RI-SB-21 (2-5)	RI-SB-21 (5-10)
Sample Depth	1.0-1.5	2.5-3.0	6.0-6.5
Sampling Date	5/13/2026	5/13/2026	5/13/2026
Compound	Result	Result	Result
METALS			
Lead	152	219	71
Mercury	0.282	0.882	ND

SOIL BORING	RI-SB-18		
Sample Name	RI-SB-18 (0-2)	RI-SB-18 (2-5)	RI-SB-18 (5-10)
Sample Depth	0.5-1.0	4.5-5.0	6.5-7.0
Sampling Date	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result
METALS			
Lead	77	8	5

SOIL BORING	RI-SB-28		
Sample Name	RI-SB-28 (0-2)	RI-SB-28 (2-5)	RI-SB-28 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	5.5-6.0
Sampling Date	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result
SVOCs			
Phenanthrene	0.0468	1.44	0.0964
METALS			
Chromium	30	39	14
Lead	65	39	233
Zinc	110	129	205
Mercury	0.171	0.082	0.291

SOIL BORING	RI-SB-35		
Sample Name	RI-SB-35 (0-2)	RI-SB-35 (2-5)	RI-SB-35 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	6.0-6.5
Sampling Date	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result
PESTICIDES			
4,4'-DDE	0.0165	ND	0.00683
4,4'-DDT	ND	ND	0.00460
METALS			
Copper	77.2	72.9	3.4
Lead	118	130	8

SOIL BORING	RI-SB-29		
Sample Name	RI-SB-29 (0-2)	RI-SB-29 (2-5)	RI-SB-29 (5-10)
Sample Depth	1.5-2.0	4.0-4.5	5.0-5.5
Sampling Date	5/13/2026	5/13/2026	5/13/2026
Compound	Result	Result	Result
METALS			
Arsenic	2.010	18.7	9.920
Copper	119	42.9	47.200
Lead	11	301	209
Zinc	56.4	156	132
Mercury	0.134	0.475	0.456

SOIL BORING	RI-SB-34		
Sample Name	RI-SB-34 (0-2)	RI-SB-34 (2-5)	RI-SB-34 (5-10)
Sample Depth	0.5-1.0	4.0-4.5	7.0-7.5
Sampling Date	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result
SVOCs			
Benzo(a)anthracene	0.9790	5.09	0.9860
Benzo(a)pyrene	1.0600	4.92	0.8790
Benzo(b)fluoranthene	0.8740	4.24	0.7920
Benzo(k)fluoranthene	0.7860	3.44	0.7420
Chrysene	0.9580	5.33	0.8850
Dibenzo(a,h)anthracene	0.1520	0.778	0.2750
Indeno(1,2,3-cd)pyrene	0.6690	2.02	0.5780
Phenanthrene	1.0500	6.29	0.6290
PESTICIDES			
4,4'-DDD	ND	ND	0.03190
4,4'-DDE	ND	ND	0.00622
4,4'-DDT	0.01180	0.00431	0.01000
METALS			
Lead	112	75	511
Zinc	189	82.8	376
Mercury	0.160	0.292	0.528

SOIL BORING	RI-SB-43	
Sample Name	RI-SB-43 (0-2)	RI-SB-43 (2-5)
Sample Depth	1.5-2.0	3.5-4.0
Sampling Date	5/18/2026	5/18/2026
Compound	Result	Result
VOCs		
Acetone	0.032	0.00940
PESTICIDES		
4,4'-DDE	0.0084	ND
4,4'-DDT	0.00439	ND
METALS		
Lead	349	194
Zinc	227	189
Mercury	0.338	0.124
PFAS		
PFOS	3.72	6.66

SOIL BORING	RI-SB-36			
Sample Name	RI-SB-36 (0-2)	RI-SB-36 (2-5)	RI-SB-36 (5-10)	RI-SB-36 (10-15)
Sample Depth	1.0-1.5	4.5-5.0	6.0-6.5	10.5-11.0
Sampling Date	5/18/2026	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result	Result
PESTICIDES				
4,4'-DDT	0.00626	ND	ND	ND
METALS				
Chromium	22	31	116	36
Copper	32.5	82.9	16.1	28.5
Lead	48	102	27	37
Zinc	59.7	150	77.1	71.2
Mercury	0.287	0.113	ND	0.071

SOIL BORING	RI-SB-44			
Sample Name	RI-SB-44 (0-2)	RI-SB-44 (2-5)	RI2026-DUP5	RI-SB-44 (5-10)
Sample Depth	1.0-1.5	4.5-5.0	4.5-5.0	5.0-5.5
Sampling Date	5/18/2026	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result	Result
METALS				
Chromium	32	19	21	20
Lead	95	20	11	10
Mercury	0.215	ND	ND	0.162

SOIL BORING	RI-SB-37			
Sample Name	RI-SB-37 (0-2)	RI-SB-37 (2-5)	RI-SB-37 (5-10)	RI2026-Dup1
Sample Depth	1.5-2.0	2.5-3.0	5.0-5.5	5.0-5.5
Sampling Date	5/12/2026	5/12/2026	5/12/2026	5/12/2026
Compound	Result	Result	Result	Result
METALS				
Copper	40.3	20.1	57.1	23.6
Lead	208	51	156	134
Zinc	141	63	102	88.5
Mercury	0.239	0.042	0.161	0.140

SOIL BORING	RI-SB-2			
Sample Name	RI-SB-2 (0-2)	RI-SB-2 (2-5)	RI-SB-2 (5-10)	RI-SB-2 (10-15)
Sample Depth	1.5-2.0	4.5-5.0	6.5-7.0	12.5-13.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result	Result
METALS				
Lead	98	40	111	40
Nickel	24.9	34.6	32.2	31.2
Zinc	167	139	88.9	89.1
PFAS				
PFOS	120.0	19.6	6.94	39.10
PFOA	3.66	1.68	1.13	0.884

SOIL BORING	RI-SB-9	
Sample Name	RI-SB-09 (0-2)	RI-SB-09 (2-5)
Sample Depth	1.0-1.5	3.5-4.0
Sampling Date	5/14/2026	5/14/2026
Compound	Result	Result
SVOCs		
Benzo(a)anthracene	0.3730	1.01
Benzo(a)pyrene	0.3750	0.9
Benzo(g,h,i)perylene	0.2480	0.684
Indeno(1,2,3-cd)pyrene	0.2770	0.771
METALS		
Lead	110	48
Zinc	170	112
Mercury	0.207	0.248

SOIL BORING	RI-SB-5	
Sample Name	RI-SB-5 (0-2)	RI-SB-5 (2-5)
Sample Depth	1.0-1.5	3.0-3.5
Sampling Date	5/14/2026	5/14/2026
Compound	Result	Result
METALS		
Copper	50.7	44.0
Lead	227	106
Zinc	130	106
Mercury	0.200	0.276
PCBs		
Total PCBs	0.422	0.42

SOIL BORING	RI-SB-3		
Sample Name	RI-SB-3 (0-2)	RI-SB-3 (2-5)	RI-SB-3 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	6.0-6.5
Sampling Date	5/14/2026	5/14/2026	5/14/2026
NO EXCEEDANCES DETECTED			

SOIL BORING	RI-SB-7		
Sample Name	RI-SB-7 (0-2)	RI-SB-7 (2-5)	RI-SB-7 (5-10)
Sample Depth	1.0-1.5	4.5-5.0	7.5-8.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	155	7	16
Zinc	184	141	58.3

SOIL BORING	RI-SB-13
NO SAMPLE COLLECTED (SMALLOW REFUSAL)	

SOIL BORING	RI-SB-10	
Sample Name	RI-SB-10 (0-2)	RI-SB-10 (2-5)
Sample Depth	0.5-1.0	3.0-3.5
Sampling Date	5/14/2026	5/14/2026
Compound	Result	Result
METALS		
Copper	23	61.7
Zinc	265	119

SOIL BORING	RI-SB-16	
Sample Name	RI-SB-16 (0-2)	RI-SB-16 (2-5)
Sample Depth	0.5-1.0	3.0-3.5
Sampling Date	5/14/2026	5/14/2026
NO EXCEEDANCES DETECTED		

SOIL BORING	RI-SB-13		
Sample Name	RI-SB-13 (0-2)	RI-SB-13 (2-5)	RI-SB-13 (5-10)
Sample Depth	1.5-2.0	4.0-4.5	6.5-7.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Chromium	14	35	30
Copper	29	77	38.2
Nickel	21.7	36.5	18.1

SOIL BORING	RI-SB-14		
Sample Name	RI-SB-14 (0-2)	RI-SB-14 (2-5)	RI-SB-14 (5-10)
Sample Depth	0.5-1.0	2.0-2.5	5.5-6.0
Sampling Date	5/19/2026	5/19/2026	5/19/2026
Compound	Result	Result	Result
METALS			
Chromium	22	33	23
Lead	222	254	11
Zinc	511	1,860	55.70
Mercury	0.110	0.187	ND

SOIL BORING	RI-SB-15		
Sample Name	RI-SB-15 (0-2)	RI-SB-15 (2-5)	RI2026-DUP3
Sample Depth	1.0-1.5	4.0-4.5	4.0-4.5
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	116	145	258
Mercury	0.161	0.107	0.263

SOIL BORING	RI-SB-12		
Sample Name	RI-SB-12 (0-2)	RI-SB-12 (2-5)	RI-SB-12 (5-10)
Sample Depth	1.0-1.5	4.5-5.0	5.5-6.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	235	286	496
Zinc	463	748	210
Mercury	0.174	0.537	1.580

SOIL BORING	RI-SB-23	
Sample Name	RI-SB-23 (0-2)	RI-SB-23 (2-5)
Sample Depth	1.0-1.5	2.0-2.5
Sampling Date	5/14/2026	5/14/2026
Compound	Result	Result
PESTICIDES		
4,4'-DDT	0.00530	ND
METALS		
Lead	124	160
Zinc	98.50	169.00
Mercury	0.150	0.660
PFAS		
PFOS	1.89	1.31

SOIL BORING	RI-SB-25	
Sample Name	RI-SB-25 (0-2)	RI-SB-25 (2-5)
Sample Depth	0.5-1.0	4.0-4.5
Sampling Date	5/14/2026	5/14/2026
Compound	Result	Result
METALS		
Lead	300	4
Zinc	305	4.770
Mercury	0.180	ND

SOIL BORING	RI-SB-26	
Sample Name	RI-SB-26 (0-2)	RI-SB-26 (2-5)
Sample Depth	1.0-1.5	4.0-4.5
Sampling Date	5/13/2026	5/13/2026
Compound	Result	Result
METALS		
Lead	236	73
Mercury	0.250	0.121

SOIL BORING	RI-SB-22		
Sample Name	RI-SB-22 (0-2)	RI-SB-22 (2-5)	RI-SB-22 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	6.0-6.5
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	15	247	17
Zinc	33.4	166.0	62.3
Mercury	ND	0.316	ND

SOIL BORING	RI-SB-24	
Sample Name	RI-SB-24 (0-2)	RI-SB-24 (2-5)
Sample Depth	1.5-2.0	4.0-4.5
Sampling Date	5/13/2026	5/13/2026
NO EXCEEDANCES DETECTED		

SOIL BORING	RI-SB-31	
Sample Name	RI-SB-31 (0-2)	RI-SB-31 (2-5)
Sample Depth	1.5-2.0	3.5-4.0
Sampling Date	5/13/2026	5/13/2026
Compound	Result	Result
METALS		
Lead	64	7
PFAS		
PFOS	1.55	22.0
PFOA	1.9	17.1

SOIL BORING	RI-SB-33	
Sample Name	RI-SB-33 (0-2)	RI-SB-33 (2-5)
Sample Depth	1.5-2.0	3.0-3.5
Sampling Date	5/13/2026	5/13/2026
Compound	Result	Result
METALS		
Chromium	22	31

SOIL BORING	RI-SB-27		
Sample Name	RI-SB-27 (0-2)	RI-SB-27 (2-5)	RI-SB-27 (5-10)
Sample Depth	1.0-1.5	3.5-4.0	5.5-6.0
Sampling Date	5/13/2026	5/13/2026	5/13/2026
Compound	Result	Result	Result
SVOCs			
Benzo(a)anthracene	4.85	0.1320	0.1140
Benzo(a)pyrene	2.91	0.1210	0.1110
Benzo(b)fluoranthene	2.56	0.180	0.0968
Benzo(g,h,i)perylene	1.89	0.0678	0.0606
Benzo(k)fluoranthene	2.92	0.0973	0.0919
Chrysene	4.58	0.1260	0.1200
Dibenzo(a,h)anthracene	0.97	ND	ND
Indeno(1,2,3-cd)pyrene	1.76	0.0761	0.0696
Phenanthrene	8.19	0.2010	0.1870
METALS			
Arsenic	22.8	2.870	ND
Lead	235	57	14
Zinc	449.0	37.800	20.600
Mercury	0.240	0.032	ND

SOIL BORING	RI-SB-32		
Sample Name	RI-SB-32 (0-2)	RI-SB-32 (2-5)	RI-SB-32 (5-10)
Sample Depth	1.5-2.0	4.5-5.0	6.5-7.0
Sampling Date	5/13/2026	5/13/2026	5/13/2026
Compound	Result	Result	Result
PFAS			
PFOS	3.56	2.09	13.50

SOIL BORING	RI-SB-30			
Sample Name	RI-SB-30 (0-2)	RI-SB-30 (2-5)	RI2026-DUP2	RI-SB-30 (5-10)
Sample Depth	1.0-1.5	3.0-3.5	3.0-3.5	6.0-6.5
Sampling Date	5/13/2026	5/13/2026	5/13/2026	5/13/2026
Compound	Result	Result	Result	Result
NO EXCEEDANCES DETECTED				

SOIL BORING	RI-SB-40		
Sample Name	RI-SB-40 (0-2)	RI-SB-40 (2-5)	RI-SB-40 (5-10)
Sample Depth	1.5-2.0	3.5-4.0	6.0-6.5
Sampling Date	5/12/2026	5/12/2026	5/12/2026
Compound	Result	Result	Result
METALS			
Lead	123	11	9

SOIL BORING	RI-SB-42			
Sample Name	RI-SB-42 (0-2)	RI-SB-42 (2-5)	RI-SB-42 (5-10)	RI-SB-42 (10-15)
Sample Depth	1.0-1.5	2.5-3.0	6.5-7.0	10.5-11.0
Sampling Date	5/12/2026	5/12/2026	5/12/2026	5/12/2026
Compound	Result	Result	Result	Result
METALS				
Lead	150	44	9	80

SOIL BORING	RI-SB-41			
Sample Name	RI-SB-41 (0-2)	RI-SB-41 (2-5)	RI-SB-41 (5-10)	RI-SB-41 (10-15)
Sample Depth	1.5-2.0	4.5-5.0	5.5-6.0	10.5-11.0
Sampling Date	5/12/2026	5/12/2026	5/12/2026	5/12/2026
Compound	Result	Result	Result	Result
METALS				
Lead	150	29	13	32
Mercury	0.240	0.047	ND	ND

SOIL BORING	RI-SB-38	
Sample Name	RI-SB-38 (0-2)	RI-SB-38 (2-5)
Sample Depth	1.5-2.0	3.5-4.0
Sampling Date	5/12/2026	5/12/2026
Compound	Result	Result
METALS		
Lead	103	101

SOIL BORING	RI-SB-45	
Sample Name	RI-SB-45 (0-2)	RI-SB-45 (2-5)
Sample Depth	0.5-1.0	3.0-3.5
Sampling Date	5/19/2026	5/19/2026
Compound	Result	Result
NO EXCEEDANCES DETECTED		

SOIL BORING	RI-SB-39		
Sample Name	RI-SB-39 (0-2)	RI-SB-39 (2-5)	RI-SB-39 (5-10)
Sample Depth	1.0-1.5	3.5-4.0	5.5-6.0
Sampling Date	5/12/2026	5/12/2026	5/12/2026
Compound	Result	Result	Result
PESTICIDES			
4,4'-DDE	0.00818	ND	ND
METALS			
Lead	267	39	24
Zinc	126	55.4	46.2
Mercury	0.207	0.048	ND

COMPOUND	CAS	UNIT	NY UUSCO	NY RRSCO	NY PGWSCO
VOCs					
Acetone	67-64-1	mg/kg	0.03	100	~
SVOCs					
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	~
Benzo(a)pyrene	50-32-8	mg/kg	1	1	~
Benzo(b)fluoranthene	205-99-2	mg/kg	1	1.4	~
Benzo(g,h,i)perylene	191-24-2	mg/kg	0.64	4.9	~
Benzo(k)fluoranthene	207-08-9	mg/kg	0.8	4.9	~
Chrysene	218-01-9	mg/kg	1	4.9	~
Dibenzo(a,h)anthracene	53-70-3	mg/kg	0.33	0.33	~
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	0.5	1.4	~
Phenanthrene	85-01-8	mg/kg	1.1	4.9	~
PESTICIDES					
4,4'-DDD	72-54-8	mg/kg	0.0033	5	~
4,4'-DDE	72-55-9	mg/kg	0.0033	3.4	~
4,4'-DDE [2C]	72-55-9	mg/kg	0.0033	3.4	~
4,4'-DDT	50-29-3	mg/kg	0.0033	3.8	~
Dieldrin	60-57-1	mg/kg	0.005	0.075	~
METALS					
Arsenic	7440-38-2	mg/kg	13	16	~
Chromium	7440-47-3	mg/kg	30	180	~
Copper	7440-50-8	mg/kg	50	280	~
Lead	7439-92-1	mg/kg	63	400	~
Nickel	7440-02-0	mg/kg	30	320	~
Zinc	7440-66-6	mg/kg	109	6,600	~
Mercury	7439-97-6	mg/kg	0.18	0.3	~
PCBs					
Total PCBs	1336-36-3	mg/kg	0.1	1	~
PFAS					
PFOS	1763-23-1	ng/g	0.88	44	1
PFOA	335-67-1	ng/g	0.66	33	0.8

Notes:
mg/kg = milligrams per kilogram
ng/g = nanograms per gram
ND = Not Detected
~ = No Standard (Or Not Detected in Site Groundwater for PGWSCO
NY UUSCO = Unrestricted Use Soil Cleanup Criteria
NY RRSCO = Restricted Residential Use Soil Cleanup Criteria
NY PGWSCO = NY Protection of Groundwater Soil Cleanup Criteria
= Exceeds NY UUSCO
= Exceeds NY RRSCO
= Exceeds NY PGWSCO

14 FT
6.5 FT
6.0 FT
NO EX
7.0 FT
5.5 FT
5.5 FT
11.5 FT
5.5 FT
NO EX
4.5 FT
7.0 FT
6.5 FT
8.0 FT
5.0 FT
6.5 FT
12.0 FT
12.0 FT
8.5 FT
NO EX
5.0 FT

RI-SB-1, RI-SB-2, RI-SB-3, RI-SB-4, RI-SB-5, RI-SB-6, RI-SB-7, RI-SB-8, RI-SB-9, RI-SB-10, RI-SB-11, RI-SB-12, RI-SB-13, RI-SB-14, RI-SB-15, RI-SB-16, RI-SB-17, RI-SB-18, RI-SB-19, RI-SB-20, RI-SB-21, RI-SB-22, RI-SB-23, RI-SB-24, RI-SB-25, RI-SB-26, RI-SB-27, RI-SB-28, RI-SB-29, RI-SB-30, RI-SB-31, RI-SB-32, RI-SB-33, RI-SB-34, RI-SB-35, RI-SB-36, RI-SB-37, RI-SB-38, RI-SB-39, RI-SB-40, RI-SB-41, RI-SB-42, RI-SB-43, RI-SB-44, RI-SB-45

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NOTE:
1. THIS PLAN IS FOR LOCATING BORING LOCATIONS ONLY. OTHER SITE WORK SHOWN HERE NOT INTENDED FOR CONSTRUCTION.
2. BORINGS ON BOTTOM HALF OF PROPERTY SHOWN ON SHEET 2.

REFERENCE:
PREVIOUS SAMPLE LOCATIONS TAKEN FROM "SITE (BASE) MAP" - FIG 2. PREVIOUS CONDITIONS AND BOUNDARIES TAKEN FROM 1971 SANBORN MAP. APPROXIMATE BCP BOUNDARY TAKEN FROM "BROWNFIELD CLEANUP PROGRAM AREA MAP", PREPARED BY INSITE ENGINEERING, SURVEYING, AND LANDSCAPE ARCHITECTURE FOR WBP DEVELOPMENT LLC. PUBLIC TAX PARCELS TAKEN FROM NYS OFFICE OF INFORMATION TECHNOLOGY SERVICES - 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-SB-1 — SOIL BORING NO. AND APPROX. LOCATION
SAMPLE GRID BOUNDARY
APPROXIMATE BCP BOUNDARY
14.0 FT - EXCAVATION DEPTH

SCALE: 1" = 40'
0 20 40 80 120 160 FEET

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GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 route 46e, 3rd floor, parsippany, nj 07054 ph: 973.808.9050

dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 7/13/2026

by	description	rev	date

BLOCK 2, LOT 17, 18, AND 68
34 STATE STREET
OSSINING, WESTCHESTER, NY

project:

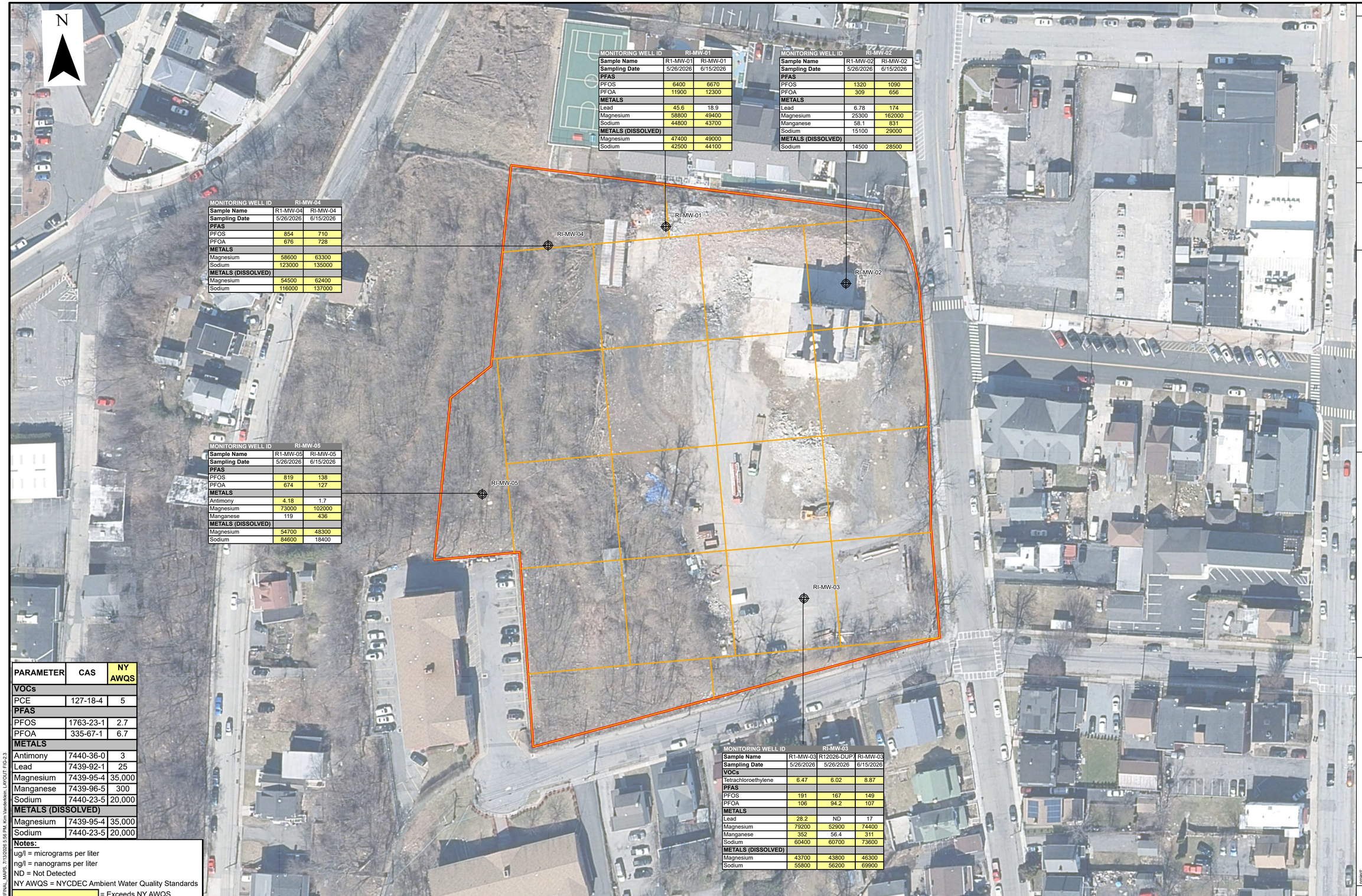
SOIL SAMPLING EXCEEDANCES AND EXCAVATION PLAN

bbk:

job no.: 13968
drawing no:

FIG-2.2

Y:\GIS\Project_Numbers\13968\FINAL_MAPS_ 7\13\2026 4:07 PM, Kim Vanderhein, LAYOUT FIG-2.2



MONITORING WELL ID	RI-MW-01	
Sample Name	R1-MW-01	RI-MW-01
Sampling Date	5/26/2026	6/15/2026
PFAS		
PFOS	6400	6670
PFOA	11900	12300
METALS		
Lead	45.6	18.9
Magnesium	58800	49400
Sodium	44800	43700
METALS (DISSOLVED)		
Magnesium	47400	49000
Sodium	42500	44100

MONITORING WELL ID	RI-MW-02	
Sample Name	R1-MW-02	RI-MW-02
Sampling Date	5/26/2026	6/15/2026
PFAS		
PFOS	1320	1090
PFOA	309	656
METALS		
Lead	6.78	174
Magnesium	25300	162000
Manganese	58.1	831
Sodium	15100	29000
METALS (DISSOLVED)		
Sodium	14500	28500

MONITORING WELL ID	RI-MW-04	
Sample Name	R1-MW-04	RI-MW-04
Sampling Date	5/26/2026	6/15/2026
PFAS		
PFOS	854	710
PFOA	676	728
METALS		
Magnesium	58600	63300
Sodium	123000	135000
METALS (DISSOLVED)		
Magnesium	54500	62400
Sodium	116000	137000

MONITORING WELL ID	RI-MW-05	
Sample Name	R1-MW-05	RI-MW-05
Sampling Date	5/26/2026	6/15/2026
PFAS		
PFOS	819	138
PFOA	674	127
METALS		
Antimony	4.18	1.7
Magnesium	73000	102000
Manganese	119	436
METALS (DISSOLVED)		
Magnesium	54700	48300
Sodium	84600	18400

MONITORING WELL ID	RI-MW-03		
Sample Name	R1-MW-03	R12026-DUP7	RI-MW-03
Sampling Date	5/26/2026	5/26/2026	6/15/2026
VOCs			
Tetrachloroethylene	6.47	6.02	8.87
PFAS			
PFOS	191	167	149
PFOA	106	94.2	107
METALS			
Lead	28.2	ND	17
Magnesium	79200	52900	74400
Manganese	352	56.4	311
Sodium	60400	60700	73600
METALS (DISSOLVED)			
Magnesium	43700	43800	46300
Sodium	55800	56200	69900

PARAMETER	CAS	NY AWQS
VOCs		
PCE	127-18-4	5
PFAS		
PFOS	1763-23-1	2.7
PFOA	335-67-1	6.7
METALS		
Antimony	7440-36-0	3
Lead	7439-92-1	25
Magnesium	7439-95-4	35,000
Manganese	7439-96-5	300
Sodium	7440-23-5	20,000
METALS (DISSOLVED)		
Magnesium	7439-95-4	35,000
Sodium	7440-23-5	20,000

Notes:
ug/l = micrograms per liter
ng/l = nanograms per liter
ND = Not Detected
NY AWQS = NYCDEC Ambient Water Quality Standards
= Exceeds NY AWQS

NYS Education Law

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LEGEND:
RI-MW-01 — MONITORING WELL NO. AND APPROX. LOCATION
SAMPLE GRID BOUNDARY
APPROXIMATE BCP BOUNDARY

SCALE: 1" = 40'
0 20 40 80 120 160 FEET

X:\GIS\Project_Numbers\13968\FINAL_MAPS, 7/13/2026 5:55 PM, Kim Vanderkiva, LAYOUT: FIG-2.3

rev	date	description	by

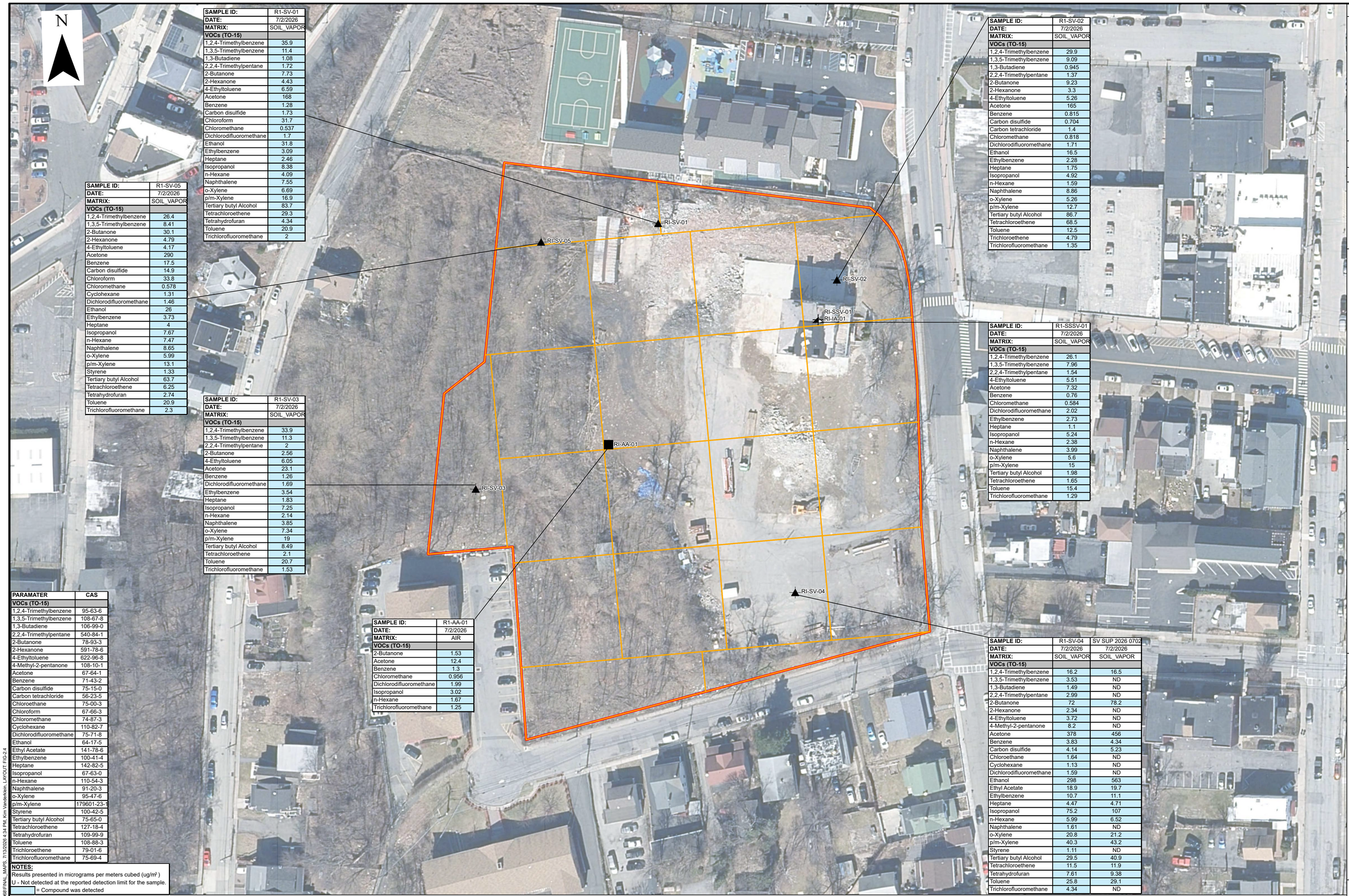
dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 7/13/2026

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959 route 46e, 3rd floor, parsippany, nj 07054 ph: 973.808.9050

project:
BLOCK 3, LOT 17, 18, AND 68
34 STATE STREET
OSSINING, WESTCHESTER, NY

title:
GROUNDWATER EXCEEDANCE PLAN

job no.: 13968
drawing no:
FIG-2.3



SAMPLE ID:	R1-SV-01
DATE:	7/2/2026
MATRIX:	SOIL_VAPOR
VOCs (TO-15)	
1,2,4-Trimethylbenzene	35.9
1,3,5-Trimethylbenzene	11.4
1,3-Butadiene	1.08
2,2,4-Trimethylpentane	1.72
2-Butanone	7.73
2-Hexanone	4.43
4-Ethyltoluene	6.59
Acetone	168
Benzene	1.28
Carbon disulfide	1.73
Chloroform	31.7
Chloromethane	0.537
Dichlorodifluoromethane	1.7
Ethanol	31.8
Ethylbenzene	3.09
Heptane	2.46
Isopropanol	8.38
n-Hexane	4.09
Naphthalene	7.55
o-Xylene	6.69
p/m-Xylene	16.9
Tertiary butyl Alcohol	83.7
Tetrachloroethene	29.3
Tetrahydrofuran	4.34
Toluene	20.9
Trichlorofluoromethane	2

SAMPLE ID:	R1-SV-02
DATE:	7/2/2026
MATRIX:	SOIL_VAPOR
VOCs (TO-15)	
1,2,4-Trimethylbenzene	29.9
1,3,5-Trimethylbenzene	9.09
1,3-Butadiene	0.945
2,2,4-Trimethylpentane	1.37
2-Butanone	9.23
2-Hexanone	3.3
4-Ethyltoluene	5.26
Acetone	165
Benzene	0.815
Carbon disulfide	0.704
Carbon tetrachloride	1.4
Chloromethane	0.818
Dichlorodifluoromethane	1.71
Ethanol	16.5
Ethylbenzene	2.28
Heptane	1.75
Isopropanol	4.92
n-Hexane	1.59
Naphthalene	8.86
o-Xylene	5.26
p/m-Xylene	12.7
Tertiary butyl Alcohol	86.7
Tetrachloroethene	68.5
Toluene	12.5
Trichloroethene	4.79
Trichlorofluoromethane	1.35

SAMPLE ID:	R1-SV-05
DATE:	7/2/2026
MATRIX:	SOIL_VAPOR
VOCs (TO-15)	
1,2,4-Trimethylbenzene	26.4
1,3,5-Trimethylbenzene	8.41
2-Butanone	30.1
2-Hexanone	4.79
4-Ethyltoluene	4.17
Acetone	290
Benzene	17.5
Carbon disulfide	14.9
Chloroform	33.8
Chloromethane	0.578
Cyclohexane	1.31
Dichlorodifluoromethane	1.46
Ethanol	26
Ethylbenzene	3.73
Heptane	4
Isopropanol	7.67
n-Hexane	7.47
Naphthalene	8.65
o-Xylene	5.99
p/m-Xylene	13.1
Styrene	1.33
Tertiary butyl Alcohol	63.7
Tetrachloroethene	6.25
Tetrahydrofuran	2.74
Toluene	20.9
Trichlorofluoromethane	2.3

SAMPLE ID:	R1-SSSV-01
DATE:	7/2/2026
MATRIX:	SOIL_VAPOR
VOCs (TO-15)	
1,2,4-Trimethylbenzene	26.1
1,3,5-Trimethylbenzene	7.96
2,2,4-Trimethylpentane	1.54
4-Ethyltoluene	5.51
Acetone	7.32
Benzene	0.76
Chloromethane	0.584
Dichlorodifluoromethane	2.02
Ethylbenzene	2.73
Heptane	1.1
Isopropanol	5.24
n-Hexane	2.38
Naphthalene	3.99
o-Xylene	5.6
p/m-Xylene	15
Tertiary butyl Alcohol	1.98
Tetrachloroethene	1.65
Toluene	15.4
Trichlorofluoromethane	1.29

SAMPLE ID:	R1-SV-03
DATE:	7/2/2026
MATRIX:	SOIL_VAPOR
VOCs (TO-15)	
1,2,4-Trimethylbenzene	33.9
1,3,5-Trimethylbenzene	11.3
2,2,4-Trimethylpentane	2
2-Butanone	2.56
4-Ethyltoluene	6.05
Acetone	23.1
Benzene	1.26
Dichlorodifluoromethane	1.69
Ethylbenzene	3.54
Heptane	1.83
Isopropanol	7.25
n-Hexane	2.14
Naphthalene	3.85
o-Xylene	7.34
p/m-Xylene	19
Tertiary butyl Alcohol	8.49
Tetrachloroethene	2.1
Toluene	20.7
Trichlorofluoromethane	1.53

SAMPLE ID:	R1-AA-01
DATE:	7/2/2026
MATRIX:	AIR
VOCs (TO-15)	
2-Butanone	1.53
Acetone	12.4
Benzene	1.3
Chloromethane	0.956
Dichlorodifluoromethane	1.99
Isopropanol	3.02
n-Hexane	1.67
Trichlorofluoromethane	1.25

SAMPLE ID:	R1-SV-04	SV SUP 2026 0702
DATE:	7/2/2026	7/2/2026
MATRIX:	SOIL_VAPOR	SOIL_VAPOR
VOCs (TO-15)		
1,2,4-Trimethylbenzene	16.2	16.5
1,3,5-Trimethylbenzene	3.53	ND
1,3-Butadiene	1.49	ND
2,2,4-Trimethylpentane	2.99	ND
2-Butanone	72	78.2
2-Hexanone	2.34	ND
4-Ethyltoluene	3.72	ND
4-Methyl-2-pentanone	8.2	ND
Acetone	378	456
Benzene	3.83	4.34
Carbon disulfide	4.14	5.23
Chloroethane	1.64	ND
Cyclohexane	1.13	ND
Dichlorodifluoromethane	1.59	ND
Ethanol	298	563
Ethyl Acetate	18.9	19.7
Ethylbenzene	10.7	11.1
Heptane	4.47	4.71
Isopropanol	75.2	107
n-Hexane	5.99	6.52
Naphthalene	1.61	ND
o-Xylene	20.8	21.2
p/m-Xylene	40.3	43.2
Styrene	1.11	ND
Tertiary butyl Alcohol	29.5	40.9
Tetrachloroethene	11.5	11.9
Tetrahydrofuran	7.61	9.38
Toluene	25.8	29.1
Trichlorofluoromethane	4.34	ND

PARAMATER	CAS
VOCs (TO-15)	
1,2,4-Trimethylbenzene	95-63-6
1,3,5-Trimethylbenzene	108-67-8
1,3-Butadiene	106-99-0
2,2,4-Trimethylpentane	540-84-1
2-Butanone	78-93-3
2-Hexanone	591-78-6
4-Ethyltoluene	622-96-8
4-Methyl-2-pentanone	108-10-1
Acetone	67-64-1
Benzene	71-43-2
Carbon disulfide	75-15-0
Carbon tetrachloride	56-23-5
Chloroethane	75-00-3
Chloroform	67-66-3
Chloromethane	74-87-3
Cyclohexane	110-82-7
Dichlorodifluoromethane	75-71-8
Ethanol	64-17-5
Ethyl Acetate	141-78-6
Ethylbenzene	100-41-4
Heptane	142-82-5
Isopropanol	67-63-0
n-Hexane	110-54-3
Naphthalene	91-20-3
o-Xylene	95-47-6
p/m-Xylene	179601-23-1
Styrene	100-42-5
Tertiary butyl Alcohol	75-65-0
Tetrachloroethene	127-18-4
Tetrahydrofuran	109-99-9
Toluene	108-88-3
Trichloroethene	79-01-6
Trichlorofluoromethane	75-69-4

NOTES:
Results presented in micrograms per meters cubed (ug/m³)
U - Not detected at the reported detection limit for the sample.
= Compound was detected

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

REFERENCE:
APPROXIMATE BCP BOUNDARY TAKEN FROM "BROWNFIELD CLEANUP PROGRAM AREA MAP", PREPARED BY INSITE ENGINEERING, SURVEYING, AND LANDSCAPE ARCHITECTURE FOR WBP DEVELOPMENT LLC. PUBLIC TAX PARCELS TAKEN FROM NYS OFFICE OF INFORMATION TECHNOLOGY SERVICES - 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-AA-01 — AMBIENT AIR SAMPLE NO. AND APPROX. LOCATION
RI-SV-01 — SOIL VAPOR SAMPLE NO. AND APPROX. LOCATION
RI-SSSV-01 — SUB-SLAB SOIL VAPOR NO. AND APPROX. LOCATION
SAMPLE GRID BOUNDARY
APPROXIMATE BCP BOUNDARY

SCALE: 1" = 40'
0 15 30 60 90 120 FEET

no.	description	date	by

dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 7/13/2026

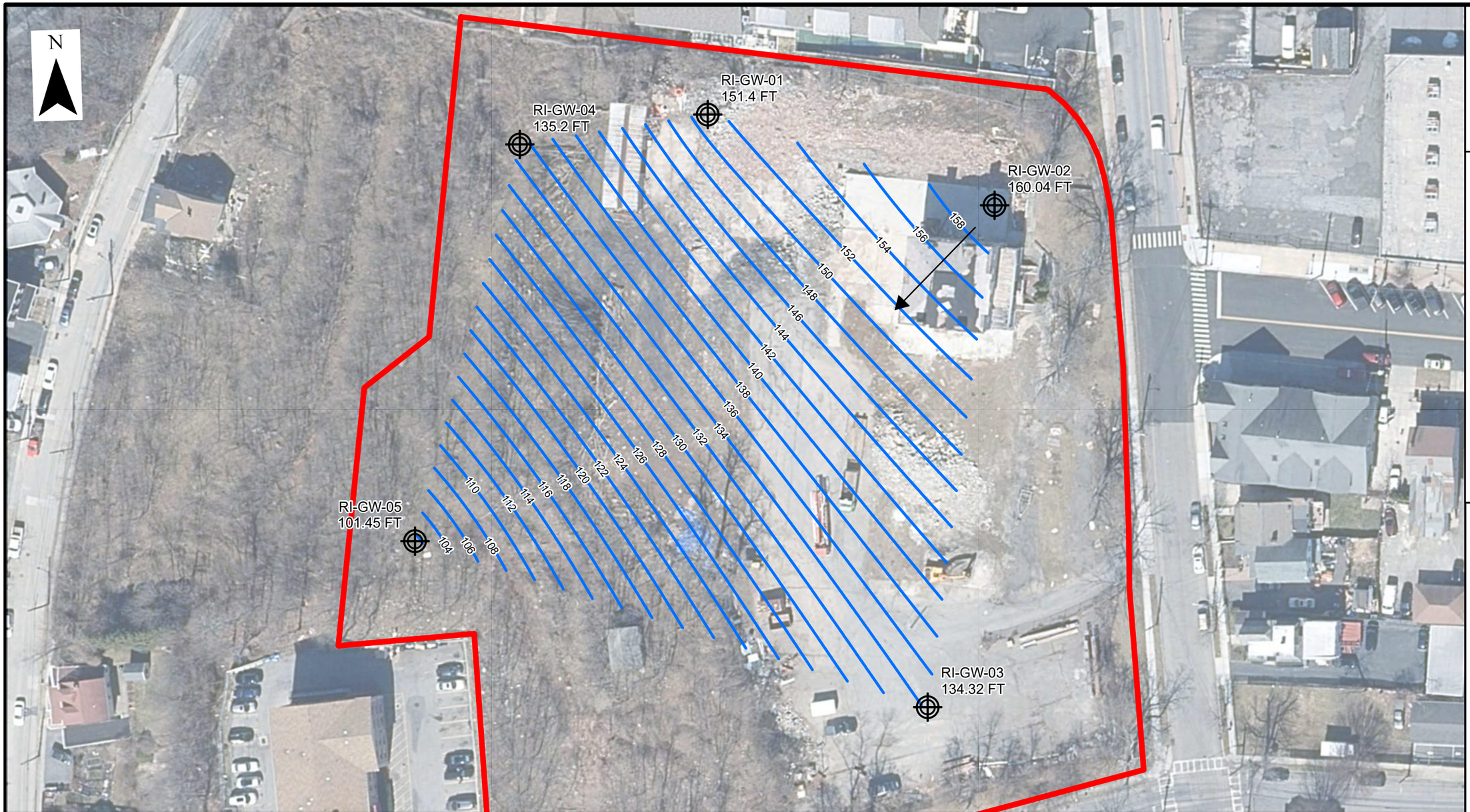
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project:
BLOCK 2, LOT 17, 18, AND 68
34 STATE STREET
OSSINING, WESTCHESTER, NY

title:
SOIL VAPOR SAMPLE LOCATIONS AND CONCENTRATIONS

job no.: 13968
drawing no:
FIG-2.4

Y:\GIS\Project_Numbers\13968\FINAL_MAPS, 7/13/2026 4:34 PM, Kim Vandeusen, LAYOUT: FIG-2.4



NOTE:
1. THIS PLAN IS FOR LOCATING GROUNDWATER CONTOURS ONLY. OTHER SITE WORK SHOWN HERE NOT INTENDED FOR CONSTRUCTION.
2. GROUNDWATER MEASUREMENTS WERE TAKEN IN MAY 2026.
3. GROUNDWATER MEASUREMENTS ARE REPORTED IN FEET ABOVE MEAN SEA LEVEL.

REFERENCE:

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

LEGEND:

MW1	MONITORING WELL NO AND APPROX LOCATION
	INTERPOLATED GROUNDWATER CONTOUR
	BCP BOUNDARY
→	GROUNDWATER FLOW DIRECTION
[151.4 FT]	GROUNDWATER ELEVATION AT MONITORING WELL (FT AMSL)
158	GROUNDWATER CONTOUR ELEVATION (FT AMSL)
AMSL	ABOVE GROUND MEAN SEA LEVEL

SCALE: 1" = 60'

0 30 60 120 FEET

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chk by: MKC
scale: AS NOTED
date: 7/13/2026

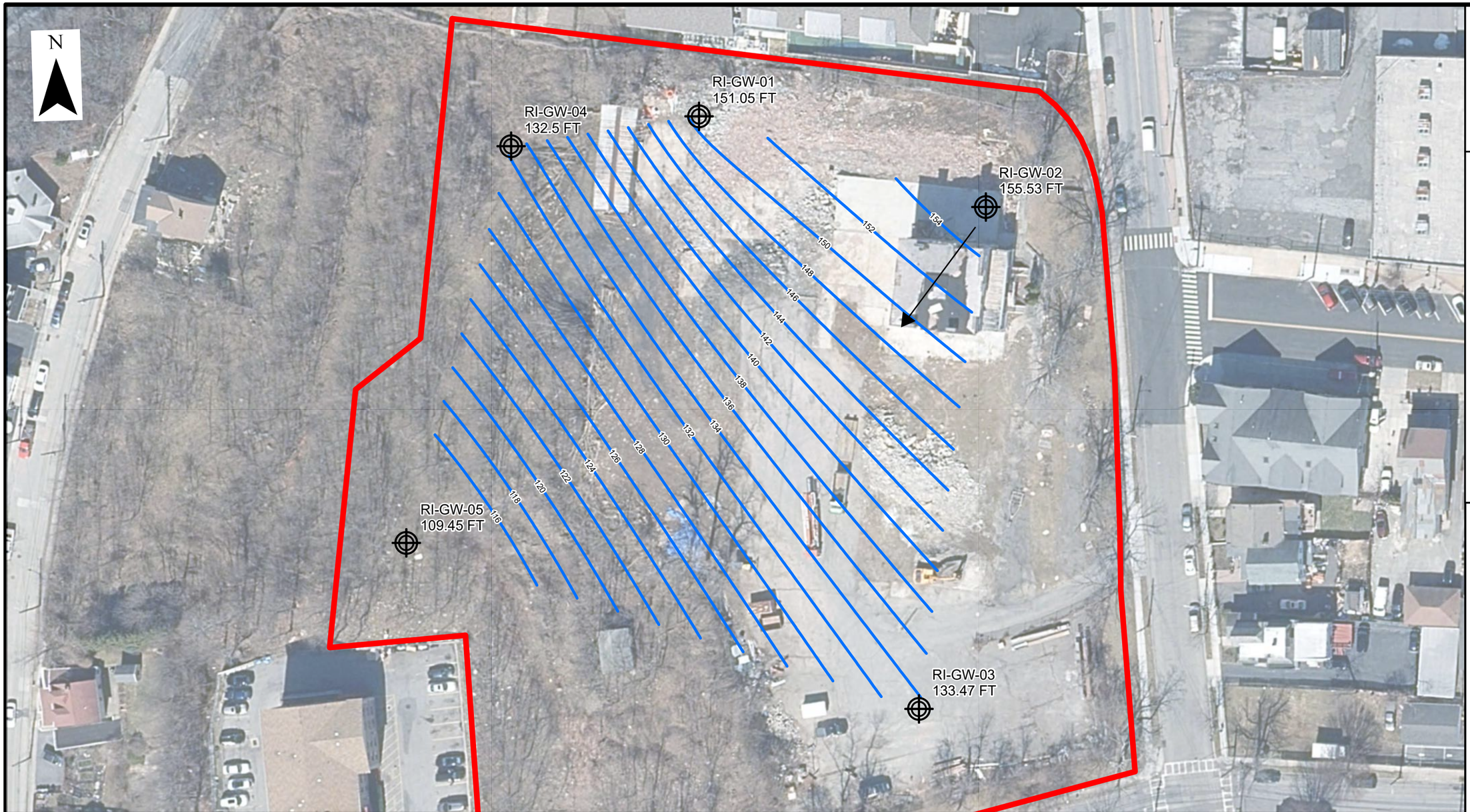
project: BLOCK 2, LOT 17, 18, AND 68
34 STATE STREET
OSSINING, WESTCHESTER, NY

title: **GROUNDWATER CONTOUR MAP (MAY 2026)**

job no.: 13968
drawing no:

FIG-2.5A

Y:\GIS\Project_Numbers\13968\FINAL_MAPS, 7/13/2026 5:41 PM, Kim Vanderklein, LAYOUT: FIG-2.5A



NOTE:
1. THIS PLAN IS FOR LOCATING GROUNDWATER CONTOURS ONLY. OTHER SITE WORK SHOWN HERE NOT INTENDED FOR CONSTRUCTION.
2. GROUNDWATER MEASUREMENTS WERE TAKEN IN JUNE 2026.
3. GROUNDWATER MEASUREMENTS ARE REPORTED IN FEET ABOVE MEAN SEA LEVEL.

REFERENCE:

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

LEGEND:

RI-MW-1	MONITORING WELL NO AND APPROX LOCATION	→	GROUNDWATER FLOW DIRECTION
	INTERPOLATED GROUNDWATER CONTOUR	[151.05 FT]	GROUNDWATER ELEVATION AT MONITORING WELL (FT AMSL)
	BCP BOUNDARY	154	GROUNDWATER CONTOUR ELEVATION (FT AMSL)
		AMSL	ABOVE GROUND MEAN SEA LEVEL

SCALE: 1" = 60'

0 30 60 120 FEET

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dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 7/13/2026

project: BLOCK 2, LOT 17, 18, AND 68
34 STATE STREET
OSSINING, WESTCHESTER, NY

title: **GROUNDWATER CONTOUR MAP (JUNE 2026)**

job no.: 13968
drawing no:

FIG-2.5B

Y:\GIS\Project_Numbers\13968\FINAL_MAPS, 7/13/2026 5:44 PM, Kim Vanderklein, LAYOUT: FIG-2.5B

N

SOIL BORING	RI-SB-6		
Sample Name	RI-SB-6 (0-2)	RI-SB-6 (2-5)	RI-SB-6 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	5.5-6.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	68	4	3
Zinc	145	24.0	20.3
Mercury	0.224	ND	ND

SOIL BORING	RI-SB-5	
Sample Name	RI-SB-5 (0-2)	RI-SB-5 (2-5)
Sample Depth	1.0-1.5	4.0-4.5
Sampling Date	5/19/2026	5/19/2026
Compound	Result	Result
PESTICIDES		
4,4'-DDT	ND	0.00405
Dieldrin	ND	0.0114
METALS		
Chromium	26	38
Copper	26.8	58.1
Lead	67	169
Zinc	100	263
PCBs		
Total PCBs	ND	0.142

SOIL BORING	RI-SB-8			
Sample Name	RI-SB-8 (0-2)	RI-SB-8 (2-5)	RI-SB-8 (5-10)	RI-SB-8 (10-15)
Sample Depth	1.0-1.5	4.5-5.0	5.0-5.5	10.0-10.5
Sampling Date	5/14/2026	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result	Result
SVOCs				
Benzo(a)anthracene	ND	ND	0.7880	1.74
Benzo(a)pyrene	ND	ND	0.7340	1.27
Benzo(b)fluoranthene	ND	ND	0.8870	1.40
Benzo(g,h,i)perylene	ND	ND	0.4920	1.33
Benzo(k)fluoranthene	ND	ND	0.4940	1.42
Chrysene	ND	ND	0.8320	2.06
Dibenzo(a,h)anthracene	ND	ND	0.1450	0.456
Indeno(1,2,3-cd)pyrene	ND	ND	0.3690	1.10
Phenanthrene	ND	ND	0.9260	2.38
METALS				
Lead	300	8	269	47
Zinc	261	42.0	232	67.2
Mercury	0.255	ND	0.284	0.036

SOIL BORING	RI-SB-20				
Sample Name	RI-SB-20 (0-2)	RI-SB-20 (2-5)	RI-SB-20 (5-10)	RI-2026-DUP4	RI-SB-20 (10-15)
Sample Depth	1.0-1.5	4-5.0	6.5-7.0	6.5-7.0	10.0-10.5
Sampling Date	5/14/2026	5/14/2026	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result	Result	Result
VOCs					
Acetone	0.00650	0.01100	0.062	0.00740	0.060
SVOCs					
Benzo(a)anthracene	0.5400	2.43	0.0340	0.5310	1.90
Benzo(a)pyrene	0.5720	2.12	ND	0.5360	2.01
Benzo(b)fluoranthene	0.5580	2.14	ND	0.6080	2.21
Benzo(g,h,i)perylene	0.3360	1.81	ND	0.3320	1.15
Benzo(k)fluoranthene	0.4580	1.77	ND	0.6150	1.46
Chrysene	0.5100	2.82	ND	0.6720	2.16
Dibenzo(a,h)anthracene	0.1030	0.66	ND	0.1080	0.34
Indeno(1,2,3-cd)pyrene	0.3860	1.51	ND	0.2790	1.08
Phenanthrene	0.4580	2.99	0.0377	0.5500	2.01
METALS					
Copper	59.4	152.0	22.0	22.2	55.0
Lead	168	33	7	15	61
Zinc	157.0	68.4	32.7	44.2	80.4
PFAS					
PFOS	7.14	7.80	0.634	6.13	4.89
PFOA	0.729	0.549	3.49	0.213	1.73

SOIL BORING	RI-SB-18		
Sample Name	RI-SB-18 (0-2)	RI-SB-18 (2-5)	RI-SB-18 (5-10)
Sample Depth	0.5-1.0	4.5-5.0	6.5-7.0
Sampling Date	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result
METALS			
Lead	77	8	5

SOIL BORING	RI-SB-28		
Sample Name	RI-SB-28 (0-2)	RI-SB-28 (2-5)	RI-SB-28 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	5.5-6.0
Sampling Date	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result
SVOCs			
Phenanthrene	0.0468	1.44	0.0964
METALS			
Chromium	30	39	14
Lead	65	39	233
Zinc	110	129	205
Mercury	0.171	0.082	0.291

SOIL BORING	RI-SB-35		
Sample Name	RI-SB-35 (0-2)	RI-SB-35 (2-5)	RI-SB-35 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	6.0-6.5
Sampling Date	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result
PESTICIDES			
4,4'-DDE	0.0165	ND	0.00683
4,4'-DDT	ND	ND	0.00460
METALS			
Copper	77.2	72.9	3.4
Lead	118	130	8

SOIL BORING	RI-SB-4		
Sample Name	RI-SB-4 (0-2)	RI-SB-4 (2-5)	RI-SB-4 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	6.0-6.5
Sampling Date	5/19/2026	5/19/2026	5/19/2026
Compound	Result	Result	Result
METALS			
Chromium	23	36	6
Copper	16	26	88

SOIL BORING	RI-SB-17		
Sample Name	RI-SB-17 (0-2)	RI-SB-17 (2-5)	RI2026-DUP6
Sample Depth	0.5-1.0	3.0-3.5	3.0-3.5
Sampling Date	5/19/2026	5/19/2026	5/19/2026
Compound	Result	Result	Result
SVOCs			
Indeno(1,2,3-cd)pyrene	0.5110	ND	0.0934
METALS			
Lead	80	40	173
Zinc	117	74.1	250
Mercury	0.212	0.190	0.421

SOIL BORING	RI-SB-19	
Sample Name	RI-SB-19 (0-2)	RI-SB-19 (2-5)
Sample Depth	1.0-1.5	3.0-3.5
Sampling Date	5/19/2026	5/19/2026
NO EXCEEDANCES DETECTED		

SOIL BORING	RI-SB-21		
Sample Name	RI-SB-21 (0-2)	RI-SB-21 (2-5)	RI-SB-21 (5-10)
Sample Depth	1.0-1.5	2.5-3.0	6.0-6.5
Sampling Date	5/13/2026	5/13/2026	5/13/2026
Compound	Result	Result	Result
METALS			
Lead	152	219	71
Mercury	0.282	0.502	ND

SOIL BORING	RI-SB-29		
Sample Name	RI-SB-29 (0-2)	RI-SB-29 (2-5)	RI-SB-29 (5-10)
Sample Depth	1.5-2.0	4.0-4.5	5.0-5.5
Sampling Date	5/13/2026	5/13/2026	5/13/2026
Compound	Result	Result	Result
METALS			
Arsenic	2.010	18.2	9.920
Copper	119	42.9	47.200
Lead	11	301	209
Zinc	56.4	156	132
Mercury	0.134	0.215	0.450

SOIL BORING	RI-SB-34		
Sample Name	RI-SB-34 (0-2)	RI-SB-34 (2-5)	RI-SB-34 (5-10)
Sample Depth	0.5-1.0	4.0-4.5	7.0-7.5
Sampling Date	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result
SVOCs			
Benzo(a)anthracene	0.9790	5.09	0.9860
Benzo(a)pyrene	1.0600	4.62	0.8790
Benzo(b)fluoranthene	0.8740	4.25	0.7920
Benzo(k)fluoranthene	0.7860	3.44	0.7420
Chrysene	0.9580	5.33	0.8850
Dibenzo(a,h)anthracene	0.1520	0.779	0.2150
Indeno(1,2,3-cd)pyrene	0.6690	2.02	0.5780
Phenanthrene	1.0500	6.29	0.6290
PESTICIDES			
4,4'-DDD	ND	ND	0.03190
4,4'-DDE	ND	ND	0.00622
4,4'-DDT	0.01180	0.00431	0.01000
METALS			
Lead	112	75	511
Zinc	189	82.8	376
Mercury	0.160	0.292	0.528

SOIL BORING	RI-SB-43	
Sample Name	RI-SB-43 (0-2)	RI-SB-43 (2-5)
Sample Depth	1.5-2.0	3.5-4.0
Sampling Date	5/18/2026	5/18/2026
Compound	Result	Result
VOCs		
Acetone	0.032	0.00940
PESTICIDES		
4,4'-DDE	0.0094	ND
4,4'-DDT	0.00439	ND
METALS		
Lead	349	194
Zinc	227	189
Mercury	0.338	0.124
PFAS		
PFOS	3.72	6.66

SOIL BORING	RI-SB-36			
Sample Name	RI-SB-36 (0-2)	RI-SB-36 (2-5)	RI-SB-36 (5-10)	RI-SB-36 (10-15)
Sample Depth	1.0-1.5	4.5-5.0	6.0-6.5	10.5-11.0
Sampling Date	5/18/2026	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result	Result
PESTICIDES				
4,4'-DDT	0.00626	ND	ND	ND
METALS				
Chromium	22	31	116	36
Copper	32.5	82.9	16.1	28.5
Lead	48	102	27	37
Zinc	59.7	150	77.1	71.2
Mercury	0.287	0.113	ND	0.071

SOIL BORING	RI-SB-44			
Sample Name	RI-SB-44 (0-2)	RI-SB-44 (2-5)	RI2026-DUP5	RI-SB-44 (5-10)
Sample Depth	1.0-1.5	4.5-5.0	4.5-5.0	5.0-5.5
Sampling Date	5/18/2026	5/18/2026	5/18/2026	5/18/2026
Compound	Result	Result	Result	Result
METALS				
Chromium	32	19	21	20
Lead	95	20	11	10
Mercury	0.215	ND	ND	0.162

SOIL BORING	RI-SB-37			
Sample Name	RI-SB-37 (0-2)	RI-SB-37 (2-5)	RI-SB-37 (5-10)	RI2026-Dup1
Sample Depth	1.5-2.0	2.5-3.0	5.0-5.5	5.0-5.5
Sampling Date	5/12/2026	5/12/2026	5/12/2026	5/12/2026
Compound	Result	Result	Result	Result
METALS				
Copper	40.3	20.1	57.1	23.6
Lead	208	51	156	134
Zinc	141	63	102	88.5
Mercury	0.239	0.042	0.161	0.140

SOIL BORING	RI-SB-1		
Sample Name	RI-SB-1 (0-2)	RI-SB-1 (2-5)	RI-SB-1 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	5.5-6.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	98	40	111	40
Nickel	24.9	34.6	32.2	31.2
Zinc	167	139	88.9	89.1
PFAS				
PFOS	120.0	19.6	6.94	39.10
PFOA	3.66	1.68	1.13	0.884

SOIL BORING	RI-SB-2			
Sample Name	RI-SB-2 (0-2)	RI-SB-2 (2-5)	RI-SB-2 (5-10)	RI-SB-2 (10-15)
Sample Depth	1.5-2.0	4.5-5.0	6.5-7.0	12.5-13.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result	Result

SOIL BORING	RI-SB-9	
Sample Name	RI-SB-9 (0-2)	RI-SB-09 (2-5)
Sample Depth	1.0-1.5	3.5-4.0
Sampling Date	5/14/2026	5/14/2026
Compound	Result	Result
SVOCs		
Benzo(a)anthracene	0.3730	1.01
Benzo(a)pyrene	0.3770	0.9
Benzo(g,h,i)perylene	0.2480	0.684
Indeno(1,2,3-cd)pyrene	0.2770	0.771
METALS		
Lead	110	48
Zinc	170	112
Mercury	0.207	0.248

SOIL BORING	RI-SB-7		
Sample Name	RI-SB-7 (0-2)	RI-SB-7 (2-5)	RI-SB-7 (5-10)
Sample Depth	1.0-1.5	4.5-5.0	7.5-8.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	155	7	16
Zinc	184	141	58.3

SOIL BORING	RI-SB-3		
Sample Name	RI-SB-3 (0-2)	RI-SB-3 (2-5)	RI-SB-3 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	6.0-6.5
Sampling Date	5/14/2026	5/14/2026	5/14/2026
NO EXCEEDANCES DETECTED			

SOIL BORING	RI-SB-10	
Sample Name	RI-SB-10 (0-2)	RI-SB-10 (2-5)
Sample Depth	0.5-1.0	3.0-3.5
Sampling Date	5/14/2026	5/14/2026
Compound	Result	Result
METALS		
Copper	23	61.7
Zinc	265	119

SOIL BORING	RI-SB-13		
Sample Name	RI-SB-13 (0-2)	RI-SB-13 (2-5)	RI-SB-13 (5-10)
Sample Depth	1.5-2.0	4.0-4.5	6.5-7.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Chromium	14	35	30
Copper	29	77	38.2
Nickel	21.7	36.5	18.1

SOIL BORING	RI-SB-16	
Sample Name	RI-SB-16 (0-2)	RI-SB-16 (2-5)
Sample Depth	0.5-1.0	3.0-3.5
Sampling Date	5/14/2026	5/14/2026
NO EXCEEDANCES DETECTED		

SOIL BORING	RI-SB-14		
Sample Name	RI-SB-14 (0-2)	RI-SB-14 (2-5)	RI-SB-14 (5-10)
Sample Depth	0.5-1.0	2.0-2.5	5.5-6.0
Sampling Date	5/19/2026	5/19/2026	5/19/2026
Compound	Result	Result	Result
METALS			
Chromium	22	33	23
Lead	222	254	11
Zinc	511	1,860	55.70
Mercury	0.110	0.187	ND

SOIL BORING	RI-SB-15		
Sample Name	RI-SB-15 (0-2)	RI-SB-15 (2-5)	RI2026-DUP3
Sample Depth	1.0-1.5	4.0-4.5	4.0-4.5
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	116	145	258
Mercury	0.161	0.107	0.263

SOIL BORING	RI-SB-12		
Sample Name	RI-SB-12 (0-2)	RI-SB-12 (2-5)	RI-SB-12 (5-10)
Sample Depth	1.0-1.5	4.5-5.0	5.5-6.0
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	235	286	496
Zinc	463	748	210
Mercury	0.174	0.537	1.580

SOIL BORING	RI-SB-23	
Sample Name	RI-SB-23 (0-2)	RI-SB-23 (2-5)
Sample Depth	1.0-1.5	2.0-2.5
Sampling Date	5/14/2026	5/14/2026
Compound	Result	Result
PESTICIDES		
4,4'-DDT	0.00530	ND
METALS		
Lead	124	160
Zinc	98.50	169.00
Mercury	0.137	0.660
PFAS		
PFOS	1.89	1.31

SOIL BORING	RI-SB-25	
Sample Name	RI-SB-25 (0-2)	RI-SB-25 (2-5)
Sample Depth	0.5-1.0	4.0-4.5
Sampling Date	5/14/2026	5/14/2026
Compound	Result	Result
METALS		
Lead	360	4
Zinc	305	4.770
Mercury	0.136	ND

SOIL BORING	RI-SB-26	
Sample Name	RI-SB-26 (0-2)	RI-SB-26 (2-5)
Sample Depth	1.0-1.5	4.0-4.5
Sampling Date	5/13/2026	5/13/2026
Compound	Result	Result
METALS		
Lead	236	73
Mercury	0.230	0.121

SOIL BORING	RI-SB-22		
Sample Name	RI-SB-22 (0-2)	RI-SB-22 (2-5)	RI-SB-22 (5-10)
Sample Depth	1.0-1.5	4.0-4.5	6.0-6.5
Sampling Date	5/14/2026	5/14/2026	5/14/2026
Compound	Result	Result	Result
METALS			
Lead	15	247	17
Zinc	33.4	166.0	62.3
Mercury	ND	0.316	ND

SOIL BORING	RI-SB-24	
Sample Name	RI-SB-24 (0-2)	RI-SB-24 (2-5)
Sample Depth	1.5-2.0	4.0-4.5
Sampling Date	5/13/2026	5/13/2026
NO EXCEEDANCES DETECTED		

SOIL BORING	RI-SB-31	
Sample Name	RI-SB-31 (0-2)	RI-SB-31 (2-5)
Sample Depth	1.5-2.0	3.5-4.0
Sampling Date	5/13/2026	5/13/2026
Compound	Result	Result
METALS		
Lead	64	7
PFAS		
PFOS	135	22.0
PFOA	1.9	17.1

SOIL BORING	RI-SB-33	
Sample Name	RI-SB-33 (0-2)	RI-SB-33 (2-5)
Sample Depth	1.5-2.0	3.0-3.5
Sampling Date	5/13/2026	5/13/2026
Compound	Result	Result
METALS		
Chromium	22	31

SOIL BORING	RI-SB-40		
Sample Name	RI-SB-40 (0-2)	RI-SB-40 (2-5)	RI-SB-40 (5-10)
Sample Depth	1.5-2.0	3.5-4.0	6.0-6.5
Sampling Date	5/12/2026	5/12/2026	5/12/2026
Compound	Result	Result	Result
METALS			
Lead	123	11	9

SOIL BORING	RI-SB-27		
Sample Name	RI-SB-27 (0-2)	RI-SB-27 (2-5)	RI-SB-27 (5-10)
Sample Depth	1.0-1.5	3.5-4.0	5.5-6.0
Sampling Date	5/13/2026	5/13/2026	5/13/2026
Compound	Result	Result	Result
SVOCs			
Benzo(a)anthracene	4.85	0.1320	0.1140
Benzo(a)pyrene	2.91	0.1210	0.1110
Benzo(b)fluoranthene	2.85	0.180	0.0968
Benzo(g,h,i)perylene	1.89	0.0678	0.0606
Benzo(k)fluoranthene	2.92	0.0973	0.0919
Chrysene	4.58	0.1260	0.1200
Dibenzo(a,h)anthracene	0.97	ND	ND
Indeno(1,2,3-cd)pyrene	1.76	0.0761	0.0696
Phenanthrene	8.19	0.2010	0.1870
METALS			
Arsenic	22.8	2.870	ND
Lead	235	57	14
Zinc	449.0	37.800	20.600
Mercury	0.246	0.032	ND

SOIL BORING	RI-SB-32		
Sample Name	RI-SB-32 (0-2)	RI-SB-32 (2-5)	RI-SB-32 (5-10)
Sample Depth	1.5-2.0	4.5-5.0	6.5-7.0
Sampling Date	5/13/2026	5/13/2026	5/13/2026
Compound	Result	Result	Result
PFAS			
PFOS	3.56	2.09	13.50

SOIL BORING	RI-SB-30			
Sample Name	RI-SB-30 (0-2)	RI-SB-30 (2-5)	RI2026-DUP2	RI-SB-30 (5-10)
Sample Depth	1.0-1.5	3.0-3.5	3.0-3.5	6.0-6.5
Sampling Date	5/13/2026	5/13/2026	5/13/2026	5/13/2026
Compound	Result	Result	Result	Result
NO EXCEEDANCES DETECTED				

SOIL BORING	RI-SB-42			
Sample Name	RI-SB-42 (0-2)	RI-SB-42 (2-5)	RI-SB-42 (5-10)	RI-SB-42 (10-15)
Sample Depth	1.0-1.5	2.5-3.0	6.5-7.0	10.5-11.0
Sampling Date	5/12/2026	5/12/2026	5/12/2026	5/12/2026
Compound	Result	Result	Result	Result
METALS				
Lead	150	44	9	80

SOIL BORING	RI-SB-41			
Sample Name	RI-SB-41 (0-2)	RI-SB-41 (2-5)	RI-SB-41 (5-10)	RI-SB-41 (10-15)
Sample Depth	1.5-2.0	4.5-5.0	5.5-6.0	10.5-11.0
Sampling Date	5/12/2026	5/12/2026	5/12/2026	5/12/2026
Compound	Result	Result	Result	Result
METALS				
Lead	150	29	13	32
Mercury	0.240	0.047	ND	ND

SOIL BORING	RI-SB-38	
Sample Name	RI-SB-38 (0-2)	RI-SB-38 (2-5)
Sample Depth	1.5-2.0	3.5-4.0
Sampling Date	5/12/2026	5/12/2026
Compound	Result	Result
METALS		
Lead	103	101

SOIL BORING	RI-SB-45	
Sample Name	RI-SB-45 (0-2)	RI-SB-45 (2-5)
Sample Depth	0.5-1.0	3.0-3.5
Sampling Date	5/19/2026	5/19/2026
Compound	Result	Result
NO EXCEEDANCES DETECTED		

SOIL BORING	RI-SB-39		
Sample Name	RI-SB-39 (0-2)	RI-SB-39 (2-5)	RI-SB-39 (5-10)
Sample Depth	1.0-1.5	3.5-4.0	5.5-6.0
Sampling Date	5/12/2026	5/12/2026	5/12/2026
Compound	Result	Result	Result
PESTICIDES			
4,4'-DDE	0.00818	ND	ND
METALS			
Lead	267	39	24
Zinc	126	55.4	46.2
Mercury	0.202	0.048	ND

COMPOUND	CAS	UNIT	NY UUSCO	NY RRSCO	NY PGWSCO
VOCs					
Acetone	67-64-1	mg/kg	0.03	100	~
SVOCs					
Benzo(a)anthracene	56-55-3	mg/kg	1	1.4	~
Benzo(a)pyrene	50-32-8	mg/kg	1	1	~
Benzo(b)fluoranthene	205-99-2	mg/kg	1	1.4	~
Benzo(g,h,i)perylene	191-24-2	mg/kg	0.64	4.9	~
Benzo(k)fluoranthene	207-08-9	mg/kg	0.8	4.9	~
Chrysene	218-01-9	mg/kg	1	4.9	~
Dibenzo(a,h)anthracene	53-70-3	mg/kg	0.33	0.33	~
Indeno(1,2,3-cd)pyrene	193-39-5	mg/kg	0.5	1.4	~
Phenanthrene	85-01-8	mg/kg	1.1	4.9	~
PESTICIDES					
4,4'-DDD	72-54-8	mg/kg	0.0033	5	~
4,4'-DDE	72-55-9	mg/kg	0.0033	3.4	~
4,4'-DDE [2C]	72-55-9	mg/kg	0.0033	3.4	~
4,4'-DDT	50-29-3	mg/kg	0.0033	3.8	~
Dieldrin	60-57-1	mg/kg	0.005	0.075	~
METALS					
Arsenic	7440-38-2	mg/kg	13	16	~
Chromium	7440-47-3	mg/kg	30	180	~
Copper	7440-50-8	mg/kg	50	280	~
Lead	7439-92-1	mg/kg	63	400	~
Nickel	7440-02-0	mg/kg	30	320	~
Zinc	7440-66-6	mg/kg	109	6,600	~
Mercury	7439-97-6	mg/kg	0.18	0.3	~
PCBs					
Total PCBs	1336-36-3	mg/kg	0.1	1	~
PFAS					
PFOS	1763-23-1	ng/g	0.88	44	1
PFOA	335-67-1	ng/g	0.66	33	0.8

Notes:
mg/kg = milligrams per kilogram
ng/g = nanograms per gram
ND = Not Detected
~ = No Standard (Or Not Detected in Site Groundwater for PGWSCO
NY UUSCO = Unrestricted Use Soil Cleanup Criteria
NY RRSCO = Restricted Residential Use Soil Cleanup Criteria
NY PGWSCO = NY Protection of Groundwater Soil Cleanup Criteria
= Exceeds NY UUSCO
= Exceeds NY RRSCO
= Exceeds NY PGWSCO

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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NOTE:
1. THIS PLAN IS FOR LOCATING BORING LOCATIONS ONLY. OTHER SITE WORK SHOWN HERE NOT INTENDED FOR CONSTRUCTION.
2. BORINGS ON BOTTOM HALF OF PROPERTY SHOWN ON SHEET 2.

REFERENCE:
PREVIOUS SAMPLE LOCATIONS TAKEN FROM "SITE (BASE) MAP" - FIG.2. PREVIOUS CONDITIONS AND BOUNDARIES TAKEN FROM 1971 SANBORN MAP. APPROXIMATE BCP BOUNDARY TAKEN FROM "BROWNFIELD CLEANUP PROGRAM AREA MAP", PREPARED BY INSITE ENGINEERING, SURVEYING, AND LANDSCAPE ARCHITECTURE FOR WBP DEVELOPMENT LLC. PUBLIC TAX PARCELS TAKEN FROM NYS OFFICE OF INFORMATION TECHNOLOGY SERVICES - 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-SB-1 = SOIL BORING NO. AND APPROX. LOCATION
= PROPOSED POST-EXCAVATION SOIL SAMPLE LOCATION
= SAMPLE GRID BOUNDARY
= APPROXIMATE BCP BOUNDARY

SCALE: 1" = 40'
0 20 40 80 120 160 FEET

by	description	rev	date

dwg by: KBV
chk by: MKC
scale: AS NOTED
date: 7/13/2026

SESI CONSULTING ENGINEERS
GEOTECHNICAL | ENVIRONMENTAL | SITE CIVIL
959 route 46e, 3rd floor, parsippany, nj 07054 ph: 973.808.9050

BLOCK 2, LOT 17, 18, AND 68
34 STATE STREET
OSSINING, WESTCHESTER, NY

project:

POST EXCAVATION SOIL SAMPLE LOCATION PLAN

title:

job no.: 13968
drawing no:

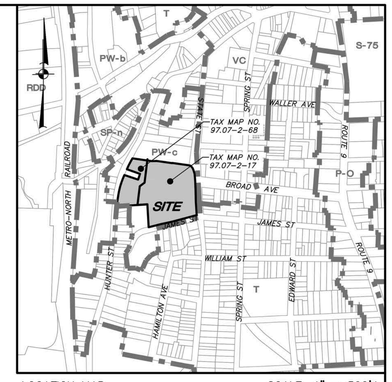
FIG-5.1

Y:\GIS\Project_Numbers\13968\FINAL_MAPS_7\13JOB6.4.07 PM, Kim.Vanderhein, LAYOUT FIG-5.1

APPENDIX A

CONCEPTUAL REDEVELOPMENT PLANS





LOCATION MAP SCALE: 1" = 500'±

OWNER:

OSSSINING MEMBERSHIP LLC
405 LEXINGTON AVENUE, 59TH FLOOR
NEW YORK, NY, 10174

SITE DATA:

Zone:	PW-c
Total Acreage	5.907 AC
Tax Map No.:	97.07-2-17
	97.07-2-68

APPLICANT:

WB 34 STATE LLC
480 NORTH BEDFORD ROAD
CHAPPAQUA, NY, 10514

GENERAL NOTES:

1. Existing conditions, topography, and property lines shown hereon obtained from Topographic Survey of Property prepared by Insite Engineering, Surveying & Landscape Architecture, P.C., last revised June 27, 2025. Elevations shown hereon conform to the North American Vertical Datum of 1988 (NAVD 88). The contour interval is 2'.
2. Location of existing water main along State Street, James Street and Hunter Street obtained from Engineering Drawings for Hudson Steppe, prepared by Warshauer Mellusi Warshauer Architecs, PC. and is approximate.
3. Aerial orthoimagery shown hereon is taken from Google Earth Pro, dated May 2023.
4. Construction of walls greater than or equal to four (4) feet in height shall be certified by the Design Professional prior to issuance of a certificate of occupancy completion.
5. Limits of disturbace shall be staked in the field prior to construction.

LEGEND

- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING BUILDING TO BE REMOVED
- EXISTING STONE & MASONRY RETAINING WALL
- EXISTING GATE
- EXISTING CHAIN LINK FENCE
- EXISTING GUIDE RAIL
- EXISTING CONCRETE CURB
- EXISTING DROP IN CONCRETE CURB
- EXISTING SIGN
- EXISTING EVERGREEN TREE
- EXISTING DECIDUOUS TREE
- PROPOSED # OF STALLS TO BE STRIPED
- PROPOSED CONCRETE CURB
- PROPOSED EDGE OF SIDEWALK
- PROPOSED RETAINING WALL
- PROPOSED DOOR LOCATION
- PROPOSED LANDSCAPING

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

NO.	DATE	REVISION	BY
5	5-7-26	PLANNING BOARD REISSUE	HMF
4	4-9-26	PLANNING BOARD REISSUE	HMF
3	1-8-26	REVISED PER VILLAGE COMMENTS	HMF
2	11-6-25	REVISED PER VILLAGE COMMENTS	HMF
1	10-9-25	REVISED PER VILLAGE COMMENTS	HMF

INSITE
ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.
3 Garrett Place
Carmel, NY 10512
(845) 225-9690
(845) 225-9717 fax
www.insite-eng.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
OVERALL PLAN

STATE OF NEW YORK · RICHARD D. WILLIAMS · OSSINING · PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.	DRAWING NO.	SHEET
DATE	7-24-25	DRAWN BY	R.A.R.	OP-1	1 / 17
SCALE	1" = 30'	CHECKED BY	E.J.P.		

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

Z:\E\25154\00 WIP\ 34 State St., Ossining\Site Engineering\20-OP Eng. 7-24-2025 3:57:23 PM, by Richard A. Rotella, 1:1

Z:\E\25154\00 WIP\ 34 State St., Ossining\01 OP-1.dwg, 5/6/2026 3:57:34 PM, HFarnsworth, 1:1



CONSTRUCTION NOTES:

1. The contractor is advised that additional notes will be found on subsequent drawings and such notes, while pertaining to the specific drawings they are placed in, also supplement the construction notes listed hereon.
2. All work and materials shall be in accordance with these plans and project specifications.
3. The contractor shall notify the Engineer 72 hours prior to start of work.
4. The subject project has coverage under the New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges from Construction Activity, permit No. GP-0-25-001. As required by the permit all contractors and subcontractors will be required to sign a certification statement that they understand and agree to comply with the requirements of GP-0-25-001.
5. The contractor shall have a representative onsite that is a NYSDEC Trained Contractor at all times site work is being performed under this contract. The contractor shall provide a contractor's certification as contained in the NYSDEC Construction Site Logbook to the project engineer upon start of construction.
6. The contractor shall coordinate the layout of the work with the owner, and the project engineer, and eliminate all conflicts including but not limited to utility location conflicts, prior to commencement of any proposed work.
7. The contractor shall coordinate their construction operations with the project engineer and any other contractors/subcontractors and construction activities occurring simultaneously on the property.
8. It shall be the contractor's/subcontractor's responsibility to provide sanitary facilities (i.e. porta-john (and other necessary temporary facilities) throughout the duration of construction.
9. The contractor shall be responsible for providing all power, water, and other resources necessary to complete the project work.
10. Minimum OSHA site standards must be maintained including personal protective equipment and vests. The contractor shall be responsible for guarding and protecting all open excavations in accordance with the latest edition and current OSHA requirements.
11. The contractor shall field verify all dimensions relative to the scope of work.
12. The contractor shall stake out the limits of clearing and it shall be reviewed with the project engineer prior to the start of clearing operations. Existing trees to remain outside the limits of clearing shall be protected per the detail.
13. It shall be the contractor's responsibility to identify and protect all underground utilities. The contractor shall contact Dig Safely New York at 811 or 1-800-962-7962 and any other required utility locators prior to the start of construction.
14. The exact location, size, and type of the existing utilities may differ from what is shown hereon. The contractor shall field verify the location, size and type of the existing utilities by performing a test pit ahead of construction as necessary to permit revisions to meet existing utilities or relocate proposed utilities as required. Horizontal location and elevation of the existing utility as determined by test pit shall be provided to the project engineer.
15. The contractor shall field verify the existing grades / utility locations prior to commencement of any work. Any discrepancy shall be reported to the project engineer when identified.
16. The contractor shall perform all work with care so that any materials which are to remain in place, or which are to remain on the property, shall not be damaged. The contractor will be held responsible for all damage caused to existing utilities / features / facilities / vegetation during execution of the work not proposed to be modified or removed by these plans. All damage to any existing utilities / features / facilities / vegetation not proposed to be modified by the contract shall be repaired or replaced by the contractor to the satisfaction of the owner at no additional cost.
17. Original condition shall mean the condition in which the feature was found (or better) at the start of construction.
18. The contractor shall be responsible for the implementation and maintenance of erosion and sediment controls (shown or not) as necessary to prevent erosion and migration of sediment outside of the contract limit line or into the stormwater collection system. Erosion and sediment controls may include but are not limited to silt fence, stabilized construction entrance, berms and inlet protection. All erosion and sediment controls shall be installed in accordance with the New York State Standards and Specifications for Erosion and Sediment Control. Additional erosion and sediment controls may be required during construction by the project engineer. All disturbed areas shall be stabilized in accordance with the Erosion & Sediment Control Notes and details.
19. Silt fence shall be installed parallel to the contours.
20. Contractor is responsible for protecting soil stockpiles, trenches, and building excavations against weather. No additional fee will be paid to the contractor for removal and replacement of suitable soils due to degradation from weather related events.
21. During execution of the work, the contractor shall be responsible for dewatering and control of surface water in accordance with the New York State Standards and Specifications for Erosion and Sediment Control. The New York State Standards and Specifications for Erosion and Sediment Control can be found at http://www.dec.ny.gov/chemical/29066.html.
22. All existing pavement shall be cleaned and swept prior to the completion of construction.
23. The contractor shall provide temporary construction fence for all work areas including the material storage/staging areas.
24. All personal vehicles, materials, and construction equipment must be kept within the construction staging area. Use of additional onsite storage areas must be pre-authorized by the owner of the property.
25. Trees shown on the plans for reference only. All trees and vegetation within the contract limit line shall be removed unless otherwise labeled to be protected and saved. Not all trees to be removed may be shown.
26. Topsoil and subsoil shall be stripped, screened, and stockpiled in locations shown for future use. The contractor must keep enough topsoil onsite for final restoration. Four inches of screened topsoil shall be placed and raked to finish grade over all disturbed areas not covered by pavement, concrete and/or gravel surfaces, unless otherwise noted.
27. The contractor shall maintain existing grades unless otherwise noted.
28. Contractor shall be responsible for removal of all excess rock, topsoil, subsoil, and construction debris from the site.
29. There shall be no burying of construction and demolition (C&D) debris or stumps on site. All C&D debris and stumps must be removed by the contractor, and disposed of in accordance with all pertinent regulations.
30. All proposed concrete drainage structures shall be precast concrete and all structures, frames, and grates are to meet H-20 loading requirements.
31. Design Engineer to approve locations and elevations of all structures prior to placement.
32. Where side drain inlets are proposed the Contractor shall extend the upstream swale to the side inlet of the drainage structure.
33. Unless otherwise shown on the drawings the contractor shall match the material, thickness and quality of all existing pavements that are to be replaced.
34. Temporary asphalt wedges shall be placed in all areas open to vehicular access. The wedges shall be installed between any sudden abrupt grade changes in excess of 1" as a result of construction. All temporary wedges shall be removed prior to placement of asphalt course.
35. The contractor will be responsible for the implementation of all maintenance and protection of traffic (MP&T) measures if necessary. MP&T shall include but not be limited to placement of traffic cones and warning signs around work zone. Safe and adequate pedestrian vehicular traffic flow shall be maintained at all times to the existing buildings, while the work is in progress. The contractor shall submit for approval of the Architect, a construction sequence schedule and plan for pedestrian and vehicular traffic flow.
36. A retaining wall design signed and sealed by a NYS licensed Engineer shall be submitted to the Consulting Town Engineer prior to the construction of any wall greater than 4 feet in height.

LEGEND

- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING STONE & MASONRY RETAINING WALL
- EXISTING GATE
- EXISTING CHAIN LINK FENCE
- EXISTING GUIDE RAIL
- EXISTING CONCRETE CURB
- EXISTING DROP IN CONCRETE CURB
- EXISTING UTILITY POLE w/ guy & overhead wires
- EXISTING UTILITY PAD & RISERS
- EXISTING TRAFFIC SIGNAL BOX
- EXISTING SIGN
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING UNDERGROUND SEWER MAIN
- EXISTING UNDERGROUND WATER MAIN
- EXISTING CATCH BASIN
- EXISTING MANHOLE (Type unidentified)
- EXISTING DRAINAGE MANHOLE
- EXISTING SEWER MANHOLE
- EXISTING HYDRANT
- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING SPOT GRADE

REMOVAL NOTES

1. Prior to submitting the bid, the contractor shall visit the site and familiarize themselves with the site conditions and existing improvements to be removed.
2. The contractor shall provide all removals incidental and necessary to execute the work prescribed in the contract documents. All existing features specified to be removed shall be removed in their entirety unless otherwise authorized in writing by the owner or the project engineer.
3. These drawings are intended to show an overall Limit of Disturbance and general features to be removed. Not all features incidental to the general scope of the site work have been shown to be removed. The contractor shall be responsible for all removals within the limits of both above and below grade features, necessary for the construction of the site improvements shown hereon.
4. All underground utility piping (water, sewer, drainage conduits) shall be capped and abandoned in place. All abandoned pipes left in place shall be filled with controlled low strength material (CLSM) sealing both ends. Any exposed utility piping shall be cut and removed such that a minimum of 1' of soil cover is maintained on all pipes that are to be capped and abandoned in place.
5. All building materials shall be demolished and removed from the site.
6. Burying of any demolished building materials on site is prohibited. Building foundations may be crushed and abandoned, filled in and restored in accordance with the project specifications.
7. Remove existing electrical wiring and conduit back to the source panel.

UTILITY NOTES:

1. The locations of existing utilities, water, sewers, and drainage structures have been indicated based on the best available information. It is possible that the actual subsurface utilities and piping may vary from that indicated. Therefore, prior to starting work in any area, the contractor shall take the necessary steps to determine the locations of all existing underground piping, conduit and structures. The contractor shall carry out their operations in such a manner as to prevent interference with lines which are to remain. Any pipe or conduit disturbed in the course of contract shall be repaired by the contractor at no extra cost to the owner.
2. Existing utility locations, sizes and elevations to be verified by contractor prior to the start of construction and any discrepancies reported to the project engineer immediately.
3. Whenever a connection to an existing pipe or structure is shown, the contractor shall confirm existing pipe materials of construction, dimensions, and connection requirement prior to submitting materials for approval.
4. When structures are to be placed on existing utility lines or where the proposed utility lines are assume to cross existing utilities, the contractor shall locate the existing utility and shall verify its existing invert elevation. The contractor shall notify the engineer if different utility invert elevations or locations are revealed by field exploration.
5. Where interference with other utilities or construction are encountered during construction of new utility lines, the contractor may adjust the alignment or invert elevations of that system only at the direction of the project engineer.
6. All existing utilities shall be removed to the main unless otherwise permitted by the utility service provider.
7. It shall be the contractor's responsibility to locate all overhead wires and utility poles, if any, in the vicinity of the proposed work. Furthermore, it is the contractor's responsibility to make the necessary arrangements to perform the work in the vicinity of these overhead wires.
8. The contractor shall exercise extreme caution when working adjacent to active power and communication lines to prevent damage to these lines. The contractor shall hand excavate test pits to expose those lines prior to performing any other excavation work in the area. The contractor shall repair at their expense, any power or communication interruption immediately.
9. Should any utility poles require bracing or relocating to accomplish the proposed work, it shall be the contractor's responsibility to make the appropriate arrangements to properly secure or relocate such utility poles. The contractor will not receive any additional payment for utility pole bracing or relocating. The contractor must include any costs for such work within their bid submittal.
10. The location of the proposed electric and gas service lines for the property are approximate and subject to the utility company design. The contractor shall coordinate with the owner and utility service provider(s) to determine the location of the site's electric and gas service connections. The contractor shall be responsible for obtaining all required permits necessary for the installation of utility connections, and shall provide electric service lines to each light in accordance with the owner's direction, manufacturer's specifications, and applicable electric code.
11. The gas, electric and communication utilities shall be installed in accordance with the utility provider specifications including but not limited to provided the proper bedding, cover, and detectable warning tape / tracer wire.
12. All sewer manhole pipe penetrations shall be provided with a waterproof rubber boot and gasket.
13. Cuts and fills are proposed over existing utilities. Site contractor shall protect all utilities whether shown or not shown during earthwork operations. Site contractor shall lower existing utilities as required to maintain adequate cover and adjust access and covers for existing structures to proposed grade.

WELL ABANDONMENT NOTES:

1. Existing well to be abandoned shall be decommissioned by a NYSDEC registered well driller in accordance with the Westchester County Department of Health Rules and Regulations.
2. The existing pump, equipment and wiring shall be removed from the existing well, casing cut to below finish grade and filled with puddled clay, concrete, grout or other suitable impervious material.

REFER TO DRAWING TR-1 "TREE REMOVAL PLAN" FOR EXISTING TREES TO BE REMOVED

EXCAVATION NOTES:

1. All pavement to be saw cut to its full depth by the contractor prior to excavation.
2. The Contractor shall provide sheeting, shoring, a benched excavation, or a sloped excavation for all excavations 5.0 feet or greater in depth.
3. All sheeting and shoring protective systems used for excavation shall be designed and stamped by a NYS licensed Professional Engineer.
4. Where construction crosses or is adjacent to existing utility lines (fuel, water gas, telephone, electric or communication), the contractor shall carefully hand excavate so as to locate, mark and protect the utility lines against disturbance or damage by providing adequate support and protection as approved by the Engineer. The contractor shall repair any power or communication interruption immediately, at no additional cost to the owner.
5. Trench excavation outside of temporary construction fence is to be backfilled on the same day as excavation. Temporary orange construction fence is required around these work areas for on going work.
6. All utility trenching in and adjacent to roadways shall be backfilled prior to the end of the work day, unless otherwise authorized by the Engineer. Item 4 shall be temporarily brought to the surface of the utility trench flush with the adjacent pavement and maintained until the final pavement is installed. Road plates, if used, shall be designed to meet H25 loading requirements.
7. Excavations needing to be open greater than a single day on school property shall have 6' temporary chain link fence installed overnight or when no work is being performed at the location. Temporary orange construction fence shall be in place when work is being performed.

LINE	BEARING	DISTANCE
L1	S75°21'22"E	10.09'
L2	S52°39'22"E	9.44'
L3	S38°33'52"E	17.61'
L4	S22°52'22"E	18.20'
L5	S17°07'42"E	25.05'
L6	S09°15'22"E	12.60'
L7	S04°29'22"E	27.87'
L8	S03°15'22"E	19.61'
L9	S02°38'22"E	10.00'
L10	S01°29'22"E	61.49'
L11	S00°17'22"E	103.86'
L12	S02°47'22"E	108.97'

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

NO.	DATE	REVISION	BY
5	5-7-26	PLANNING BOARD REISSUE	HMF
4	4-9-26	PLANNING BOARD REISSUE	HMF
3	1-8-26	REVISED PER VILLAGE COMMENTS	HMF
2	11-6-25	REVISED PER VILLAGE COMMENTS	HMF
1	10-6-25	REVISED PER VILLAGE COMMENTS	HMF

INSITE
ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.
3 Garrett Place
Carmel, NY 10512
(845) 225-9090
(845) 225-9717 fax
www.insite-eng.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
EXISTING CONDITIONS & REMOVALS PLAN

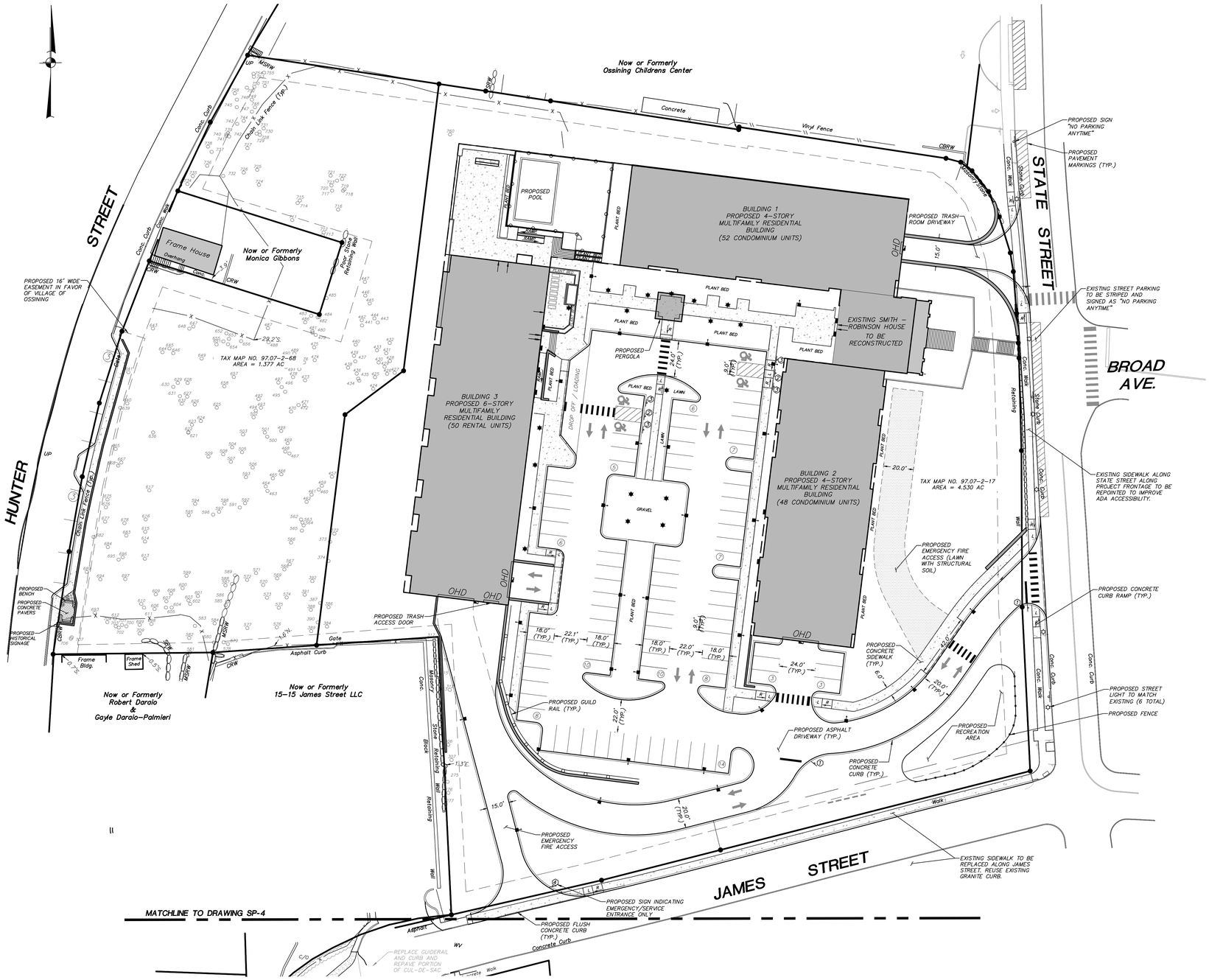
RICHARD D. WILLIAMS JR. STATE OF NEW YORK LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	7-24-25	DRAWN BY	R.A.R.
SCALE	1" = 30'	CHECKED BY	E.J.P.

DRAWING NO. EX-1
SHEET 2 / 17

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

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LEGEND

- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING BUILDING TO BE REMOVED
- EXISTING STONE & MASONRY RETAINING WALL
- EXISTING GATE
- EXISTING CHAIN LINK FENCE
- EXISTING GUIDE RAIL
- EXISTING CONCRETE CURB
- EXISTING DROP IN CONCRETE CURB
- EXISTING SIGN
- EXISTING EVERGREEN TREE
- EXISTING DECIDUOUS TREE
- PROPOSED # OF STALLS TO BE STRIPED
- PROPOSED CONCRETE CURB
- PROPOSED FLUSH CONCRETE CURB
- PROPOSED MOUNTABLE CONCRETE CURB
- PROPOSED EDGE OF SIDEWALK
- PROPOSED RETAINING WALL
- PROPOSED PAINTED CROSSWALK
- PROPOSED PAINTED STOPBAR
- PROPOSED PAINTED DIRECTIONAL ARROW
- PROPOSED PAINTED HANDICAP PARKING SYMBOL
- PROPOSED ADA COMPLIANT RAMP
- PROPOSED STRIPED ISLAND
- PROPOSED LOADING SPACE
- PROPOSED RECYCLE / TRASH CONTAINER / REFUSE ENCLOSURE
- PROPOSED SINGLE POLE SIGN
- PROPOSED POLE MOUNTED LIGHT
- PROPOSED POST MOUNTED LIGHT
- PROPOSED BUILDING MOUNTED LIGHT
- PROPOSED DOOR LOCATION

GENERAL NOTES:

1. Refer to plans prepared by Eric Rains Landscape Architecture for plantings and site amenities.

SIGN DATA TABLE

LOCATION NO.	TEXT	M.U.T.C.D. NUMBER	SIZE OF SIGN (s.f.)	DESCRIPTION
1	STOP	R1-1C	24" x 24"	White on Red
2	NO PARKING FIRE LANE	R7-1	12" x 18"	Red on White
3	RESERVED PARKING / VAN ACCESS	NY R7-8*	12" x 18"	Green on White Blue Symbol
		R7-8P	12" x 6"	Green on White
4	EMERGENCY SERVICE ENTRANCE ONLY	–	12" x 18"	Red on White

PARKING REQUIREMENTS:

Total Parking Spaces Required: (refer to architectural drawings prepared by Arketekcher)	268 spaces
Parking Provided:	
Subsurface Parking	196 spaces
Surface Parking	87 spaces
Total Parking Spaces Provided:	283 spaces
Required – ADA Accessible parking Spaces	7 spaces
Total Parking Spaces Provided:	10 spaces

GRAPHIC SCALE

0 15 30 60

(IN FEET)

1 inch = 30 ft.

NO.	DATE	REVISION	BY
5	5-7-26	PLANNING BOARD REISSUE	HMF
4	4-9-26	PLANNING BOARD REISSUE	HMF
3	1-8-26	REVISED PER VILLAGE COMMENTS	HMF
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ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.
3 Garrett Place
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(845) 225-9690
(845) 225-9717 fax
www.insite-eng.com

PROJECT:

34 STATE STREET

34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:

LAYOUT PLAN

STATE OF NEW YORK · RICHARD D. WILLIAMS · 035556 · LICENSED PROFESSIONAL ENGINEER

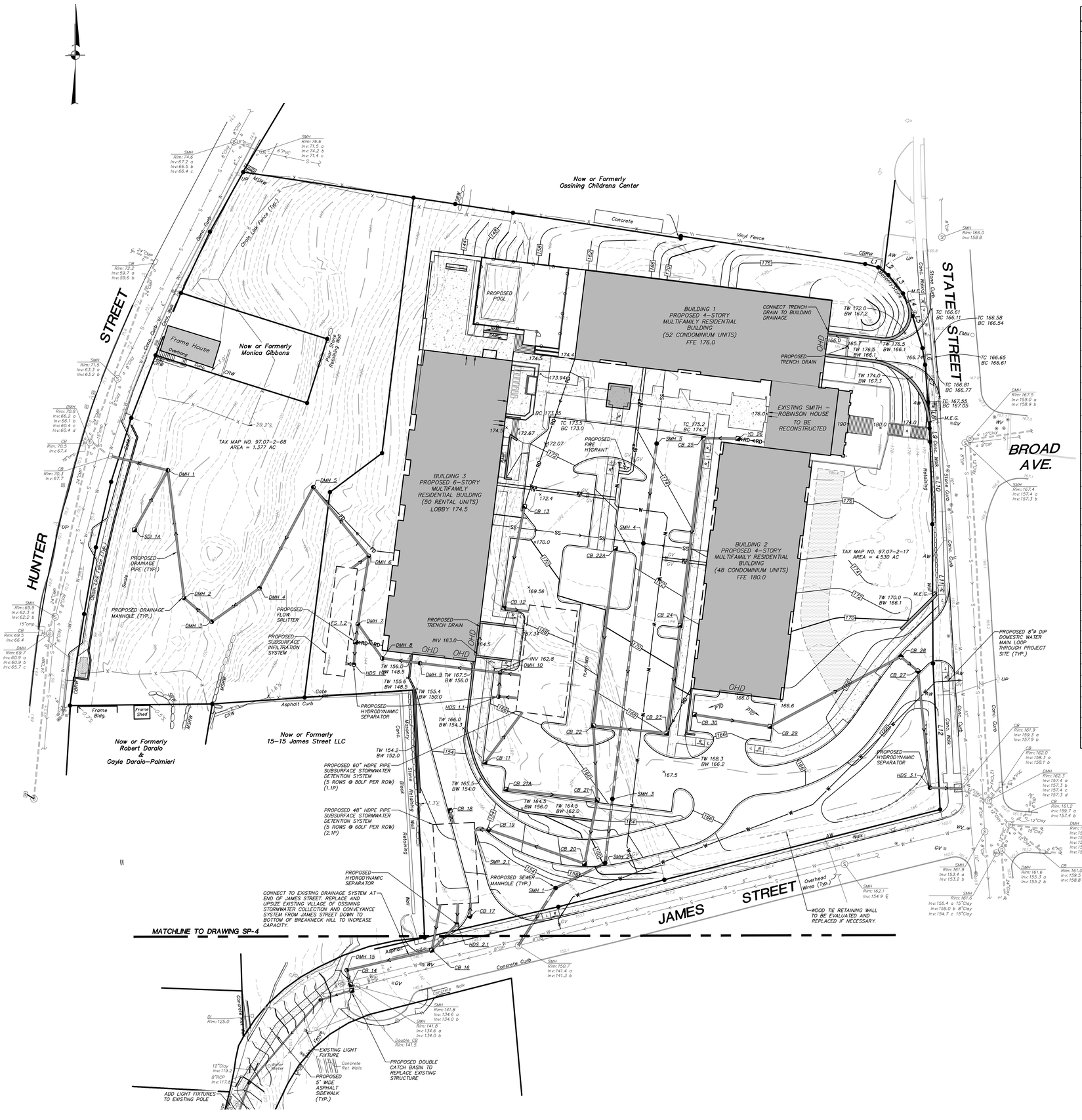
PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	7-24-25	DRAWN BY	R.A.R.
SCALE	1" = 30'	CHECKED BY	E.J.P.

DRAWING NO. SP-1

SHEET 3 / 17

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

Z:\E\25154\03 WIP_34 State St - Planning\03 SP-1.dwg, 5/7/2026 8:55:51 AM, HPerlowitz, 1:1



DRAINAGE TABLE

STRUCTURE	RIM	INVERT ELEVATION	PIPE	LENGTH	SLOPE
CB 11	164.7	INV. OUT = 161.50 TO SMP 1.1P (IN)	12" HDPE	47 L.F.	2.1%
CB 12	169.1	INV. IN = 165.70 FROM CB 13 INV. OUT = 165.70 TO SMP 1.1P (IN)	15" HDPE 15" HDPE	77 L.F. 19 L.F.	1.7% 26.1%
CB 13	170.6	INV. OUT = 167.00 TO CB 12	15" HDPE	77 L.F.	1.7%
CB 14	141.5	INV. IN = 138.00 FROM DMH 15	15" HDPE	11 L.F.	3.6%
CB 16	147.0	INV. IN = 143.00 FROM HDS 2.1 INV. IN = 142.60 FROM SMP 2.1 INV. OUT = 142.20 TO DMH 15	6" HDPE 10" HDPE 15" HDPE	27 L.F. 34 L.F. 65 L.F.	1.1% 4.9% 5.8%
CB 17	150.4	INV. OUT = 150.00 TO SMP 2.1	12" HDPE	10 L.F.	28.0%
CB 18	153.3	INV. OUT = 150.00 TO SMP 2.1	12" HDPE	10 L.F.	27.0%
CB 19	154.0	INV. IN = 150.60 FROM CB 20 INV. OUT = 150.60 TO SMP 2.1	15" HDPE 15" HDPE	76 L.F. 10 L.F.	6.6% 34.0%
CB 20	159.0	INV. IN = 155.60 FROM CB 21 INV. OUT = 155.60 TO CB 19	15" HDPE 15" HDPE	48 L.F. 76 L.F.	10.1% 6.6%
CB 21	165.8	INV. IN = 160.50 FROM CB 22 INV. IN = 160.80 FROM CB 21A INV. OUT = 160.50 TO CB 20	15" HDPE 12" HDPE 15" HDPE	55 L.F. 68 L.F. 48 L.F.	5.6% 1.0% 10.1%
CB 21A	164.7	INV. OUT = 161.50 TO CB 21	12" HDPE	68 L.F.	1.0%
CB 22	167.0	INV. IN = 163.80 FROM CB 22A INV. IN = 163.60 FROM CB 23 INV. OUT = 163.60 TO CB 21	12" HDPE 15" HDPE 15" HDPE	133 L.F. 55 L.F. 55 L.F.	3.5% 1.6% 5.6%
CB 22A	171.7	INV. OUT = 168.50 TO CB 22	12" HDPE	133 L.F.	3.5%
CB 23	168.0	INV. IN = 164.80 FROM CB 24 INV. OUT = 164.50 TO CB 22	12" HDPE 15" HDPE	81 L.F. 55 L.F.	4.0% 1.6%
CB 24	171.2	INV. IN = 168.00 FROM CB 25 INV. OUT = 168.00 TO CB 23	12" HDPE 12" HDPE	141 L.F. 81 L.F.	2.5% 4.0%
CB 25	174.7	INV. IN = 171.50 FROM YD 26 INV. OUT = 171.50 TO CB 24	12" HDPE 12" HDPE	26 L.F. 141 L.F.	2.3% 2.5%
CB 27	164.1	INV. IN = 160.40 FROM CB 28 INV. OUT = 160.40 TO	12" HDPE 12" HDPE	17 L.F. 87 L.F.	1.2% 0.9%
CB 28	164.1	INV. IN = 160.60 FROM CB 29 INV. OUT = 160.60 TO CB 27	12" HDPE 12" HDPE	110 L.F. 17 L.F.	1.0% 1.2%
CB 29	165.5	INV. IN = 161.70 FROM CB 30 INV. OUT = 161.70 TO CB 28	12" HDPE 12" HDPE	57 L.F. 110 L.F.	1.1% 1.0%
CB 30	165.5	INV. OUT = 162.30 TO CB 29	12" HDPE	57 L.F.	1.1%
DMH 1	83.0	INV. IN = 74.10 FROM DMH 2 INV. IN = 74.30 FROM SDI 1A INV. OUT = 68.20 TO EX CB	15" HDPE 12" HDPE 15" HDPE	96 L.F. 51 L.F. 43 L.F.	17.2% 1.0% 1.2%
DMH 2	94.0	INV. IN = 90.60 FROM DMH 3 INV. OUT = 90.60 TO DMH 1	15" HDPE 15" HDPE	27 L.F. 96 L.F.	29.4% 17.2%
DMH 3	102.0	INV. IN = 98.60 FROM DMH 4 INV. OUT = 98.60 TO DMH 2	15" HDPE 15" HDPE	44 L.F. 27 L.F.	22.9% 29.4%
DMH 4	112.0	INV. IN = 108.60 FROM DMH 5 INV. OUT = 108.60 TO DMH 3	15" HDPE 15" HDPE	85 L.F. 44 L.F.	10.6% 22.5%
DMH 5	121.0	INV. IN = 117.60 FROM DMH 6 INV. OUT = 117.60 TO DMH 4	15" HDPE 15" HDPE	66 L.F. 85 L.F.	25.7% 10.6%
DMH 6	140.0	INV. IN = 134.50 FROM DMH 7 INV. OUT = 134.50 TO DMH 5	15" HDPE 15" HDPE	51 L.F. 66 L.F.	4.3% 25.7%
DMH 7	144.0	INV. IN = 136.90 FROM DMH 8 INV. IN = 137.20 FROM FS 1.2 INV. OUT = 136.70 TO DMH 6	12" HDPE 8" HDPE 15" HDPE	31 L.F. 14 L.F. 51 L.F.	18.8% 1.5% 4.3%
DMH 8	146.0	INV. IN = 142.80 FROM DMH 9 INV. OUT = 142.80 TO DMH 7	12" HDPE 12" HDPE	28 L.F. 31 L.F.	14.8% 18.8%
DMH 9	154.4	INV. IN = 151.20 FROM DMH 10 INV. OUT = 147.00 TO DMH 8	12" HDPE 12" HDPE	60 L.F. 28 L.F.	1.3% 14.8%
DMH 10	166.7	INV. IN = 156.60 FROM HDS 1.1 INV. IN = 158.00 FROM SMP 1.1P (OUT) INV. OUT = 152.00 TO DMH 9	4" HDPE 8" HDPE 12" HDPE	18 L.F. 15 L.F. 60 L.F.	1.1% 1.3% 1.3%
DMH 15	141.8	INV. IN = 138.40 FROM CB 16 INV. OUT = 138.40 TO CB 14	15" HDPE 15" HDPE	65 L.F. 11 L.F.	5.8% 3.6%
EX CB	70.3	INV. IN = 67.70 FROM DMH 1	15" HDPE	43 L.F.	1.2%
EX. CB	161.9	INV. IN = 159.30 FROM HDS 3.1	12" HDPE	24 L.F.	0.0%
FS 1.2	143.0	INV. OUT = 137.40 TO DMH 7 INV. OUT = 135.70 TO HDS 1.2	8" HDPE 6" HDPE	14 L.F. 17 L.F.	1.5% 1.2%
HDS 1.1	166.2	INV. IN = 156.80 FROM SMP 1.1P (OUT) INV. OUT = 156.80 TO DMH 10	4" HDPE 4" HDPE	14 L.F. 18 L.F.	1.4% 1.1%
HDS 1.2	143.0	INV. IN = 135.50 FROM FS 1.2 INV. OUT = 135.50 TO SMP 1.2	6" HDPE 6" HDPE	17 L.F. 6 L.F.	1.2% 3.3%
HDS 2.1	150.5	INV. IN = 143.30 FROM SMP 2.1 INV. OUT = 143.30 TO CB 16	6" HDPE 6" HDPE	15 L.F. 27 L.F.	1.3% 1.1%
HDS 3.1	166.7	INV. OUT = 159.30 TO EX. CB	12" HDPE	24 L.F.	0.0%
SDI 1A	78.0	INV. OUT = 74.80 TO DMH 1	12" HDPE	51 L.F.	1.0%
SMP 1.1P (IN)		INV. IN = 160.50 FROM CB 11	12" HDPE	47 L.F.	2.1%
SMP 1.1P (OUT)		INV. OUT = 157.00 TO HDS 1.1	4" HDPE	14 L.F.	1.4%
SMP 2.1		INV. OUT = 143.50 TO HDS 2.1	6" HDPE	15 L.F.	1.3%
SMP 1.1P (IN)		INV. IN = 160.50 FROM CB 12	15" HDPE	19 L.F.	28.1%
SMP 1.1P (OUT)		INV. OUT = 158.20 TO DMH 10	8" HDPE	15 L.F.	1.3%
SMP 1.2		INV. IN = 135.30 FROM HDS 1.2	6" HDPE	6 L.F.	3.3%
SMP 2.1		INV. OUT = 144.30 TO CB 16	10" HDPE	34 L.F.	4.9%
SMP 2.1		INV. IN = 147.10 FROM CB 19	15" HDPE	10 L.F.	34.0%
SMP 2.1		INV. IN = 147.30 FROM CB 18	12" HDPE	10 L.F.	27.0%
SMP 2.1		INV. IN = 147.30 FROM CB 17	12" HDPE	10 L.F.	28.0%
YD 26	175.3	INV. OUT = 172.10 TO CB 25	12" HDPE	26 L.F.	2.3%

SEWER TABLE

STRUCTURE	RIM	INVERT ELEVATION	PIPE	LENGTH	SLOPE
EX SMH	150.7	INV. IN = 141.40 FROM SMH 1	8" HDPE	51 L.F.	16.1%
SMH 1	154.6	INV. IN = 149.70 FROM SMH 2 INV. OUT = 149.60 TO EX SMH	8" HDPE 8" HDPE	41 L.F. 51 L.F.	14.7% 16.1%
SMH 2	160.1	INV. IN = 155.90 FROM SMH 3 INV. OUT = 155.80 TO SMH 1	8" HDPE 8" HDPE	48 L.F. 41 L.F.	10.2% 14.7%
SMH 3	166.2	INV. IN = 160.90 FROM SMH 4 INV. OUT = 160.80 TO SMH 2	8" HDPE 8" HDPE	192 L.F. 48 L.F.	3.1% 10.2%
SMH 4	172.5	INV. IN = 167.00 FROM SMH 5 INV. OUT = 166.90 TO SMH 3	8" HDPE 8" HDPE	75 L.F. 192 L.F.	3.7% 3.1%
SMH 5	174.3	INV. OUT = 169.80 TO SMH 4	8" HDPE	75 L.F.	3.7%

LEGEND

- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING STONE & MASONRY RETAINING WALL
- EXISTING GATE
- EXISTING CHAIN LINK FENCE
- EXISTING GUIDE RAIL
- EXISTING CONCRETE CURB
- EXISTING DROP IN CONCRETE CURB
- EXISTING UTILITY POLE w/ guy & overhead wires
- EXISTING UTILITY PAD & RISERS
- EXISTING TRAFFIC SIGNAL BOX
- EXISTING SIGN
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING UNDERGROUND SEWER MAIN
- EXISTING UNDERGROUND WATER MAIN
- EXISTING CATCH BASIN
- EXISTING MANHOLE (type unidentified)
- EXISTING DRAINAGE MANHOLE
- EXISTING SEWER MANHOLE
- EXISTING HYDRANT
- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING SPOT GRADE
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- PROPOSED SPOT ELEVATION
- PROPOSED TOP OF CURB & BOTTOM OF CURB ELEVATIONS
- PROPOSED TOP OF WALL & BOTTOM OF WALL ELEVATIONS
- PITCH TO DRAIN
- PROPOSED SEWER MANHOLE
- PROPOSED DRAINAGE MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED OUTLET STRUCTURE
- PROPOSED END SECTION
- PROPOSED WATER GATE VALVE (OPEN RIGHT)
- PROPOSED FIRE HYDRANT
- PROPOSED DRAINAGE PIPE
- PROPOSED 8"ø CAST IRON SEWER MAIN
- PROPOSED 6"ø CAST IRON SEWER SERVICE LINE
- PROPOSED 4"ø DIP DOMESTIC WATER SERVICE LINE
- PROPOSED 6"ø DIP FIRE WATER SERVICE LINE
- PROPOSED 8"ø DIP WATER MAIN
- PROPOSED FOOTING DRAIN
- PROPOSED ROOF DRAIN
- PROPOSED GRASS SWALE

VILLAGE OF OSSINING WATER NOTES:

1. Wet taps on Village of Ossining water mains must be done by the Village of Ossining Water Department, both on State Street and James Street. First valve on new main will remain closed until approval obtained from Water Department and Westchester County Department of Health.
2. Existing and proposed gate valves within Village right-of-way will be operated only by the Water Department.
3. All gate valves shall be right-turn (clockwise) open valves.
4. 15' wide water easement, centered along proposed water main through the project site to be provided for the Village of Ossining to own and maintain proposed water main on project site up to proposed hydrant.
5. Every pipe joint and every fitting shall be secured with "Field Lok 350" restrained joint gaskets (as manufactured by U.S. Pipe Foundry Co., or approved equal).
6. Thrust blocks shall be installed at all changes in horizontal or vertical alignment.
7. All water main fittings shall be Class 350 ductile iron mechanical joints with "Megalug" connections and "Field Lok 350" restrained joint gaskets (as manufactured by U.S. Pipe Foundry Co., or approved equal) in accordance with the latest AWWA/ANSI standard C111/A21.11.

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

NO.	DATE	REVISION	BY
5	5-7-26	PLANNING BOARD REISSUE	HMF
4	4-9-26	PLANNING BOARD REISSUE	HMF
3	1-8-26	PB SUBMISSION	HMF
2	11-6-25	REVISED PER VILLAGE COMMENTS	HMF
1	10-9-25	REVISED PER VILLAGE COMMENTS	HMF

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Carmel, NY 10512
(845) 225-9690
(845) 225-9717 fax
www.insite-emp.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
GRADING & UTILITY PLAN

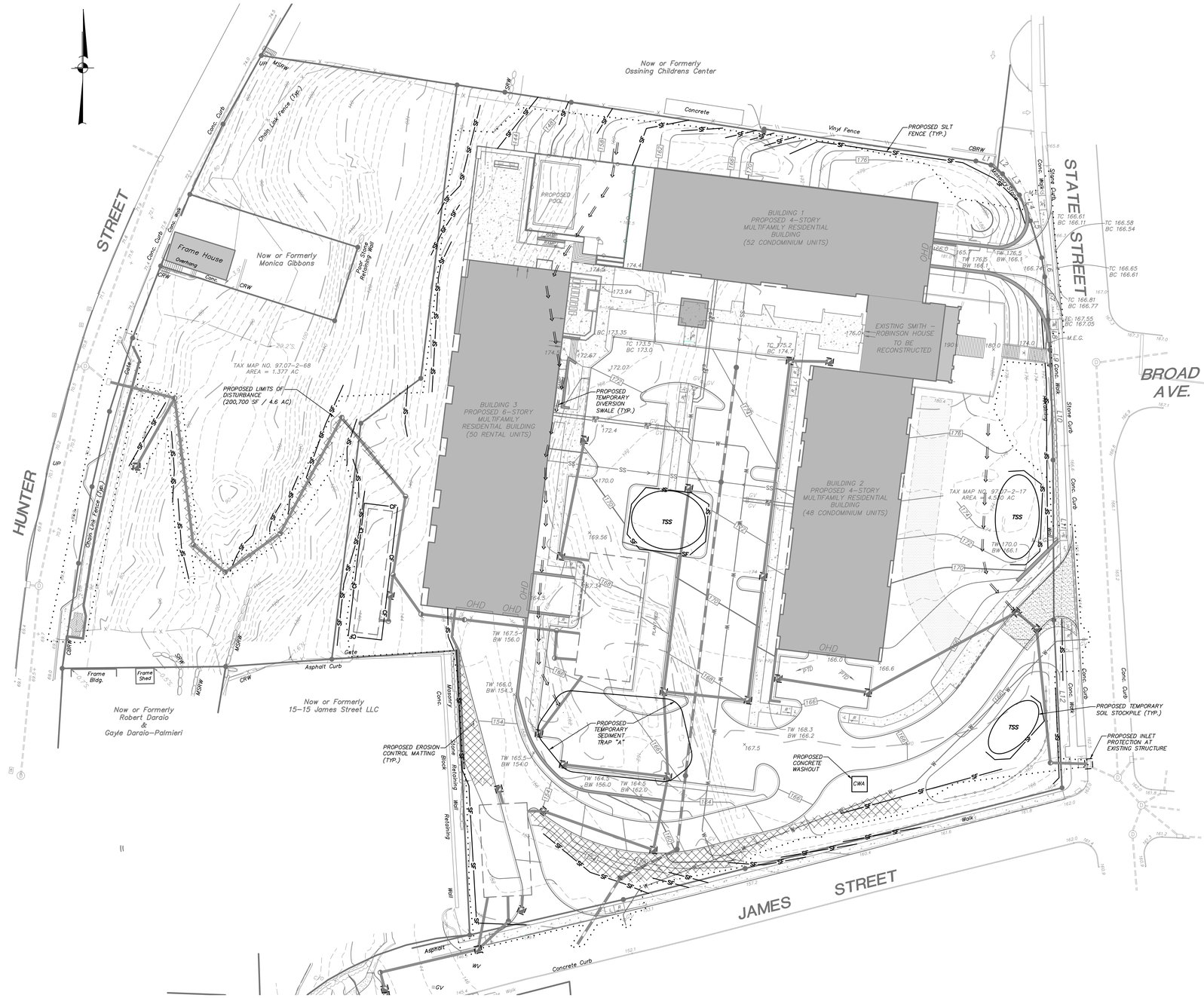
STATE OF NEW YORK — RICHARD D. WILLIAMS — 035886 — LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	7-24-25	DRAWN BY	R.A.R.
SCALE	1" = 30'	CHECKED BY	E.J.P.

DRAWING NO. SP-2 — SHEET 4 / 17

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

Z:\25154\00 WIP_34 State St - Ossining\04-SP-2.dwg, 5/7/2026 9:04:01 AM, ngwillow 1:1



REQUIRED SWPPP CONTENTS PER GP-0-25-001:

1. Pursuant to the NYSDEC "SPDES General Permit for Stormwater Discharges from Construction Activity" (GP-0-25-001), all Stormwater Pollution Prevention Plan's (SWPPP) shall include erosion and sediment control practices designed in conformance with the most current version of the technical standard, "New York Standards and Specifications for Erosion and Sediment Control." Where erosion and sediment control practices are not designed in conformance with this technical standard, the owner or operator must demonstrate equivalence to the technical standard. The following list of required SWPPP components is provided in accordance with Part III.B.1.c(i-xi) of General Permit GP-0-25-001:

   i. Background Information: The subject project consists of the redevelopment of the project site (formerly developed as Printex Textile plant) with three (3) multifamily residential buildings, paved parking, driveways, stormwater management and associated appurtenances. The existing Smith-Robinson House is proposed to be reconstructed. .

   ii. Site map / construction drawing: These plans serve to satisfy this SWPPP requirement.

   iii. Description of the soils present at the site: Onsite soils located within the proposed limits of disturbance consist of Chatsfield-Charlton complex (CsD), Hollis-Rock Outcrop complex (HrF), Urban Land (UF), and Urban-Chatfield complex (UIC), as identified on the Soil Conservation Service Web Soil Survey. These soil types belong to the Hydrologic Soil Group "B" and "D".

   iv. Construction phasing plan / sequence of operations: The Construction Sequence and phasing found on these plans provide the required phasing. A Construction Sequence and Erosion and Sediment Control Maintenance Schedule has been provided. The Sedimentation and Erosion Control Notes contained hereon outline a general sequence of operations for the proposed project. In general all erosion and sediment control facilities shall be installed prior to commencement with land disturbing activities, and areas of disturbance shall be limited to the shortest period of time as practicable.

   v. Temporary and permanent soil stabilization plan: The Sedimentation and Erosion Control Notes and Details provided heron identify temporary and permanent stabilization measures to be employed with respect to specific elements of the project, and at the various stages of development.

   vi. Site map / construction drawing: This plan serves to satisfy this SWPPP requirement.

   vii. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices: The details, Erosion and Sediment Control Notes, and Erosion and Sediment Control Maintenance Schedule serve to satisfy this SWPPP requirement.

   viii. An inspection schedule: Inspections are to be performed weekly and by a qualified professional as required by the General Permit GP-0-25-001. In addition the NYSDEC Trained Contractor shall perform additional inspections as cited in the Sedimentation and Erosion Control Notes.

   ix. A description of pollution prevention measures that will be used to control litter, construction chemicals and construction debris: In general, all construction litter / debris shall be collected and removed from the site. The general contractor shall supply either waste barrels or dumpster for proper waste disposal. Any construction chemicals utilized during construction shall either be removed from site daily by the contractor or stored in a structurally sound and weatherproof building. No hazardous waste shall be disposed of onsite, and shall ultimately be disposed of in accordance with all federal, state and local regulations. Material Safety Data Sheets (MSDS), material inventory, and emergency contact numbers shall be maintained by the general contractor for all construction chemicals utilized onsite. Finally, temporary sanitary facilities (portable toilets) shall be provided onsite during the entire length of construction, and inspected weekly for evidence of leaking holding tanks.

   x. A description and location of any stormwater discharges associated with industrial activity other than construction at the site: There are no known industrial stormwater discharges present or proposed at the site.

   xi. Identification of any elements of the design that are not in conformance with the technical standard, "New York Standards and Specifications for Erosion and Sediment Control." All proposed elements of this SWPPP have been designed in accordance with the "New York Standards and Specifications for Erosion and Sediment Control."

REQUIRED POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICE COMPONENTS:

1. Pursuant to the NYSDEC "SPDES General Permit for Stormwater Discharges from Construction Activity" (GP-0-25-001), all construction projects needing post-construction stormwater management practices shall prepare a SWPPP that also includes practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual"). Where post-construction stormwater management practices are not designed in conformance with this technical standard, the owner or operator must demonstrate equivalence to the technical standard. The following list of SWPPP components is provided in accordance with Part III.B.2e(i-vi,) and III.B.3:

   i. Identification of all post-construction stormwater management practices to be constructed as part of the project; This plan, and details/notes shown hereon serve to satisfy this SWPPP requirement.

   ii. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice; This plan, and details/notes shown hereon serve to satisfy this SWPPP requirement.

   iii. A Stormwater Modeling and Analysis Report including pre-development conditions, post-development conditions, the results of the stormwater modeling, a summary table demonstrating that each practice has been designed in conformance with the sizing criteria, identification of and justification for any deviations from the Design Manual, and identification of any design criteria that are not required. The required analysis is provided in the report titled Stormwater Pollution Prevention Plan for 34 State Street.

   iv. Soil testing results and locations. This SWPPP requirement is provided in the report titled Stormwater Pollution Prevention Plan for 34 State Street.

   v. Infiltration testing results. This SWPPP requirement is provided in the report titled Stormwater Pollution Prevention Plan for 34 State Street.

   vi. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice. The Permanent Stormwater Facilities Maintenance Schedule provided on these plans serves to satisfy this requirement.

2. Enhanced Phosphorus Removal Standards – Beginning on September 30, 2008, all construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the most current version of the technical standard, New York Stormwater Management Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2e(i-vi,) above. The permanent stormwater practices for this project have been sized according to chapter 10 of the Design Manual Enhanced Phosphorus Removal Standards. Please see 2e(i-vi,) above.

EROSION AND SEDIMENT CONTROL MAINTENANCE SCHEDULE

MONITORING REQUIREMENTS				MAINTENANCE REQUIREMENTS	
PRACTICE	DAILY	WEEKLY	AFTER RAINFALL	DURING CONSTRUCTION	AFTER CONSTRUCTION
SILT FENCE BARRIER	–	Inspect	Inspect	Clean/Replace	Remove
STABILIZED CONSTRUCTION ENTRANCE	Inspect	–	Inspect	Clean/Replace Stone and Fabric	Remove
DUST CONTROL	Inspect	–	Inspect	Mulching/ Spraying Water	N/A
*VEGETATIVE ESTABLISHMENT	–	Inspect	Inspect	Water/Reseed/ Remulch	Reseed to 80% Coverage
INLET PROTECTION	–	Inspect	Inspect	Clean/Repair/ Replace	Remove
SOIL STOCKPILES	–	Inspect	Inspect	Mulching/ Silt Fence Repair	Remove
SWALES	–	Inspect	Inspect	Clean/Mulch/ Repair	Mow Permanent Grass/Replace/ Repair Rip Rap
CHECK DAMS	–	Inspect	Inspect	Clean/Replace Stones/Repair	Clean/Replace Stones/Repair
CONCRETE DRAINAGE STRUCTURES	–	Inspect	Inspect	Clean Sumps/ Remove Debris/ Repair/Replace	Clean Sumps/ Remove Debris/ Repair/Replace
DRAINAGE PIPES	–	Inspect	Inspect	Clean/Repair	Clean/Repair
ROAD & PAVEMENT	–	Inspect	Inspect	Clean	Clean
*STORMWATER TRAP/BASIN	–	Inspect	Inspect	Clean/Mulch/ Repair/Reseed	See Permanent Stormwater Facilities Maintenance Schedule on Project Drawings

* Permanent vegetation is considered stabilized when 80% of the plant density is established. Erosion control measures shall remain in place until all disturbed areas are permanently stabilized.

Note: The party responsible for implementation of the maintenance schedule during and after construction is:

WB 34 STATE LLC
480 NORTH BEDFORD ROAD
CHAPPAQUA, NY, 10514
and/or the current owner(s) of the subject property.

STEEP SLOPE DISTURBANCE NOTES:

1. Disturbance of steep slopes shall be undertaken in workable units in which the disturbance can be completed within a reasonable timeframe so that areas are not left bare and exposed for long periods or through winter and spring-thaw periods.
2. Measures for the control of erosion and sedimentation shall be undertaken consistent with the New York Standards and Specifications for Erosion and Sediment Control, latest edition.
3. All proposed disturbance of steep slopes shall be undertaken consistent with the soils limitations ratings contained in the Westchester County soil survey.
4. Clean stormwater runoff uphill of all disturbed areas shall be diverted around the project site through implementation of silt fence and diversion swales installed installed uphill of the active work area.
5. Exposed soil disturbance shall be kept to the shortest practical period of time. Where soil disturbance activities have ceased, soil stabilization measures shall be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased.
6. Soil disturbance at any given time shall be minimized to the maximum extent practical. Slopes greater than 3H:1V shall be stabilized with erosion control matting.
7. Runoff from all areas of soil disturbance shall be directed towards the proposed downstream temporary sediment trap or other erosion control facilities.
8. The contractor shall have a representative onsite that is a NYSDEC Trained Contractor at all times site work is being performed.

GRAPHIC SCALE

0 15 30 60

(IN FEET)
1 inch = 30 ft.

LEGEND

- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING BUILDING TO BE REMOVED
- EXISTING STONE & MASONRY RETAINING WALL
- EXISTING GATE
- EXISTING CHAIN LINK FENCE
- EXISTING GUIDE RAIL
- EXISTING CONCRETE CURB
- EXISTING DROP IN CONCRETE CURB
- EXISTING SIGN
- EXISTING UNDERGROUND DRAINAGE PIPE
- CB EXISTING CATCH BASIN
- MH EXISTING MANHOLE (type unidentified)
- D EXISTING DRAINAGE MANHOLE
- 100 EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 698.6 x EXISTING SPOT GRADE
- SF PROPOSED SILT FENCE
- CF PROPOSED CONSTRUCTION FENCE
- PROPOSED STONE RIP-RAP
- PROPOSED LIMITS OF DISTURBANCE
- TSS SF PROPOSED TEMPORARY SOIL STOCKPILE
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED DRAINAGE STRUCTURE W/ INLET PROTECTION

CONSTRUCTION SEQUENCE:

Note: This construction sequence provides an overall sequence for construction and is not intended to be a construction logistics plan. A separate construction logistics plan will be prepared by others prior to construction.

1. Install silt fence in general locations indicated on the plan.
2. Begin demolition of existing site improvements.
3. Upon remove of existing asphalt pavement, install stabilized construction entrance/anti-tracking pad at existing driveway entrance.
4. Cordon off proposed infiltration area with construction fence to minimize soil compaction during construction operations.
5. Begin clearing and grubbing operations associated proposed site development.
6. Strip and stockpile topsoil on site for later use in lawn and landscape areas.
7. Begin excavation for foundation.
8. Begin construction of proposed stormwater management area and associated conveyance systems. Infiltration system shall remain offline until all contributing areas are stabilized.
9. Begin construction of proposed building.
10. Begin installation of proposed utilities.
11. Upon completion of grading operations, install finished driveway surfaces.
12. Topsoil, seed, and mulch all disturbed areas as soon as practical in accordance with the Erosion and Sediment Control Notes contained on the Project Drawings.

SOIL RESTORATION REQUIREMENTS

The contractor shall be required to perform the following soil restoration techniques prior to installing topsoil, seed and mulch. Items stricken in the following table do not need to be performed.

Type of Soil Disturbance	Soil Restoration Requirement		Comments/Examples
No soil disturbance	Restoration not permitted		Preservation of Natural Features
Minimal soil disturbance	Restoration not required		Clearing and grubbing
Areas where topsoil is stripped only – no change in grade	HSG A&B: Apply 6 inches of topsoil	HSG C&D: Aerate* and apply 6 inches of topsoil	Protect area from any ongoing construction activities.
Areas of cut or fill	HSG A&B: Aerate* and apply 6 inches of topsoil	HSG C&D: Apply full Soil Restoration**	
Heavy traffic areas on site (especially in a zone 5-25 feet around buildings but not within a 5 foot perimeter around foundation walls)	Apply full Soil Restoration (decompaction and compost enhancement)		
Areas where Runoff Reduction and/or Infiltration practices are applied	Restoration not required, but may be applied to enhance the reduction specified for appropriate practices.		Keep construction equipment from crossing these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area
Redevelopment projects	Soil Restoration is required on redevelopment projects in areas where existing impervious area will be converted to pervious area.		

* Aeration includes the use of machines such as tractor-drawn implements with coulters making a narrow slit in the soil, a roller with many spikes making indentations in the soil, or prongs which function like a mini-subsoiler.
** Per "Deep Ripping and De-compaction, DEC 2008":

WINTER SITE STABILIZATION NOTES:

1. All bare / exposed soils must be stabilized by an established vegetation, straw or mulch, matting, or other approved product such as rolled erosion control product.
2. Sediment barriers must be properly installed at all necessary perimeter and sensitive locations.
3. All slopes and grades must be properly stabilized with approved methods. Rolled erosion control products must be used on all slopes greater than 3:1, or where conditions for erosion dictate such measures.
4. Stockpiled soils must be protected by the use of established vegetation, an anchored-down straw or mulch, rolled erosion control product or other durable covering. A barrier must be installed around the pile to prevent erosion away from that location.
5. All entrance / exit locations to the site must be properly stabilized and must be maintained to accommodate snow management as set forth in the NYS Standard and Specifications for Erosion and Sediment Control.
6. Snow management must not destroy or degrade erosion and sediment control devices.

NO.	DATE	REVISION	BY
5	5-7-26	PLANNING BOARD REISSUE	HMF
4	4-9-26	PLANNING BOARD REISSUE	HMF
3	1-8-26	REVISED PER VILLAGE COMMENTS	HMF
2	11-6-25	REVISED PER VILLAGE COMMENTS	HMF
1	10-9-25	REVISED PER VILLAGE COMMENTS	HMF

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3 Garrett Place
Carmel, NY 10512
(845) 225-9690
(845) 225-9717 fax
www.insite-eng.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
EROSION AND SEDIMENT CONTROL PLAN

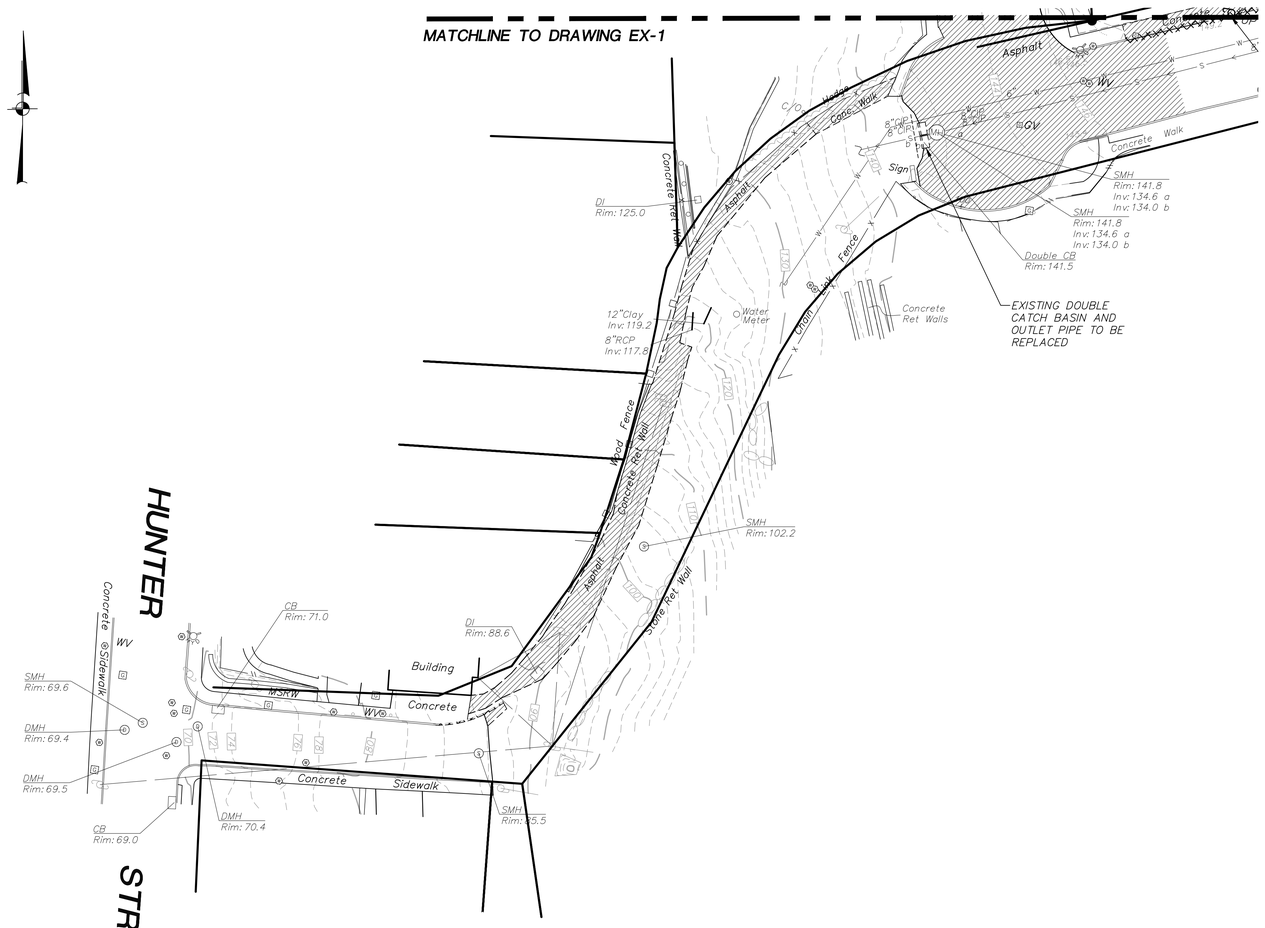
STATE OF NEW YORK – RICHARD D. WILLIAMS – 095886 – LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	7-24-25	DRAWN BY	R.A.R.
SCALE	1" = 30'	CHECKED BY	E.J.P.

DRAWING NO. SP-3 SHEET 5 / 17

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

Z:\E\25154\000 WB 34 State St - Ossining\04 SP Dwg, 8.5x11\25154.100 34 St, ESPermits, 1.1



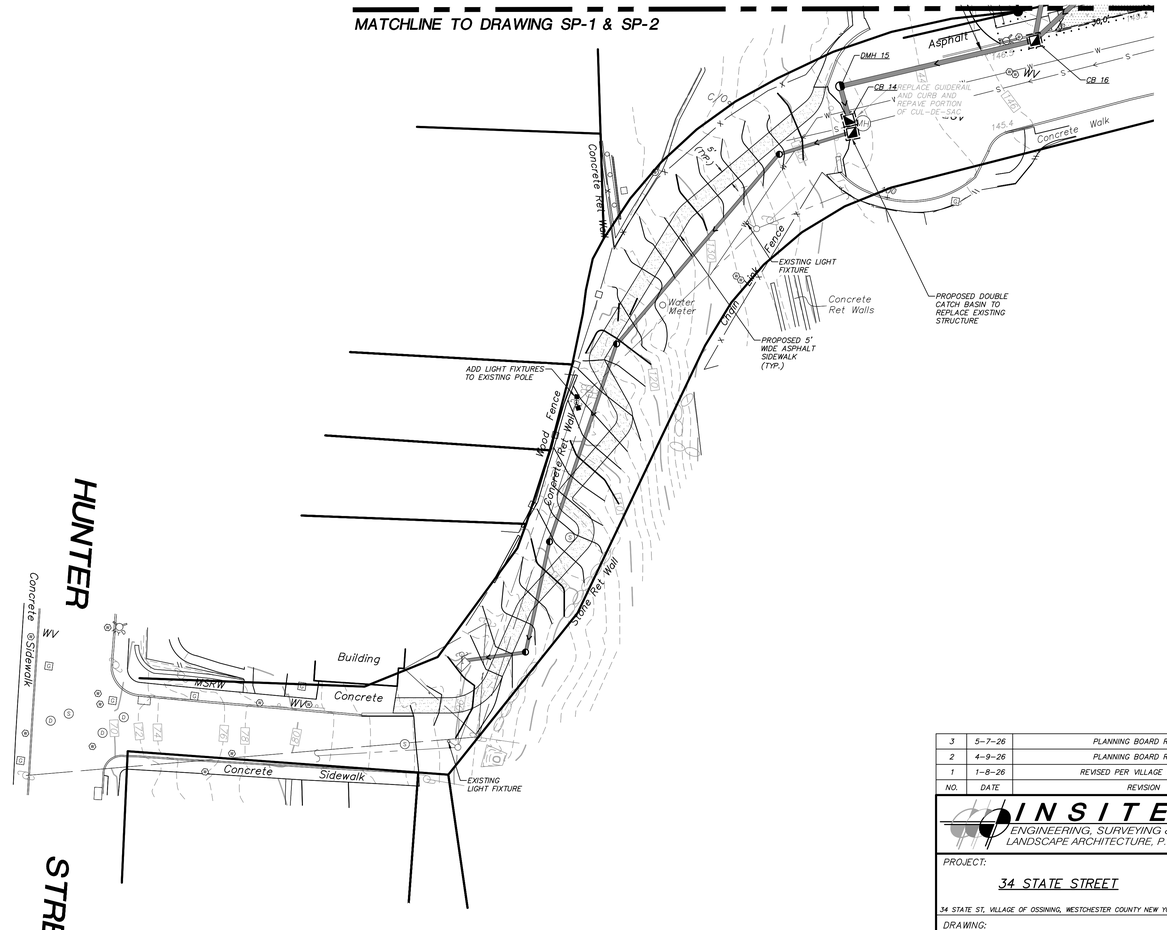
EXISTING CONDTIONS AND REMOVALS PLAN
SCALE: 1" = 20'

LEGEND

- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING STONE & MASONRY RETAINING WALL
- EXISTING GATE
- EXISTING CHAIN LINK FENCE
- EXISTING GUIDE RAIL
- EXISTING CONCRETE CURB
- EXISTING DROP IN CONCRETE CURB
- EXISTING UTILITY POLE w/ guy & overhead wires
- EXISTING UTILITY PAD & RISERS
- EXISTING TRAFFIC SIGNAL BOX
- EXISTING SIGN
- EXISTING UNDERGROUND DRAINAGE PIPE
- EXISTING UNDERGROUND SEWER MAIN
- EXISTING UNDERGROUND WATER MAIN
- EXISTING CATCH BASIN
- EXISTING MANHOLE (type unidentified)
- EXISTING DRAINAGE MANHOLE
- EXISTING SEWER MANHOLE
- EXISTING HYDRANT
- EXISTING GAS VALVE
- EXISTING WATER VALVE
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING SPOT GRADE
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- PROPOSED SPOT ELEVATION
- PROPOSED TOP OF CURB & BOTTOM OF CURB ELEVATIONS
- PROPOSED SEWER MANHOLE
- PROPOSED DRAINAGE MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED OUTLET STRUCTURE
- PROPOSED DRAINAGE PIPE
- PROPOSED SEWER SERVICE LINE
- PROPOSED CONCRETE CURB
- PROPOSED EDGE OF SIDEWALK
- PROPOSED POST MOUNTED LIGHT

GENERAL NOTES:

1. Property lines shown hereon taken from Westchester County GIS database, dated 2011.



OVERALL SITE PLAN
SCALE: 1" = 20'

GRAPHIC SCALE
0 10 20 40
(IN FEET)
1 inch = 20 ft.

NO.	DATE	REVISION	BY
3	5-7-26	PLANNING BOARD REISSUE	HMF
2	4-9-26	PLANNING BOARD REISSUE	HMF
1	1-8-26	REVISED PER VILLAGE COMMENTS	HMF

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(845) 225-9717 fax
www.insite-emp.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
BREAKNECK IMPROVEMENTS
SITE PLAN

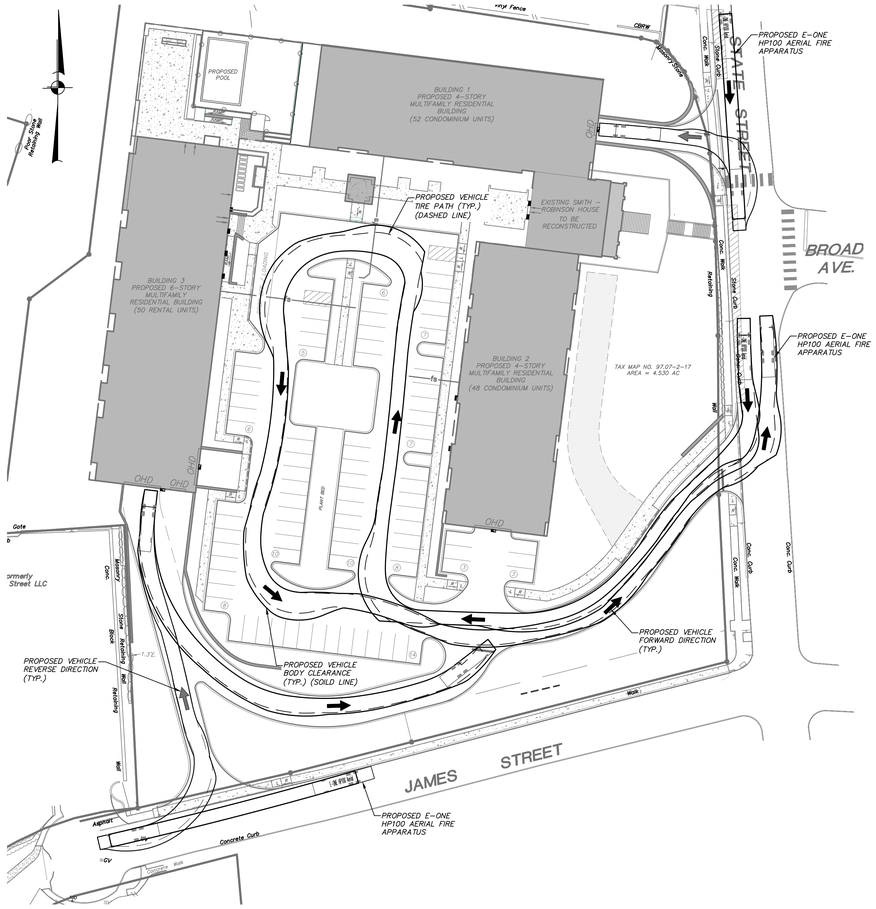
STATE OF NEW YORK — RICHARD D. WILLIAMS — 095886 — LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	11-6-25	DRAWN BY	R.A.R.
SCALE	1" = 20'	CHECKED BY	E.J.P.

DRAWING NO. SP-4
SHEET 6 / 17

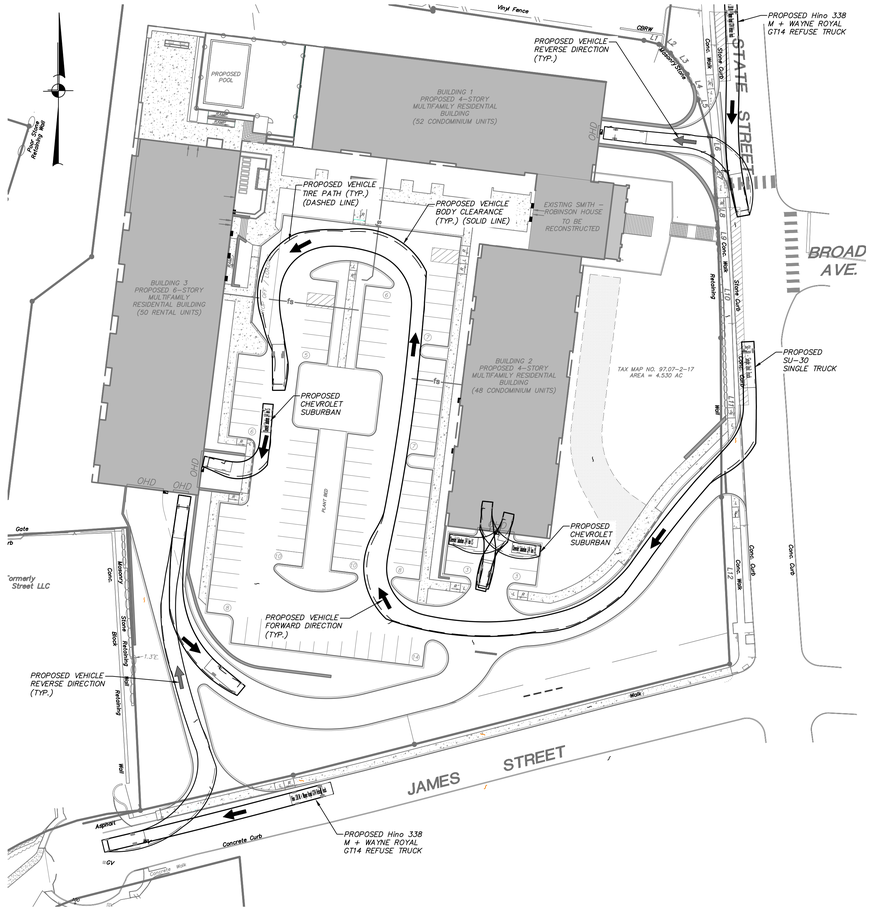
ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

Z:\25154\03 WIP_34 State St - Ossining\04-SP-4.dwg, 5/7/2026 5:54:03 PM, HPinchevski, 1:1



E-ONE HP100 AERIAL FIRE APPARATUS MANEUVERING PLAN

1" = 40'

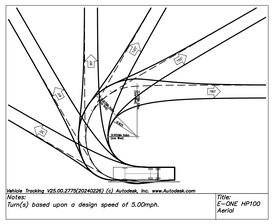


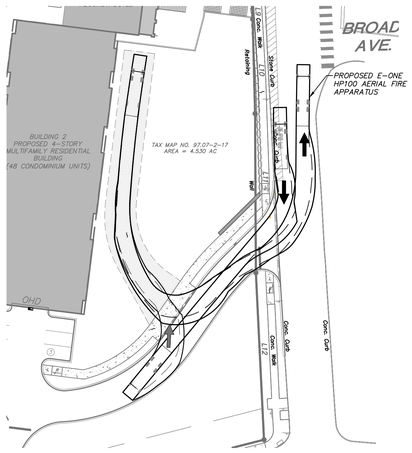
SU-30 BOX TRUCK, CHEVROLET SUBURBAN, & HINO 338M REFUSE VEHICLE MANEUVERING PLAN

1" = 40'

LEGEND

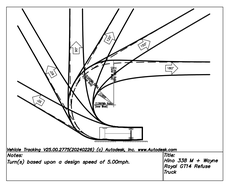
- PROPOSED VEHICLE TIRE PATH
- PROPOSED VEHICLE BODY CLEARANCE
- PROPOSED VEHICLE FORWARD DIRECTION
- PROPOSED VEHICLE REVERSE DIRECTION

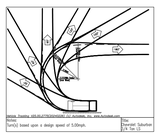


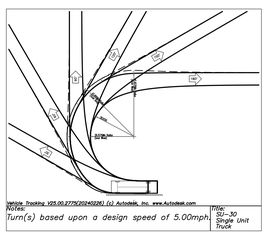


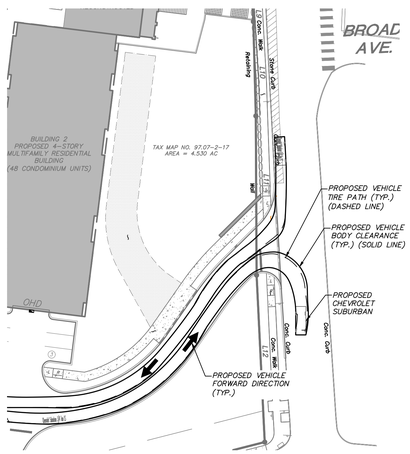
E-ONE HP100 AERIAL FIRE APPARATUS MANEUVERING PLAN
EMERGENCY FIRE LANE ENLARGEMENT

1" = 40'









CHEVROLET SUBURBAN VEHICLE MANEUVERING PLAN

1" = 40'

GRAPHIC SCALE

0 20 40 80

(IN FEET)
1 inch = 40 ft.

NO.	DATE	REVISION	BY
3	5-7-26	PLANNING BOARD REISSUE	HMF
2	4-9-26	PLANNING BOARD REISSUE	HMF
1	1-8-26	REVISED PER VILLAGE COMMENTS	HMF

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3 Garrett Place
Carmel, NY 10512
(845) 225-9690
(845) 225-9717 fax
www.insite-eng.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
VEHICLE MANEUVERING PLAN

STATE OF NEW YORK
RICHARD D. WILLIAMS, JR.
090866
LICENSED PROFESSIONAL ENGINEER

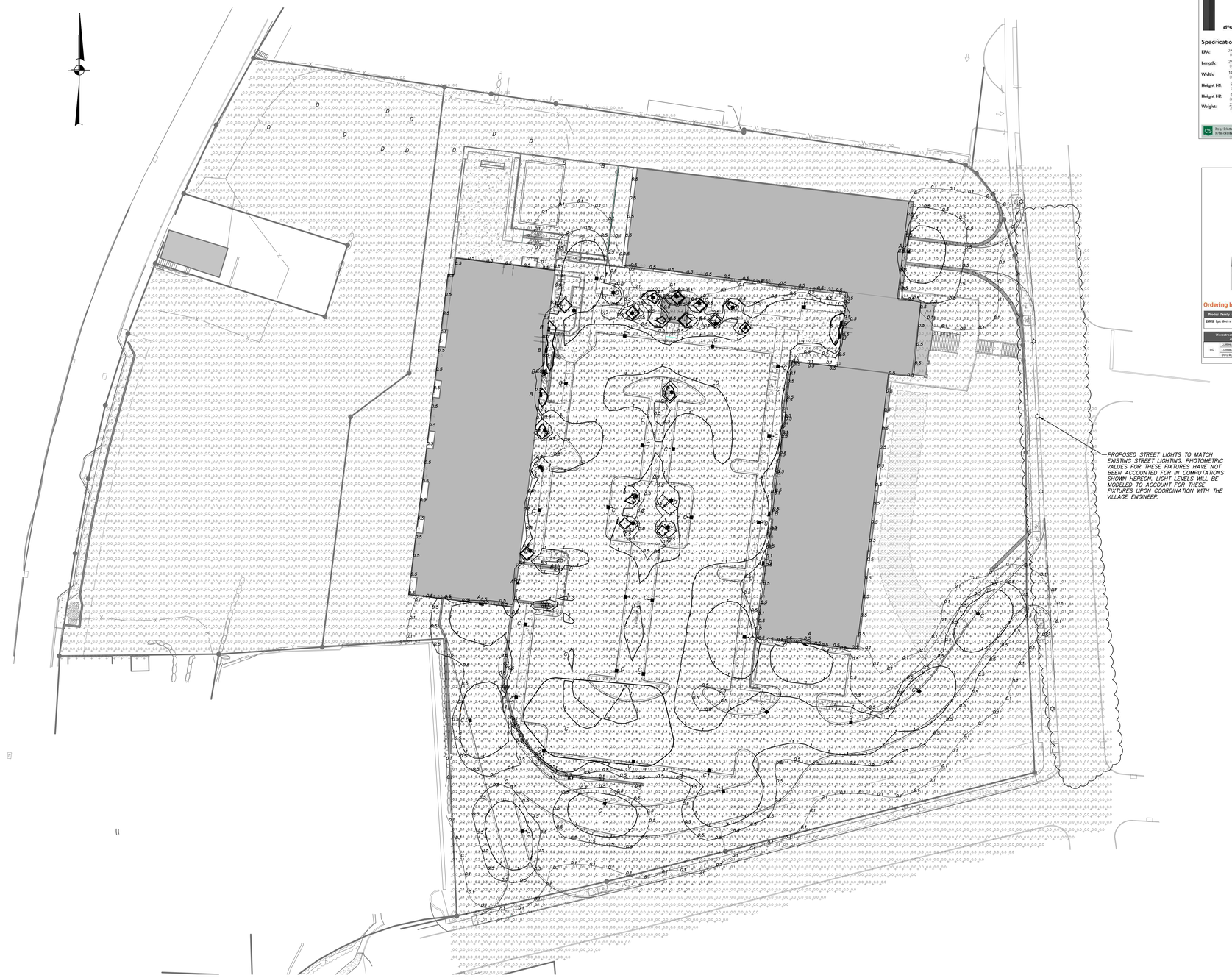
PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	11-6-25	DRAWN BY	R.A.R.
SCALE	1" = 40'	CHECKED BY	E.J.P.

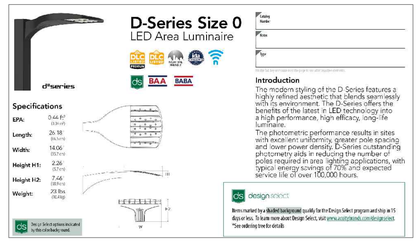
DRAWING NO. VM-1

SHEET 7 / 17

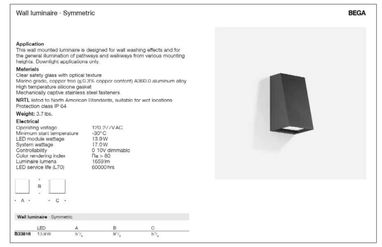
ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

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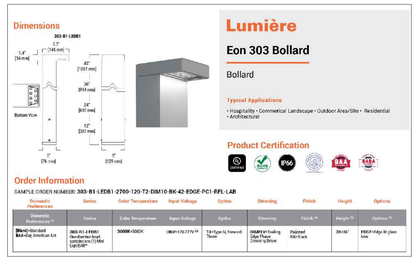
FIXTURE A:



FIXTURE B:



FIXTURE C:



FIXTURE D:

STATISTICS

DESCRIPTION	SYMBOL	AVG	MAX	MIN	MAX/MIN	AVG/MIN
Overall Site	+	0.4 fc	15.2 fc	0.0 fc [1.]	152.0:1	4.0:1

1. *In the photometric computations shown on the site plan, light levels of 0.0 footcandles are shown to depict that the proposed lighting conditions are compliant with the Village of Ossining lighting requirements. A minimum value of 0.1 was used where necessary in order to conduct the calculations for Max/Min and Min/Avg in the statistics table above.*

LUMINAIRE SCHEDULE

Sym	Qty	Catalog Number	Description	Lamp	Mounting Height	Watts
A	1	DSXO LED P1 30K 70CRI TFTM	Lithonia – DSXO LED with P1, 30K, Type TFTM distribution	LED	14'–0"	33.2
B	8	B 33 816	BEGA Lighting marine grade, building mounted downlight	LED	9'–0"	17.0
C	23	EMM2 HSN SAB1 727 T4W	Invue–Epic Decorative Pendant Luminaire. Applicable to streetscapes, squares, and pedestrian areas. 27K	LED	12'–0"	44.0
D	21	303–B1–LEDB1–3000–UNV T4–DIMELV–BK–EDGE	Lumiere Eon 303 Bollard Luminaire. Applicable to pathways, squares, and pedestrian areas. 3000K	LED	3'–0"	8.4

LIGHTING NOTES:

1. *All lighting shall be as noted on the plan or approved equal.*
2. *Calculation values shown in this plan are taken on a horizontal plane at ground level using a 0.98 light loss factor for LEDs. Topographical information and landscaping have not been accounted for in these calculations.*
3. *All lighting on this plan shall be directed and/or shielded so as to preclude objectionable glare from being observable from adjoining streets and properties.*
4. *Photometric modeling based on specified fixtures shown hereon.*
5. *Exterior lighting will automatically turn off during daylight hours. Exterior lighting will turn on between sunset and 6:00 AM.*

LIGHT CONTOUR LEGEND

0.1	0.10 Foot Candles
0.5	0.50 Foot Candles
1	1.00 Foot Candles
5	5.00 Foot Candles

* Photometric calculations shown on plan are in foot candles.

GRAPHIC SCALE

0 15 30 60

(IN FEET)
1 inch = 30 ft.

NO.	DATE	REVISION	BY
4	5–7–26	PLANNING BOARD REISSUE	HMF
3	4–9–26	PLANNING BOARD REISSUE	HMF
2	1–8–26	REVISED PER VILLAGE COMMENTS	HMF
1	11–6–25	REVISED PER VILLAGE COMMENTS	HMF

INSITE
ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.
3 Garrett Place
Carmel, NY 10512
(845) 225–9690
(845) 225–9717 fax
www.insite–eng.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
PHOTOMETRIC LIGHTING PLAN

STATE OF NEW YORK · RICHARD D. WILLIAMS · 095886 · LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	10–9–25	DRAWN BY	R.A.R.
SCALE	1" = 30'	CHECKED BY	E.J.P.

DRAWING NO. LP–1 SHEET 8 / 17

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

Z:\E\25154\00-WIP_34 State St - Ossining\04-LP-Eng_PLN-02026-130.57.PAL.vtf.vwharch.1.1

ID	Description	Invasive	Removal
101	40"Maple		X
102	14"Evergreen		X
103	12",8"Evergreen		X
104	46"Maple		X
105	50"Maple		X
106	46"Maple		X
107	32"Willow		X
108	8",8"Locust	I	X
109	4"Tree-Unk. Clump (5)		X
110	40"Maple		X(Dead)
111	4"Tree-Unk. Clump (5)		X
112	4"Tree-Unk. Clump (5)		X
113	38"Maple		X
114	8"Maple		X
115	12",6"Locust	I	X
116	4"Locust	I	X
117	4"Maple	I	X
118	6"Tree-Unk. Clump (5)	I	X
119	16"Locust	I	X
120	12"Locust	I	X
121	14"Tree-Unk.		X
122	4",4"Tree-Unk.		X
123	12"Sumac		X
124	6"Sumac		X
125	5"Sumac		X
126	8"Sumac		X
127	6"Sumac		X
128	6"Sumac		X
129	6"Sumac		X
130	4"Sumac		X
131	14"Sumac		X
132	10"Sumac		X
133	4"Sumac		X
134	4"Sumac		X
135	8",8",8"Maple		X
136	8"Sumac		X
137	12"Maple	I	X
138	8"Locust	I	X
139	14",14"Sumac		X
140	12"Sumac Clump (5)		X
141	4"Sumac		X
142	12",12"Tree-Unk.		X
143	4"Locust Clump (5)	I	X
144	14"Locust	I	X
145	14"Tree-Unk.		X
146	14"Maple	I	X
147	10"Locust	I	X
148	6"Locust	I	X
149	12"Maple	I	X
150	8",8"Maple		X
151	12"Locust	I	X
152	12"Locust	I	X
153	14"Locust	I	X
154	38"Locust	I	X
155	38"Locust	I	X
156	36"Locust	I	X
157	8"Tree-Unk.		X
158	8"Tree-Unk.		X
159	4"Tree-Unk.		X
160	4"Tree-Unk.		X
161	6"Tree-Unk.		X
162	8"Tree-Unk.		X
163	8"Tree-Unk.		X
164	6",2"Tree-Unk.		X
165	4"Tree-Unk.		X
166	4",4"Tree-Unk.		X
167	4"Maple	I	X
168	8"Locust	I	X
169	8"Locust	I	X
170	4"Locust	I	X
171	8"Maple		X
172	8"Locust	I	X
173	4"Locust	I	X
174	4"Locust	I	X
175	4"Locust	I	X
176	16"Locust	I	X
177	8"Locust	I	X
178	8"Locust	I	X
179	8"Locust	I	X
180	8"Locust		
181	12"Locust	I	X
182	6"Locust	I	X
183	4"Locust	I	X
184	4"Locust	I	X
185	8"Locust	I	X
186	10"Locust	I	X
187	4"Locust	I	X
188	4"Locust	I	X
189	4"Locust	I	X
190	6",6",6"Locust	I	X
191	12"Locust	I	X
192	4"Locust	I	X
193	4"Locust	I	X
194	4"Locust	I	X
195	4"Locust	I	X
196	4"Locust	I	X
197	6"Locust	I	X
198	4"Maple	I	X
199	4"Tree-Unk.		X
201	4"Locust		X
202	8"Locust	I	X
203	10"Locust	I	X
204	6"Locust	I	X
205	12",4"Locust	I	X
206	18"Locust	I	X
207	8"Maple	I	X
208	16"Maple	I	X
209	8"Walnut	I	X
210	8"Walnut	I	X
211	10"Locust	I	X
212	4"Locust	I	X
213	6"Locust	I	X
214	6"Maple	I	X
215	4"Maple	I	X
216	14"Locust	I	X
217	8"Locust	I	X
218	16"Locust	I	X
219	4"Maple	I	X
220	4"Locust	I	X
221	4"Locust	I	X
222	12"Locust	I	X
223	4"Locust	I	X
224	4"Locust	I	X
225	4"Locust	I	X
226	6"Locust	I	X
227	8"Locust	I	X
228	6"Locust	I	X
229	8"Locust	I	X
230	4"Maple	I	X
231	10",4"Locust	I	X
232	4"Maple	I	X
233	6"Locust	I	X
234	6"Locust	I	X
235	4"Maple	I	X
236	8"Locust	I	X
237	14"Walnut	I	X
238	4"Maple	I	X
239	8"Locust	I	X
240	4"Locust	I	X
241	6"Locust	I	X
242	6"Locust	I	X
243	4"Locust	I	X
244	4"Locust	I	X
245	4"Maple	I	X
246	6"Locust	I	X
247	6"Locust	I	X
248	6"Locust	I	X
249	4"Maple	I	X
250	8"Locust	I	X
251	6"Locust	I	X
252	12",4"Locust	I	X
253	6",4"Locust	I	X
254	4"Locust	I	X
255	6"Locust	I	X
256	6"Locust	I	X
257	4",4"Maple	I	X
258	8"Locust	I	X
259	8"Locust	I	X
260	4"Locust	I	X
261	10",4"Maple	I	X
262	10"Maple	I	X
263	12"Maple	I	X
264	6"Cherry		X
265	12"Locust	I	X
266	4"Maple	I	X
267	16"Locust	I	X
268	4"Maple	I	X
269	12"Locust	I	X
270	6"Locust	I	X
271	16"Locust	I	X
272	8"Locust	I	X
273	6",4"Locust	I	X
274	4"Locust	I	X
275	4"Locust Clump (5)		
276	4"Maple		
277	4"Maple		
278	4"Maple	I	X
279	12",4"Locust	I	X
280	4"Locust	I	X
281	6"Locust	I	X
282	6"Locust	I	X
283	6"Locust	I	X
284	4"Locust	I	X
285	6"Locust	I	X
286	4"Locust	I	X
287	4"Locust	I	X
288	6"Locust	I	X
289	6"Locust	I	X
290	4"Locust	I	X
291	6",4"Locust	I	X
292	4",4",4"Locust	I	X
294	8"Maple	I	X
295	10"Maple	I	X
296	14"Locust	I	X
297	12"Locust	I	X
298	10"Locust	I	X
299	4",6"Locust	I	X
300	8"Locust	I	X
301	12"Locust	I	X
302	8"Locust	I	X
303	4"Maple	I	X
304	4"Locust	I	X
305	4"Maple	I	X
306	4"Locust		
307	4"Locust		
308	6"Locust	I	X
309	12"Locust	I	X
310	6"Locust	I	X
311	12"Locust	I	X
312	6"Locust	I	X
313	4"Maple	I	X
314	4"Locust	I	X
315	4"Maple		
316	4"Locust		
317	4"Maple		
318	6"Locust	I	X
319	14"Locust	I	X
320	6"Locust	I	X
321	14"Poplar	I	X
322	4"Maple	I	X
323	12"Locust	I	X
324	14"Locust	I	X
325	12"Maple	I	X
326	4"Locust	I	X
327	4"Maple	I	X
328	4"Maple	I	X
329	14",14"Locust	I	X
330	4"Cherry		X
331	8",8"Locust	I	X
332	6",10"Locust	I	X
333	10"Locust	I	X
334	6",6"Locust	I	X
335	12"Locust	I	X
336	4"Locust	I	X
337	6"Locust	I	X
338	6"Locust	I	X
339	6"Locust	I	X
340	4"Locust	I	X
341	4"Maple	I	X
342	6"Locust	I	X
343	6"Locust	I	X
344	6"Locust	I	X
345	4"Locust	I	X
346	6"Locust	I	X
347	6"Locust	I	X
348	6"Locust	I	X
349	4",6"Locust	I	X
350	4"Maple	I	X
351	6",6"Locust	I	X
352	8"Locust	I	X
353	4"Maple	I	X
354	4"Maple	I	X
355	6"Locust	I	X
356	4"Locust	I	X
357	10"Locust	I	X
358	4"Locust	I	X
359	6"Maple	I	X
360	8"Locust	I	X
361	8"Maple	I	X
362	8"Maple	I	X
363	8"Locust	I	X
364	8"Locust	I	X
365	4"Maple	I	X
366	4"Maple	I	X
367	6"Maple	I	X
368	12"Locust	I	X
369	4"Locust	I	X
370	4"Locust	I	X
371	4"Locust	I	X
372	6"Locust		
373	4"Locust		
374	6"Maple		
375	4"Locust	I	X
376	4",6"Locust	I	X
377	4"Maple	I	X
378	6"Locust	I	X
379	4"Locust	I	X
380	4"Locust	I	X
381	8"Maple	I	X
382	18"Maple	I	X
383	12"Maple	I	X
384	18"Locust		
385	12"Maple	I	X
386	18"Maple		
387	10"Maple		
388	14"Maple		
389	4",6"Maple		
390	10"Maple		
391	6"Maple		
392	8"Maple		
393	14"Poplar	I	X
394	4"Locust	I	X
395	4"Locust	I	X
396	6"Locust	I	X
397	8"Locust	I	X
398	4"Locust	I	X
399	8"Locust	I	X
400	4"Locust	I	X
401	6"Maple	I	X
402	6"Locust	I	X
403	6"Locust	I	X
404	4",4"Locust	I	X
405	8"Locust	I	X
406	10"Locust	I	X
408	6"Maple	I	X
409	4"Locust	I	X
410	12"Locust	I	X
411	4"Elm		X
412	8"Locust	I	X
413	4"Maple	I	X
414	4"Locust	I	X
415	8"Locust	I	X
416	4"Locust	I	X
417	4"Sumac		X
418	6"Walnut		X
419	6"Locust	I	X
420	8",8"Locust	I	X
421	8"Locust	I	X
422	6"Maple	I	X
423	4"Locust	I	X
424	6"Locust		
425	6"Locust		
426	6"Locust		
427	6"Locust		
428	12"Locust		
429	12"Locust		
430	6"Locust		
431	6"Elm		
432	6"Elm		
433	8"Locust		
434	4"Locust		
435	4"Locust		
436	14"Locust		
437	4"Locust		
438	4"Locust		
439	4"Locust		
440	8"Locust		
441	4"Locust		
442	4"Locust		
443	8"Locust		
444	4"Locust		
445	6"Locust		
446	4"Maple		
447	4"Locust		
449	4"Locust	I	X
450	10"Locust	I	X
451	4"Locust	I	X
452	6"Locust	I	X
453	10",5"Locust	I	X
454	4"Locust	I	X
455	10"Locust	I	X
456	8"Locust	I	X
457	8"Locust		
458	4"Locust	I	X
459	6"Locust		
460	6"Locust		
461	8"Maple		
462	4"Locust		
463	10"Locust		
464	6"Locust		
465	10",8"Locust		
466	8"Locust		
467	4"Locust		
468	6"Locust		
469	6"Locust		
470	14"Locust		
471	4"Locust		
472	10"Locust		
473	4"Locust		
474	6"Sumac		
475	12",12"Locust		
476	6"Locust		
477	12"Locust		
478	8"Locust		
479	4"Locust		
480	4"Locust		
481	8"Locust		
482	8"Locust		
483	8"Locust		
484	8"Locust		
485	8"Locust		
486	6"Locust		
487	10"Locust		
488	8"Locust		
489	10"Locust		
490	6"Locust		
491	12"Locust		
492	10"Locust		
493	8"Locust		
494	6"Mulberry		
495	4"Locust		
496	8"Locust		
497	6"Locust		
498	6"Locust		
499	8"Locust		
500	10"Locust		
501	4"Locust		
502	6"Locust		
503	10"Locust		
504	8"Locust		
505	8",4"Locust		
562	6"Tree-Unk.		
563	10"Locust		
564	10"Locust		
565	8"Locust		
566	10"Locust		
567	8"Locust		
568	8"Locust		
569	8"Locust		
570	4"Locust		
571	4"Locust		
572	10",6"Maple		
573	4",2"Maple		
574	6"Locust		
575	16"Maple		
576	18"Maple		
577	20"Locust		
578	16"Maple		
579	18"Maple		
580	16"Maple		
581	20"Maple		
582	8"Locust		
583	10"Locust		
584	14"Maple		
585	4"Locust		
586	4"Locust		
587	10"Locust		
588	10"Locust		
589	4"Locust		
590	4"Locust	I	X
591	14"Locust		
592	10"Locust		
593	4"Locust		
594	6"Mulberry		
595	10"Locust		
596	6"Locust		
597	6"Cherry		
598	6"Locust		
599	10"Locust		
600	8"Locust		
601	6"Locust		
602	4"Locust		
603	4"Locust		
604	10"Locust		
605	8"Locust		
606	6"Locust		
607	6"Locust		
608	12"Locust		
609	6",4"Tree-Unk.		
610	6"Tree-Unk.		
611	4"Tree-Unk.		
612	10"Maple		
613	4"Locust		
614	6"Locust		
615	6"Locust		
616	12"Locust		
617	6"Locust		
618	4"Tree-Unk.		X
619	6"Locust	I	X
620	8",4"Tree-Unk.		X
621	8"Tree-Unk.		
622	6"Tree-Unk.		
623	6"Tree-Unk.		
624	4"Tree-Unk.		
625	4"Tree-Unk.		
626	10",4"Locust		
627	6"Locust		
628	10"Tree-Unk.		
629	8"Locust		
630	10"Locust		
631	6"Locust		
632	6"Locust		
633	6"Locust	I	X
634	10",6"Locust	I	X
635	6"Locust	I	X
636	10"Locust		
637	6"Tree-Unk.		X
638	4"Tree-Unk.		X
639	6",4"Tree-Unk.		
640	4"Tree-Unk. Clump (5)		
641	10",4"Maple		
642	10"Tree-Unk.		X
643	10"Mulberry		
644	8"Tree-Unk.		
645	4"Tree-Unk.		
646	4"Locust		
647	12"Tree-Unk.		
648	16"Mulberry		
649	4"Maple		
650	6"Maple		
651	16"Locust		
652	10"Locust		
653	4"Locust		
654	6"Locust		
655	8"Locust		
656	18"Locust		
657	4"Maple		
658	6"Maple		
660	4"Locust		X
661	6"Locust		X
662	8"Locust		X
663	12"Locust		X
664	4"Maple		X
665	6"Locust		
666	12"Locust		X
667	10"Locust		
668	4"Locust		
669	8"Locust		X
670	6"Locust		X
671	8"Locust		X
672	4"Locust		X
673	4"Maple		X
674	10"Locust		X
675	6",6"Locust		
676	12"Locust		
677	4"Maple		
678	8",4"Locust		
679	4"Locust		X
680	6"Locust		X
681	10"Locust		
682	6"Maple		
683	10",4"Locust		
684	6"Locust		
685	4"Locust		X
686	6"Locust		X
687	10"Locust		X
688	6"Locust		X
689	10"Locust		X
690	6"Locust		X
691	6"Locust		
692	4"Locust		
693	6"Maple		
694	8"Locust		
695	8"Locust		
696	8"Locust		
697	6",6",6" Maple		
698	8"Hemlock		
699	6"Hemlock		
700	6"Hemlock		
701	8"Hemlock		
702	6"Hemlock		
703	8"Hemlock		
704	8"Locust		
705	16"Mulberry		
706	20"Locust		
707	10"Maple		
708	6"Locust		
709	6"Spruce		
711	8"Locust		
712	8"Locust		
713	6"Locust		
714	10"Locust		
715	6"Locust		
716	14"Locust		
717	10"Locust		
718	12"Locust		
719	10"Locust		
720	10"Locust		
721	6",6"Sumac		
722	10"Locust		
723	6"Locust		
724	10"Locust		
725	8"Locust		
726	8"Maple Clump (5)		
727	10"Locust		
728	8"Locust		
729	8"Locust		
730	6"Locust		
731	6",4"Locust		
732	12",4"Tree-Unk.		
734	10"Maple		
735	12"Tree-Unk.		
736	8"Sumac		
737	4"Tree-Unk. Clump (5)		
738	6",6"Tree-Unk.		
739	4"Maple		
740	4"Maple		
741	6"Cherry		
742	10"Locust		
743	8"Locust		
744	4"Sumac		
745	8"Locust		I
746	4"Maple		I
747	4"Maple		
748	10"Locust		I
749	4",4"Locust		
750	10"Locust		
751	8"Locust		
752	4"Maple Clump (5)		
753	4"Maple		
754	4"Maple		
755	4"Tree-Unk.		
756	4"Tree-Unk.		
757	8"Mulberry		
758	6"Tree-Unk.		
759	4"Locust Clump (5)	I	X
760	4"Locust Clump (5)		
761	4"Locust Clump (5)	I	X

Existing Trees	593
To Be Removed	334
Invasive Trees To be Removed	259
Total Existing DBH	1671"
Removal DBH	979"
Invasive Removal DBH	634"



TOTAL AGGREGATE DIAMETER TREES TO BE REMOVED & REPLACEMENT CALCULATIONS

AGGREGATE DIAMETER OF TREES TO BE REMOVED	979"
MINUS TOTAL DIAMETER OF INVASIVE TREES TO BE REMOVED	– 634"
TOTAL DIAMETER OF TREES TO BE REPLACED	= 345"
REQUIRED REPLACEMENT (50% OF TOTAL TO BE REMOVED)	= 173"
PROPOSED AGGREGATE DIAMETER OF REPLACEMENT TREES	= 217"

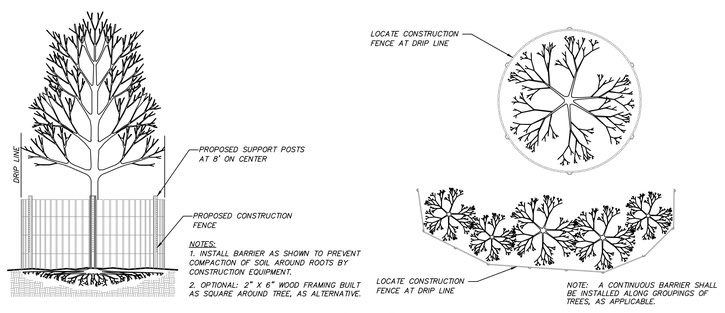
Note:
1. The proposed aggregate diameter of replacement trees is based upon the planting plan prepared by Eric Rains Landscape Architecture (ERLA). As noted on ERLA's plans, the proposed evergreen trees are not included in the replacement tree calculations.
2. Identification of invasive trees was conducted by an Arborist.

TREE NOTES:

1. Existing trees as shown hereon are based on field work performed by Insite Engineering, Surveying & Landscape Architecture, PC in November 2024.

TREE PROTECTION NOTES:

1. Trees to be preserved in proximity to disturbance areas shall be marked in the field by the project Landscape Architect prior to start of construction.
2. Install tree protection measures prior to start of site clearing & construction.
3. No construction equipment shall be parked and no earth or construction materials shall be stockpiled or stored under the canopy of trees to be preserved.
4. During tree removal operations associated with construction, do not damage adjacent trees to remain. Lower limbs and tree trunks, do not drop them.
5. Carefully tie back any tree branches that conflict with construction equipment.
6. Where trenching for utilities is required within a root zone, tunneling under and around roots shall be by hand digging. If roots 3" or larger are encountered immediately adjacent to the location of new construction and relocation is not practical, the roots shall be hand pruned under the supervision of a Certified Arborist or Landscape Architect to 6" back from the new construction limit. All exposed roots to receive appropriate treatment prior to backfilling.
7. If tree protection fencing to protect the root zone is not possible, six to eight inches of wood chip mulch and 3/4 inch plywood shall be placed over the entire affected root zone area to prevent soil compaction.
8. Any tree damaged during construction activities must be immediately repaired by a qualified arborist at no additional cost to the owner.



TREE PROTECTION DETAIL
(N.T.S.)

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

NO.	DATE	REVISION	BY
4	5-7-26	PLANNING BOARD REISSUE	HMF
3	5-1-26	EAC SUBMISSION	DLM
2	4-9-26	PLANNING BOARD REISSUE	HMF
1	1-8-26	REVISED PER VILLAGE COMMENTS	HMF

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3 Garrett Place
Carmel, NY 10512
(845) 225-9690
(845) 225-9717 fax
www.insite-eng.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
TREE REMOVAL PLAN

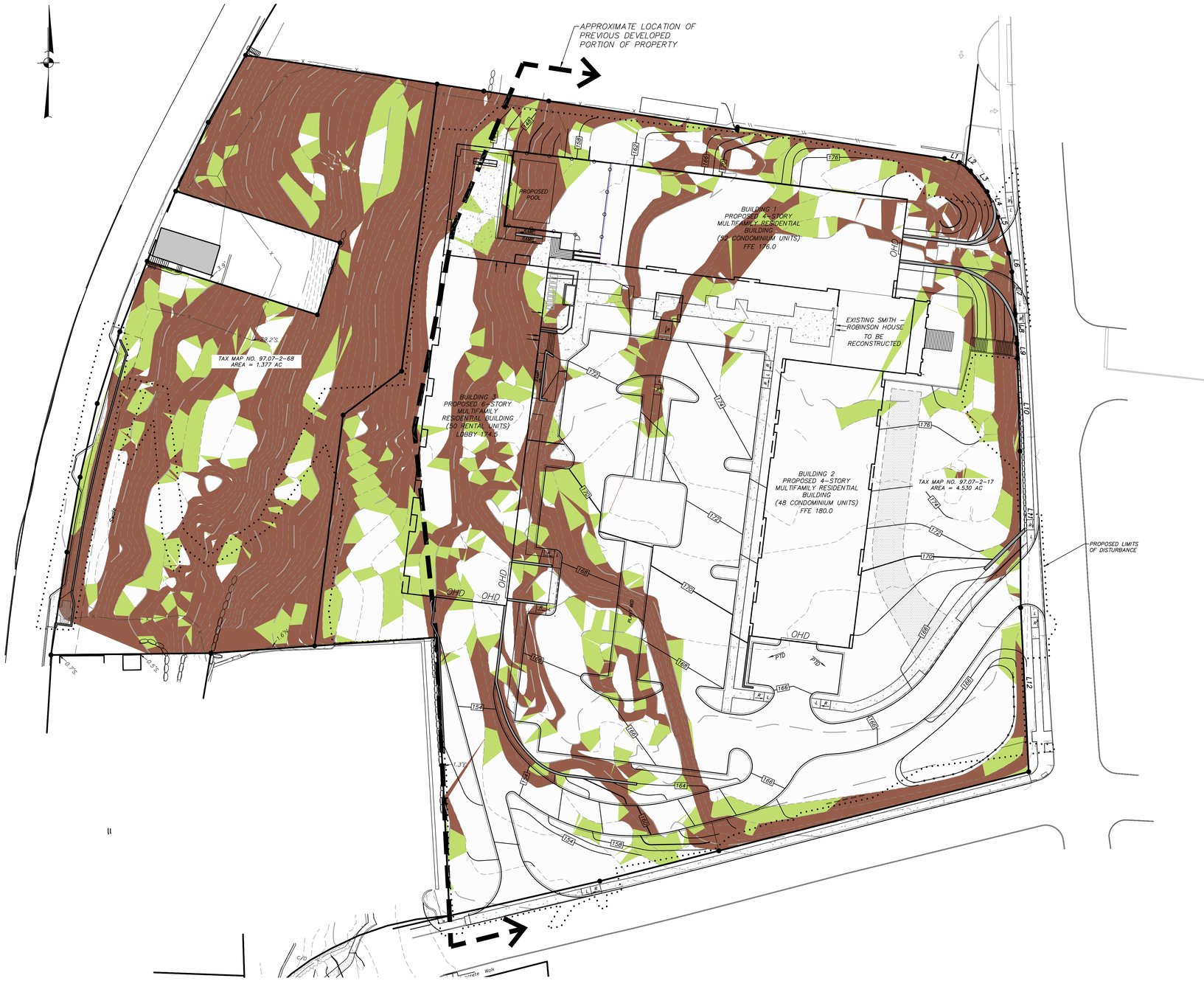
STATE OF NEW YORK · RICHARD D. WILLIAMS · 032855 · LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	11-6-25	DRAWN BY	R.A.R.
SCALE	1" = 30'	CHECKED BY	E.J.P.

DRAWING NO. TR-1
SHEET 9 / 17

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

Z:\25154\000 WIP_34 State St - Ossining\09 TR-1.dwg, 5/7/2026 8:08:21 AM, rdPrimeArts 1.1



LEGEND

- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING STONE & MASONRY RETAINING WALL
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- 100 PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- P.I.D. PITCH TO DRAIN

Slopes Table for SCS Sarles Street

Number	Minimum Slope	Maximum Slope	Color	Full Site Area	Total Disturbance Area	Proposed Disturbance in Previously Developed Area
1	0%	15%		136,064 SF	133,088 SF ±	126,488 SF ±
2	15%	25%		30,798 SF	24,258 SF ±	19,284 SF ±
3	25%	Vertical		90,444 SF	43,362 SF ±	32,736 SF ±
		TOTAL		257,306 SF	200,708 SF ±	178,508 SF ±

STEEP SLOPE DISTURBANCE NOTES:

1. Disturbance of steep slopes shall be undertaken in workable units in which the disturbance can be completed within a reasonable timeframe so that areas are not left bare and exposed for long periods or through winter and spring–thaw periods.
2. Measures for the control of erosion and sedimentation shall be undertaken consistent with the New York Standards and Specifications for Erosion and Sediment Control, latest edition.
3. All proposed disturbance of steep slopes shall be undertaken consistent with the soils limitations ratings contained in the Westchester County soil survey.
4. Clean stormwater runoff uphill of all disturbed areas shall be diverted around the project site through implementation of silt fence and diversion swales installed installed uphill of the active work area.
5. Exposed soil disturbance shall be kept to the shortest practical period of time. Where soil disturbance activities have ceased, soil stabilization measures shall be initiated by the end of the next business day and completed within seven (7) days from the date the current soil disturbance activity ceased.
6. Soil disturbance at any given time shall be minimized to the maximum extent practical. Slopes greater than 3H:1V shall be stabilized with erosion control matting.
7. Runoff from all areas of soil disturbance shall be directed towards the proposed downstream temporary sediment trap or other erosion control facilities.
8. The contractor shall have a representative onsite that is a NYSDEC Trained Contractor at all times site work is being performed.

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

NO.	DATE	REVISION	BY.

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3 Garrett Place
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(845) 225-9717 fax
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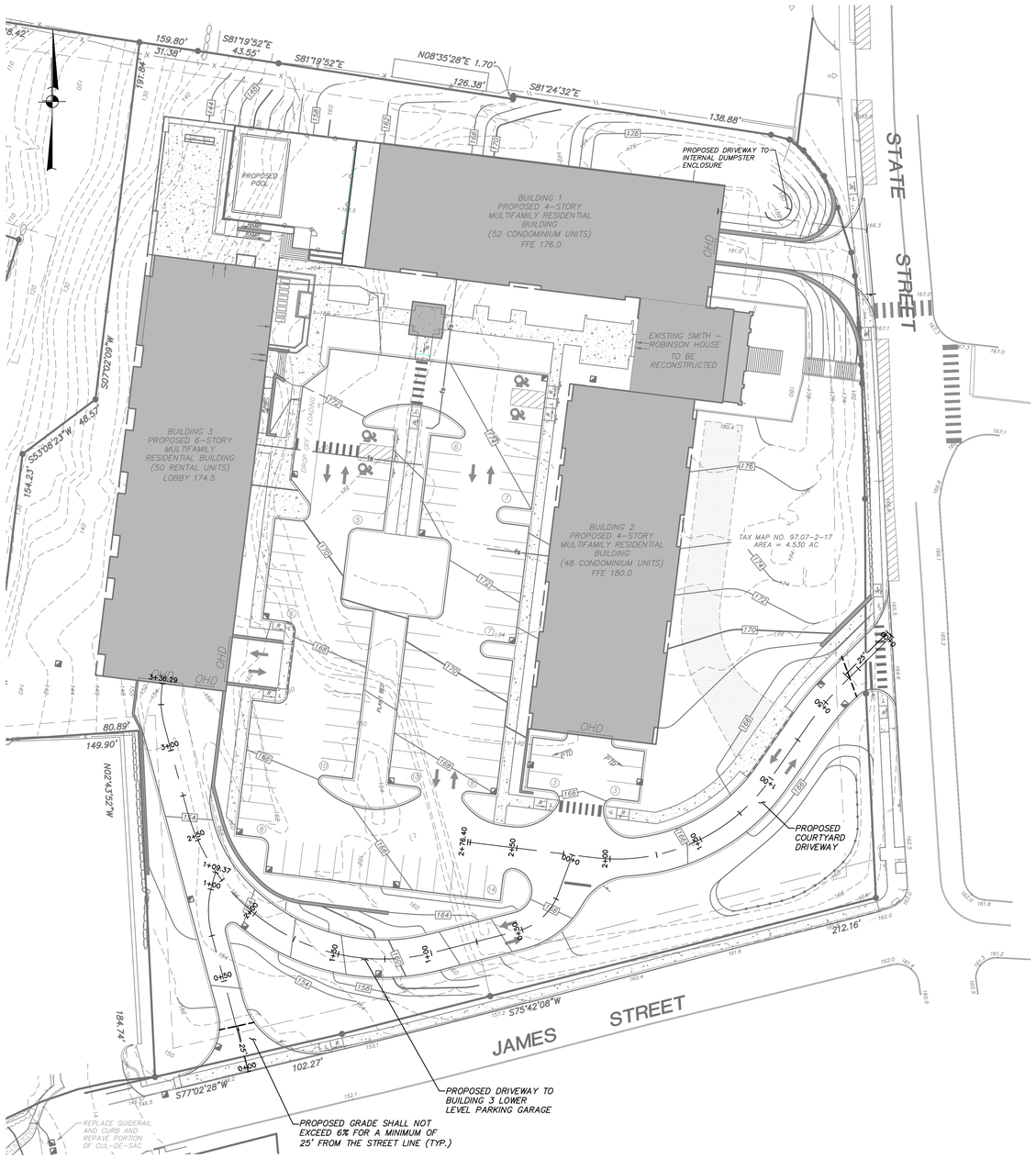
PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
STEEP SLOPES PLAN

STATE OF NEW YORK · RICHARD D. WILLIAMS · 095866 · LICENSED PROFESSIONAL ENGINEER

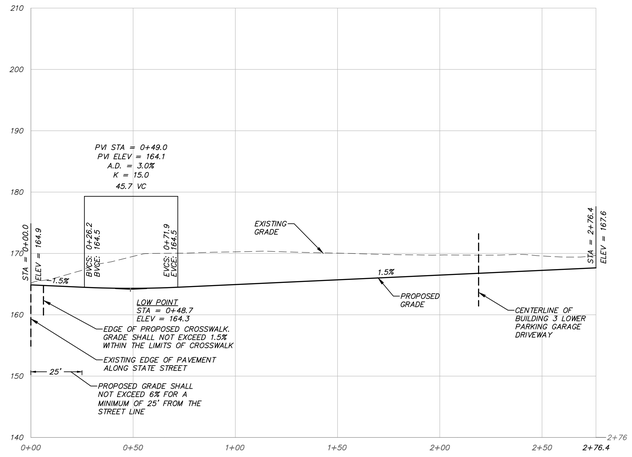
PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.	DRAWING NO.	SHEET
DATE	5-7-26	DRAWN BY	H.M.F.	SS-1	10 / 17
SCALE	1" = 30'	CHECKED BY	D.L.M.		

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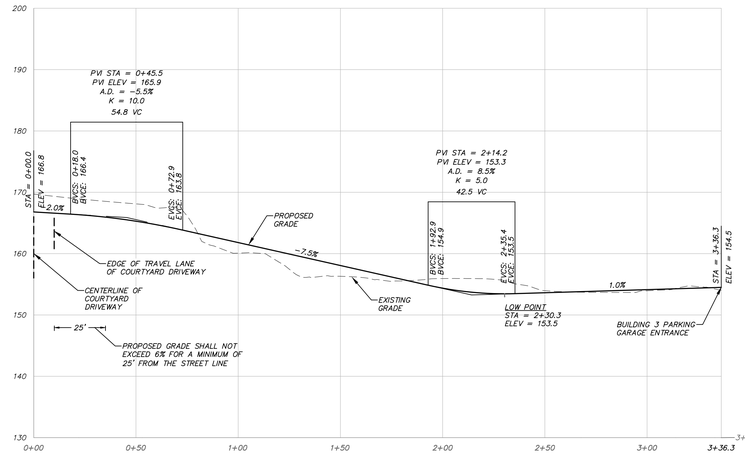
DRIVEWAY PLAN

SCALE: 1" = 30'



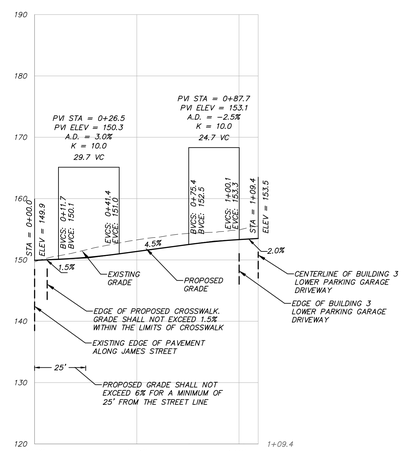
COURTYARD DRIVEWAY PROFILE

SCALE: HORIZ. 1" = 30'
VER. 1" = 10'



BUILDING 3 LOWER LEVEL PARKING GARAGE DRIVEWAY PROFILE

SCALE: HORIZ. 1" = 30'
VER. 1" = 10'



JAMES STREET SERVICE ENTRANCE DRIVEWAY PROFILE

SCALE: HORIZ. 1" = 30'
VER. 1" = 10'

LEGEND

- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- EXISTING BUILDING TO BE REMOVED
- EXISTING STONE & MASONRY RETAINING WALL
- EXISTING GATE
- EXISTING CHAIN LINK FENCE
- EXISTING GUIDE RAIL
- EXISTING CONCRETE CURB
- EXISTING SIGN
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING SPOT GRADE
- PROPOSED # OF STALLS TO BE STRIPED
- PROPOSED CONCRETE CURB
- PROPOSED EDGE OF SIDEWALK
- PROPOSED RETAINING WALL
- PROPOSED PAINTED CROSSWALK
- PROPOSED PAINTED STOPBAR
- PROPOSED PAINTED DIRECTIONAL ARROW
- PROPOSED PAINTED HANDICAP PARKING SYMBOL
- PROPOSED ADA COMPLIANT RAMP
- PROPOSED STRIPED ISLAND
- PROPOSED LOADING SPACE
- PROPOSED SINGLE POLE SIGN
- PROPOSED POLE MOUNTED LIGHT
- PROPOSED DOOR LOCATION
- PROPOSED 10' CONTOUR
- PROPOSED 2' CONTOUR
- PROPOSED SPOT ELEVATION
- PROPOSED CATCH BASIN

GRAPHIC SCALE

0 15 30 60

(IN FEET)
1 inch = 30 ft.

NO.	DATE	REVISION	BY
4	5-7-26	PLANNING BOARD REISSUE	HMF
3	4-9-26	PLANNING BOARD REISSUE	HMF
2	1-8-26	REVISED PER VILLAGE COMMENTS	HMF
1	11-6-25	REVISED PER VILLAGE COMMENTS	HMF

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PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
DRIVEWAY PROFILES PLAN

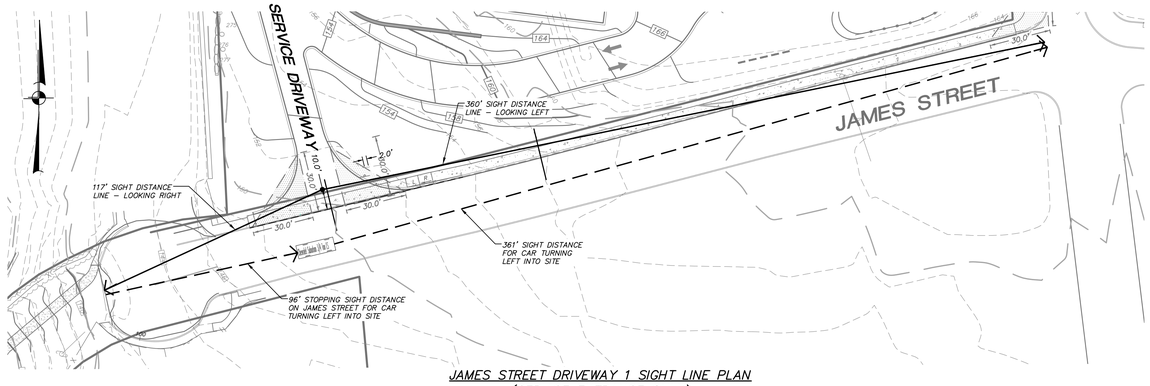
STATE OF NEW YORK RICHARD D. WILLIS 095886 LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	10-9-25	DRAWN BY	T.S.M.
SCALE	1" = 30'	CHECKED BY	E.J.P.

DRAWING NO. PR-1
SHEET 11 / 17

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

Z:\C\25154\00 WIP_34 State St - Ossining\C1-PR-1.dwg, 5/4/2026 2:28:44 PM, HFerraiolo, 1:1



JAMES STREET DRIVEWAY 1 SIGHT LINE PLAN
(SERVICE ENTRANCE ONLY)
SCALE: 1" = 30'

SIGHT DISTANCE TABLE – JAMES STREET DRIVEWAY 1		
	Required(1.)	Provided
Left Turn from Driveway (Refer to Exhibits 9–53 & 9–55)(2.)	Looking Right = 335'	117'(6.)
	Looking Left = 335'	360'
Right Turn from Driveway (Refer to Exhibits 9–53 & 9–58)(2.)	Looking Left = 290'	360'
Left Turn from James Street Into Driveway	245'	361'
Stopping Sight Distance on James Street for car turning left into site	200'	96'(3.)

(1.) Required sight distances based on 30 mph roadway speed limit.

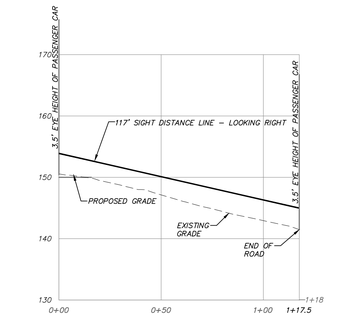
(2.) All exhibits from AASHTO Geometric Design of Highways and Streets 2004.

(3.) Required stopping sight distance on James Street for car turning left into site cannot be met based on James Street being a dead end road, thereby the inability to meet required stopping distance does not result in any traffic impacts.

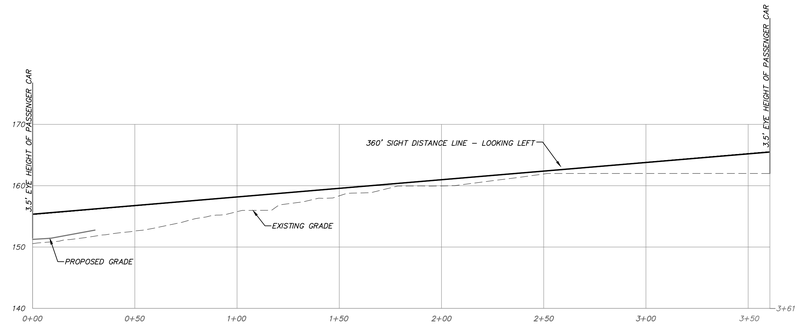
(4.) All measurements taken 10.0' from the edge of James Street traveled way. Assuming a drivers eye height of 3.5' above the roadway surface and an object height of 3.5' above the roadway surface.

(5.) If additional grading is required to satisfy the sight distance requirements, approval from NYSDOT, Town Engineer and Highway Superintendent is required.

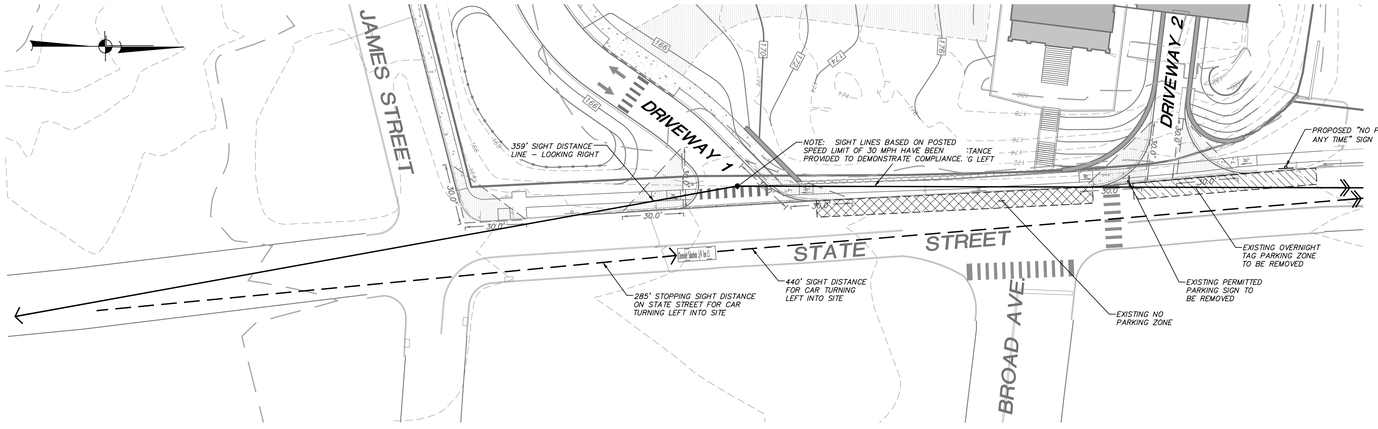
(6.) There is clear visibility to the end of James Street.



'AMES STREET SERVICE DRIVEWAY – LOOKING RIGHT
SCALE: HORIZ. 1" = 30'
VER. 1" = 10'



JAMES STREET SERVICE DRIVEWAY – LOOKING LEFT
SCALE: HORIZ. 1" = 30'
VER. 1" = 10'



STATE STREET DRIVEWAY 1 SIGHT LINE PLAN
SCALE: 1" = 30'

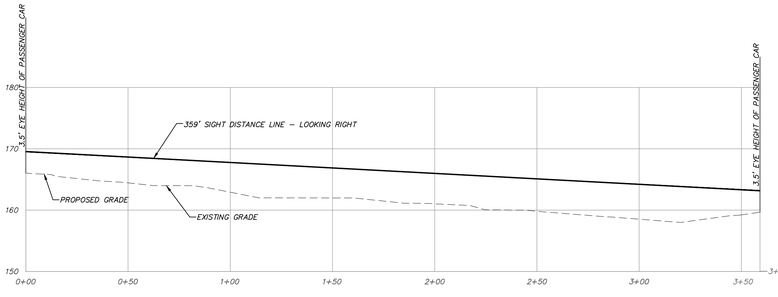
SIGHT DISTANCE TABLE – STATE STREET DRIVEWAY		
	Required(1.)	Provided
Left Turn from Driveway (Refer to Exhibits 9–53 & 9–55)(2.)	Looking Right = 335'	359'
	Looking Left = 335'	365'
Right Turn from Driveway (Refer to Exhibits 9–53 & 9–58)(2.)	Looking Left = 290'	365'
Left Turn from State Street Into Driveway	245'	440'
Stopping Sight Distance on State Street for car turning left into site	200'	285'

(1.) Required sight distances based on 30 mph roadway speed limit.

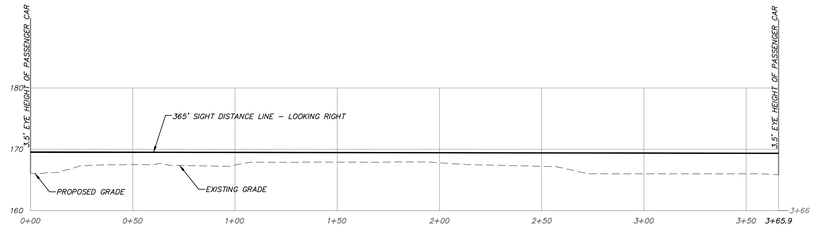
(2.) All exhibits from AASHTO Geometric Design of Highways and Streets 2004.

(3.) All measurements taken 10.0' from the edge of State Street traveled way. Assuming a drivers eye height of 3.5' above the roadway surface and an object height of 3.5' above the roadway surface.

(4.) If additional grading is required to satisfy the sight distance requirements, approval from NYSDOT, Town Engineer and Highway Superintendent is required.



STATE STREET DRIVEWAY 1 – LOOKING RIGHT
SCALE: HORIZ. 1" = 30'
VER. 1" = 10'



STATE STREET DRIVEWAY 1 – LOOKING LEFT
SCALE: HORIZ. 1" = 30'
VER. 1" = 10'

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

NO.	DATE	REVISION	BY
3	4–9–26	PLANNING BOARD SUBMISSION	HMF
2	1–8–26	REVISED PER VILLAGE COMMENTS	HMF
1	11–6–25	REVISED PER VILLAGE COMMENTS	HMF

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(845) 225–9717 fax
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PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
DRIVEWAY SIGHT LINE PROFILES

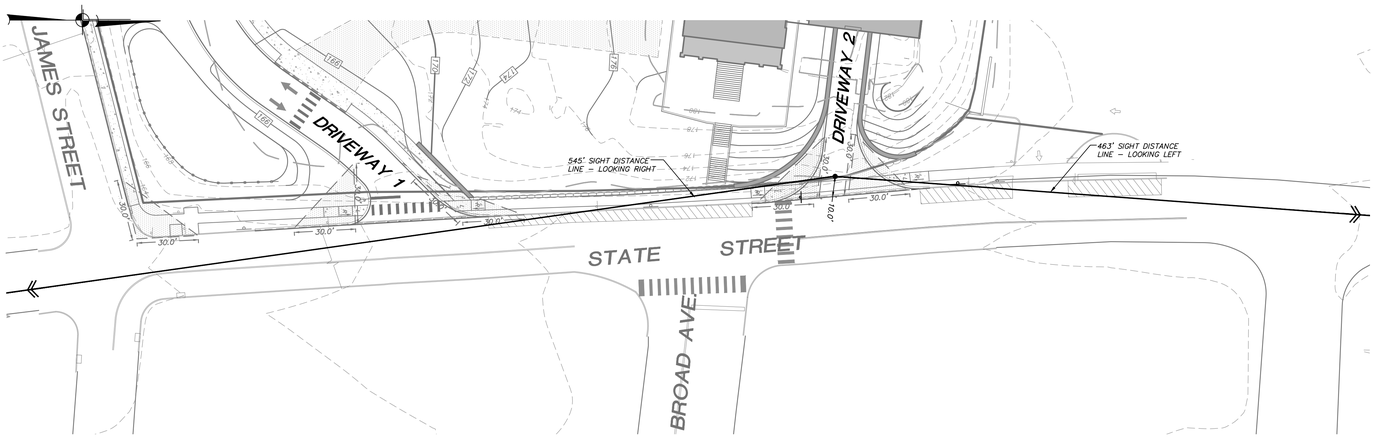
STATE OF NEW YORK · RICHARD D. WILLIAMS · 095888 · LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	10–9–25	DRAWN BY	E.P.L.
SCALE	1" = 30'	CHECKED BY	D.M.

DRAWING NO. PR–2.1 SHEET 12 / 17

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

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STATE STREET DRIVEWAY 2 SIGHT LINE PLAN

SCALE: 1" = 30'

SIGHT DISTANCE TABLE – STATE STREET DRIVEWAY 2

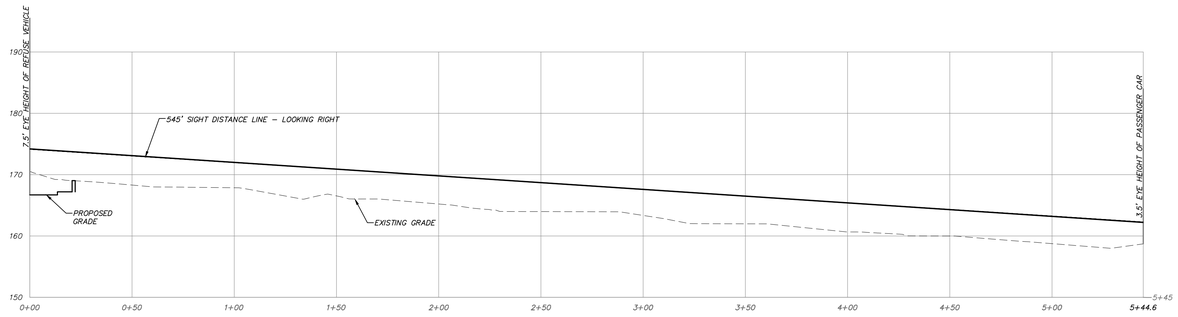
	Required(1.)	Provided
Left Turn from Driveway (Refer to Exhibits 9-53 & 9-55)(2.)	Looking Right = 335'	545'
	Looking Left = 335'	463'
Right Turn from Driveway (Refer to Exhibits 9-53 & 9-58)(2.)	Looking Left = 290'	463'
Left Turn from State Street Into Driveway	245'	440'
Stopping Sight Distance on State Street for car turning left into site	200'	285'

(1.) Required sight distances based on 30 mph roadway speed limit.

(2.) All exhibits from AASHTO Geometric Design of Highways and Streets 2004.

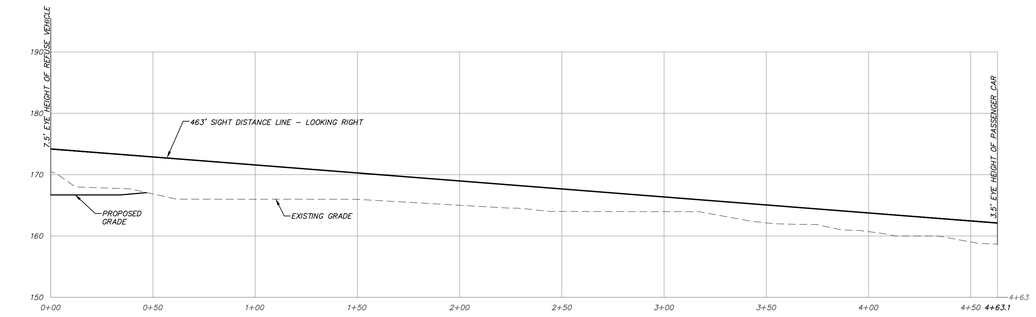
(3.) All measurements taken 10.0' from the edge of State Street traveled way. Assuming a drivers eye height of 7.5' above the roadway surface and an object height of 3.5' above the roadway surface.

(4.) If additional grading is required to satisfy the sight distance requirements, approval from NYSDOT, Town Engineer and Highway Superintendent is required.



STATE STREET DRIVEWAY 2 – LOOKING RIGHT

SCALE: HORIZ. 1" = 30'
VER. 1" = 10'



STATE STREET DRIVEWAY 2 – LOOKING LEFT

SCALE: HORIZ. 1" = 30'
VER. 1" = 10'

GRAPHIC SCALE
0 15 30 60
(IN FEET)
1 inch = 30 ft.

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

NO.	DATE	REVISION	BY

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3 Garrett Place
Carmel, NY 10512
(845) 225-9690
(845) 225-9717 fax
www.insite-eng.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
DRIVEWAY SIGHT LINE PROFILES

STATE OF NEW YORK · RICHARD D. WILLIAMS JR. · 095858 · PROFESSIONAL ENGINEER

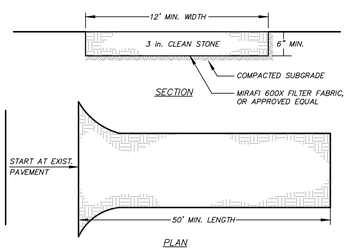
PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	5-7-26	DRAWN BY	E.P.L.
SCALE	1" = 30'	CHECKED BY	D.M.

DRAWING NO. PR-2.2
SHEET 13 / 17

Z:\25154\DWG\WIP 34 State St, Ossining\12 PR-2.dwg, 5/4/2026 4:42:32 PM, rdwilliams, 1:1

EROSION & SEDIMENT CONTROL NOTES:

1. The owner's field representative (O.F.R.) will be responsible for the implementation and maintenance of erosion and sediment control measures on this site prior to and during construction.
2. All construction activities involving the removal or disposition of soil are to be provided with appropriate protective measures to minimize erosion and contain sediment disposition within. Minimum soil erosion and sediment control measures shall be implemented as shown on the plans and shall be installed in accordance with "New York Standards and Specifications For Erosion and Sediment Control," latest edition.
3. Wherever feasible, natural vegetation should be retained and protected. Disturbance shall be minimized in the areas required to perform construction. No more than 5 acres of unprotected soil shall be exposed at any one time.
4. When land is exposed during development, the exposure shall be kept to the shortest practical period of time. In the areas where soil disturbance activity has temporarily or permanently ceased, the application of soil stabilization measures must be initiated by the end of the next business day and completed within fourteen (14) days from the date the current soil disturbance activity ceased. Disturbance shall be minimized to the areas required to perform construction.
5. Silt fence shall be installed as shown on the plans prior to beginning any clearing, grubbing or earthwork.
6. All topsoil to be stripped from the area being developed shall be stockpiled and immediately seeded for temporary stabilization. Ryegrass (annual or perennial) at a rate of 30 lbs. per acre shall be used for temporary seeding in spring, summer or early fall. "Aristook' Winter Rye (cereal rye) shall be used for temporary seeding in late fall and winter.
7. Any disturbed areas not subject to further disturbance or construction traffic, permanent or temporary, shall have soil stabilization measures initiated for permanent vegetation cover in combination with a suitable mulch within 1 business day of final grading. All seeded areas to receive a minimum 4" topsoil (from stockpile area) and be seeded and mulched as follows:
   - Seed mixture to be planted between March 21 and May 20, or between August 15 and October 15 or as directed by project representative at a rate of 100 pounds per acre in the following proportions:
     Kentucky Bluegrass 20%
     Creeping Red Fescue 40%
     Perennial Ryegrass 20%
     Annual Ryegrass 20%
   - Mulch: Salt hay or small grain straw applied at a rate of 90 lbs./1000 S.F. or 2 tons/acre, to be applied and anchored according to "New York Standards and Specification For Erosion and Sediment Control," latest edition.
8. Grass seed mix may be applied by either mechanical or hydroseeding methods. Seeding shall be performed in accordance with the current edition of the "NYSDOT Standard Specification, Construction and Materials, Section 610-3.02, Method No. 1". Hydroseeding shall be performed using materials and methods as approved by the site engineer.
9. Cut or fill slopes steeper than 2:1 shall be stabilized immediately after grading with Curlex I Single Net Erosion Control Blanket, or approved equal.
10. Paved roadways shall be kept clean at all times.
11. The site shall at all times be graded and maintained such that all stormwater runoff is diverted to soil erosion and sediment control facilities.
12. All storm drainage outlets shall be stabilized, as required, before the discharge points become operational.
13. Stormwater from disturbed areas must be passed through erosion control barriers before discharge beyond disturbed areas or discharged into other drainage systems.
14. Erosion and sediment control measures shall be inspected and maintained on a daily basis by the O.F.R. to insure that channels, temporary and permanent ditches and pipes are clear of debris, that embankments and berms have not been breached and that all straw bales and silt fences are intact. Any failure of erosion and sediment control measures shall be immediately repaired by the contractor and inspected for approval by the O.F.R. and/or site engineer.
15. Dust shall be controlled by sprinkling or other approved methods as necessary, or as directed by the O.F.R.
16. Cut and fills shall not endanger adjoining property, nor divert water onto the property of others.
17. All fills shall be placed and compacted in 6" lifts to provide stability of material and to prevent settlement.
18. The O.F.R. shall inspect downstream conditions for evidence of sedimentation on a weekly basis and after rainstorms.
19. As warranted by field conditions, special additional erosion and sediment control measures, as specified by the site engineer and/or the Town Engineer shall be installed by the contractor.
20. Erosion and sediment control measures shall remain in place until all disturbed areas are suitably stabilized.

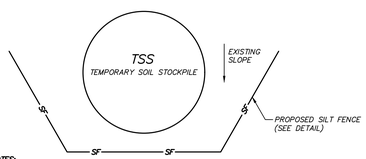


INSTALLATION NOTES

1. STONE SIZE – USE 3" STONE
2. LENGTH – AS REQUIRED, BUT NOT LESS THAN 50 FEET (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY)
3. THICKNESS – NOT LESS THAN SIX (6) INCHES.
4. WIDTH – 12 FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCUR. TWENTY FOUR (24) FOOT IF SINGLE ACCESS TO SITE.
5. FILTER CLOTH – WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE. FILTER CLOTH WILL NOT BE REQUIRED ON A SINGLE FAMILY RESIDENCE LOT.
6. SURFACE WATER – ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT OF WAY . THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT OF WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING – WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT OF WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STABILIZED CONSTRUCTION ACCESS DETAIL

(N.T.S.)



NOTES:

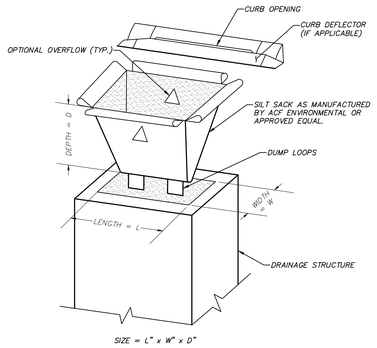
1. AREA CHOSEN FOR STOCKPILE LOCATION SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2:1.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE IMMEDIATELY SEEDED WITH K31 PERENNIAL TALL FESCUE.
4. ALL STOCKPILES SHALL BE PROTECTED WITH SILT FENCING INSTALLED ON THE DOWNGRADIENT SIDE.

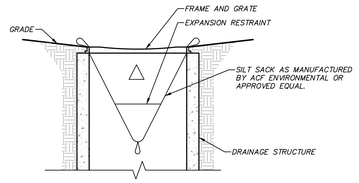
TEMPORARY SOIL STOCKPILE DETAIL

(N.T.S.)

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

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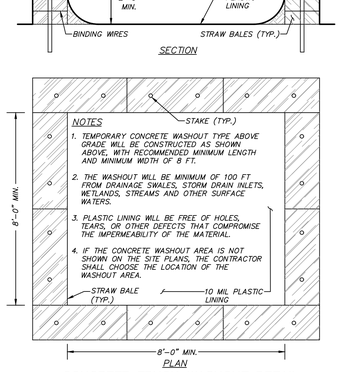


NOTE:
FABRIC FOR INSERT SHALL MEET THE FOLLOWING:

FABRIC PROPERTIES	MINIMUM ACCEPTABLE VALUE	TEST METHOD
Grab Tensile Strength (lbs)	110	ASTM D 4632
Mullen Burst Strength (PSI)	300	ASTM D 3786
Puncture Strength (lbs)	60	ASTM D 4833
Minimum Trapezoidal Tear Strength (lbs)	50	ASTM D 4533
Flow Through Rate (gal/min/sf)	25	ASTM D 4491
Equivalent Opening Size	40-80	US Std Sieve ASTM D 4751

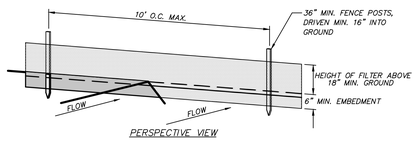
MANUFACTURED INSERT INLET PROTECTION DETAIL

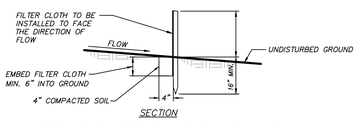
(N.T.S.)



CONCRETE TRUCK WASHOUT DETAIL

(N.T.S.)



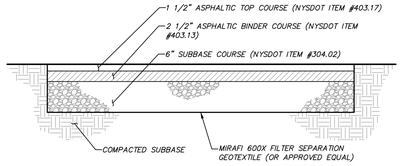


CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

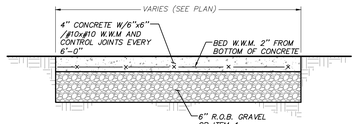
STANDARD SILT FENCE DETAIL

(N.T.S.)



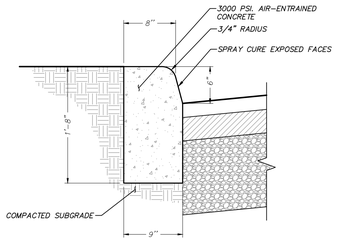
ASPHALT ROADWAY PAVEMENT DETAIL

(N.T.S.)



CONCRETE SIDEWALK DETAIL

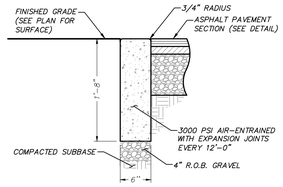
(N.T.S.)



NOTE:
TRANSVERSE JOINTS 1/2" WIDE SHALL BE INSTALLED IN THE CURB 10'-0" APART AND SHALL BE FILLED WITH CELLULAR COMPRESSION MATERIALS AS SPECIFIED, RECESSED 1/4" IN FROM FRONT FACE AND TOP OF CURB.

CONCRETE CURB DETAIL

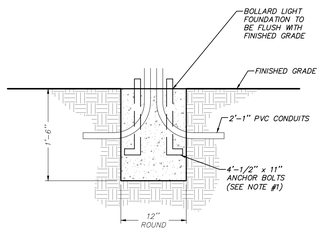
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NOTE:
PROVIDE 1/4" MAX. ELEVATION CHANGE BETWEEN FLUSH CURB AND ADJACENT SIDEWALK OR ASPHALT PAVEMENT

FLUSH CONCRETE CURB DETAIL

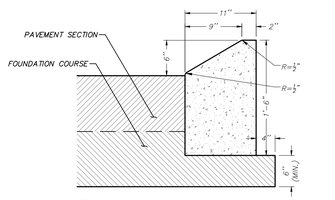
(N.T.S.)



NOTE:
1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CHECK AND VERIFY ALL ANCHOR BOLT DIMENSIONS (SIZE, BOLT CIRCLE, ETC) WITH THE CONTRACTOR WHO WILL BE INSTALLING THE LIGHTING STANDARD PRIOR TO THE INSTALLATION OF THE FOUNDATIONS.

BOLLARD LIGHT FOUNDATION DETAIL

(N.T.S.)



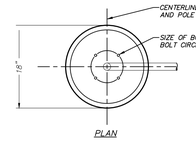
NOTE:
TRANSVERSE JOINTS 1/2" WIDE SHALL BE INSTALLED IN THE CURB 10'-0" APART AND SHALL BE FILLED WITH CELLULAR COMPRESSION MATERIALS AS SPECIFIED, RECESSED 1/4" IN FROM FRONT FACE AND TOP OF CURB.

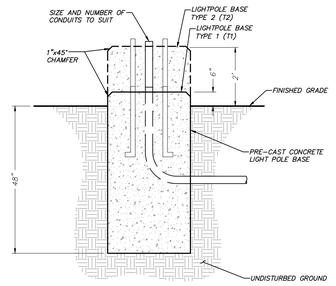
MOUNTABLE CONCRETE CURB DETAIL

(N.T.S.)

SEEDING NOTES:

1. All proposed seeded areas to receive 4" min. depth of topsoil. Soil amendments shall be determined based on specific testing of topsoil material. Topsoil shall be placed using a method that will not cause compaction.
2. Upon final grading and placement of topsoil and any required soil amendments, areas to receive permanent vegetation cover in combination with suitable mulch as follows:
   - select seed mixture per drawings and seeding notes.
   - no fertilizer is to be used in stormwater basins, within wetland buffers, or with native seed mixes within areas to be naturalized. Nutrient requirements shall be met by incorporation of acceptable organic matter based on results of soil testing.
   - mulch: salt hay or small grain straw applied at a rate of 90 lbs./1000 s.f. or 2 tons/acre, to be applied and anchored according to New York State Standards and Specifications for Erosion and Sediment Control, August 2005.
   - If the season prevents the establishment of a permanent vegetation cover, the disturbed areas will be mulched with straw or equivalent.
3. Seeding should begin immediately upon completion of finish grading and seed bed preparation while soil is still friable and before weeds can emerge. If seeding area is crusted or compacted, it should be loosened by discing or tilling. If weeds are present, they should be mowed short and removed or tilled under before seed is applied. Refer to technical specifications for additional information.
   A. Seed Mix #1 for slopes 3H:1V or steeper shall be (ERNMX-181) Native Steep Slopes Mix with annual ryegrass at a rate of 60 lbs. per acre.
   B. Seed Mix #2 for areas adjacent to the Kill Greenway Trail shall be (ERNMX-178) Riparian Buffer Mix at a rate of 20 lbs. per acre.
   C. Temporary Seed Mix for temporary seeding shall be annual or perennial ryegrass in spring, summer or early fall, at a rate of 30 lbs. per acre or winter rye (cereal rye) in late fall or early winter at a rate of 100 lbs. per acre.





NOTE:
1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE BOLT PATTERN AND CONDUIT SIZES WITH LIGHTING SUPPLIER AND ELECTRICAL DESIGN.
2. LIGHT POLE FOUNDATION TYPE 1, SHALL RISE TO 6" ABOVE GRADE
3. LIGHT POLE FOUNDATION TYPE 2, SHALL RISE 2' ABOVE GRADE
4. FIXTURE MOUNTING HEIGHT SHALL BE CONSISTENT REGARDLESS OF LIGHT POLE BASE TYPE.

LIGHT POLE FOUNDATION DETAIL

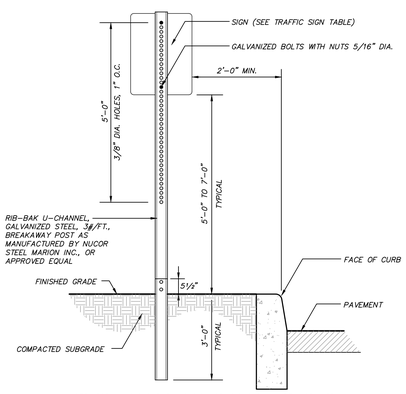
(N.T.S.)

LIGHT POLE FOUNDATION TYPE LEGEND

T1-3.75' EOP
- DISTANCE FROM ADJACENT EDGE OF PAVEMENT
- LIGHT POLE FOUNDATION TYPE (SEE LIGHT POLE FOUNDATION DETAIL)

T2-2.0' FOC
- DISTANCE FROM ADJACENT FACE OF CURB
- LIGHT POLE FOUNDATION TYPE (SEE LIGHT POLE FOUNDATION DETAIL)

1. FOC = FACE OF CURB
   EOP = EDGE OF PAVEMENT
2. DISTANCE FROM FACE OF ADJACENT CURB OR EDGES OF PAVEMENT ARE MEASURED FROM THE CENTER POINT OF THE LIGHT POLE FOUNDATION.



NOTE: FOR HANDICAP PARKING SIGNAGE, SIGNS SHALL BE INSTALLED AT A CLEAR HEIGHT OF BETWEEN 5'-0" AND 7'-0" ABOVE GRADE OF PARKING SPACE AND SUCH THAT SIGNS SHALL NOT BE OBSCURED BY A VEHICLE PARKED IN THE SPACE.

TRAFFIC SIGN DETAIL

(N.T.S.)

NO.	DATE	REVISION	BY
5	5-7-26	PLANNING BOARD REISSUE	HMF
4	4-9-26	PLANNING BOARD REISSUE	HMF
3	1-8-26	REVISED PER VILLAGE COMMENTS	HMF
2	11-6-25	REVISED PER VILLAGE COMMENTS	HMF
1	10-9-25	REVISED PER VILLAGE COMMENTS	HMF

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(845) 225-9717 fax
www.insite-eng.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
DETAILS

STATE OF NEW YORK · RICHARD D. WILLIAMS · 125558 · LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	7-24-25	DRAWN BY	R.A.R.
SCALE	N.T.S.	CHECKED BY	E.J.P.

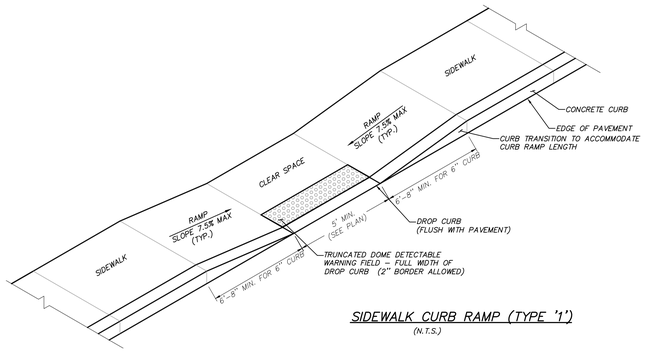
DRAWING NO. D-1 · SHEET 14 / 17

GENERAL NOTES FOR ACCESSIBLE ROUTES:

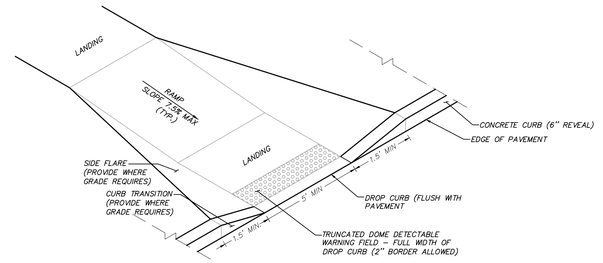
1. Accessible routes to and within a site shall be provided from accessible building entrances to accessible pedestrian walkways, accessible facilities, accessible site elements and spaces, accessible parking spaces, access aisles, passenger loading zones, and to the public way, including public transportation stops, public streets and sidewalks.
2. These sheets are in accordance with the Americans with Disabilities Act (ADA) and the NYS Building Code for Site Accessibility.
3. Dimensions shown in the details as minimums and maximums are the limits for design and field layout. Facilities shall not be constructed with values outside the limits for work acceptance. See table "Design Element Tolerances" on this sheet.
4. To check field layout and to verify work acceptance, all slopes and grades will be measured with a 4' long digital level using at least two readings. Where the readings vary, the measurements will be averaged. Grade (running slope) will be measured along the centerline and offset 1' to 1'-6" from the centerline. Cross slopes will be measured perpendicular to centerline at 5' to 10' intervals.
5. Grade (running slopes) are measured in the direction of pedestrian travel. Cross slopes are measured perpendicular to the direction of pedestrian travel.
6. Joints between sidewalks, curbs, turning spaces and roadways shall be flush and free from abrupt vertical changes greater than 1/4". Vertical surface discontinuities between 1/4" and 1/2" shall be beveled with a slope not steeper than 1V:2H. The bevel shall be applied across the entire joint.
7. Sidewalks are connected to roadways by either blended transitions or curb ramps. Blended transitions are connections between the sidewalk level and the roadway level that have a maximum grade (running slope) of 5.0% and transitions greater than 5.0% are considered curb ramps.
8. Curb ramps and blended transitions may require the installation of detectable warnings. See additional "Detectable Warning" notes on this sheet, and sidewalk and curb ramp details included in the site plan set.
9. Vertical alignment shall be generally planar. Grade breaks within the pedestrian access route shall be perpendicular to the direction of travel and shall not be rounded.
10. Sidewalk grade (running slope) shall not exceed 4.5% for design and layout, except when matching into existing sidewalk or when the highway grade is steeper. When adjacent road grade is greater than 5.0%, the sidewalk grade shall not exceed the adjacent road grade.
11. The cross slope of pedestrian access routes shall be 1.5% maximum for design and layout, and 2.0% maximum for work acceptance. The following exceptions are allowed:
    a. Where pedestrian street crossings are provided at intersections without yield or stop control, or where there is any traffic signal without a flashing red, the cross slope of a pedestrian access route contained within a street crossing shall be 4.5% maximum for design and layout, and 5.0% maximum for work acceptance.
    b. Where midblock pedestrian street crossings are provided, the cross slope of a pedestrian access route contained within a midblock street crossing shall be permitted to equal the street or highway grade.
12. Marked Accessible Parking Spaces and Access Aisles:
    a. Dimensions – accessible parking spaces shall be at least 8' wide and shall have an adjacent access aisle 8' wide measured perpendicular to the stall stripe to accommodate vans with lifts.
    b. Common access aisles for 90° parking – two accessible parking spaces may share a common access aisle. For acute angled parking, such as 60° parking, or where one way driveway aisles would prevent vans with passenger side lifts from backing into accessible spaces, an accessible access aisle must be provided for each accessible parking space, width of access aisles and parking spaces are measured perpendicular to the striping.
    c. Signing – each accessible parking space shall be marked by permanently installed signs which display the International Symbol of Access. Each access aisle shall be marked by permanently installed signs indicating that stopping is not permitted in the aisle. Signs shall not block the accessible clear width of adjacent walkways. Signs located where they may be hit by vehicles being parked shall be installed in a post base. The bottoms of the signs located on posts installed in paved areas shall be 7' minimum above the walkway surface. The bottoms of signs located in unpaved area shall be 7' minimum above the pavement surface.
    d. Surface slopes – slopes at accessible parking spaces, access aisles, and adjoining walkways shall be 1.5% maximum in any direction for design and layout, and 2.0% maximum for work acceptance, while providing positive drainage.
    e. Overhead clearance – vehicle access routes to and from accessible parking spaces, including in garages and open parking structures, shall have a minimum vertical clearance of 8'-2".
    f. Pavement marking colors – required accessible parking space and access aisle striping and other optional pavement markings, such as the International Symbol of Access, shall be painted white or blue.
    g. A smooth, flush transition must be provided between all pedestrian walkways, accessible parking spaces and aisles.
    h. Where a change in direction is required to access a curb ramp from an access aisle, a turning space 4'-0" x 4'-0" minimum shall be provided at the base or the top of curb ramp, as applicable. The cross slope of turning spaces shall not exceed 1.5% in any direction for design and layout, and 2.0% for work acceptance, while providing positive drainage.
13. Sidewalk Curb Ramps:
    a. Walking surfaces of sidewalk curb ramps shall be stable, firm and slip resistant.
    b. The minimum width of a curb ramp shall be 4'-0". Refer to site plans and sidewalk curb ramp details for curb ramp widths.
    c. The grade (running slope) of a curb ramp shall be a minimum of 5.0% The grade for design and layout shall be 7.5% maximum, and 8.3% maximum for ADA accessibility and work acceptance.
    d. The cross slope of the curb ramp shall be as flat as possible and still provide positive drainage. The cross slope of a curb ramp shall not exceed 1.5% for design and layout, and 2.0% maximum for work acceptance.
    e. Where provided, side flares for curb ramps where a pedestrian circulation path crosses the curb ramp shall be 9.5% maximum for design and layout, and 10.0% maximum for work acceptance. The slope of flared sides is measured parallel to the curb line.
    f. Curb ramps at marked crosswalks shall be wholly contained within the markings, excluding any flared sides.
    g. Where a change in direction is required to utilize a curb ramp, a turning space shall be provided at the base or the top of curb ramp as applicable. Turning spaces shall be permitted to overlap clear spaces.
    h. Where there are no vertical constraints at the back of sidewalk, (e.g., vertical curb, buildings, fences) the turning space dimensions shall be 4'-0" x 4'-0" minimum. Where the turning space is constrained at the back of sidewalk, the turning space shall be 4'-0" x 5'-0" minimum. The 5'-0" dimension shall be provided perpendicular to the constraint.
    i. Turning spaces shall not be designed with cross slope greater than 1.5% in any direction for design and layout, while providing positive drainage. The maximum cross slope for work acceptance is 2.0%.
    j. Beyond the bottom grade break, a clear space of 4'-0" x 4'-0" minimum shall be provided within the width of the pedestrian crosswalk, and outside the parallel vehicle travel lane. The clear space may overlap turning spaces, detectable warning surfaces, and drop curb.
14. Detectable Warning:
    a. Detectable warning surfaces shall be provided at curb ramps and blended transitions at pedestrian street crossings.
    b. Detectable warning surfaces shall be provided where the pedestrian access route crosses driveways with signal, yield or stop control. Detectable warning surfaces shall not be provided at crossings of uncontrolled driveway aprons.
    c. Some detectable warning products require a concrete border for proper installation. If required, the border shall not exceed 2". Where the back of curb edge is tooled to provide a radius, the border dimension shall be measured from the inside edge of the curb radius.
    d. The details provided are not drawn to scale. The quantity of domes depicted on the detectable warning unit is for illustration only. The size of the detectable warning field shall be 2'-0" minimum in the direction of travel and shall extend the full width of the curb ramp or flush surface, exclusing any flared sides. The width of the detectable warning field includes a concrete border, if provided.
    e. On slopes of 5.0% or greater, the rows of domes shall be aligned to be perpendicular or radial to the lower grade break on the ramp run. Where domes are arrayed radially, they may differ in dome diameter and center-to-center spacing within the ranges specified on sheet 2 of the New York State Department of Transportation (NYSDOT) Standard Sheets 608-01. On slopes less than 5.0% dome orientation is less critical and may differ from perpendicular or radial alignment to the grade break.
    f. The detectable warning field shall be the color specified in the contract documents. Detectable warning surfaces shall contrast visually with adjacent gutter, street, highway, or pedestrian access route surface, either light-on-dark or dark-on-light.
    g. Refer to sidewalk curb ramp details for additional information.
15. Walkways Along an Accessible Route:
    a. Walking surfaces shall be stable, firm and slip resistant.
    b. Vertical changes in level along walking surface shall not exceed 1/4". Changes in level greater than 1/4" in height and not more than 1/2" shall be beveled with a slope not steeper than 1V:2H.
    c. The running slope of the walking surfaces shall not be steeper than 4.5%
    d. The cross slope of a walking surface shall not be steeper than 1.5%
    e. The clear width of an accessible route shall be 3'-0" minimum.
    f. An accessible route with a clear width less than 5'-0" shall provide passing spaces at intervals of 200' maximum. Passing spaces shall be 5'-0" minimum by 5'-0" minimum.
16. Ramps along an accessible route:
    a. Ramp runs shall have a running slope greater than 5.0%
    b. Ramp runs shall have a running slope of 7.5% maximum for design and layout, and 8.3% maximum for work acceptance.
    c. The cross slope of ramp runs shall not exceed 1.5% for design and layout, and 2.0% maximum for work acceptance.
    d. Walking surfaces of ramp runs and associated landings shall be stable, firm and slip resistant.
    e. Handrails shall be provided on both sides of ramps.
    f. The clear width of a ramp shall be 3'-0" minimum or as shown. Handrails and handrail supports provided on the ramp run shall not project into the required clear width of the ramp run or associated landing.
    g. The rise for any ramp run shall be 30 inches maximum. The length of any ramp run shall be 30 feet maximum unless approved by the project engineer.
    h. Ramps shall have landings at the bottom and top of each ramp run. Landings shall have a slope not to exceed 1.5% for design and layout, and 2.0% maximum for work acceptance, while providing positive drainage. Landings shall have a clear length and width of 5'-0" minimum.
    i. Adjacent finished grades along sides of ramp and landings shall not have a vertical drop-off greater than 1/2" within 10" of the edge of the concrete. If the adjacent finished grades do not meet this criterion, a 4" minimum high curb shall be provided (see plan for location).
    j. If drop-off to adjacent grade is 2'-6" or greater, "guards" will need to be provided to meet the requirements as specified in the NYS Building Code latest edition.
    k. Refer to concrete handicap ramp detail for additional information.
17. For access to and within refuse enclosures, refer to the Refuse Enclosure Detail.

DESIGN ELEMENT TOLERANCES

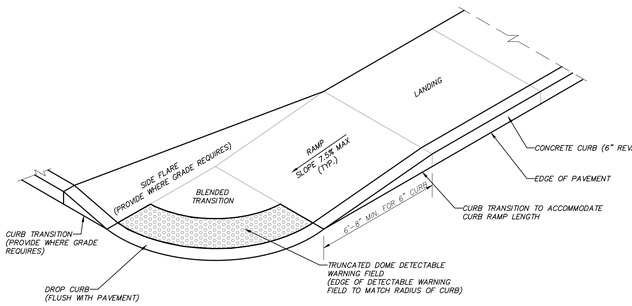
ELEMENT	DESIGN AND FIELD LAYOUT LIMIT	LIMIT FOR WORK ACCEPTANCE
SIDEWALK/RAMP CROSS SLOPE – SEE NOTES 11, 13, & 16	1.5% MAX.	2.0% MAX.
SIDEWALK GRADE (RUNNING SLOPE) – SEE NOTES 10 & 13	4.5% MAX.	5.0% MAX.
CURB RAMP GRADE (RUNNING SLOPE) – SEE NOTE 13	7.5% MAX.	8.3% MAX.
BLENDED TRANSITION GRADE (RUNNING SLOPE) – SEE NOTE 7	4.5% MAX.	5.0% MAX.
ACCESSIBLE PARKING SPACES & ACCESS AISLES (SURFACE SLOPES – ALL DIRECTIONS) – SEE NOTE 12	1.5% MAX.	2.0% MAX.
RAMPS (RUNNING SLOPE) – SEE NOTE 16	7.5% MAX.	8.3% MAX.



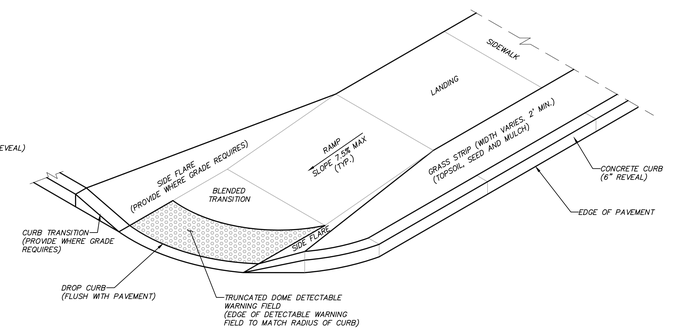
SIDEWALK CURB RAMP (TYPE '1')
(N.T.S.)



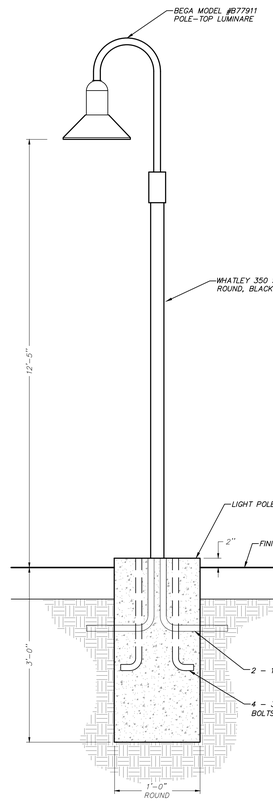
SIDEWALK CURB RAMP 'TYPE 2'
(N.T.S.)



SIDEWALK CURB RAMP 'TYPE 3'
(N.T.S.)

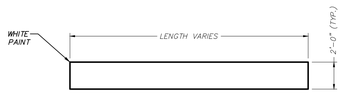


SIDEWALK CURB RAMP 'TYPE 4'
(N.T.S.)



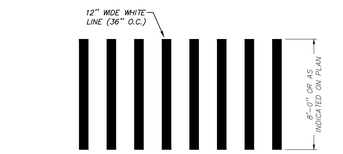
NOTES:
1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CHECK AND VERIFY ALL ANCHOR BOLT DIMENSIONS (SIZE, BOLT CIRCLE, ETC.) WITH THE CONTRACTOR WHO WILL BE INSTALLING THE LIGHTING STANDARD PRIOR TO INSTALLATION OF THE FOUNDATIONS.

BEGA LIGHT DETAIL
(N.T.S.)



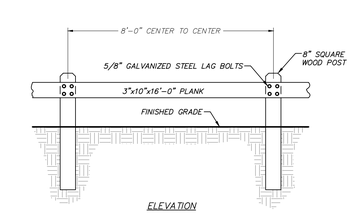
NOTES:
INSTALLATION TO CONFORM WITH CURRENT NYSDOT STANDARDS AND SPECIFICATIONS.

PAINTED STOP BAR DETAIL
(N.T.S.)



NOTE:
INSTALLATION TO CONFORM WITH CURRENT NYSDOT STANDARDS AND SPECIFICATIONS.

CROSSWALK MARKING DETAIL (TYPE 2)
(N.T.S.)

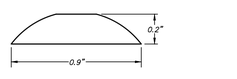


ELEVATION

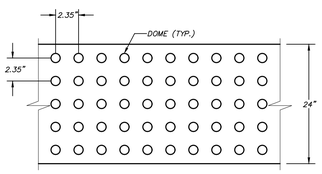
SECTION

NOTES:
1. ALL WOOD TO BE SEASONED NO.1 DOUGLAS FIR, SOUTHERN YELLOW PINE OR OTHER APPROVED STRUCTURAL LUMBER.
2. ALL WOOD TO BE TREATED WITH AN APPROVED WOOD PRESERVATIVE SUITABLE FOR INSTALLATION IN AND ADJACENT TO GROUND SURFACES.

WOOD GUIDERAIL DETAIL
(N.T.S.)



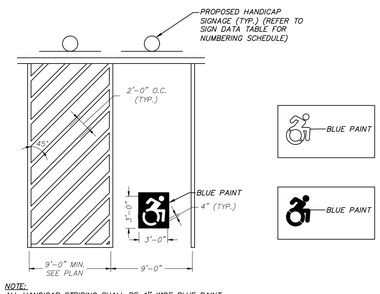
TRUNCATED DOME SECTION



TRUNCATED DOME SPACING

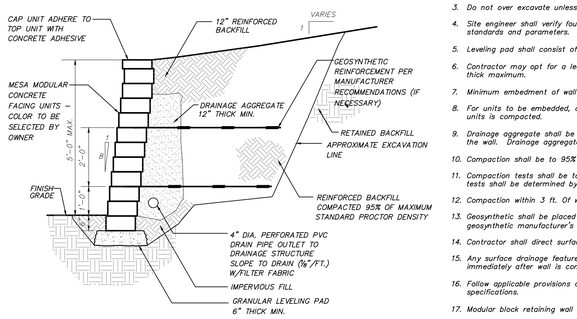
NOTES:
1. The detectable warning field shall consist of raised truncated domes with a nominal diameter of 0.9 inches, a nominal height of 0.2 inches, and a nominal spacing of 2.35 inches on center in accordance with the Department of Justice–Code of Federal Regulations, 28 CFR Part 36, Chapter 4 "ADA Standards for Accessible Design", revised as of July 1, 1994.
2. The details provided are not drawn to scale. The quantity of domes depicted on the detectable warning field (the domes and the entire 24 inch level surface) is for illustration only.
3. The size of the detectable warning field shall be 24 inches in the direction of travel and shall extend the full width of the curb ramp or flush surface, exclusive of side flares.
4. Detectable warnings shall be located so that the edge of the warning field nearest to the roadway or street surface is 6 inches to 8 inches from the edge of the roadway/street, or from the front of the dropped curb, where a dropped curb continues across the bottom of the sidewalk curb ramp.
5. Domes shall be aligned on a square grid in the predominant direction of travel.
6. The detectable warning field shall be the color specified in the contract documents. Detectable warning surfaces shall contrast visually with adjacent gutter, street, highway, or pedestrian access route surface, either light-on-dark or dark-on-light.
7. Provide a broom finish, flush to adjacent sidewalk/curb, on all areas to receive the detectable warning fields.

TRUNCATED DOME DETAIL
(N.T.S.)



NOTE:
ALL HANDICAP STRIPING SHALL BE 4" WIDE BLUE PAINT.

PAINTED NYS ACCESSIBLE PARKING DETAIL
(N.T.S.)



NOTES:
1. Strip vegetation and organic soil from wall and geosynthetic alignment.
2. Bench cut all excavated slopes.
3. Do not over excavate unless directed by site engineer to remove unsuitable soil.
4. Site engineer shall verify foundation soils as being competent per the design standards and parameters.
5. Leveling pad shall consist of compacted coarse sand or crushed gravel, 6" thick min.
6. Contractor may opt for a lean concrete pad. Concrete pad shall be unreinforced, 3" thick maximum.
7. Minimum embedment of wall below finish grade shall be 6".
8. For units to be embedded, compact fill in front of units at the same time fill behind units is compacted.
9. Drainage aggregate shall be installed directly behind the wall within 12" of the top of the wall. Drainage aggregate shall not extend below final grade in front of wall.
10. Compaction shall be to 95% of maximum standard proctor density.(astm d-698)
11. Compaction tests shall be taken as the wall is installed. The minimum number of tests shall be determined by the site soils engineer.
12. Compaction within 3 ft. Of wall shall be limited to hand operated equipment.
13. Geosynthetic shall be placed with strongest direction perpendicular to wall. Follow geosynthetic manufacturer's installation instructions and written specifications.
14. Contractor shall direct surface runoff to avoid damaging wall while under construction.
15. Any surface drainage features, finish grading, pavement, or turf shall be installed immediately after wall is completed.
16. Follow applicable provisions of the manufacturer's installation instructions and written specifications.
17. Modular block retaining wall at steps to be installed vertically (no batter)
18. Modular block retaining wall manufacturer to supply construction details of wall signed and sealed by an engineer licensed in the state of new york.

MODULAR BLOCK RETAINING WALL DETAIL
(N.T.S.)

NO.	DATE	REVISION	BY
5	5-7-26	PLANNING BOARD REISSUE	HMF
4	4-9-26	PLANNING BOARD REISSUE	HMF
3	1-8-26	REVISED PER VILLAGE COMMENTS	HMF
2	11-6-25	REVISED PER VILLAGE COMMENTS	HMF
1	10-9-25	REVISED PER VILLAGE COMMENTS	HMF

INSITE ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.
3 Garrett Place
Carmel, NY 10512
(845) 225-9690
(845) 225-9717 fax
www.insite-enp.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
DETAILS

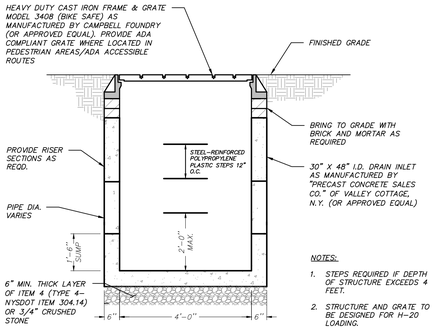
RICHARD D. WILLEY — 090886 — LICENSED PROFESSIONAL ENGINEER — STATE OF NEW YORK

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	7-24-25	DRAWN BY	R.A.R.
SCALE	N.T.S.	CHECKED BY	E.J.P.

DRAWING NO. D-2
SHEET 15 / 17

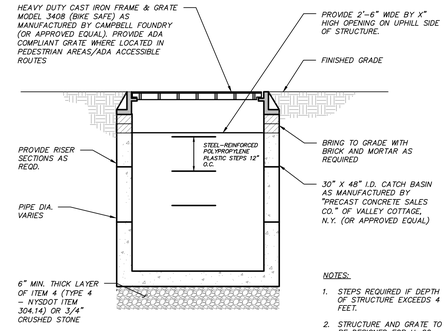
ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

Z:\D\25154\100 WAP_34 Acorn Dr., Ossining\05 Dwg_Sht\2026.1.07-D7.PAL, HP.pc3=whole, 1:1



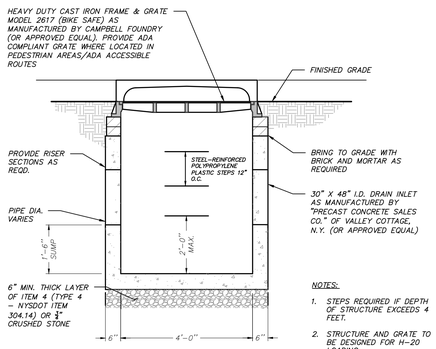
30" X 48" DRAIN INLET DETAIL
(N.T.S.)

NOTES:
1. STEPS REQUIRED IF DEPTH OF STRUCTURE EXCEEDS 4 FEET.
2. STRUCTURE AND GRATE TO BE DESIGNED FOR H–20 LOADING.
3. KNOCKOUT STRUCTURES ACCEPTABLE.



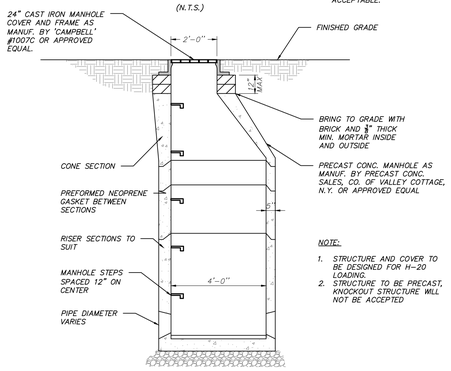
30" X 48" SIDE DRAIN INLET DETAIL
(N.T.S.)

NOTES:
1. STEPS REQUIRED IF DEPTH OF STRUCTURE EXCEEDS 4 FEET.
2. STRUCTURE AND GRATE TO BE DESIGNED FOR H–20 LOADING.
3. KNOCKOUT STRUCTURES ACCEPTED.



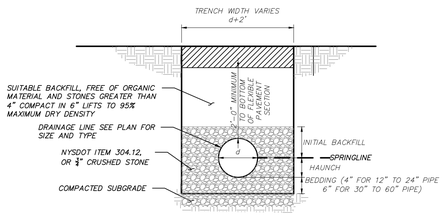
30" X 48" CATCH BASIN DETAIL
(N.T.S.)

NOTES:
1. STEPS REQUIRED IF DEPTH OF STRUCTURE EXCEEDS 4 FEET.
2. STRUCTURE AND GRATE TO BE DESIGNED FOR H–20 LOADING.
3. KNOCKOUT STRUCTURES ACCEPTABLE.

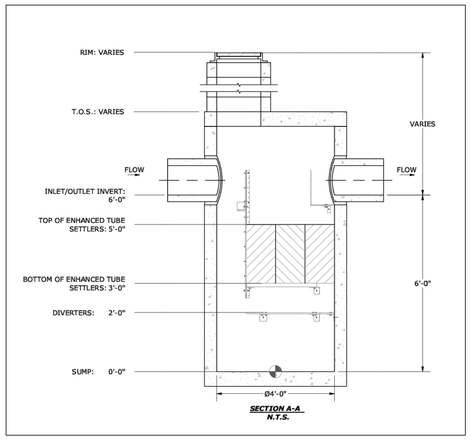


DRAINAGE MANHOLE DETAIL
(N.T.S.)

NOTE:
1. STRUCTURE AND COVER TO BE DESIGNED FOR H–20 LOADING.
2. STRUCTURE TO BE PRECAST, KNOCKOUT STRUCTURE WILL NOT BE ACCEPTED

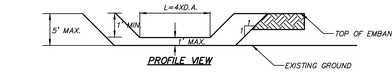


DRAINAGE LINE TRENCH DETAIL
(N.T.S.)

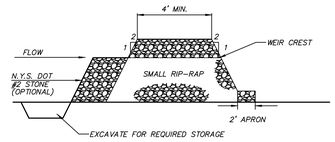


SECTION A-A
N.T.S.

STORMTRAP STORMSETTLER 4 DETAIL
(N.T.S.)



PROFILE VIEW



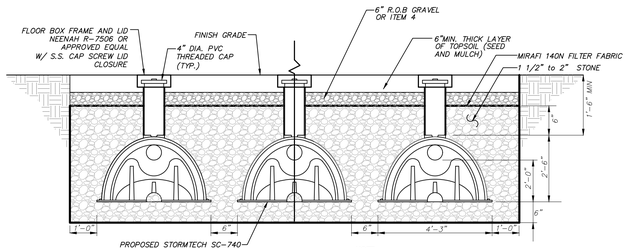
PROFILE VIEW

NOTES:
1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS AND OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER.
4. THE STONE USED IN THE OUTLET SHALL BE SMALL RIP-RAP 4"–8" ALONG WITH A 1' THICKNESS OF 2" AGGREGATE PLACED ON THE UP-GRADE SIDE ON THE SMALL RIP-RAP OR EMBEDDED FILTER CLOTH IN THE RIP-RAP.
5. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ½ THE DESIGN DEPTH OF THE TRAP. IT SHALL BE PLACED ON SITE AND STABILIZED.
6. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
7. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
8. FOR TEMPORARY SEDIMENT TRAP A, UPON STABILIZATION OF ALL TRIBUTARY AREAS, THE BASIN SHALL BE REMOVED AND THE AREA GRADED TO FINISH GRADE AND STABILIZED.

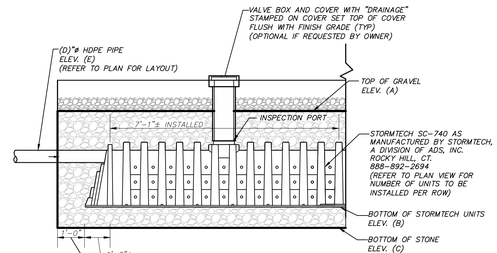
MAXIMUM DRAINAGE AREA 5 ACRES

TEMP. SEDIMENT TRAP ID	CONTRIBUTING AREA (AC)	STORAGE VOLUME REQUIRED (CF)	STORAGE VOLUME PROVIDED BELOW WEIR (CF)	TOP OF BERM ELEVATION	BOTTOM OF TEMPORARY BASIN ELEVATION	LENGTH OF WEIR L = 4 x D.A.
A	1.8	6,480	8,000	158.0	155.0	7.2'

TEMPORARY STONE OUTLET SEDIMENT TRAP
(N.T.S.)



SECTION (TYP.)



ELEVATION (TYP.)

NOTE:
THE DESIGN ENGINEER SHALL BE CONTACTED 48 HOURS PRIOR TO GRAVEL BACKFILL OF THE INFILTRATION SYSTEM. ALL SYSTEM COMPONENTS, INCLUSIVE OF THE INFILTRATORS, HEADER SYSTEMS, AND CONNECTING PIPES WHERE APPLICABLE, OF THE INFILTRATION SYSTEM MUST BE EXPOSED AND INSPECTED PRIOR TO BACKFILL.

SUBSURFACE INFILTRATION SYSTEM DETAIL
(N.T.S.)

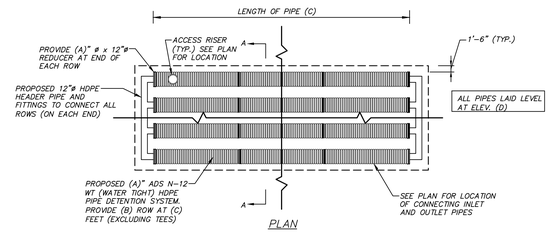
STORMWATER MANAGMENT PRACTICE	TOP OF GRAVEL ELEVATION (A)	BOTTOM OF INFILTRATION UNITS ELEVATION (B)	BOTTOM OF STONE ELEVATION (C)	INLET PIPE DIAMETER (D)	INLET PIPE ELEVATION (E)	OUTLET PIPE DIAMETER (F)	OUTLET PIPE ELEVATION (G)	NUMBER OF UNITS
1.2P	136.5	133.5	133.0	6"	135.5	8"	135.3	33

PERMANENT STORMWATER FACILITIES MAINTENANCE SCHEDULE

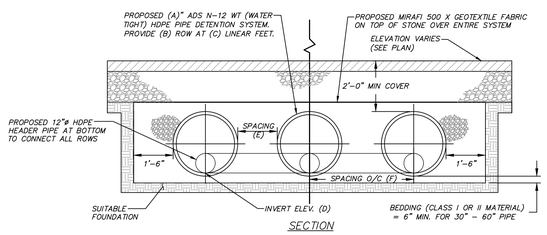
PRACTICE/FACILITY	MONTHLY	AFTER MAJOR STORM EVENTS	BI–ANNUALLY	YEARLY	EVERY 5 to 10 YEARS
HYDRODYNAMIC SEPARATOR	Refer to Manufacturer's Specifications in the Project SWPPP				
SUBSURFACE STORMWATER COLLECTION SYSTEMS	–	–	Inspect & clean	Inspect, clean, repair and/or replace structures. Remove debris.	–
GRASS SWALES	Inspect first few months after construction for eroding soils & slumpage & repair immediately	–	Inspect & clean Mow & remove debris & litter. Revegetate as needed.	–	Inspect for & remove accumulated sediment
SUBSURFACE INFILTRATION UNITS	–	Confirm infiltrators dewater within 48 hours	Inspect & clean	Inspect outlet structures & remove accumulated sediment.	Clean isolator row per manufactures recommendations

Note: The party responsible for implementation of the maintenance schedule during and after construction is:

WB 34 State, LLC
480 North Bedford Road
chappaqua, NY 10514



PLAN



SECTION

STORMWATER MANAGEMENT PRACTICE	DETENTION PIPE DIAMETER ø (A)	NUMBER OF ROWS (B)	LENGTH PER ROW (C)	DETENTION PIPE ELEV. (D)	SPACING (E)	SPACING O/C (F)
1.1P	60"	5	80'	157.0	2'–0"	7'–6"
2.1P	48"	5	60'	143.5	2'–1"	6'–7"

SUBSURFACE DETENTION SYSTEM DETAIL
(N.T.S.)

NO.	DATE	REVISION	BY
5	5–7–26	PLANNING BOARD REISSUE	HMF
4	4–9–26	PLANNING BOARD REISSUE	HMF
3	1–8–26	REVISED PER VILLAGE COMMENTS	HMF
2	11–6–25	REVISED PER VILLAGE COMMENTS	HMF
1	10–9–25	REVISED PER VILLAGE COMMENTS	HMF

INSITE
ENGINEERING, SURVEYING & LANDSCAPE ARCHITECTURE, P.C.
3 Garrett Place
Carmel, NY 10512
(845) 225–9690
(845) 225–9717 fax
www.insite–emp.com

PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
DETAILS

STATE OF NEW YORK — RICHARD D. WILLEN — 035886 — LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	7–24–25	DRAWN BY	R.A.R.
SCALE	N.T.S.	CHECKED BY	E.J.P.

DRAWING NO. D–3
SHEET 16 / 17

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

Z:\25154\100 WIP 34 State St - Ossining\01 D-Leg, 5/31/2026 8:42:54 AM, mfinnerty, 1:1

SEWER MAIN NOTES

1. *All sewer mains & sewer services shown on these plans shall be heavy cast iron pipe.*
2. *Sewers shall be laid at least 10 feet horizontally from any existing or proposed water main. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot horizontal separation, the Design Engineer and Westchester County Department of Health may allow deviation with prior approval on a case–by–case basis, if supported by data from the Design Engineer. The horizontal separation also applies to service connections.*
3. *Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. In cases where it is not practical to maintain a 10 foot horizontal separation, the Design Engineer and Westchester County Department of Health may allow deviation with prior approval on a case–by–case basis, if supported by data from the Design Engineer prior to sewer line installation. The vertical separation also applies to service connections.*
4. *Sanitary sewer service lines shall be tested in conjunction with the sewer mains to the property line or easement line, and in accordance with the latest Westchester County Department of Health Rules & Regulations.*
5. *Testing of the manholes with the pipeline shall not be permitted. Manholes & sanitary sewer lines shall be tested independently of each other.*
6. *The owner/applicant shall be responsible for acquiring supervision of the construction of the sanitary sewer main system by a person or firm qualified to practice professional engineering in the state of New York.*
7. *Upon completion of construction and prior to the sanitary sewer main being placed into service, the owner/applicant shall be responsible for providing two (2) sets of as–built drawings signed and sealed by a licensed and registered New York State Professional Engineer to the Westchester County Department of Health along with a Professional Engineer certification of construction compliance and acceptable results of air or water testing of the sewer main(s) and sewer manhole(s). The sanitary sewer main(s) shall not be placed into service until a certificate of construction compliance has been accepted by the Westchester County Department of Health.*
8. *The Design Engineer, Westchester County Department of Health, and Village Engineering Department shall be notified forty eight (48) hours before construction is started.*
9. *The Westchester County Department of Health must be notified forty eight (48) hours prior to pressure testing the sewer main improvements.*
10. *Manhole frames & covers to be campbell pattern #1007C for 24" opening or approved equal. M.H. covers to be marked "SEWER" and to have six 3/4"ø hole vents. (use solid covers where necessary.)*
11. *The exterior of all manholes shall be covered with an approved asphalt waterproofing.*
12. *Concrete base slabs shall be air entrained concrete with a minimum design strength of 3,000 psi.*
13. *The contractor shall submit shop drawings of the precast manholes to the Design Engineer for review and acceptance.*
14. *Precast manholes shall have minimum reinforcement of 0.12 sq., in. per lin. ft. for 48" barrel & be designed in accordance with A.S.T.M. C–478, and withstand an H–20 design loading.*
15. *Precast base sections to have the required number of gaskets and openings as shown and specified.*
16. *Precast manhole sections shall employ a watertight gasket arrangement between each section approved by the Design Engineer.*
17. *Openings for pipes shall be precast or machine cored. Gaskets or collars for pipe connections to manholes shall be resilient and watertight and compatable with the type of pipe being used.*
18. *The length of pipes entering or leaving any manhole shall be greater than 2'–0".*
19. *Precast manholes under 6'–0" deep shall have a "Flat Top" slab roof.*
20. *Gaskets or collars for pipe connections to manhole shall provide a minimum of 0.1' drop across the manhole.*

SEWER TESTING PROCEDURES

TESTS FOR NON–PRESSURE PIPELINES FOR TRANSPORT OF SEWAGE

The leakage shall be determined by exfiltration, infiltration or low pressure air.

A. *Exfiltration Testing*

1. *Exfiltration tests shall be made by filling a section of pipeline with water and measuring the quantity of leakage.*
2. *The head of water at the beginning of the test shall be at least 2 feet above the highest pipe within the section being tested.*
   a. *Should groundwater be present within the section being tested, the head of water for the test shall be 2 feet above the hydraulic gradient of the groundwater.*
   b. *Should the requirement of 2 feet of water above the highest pipe subject any joint at the lower end of the test section to a differential head of greater than 11.5 feet, another method of testing shall be employed.*

B. *Infiltration Testing*

1. *Infiltration tests will be allowed only when the water table gauges determine the groundwater level to be 2 feet or more above the highest pipe of the section being tested.*
2. *Infiltration test shall be made by measuring the quantity of water leaking into a section of pipeline.*
3. *Measurement of the infiltration shall be by means of a calibrated weir constructed at the outlet of the section being tested.*

C. *Allowable Leakage for Non–Pressure Pipelines*

1. *The allowable leakage (exfiltration or infiltration) for non–pressure pipelines shall not exceed the following in gallons per 24 hours per inch of diameter mile feet of pipe:*

Type of Pipe	*Leakage*
Ductile iron – mechanical or push–on joints	*100*
Polyvinyl chloride, thermal plastic or fiberglass with rubber joints	*100*
Cast iron soil pipe	*0*

2. *Regardless of the above allowable leakage, any spurting leaks detected shall be permanently stopped.*

D. *Low Pressure Air Testing*

1. *Air testing for acceptance shall not be performed until the backfilling has been completed.*
2. *Low pressure air tests shall conform to ASTM C 828 or ASTM F1417–16, Section 8.2.2, Time–Pressure Drop Method for a 0.5 psi drop, except as specified herein and shall not be limited to type or size of pipe.*
3. *All sections of pipelines shall be cleaned and flushed prior to testing.*
4. *The air test shall be based on the starting pressure of 3.5 to 4.0 psi gauge. The time allowed for the 0.5 psi drop in pressure, measured in seconds, will be computed based on the size and length of the test section by the Engineer.*
   a. *When groundwater is present, the average test pressure of 3 psig shall be above any back pressure due to the groundwater level.*
   b. *The maximum pressure allowed under any condition in air testing shall be 10 psig. The maximum groundwater level for air testing is 13 feet above the top of the pipe.*
5. *The equipment required for air testing shall be furnished by the Contractor and shall include the necessary compressor, valves, gauges and plugs to allow for the monitoring of the pressure, release of pressure and a separable test gauge.*
   a. *The test gauge shall be sized to allow for the measuring of the 0.5 psig loss allowed during the test period and shall be on a separate line to the test section.*

E. *Deflection Testing*

1. *Deflection testing shall be performed 30 days after backfilling. The test shall be made by passing a ball or cylinder no less then 95% of the pipe diameter through the pipe. The test shall be performed without mechanical pulling devices.*

F. *Manhole Testing*

1. *General*
   a. *Each manhole shall be tested by either exfiltration, infiltration or vacuum testing.*
   b. *A manhole will be acceptable if the leakage does not exceed an allowance of one gallon per vertical foot of depth for 24 hours. Regardless of the allowable leakage, any leaks detected shall be permanently stopped.*
2. *Exfiltration tests shall be performed after backfilling. Each manhole must must be filled to the rim, presoaked for a minimum of 72 hours, tested for a minimum of 24 hours, and have a maximum leakage of 100 gallons per mile of pipe per day per inch of nominal pipe diameter. Any exfiltration testing will be considered only if air testing fails, following repairs and following provision of calculations to this department of the allowable water level drop.*
3. *Infiltration tests shall be performed after backfilling when the groundwater level is above the joint of the top section of a precast manhole.*
4. *Vacuum testing shall be performed after backfilling in accordance with the latest revision of ASTM C1244–11R17 as follows:*
   a. *The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendations.*
   b. *A vacuum of 10 in. of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 in. of mercury.*
   c. *The manhole shall pass if the time for the vacuum reading to drop from 10 in. of mercury to 9 in. of mercury meets or exceeds the values indicated below:*

Minimum Test Times for Various Manhole Diameters in Seconds:

Depth (ft)	*Diameter (Inches) 48*	*60*
	Time (seconds)	
8 or less	*20*	*26*
10	*25*	*33*
12	*30*	*39*
14	*35*	*46*
16	*40*	*52*
18	*45*	*59*
20	*50*	*65*

   d. *If the manhole fails the initial test, necessary repairs shall be made by an approved method. The manhole shall then be retested until a satisfactory test is obtained.*

ALTERATION OF THIS DOCUMENT, UNLESS UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, IS A VIOLATION OF SECTION 7209 OF ARTICLE 145 OF THE EDUCATION LAW.

DUCTILE IRON PIPE WATER TESTING PROCEDURES

TESTS ON PRESSURE PIPING FOR TRANSPORT OF WATER

A. *Hydrostatic Pressure Test*
Hydrostatic testing shall be performed in accordance with the revision of AWWA C600, Section 5.2, "Hydrostatic Testing".

1. *Test pressure shall be as scheduled or, where no pressure is scheduled, shall be 150% of the maximum working pressure or 150 psi, whichever is higher.*
2. *Test pressure shall be held on the piping for a period of at least 2 hours, unless a longer period is requested by the Engineer.*
3. *The test medium shall be water.*

B. *Hydrostatic Leakage Test*

1. *The leakage test shall be conducted concurrently with the pressure test.*
2. *The rate of leakage shall be determined at 15–minute intervals by means of volumetric measurement of the makeup water added to maintain the test pressure. The test shall proceed until the rate of leakage has stabilized or is decreasing below an allowable value, for three consecutive 15–minute intervals. After this, the test pressure shall be maintained for at least another 15 minutes.*
   a. *At the completion of the test, the pressure shall be released at the furthermost point from the point of application.*
3. *All exposed piping shall be examined during the test and all leaks, defective material or joints shall be repaired or replaced before repeating the tests.*
4. *The allowable leakage will be determined by the following formula.*

$$Q = \frac{LD\sqrt{P}}{148{,}000}$$

Where:
Q = quantity of makeup water, in gallons per hour
L = length of pipe tested, in feet
D = nominal diameter of the pipe, in inches
P = average test pressure during the hydrostatic test, in pounds per square inch (gauge)

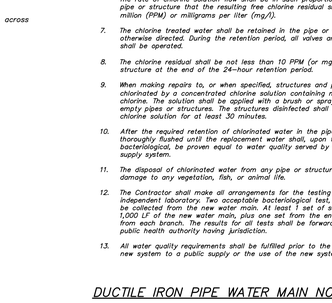
5. *Regardless of the above allowables, any visible leaks shall be permanently stopped.*
6. *The test medium shall be water.*

C. *Disinfection*
Prior to placing the water main into service, the new pipe shall be cleaned and disinfected in accordance with the latest revision of AWWA C651, Section 4.4.3, "The Continuous Feed Method". The "Tablet Method" will not be accepted.

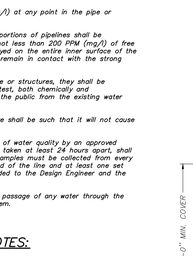
1. *All work under this section shall be performed in the presence of the Design Engineer, and a representative of the public health authority having jurisdiction, as required.*
2. *Chlorination shall be scheduled such that sampling and flushing will be performed during normal daylight working hours. The contractor shall provide acceptable backflow prevention on all supply water to prevent any potential backflow contamination or cross connection.*
3. *Chlorination shall be by the use of a solution of water and liquid chlorine, calcium hypochlorite or sodium hypochlorite and the solution shall be contained in the pipe or structure as specified.*
4. *Prior to chlorination, all dirt and foreign matter shall be removed by a thorough cleaning and flushing of the pipeline or structure.*
5. *The chlorine solution shall be introduced to pipelines through corporation stops placed in the horizontal axis of the pipe, to structures by means of tubing extending directly into the structure, or other approved methods.*
6. *The application of the chlorine solution shall be by means of a controlled solution feed device. The rate of chlorine solution flow shall be in such proportion to the rate of water entering the pipe or structure that the resulting free chlorine residual shall be between 25 and 50 parts per million (PPM) or milligrams per liter (mg/l).*
7. *The chlorine treated water shall be retained in the pipe or structure at least 24 hours, unless otherwise directed. During the retention period, all valves and hydrants within the treated sections shall be operated.*
8. *The chlorine residual shall be not less than 10 PPM (or mg/l) at any point in the pipe or structure at the end of the 24–hour retention period.*
9. *When making repairs to, or when specified, structures and portions of pipelines shall be chlorinated by a concentrated chlorine solution containing not less than 200 PPM (mg/l) of free chlorine. The solution shall be applied with a brush or sprayed on the entire inner surface of the empty pipes or structures. The structures disinfected shall remain in contact with the strong chlorine solution for at least 30 minutes.*
10. *After the required retention of chlorinated water in the pipe or structures, they shall be thoroughly flushed until the replacement water shall, upon test, both chemically and bacteriological, be proven equal to water quality served by the public from the existing water supply system.*
11. *The disposal of chlorinated water from any pipe or structure shall be such that it will not cause damage to any vegetation, fish, or animal life.*
12. *The Contractor shall make all arrangements for the testing of water quality by an approved independent laboratory. Two acceptable bacteriological test, taken at least 24 hours apart, shall be collected from the new water main. At least 1 set of samples must be collected from every 1,000 LF of the new water main, plus one set from the end of the line and at least one set from each branch. The results for all tests shall be forwarded to the Design Engineer and the public health authority having jurisdiction.*
13. *All water quality requirements shall be fulfilled prior to the passage of any water through the new system to a public supply or the use of the new system.*

DUCTILE IRON PIPE WATER MAIN NOTES:

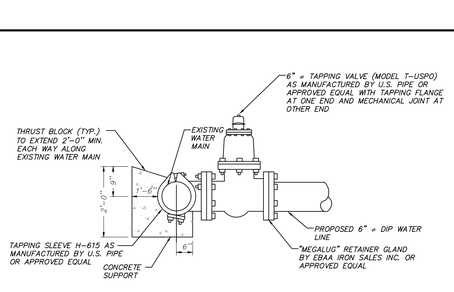
1. *All water mains shall be class 54 cement lined tyton joint ductile iron pipe, push on (rubber gasket) type and installed with 2 bronze wedges for continuous electrical conductivity per joint. All pipe and appurtenances shall be in accordance with the latest edition of AWWA/ANSI standard C600, C150/A21.50, C151/A21.51, C110/A21.10 and C104/A21.4.*
2. *All water main fittings shall be Class 350 ductile iron mechanical joints with "Megalug" connections and "Field Lok 350" restrained joint gaskets (as manufactured by U.S. Pipe Foundry Co., or approved equal) in accordance with the latest AWWA/ANSI standard C111/A21.11.*
3. *All water mains and appurtenances shall be installed in accordance with the latest edition of AWWA C600.*
4. *Gate valves shall be "CLOW" or approved equal, iron body, non–rising stem conventional packing, resilient seated, mechanical joint with restrained joint gaskets, pressure class 350, opening shall be right (CW) and operation shall be by 2" square wrench nut.*
5. *Every pipe joint and every fitting shall be secured with "Field Lok 350" restrained joint gaskets (as manufactured by U.S. Pipe Foundry Co., or approved equal) unless otherwise authorized by the Design Engineer, and with prior approval.*
6. *Thrust blocks shall be installed at all changes in horizontal or vertical alignment.*
7. *All water mains and appurtenances (including water service lines up to the curb stop) shall be pressure tested and leakage tested to the satisfaction of the Design Engineer, and the Westchester County Department of Health. This shall be done in accordance with the latest edition of AWWA Standard C600.*
8. *All water mains and appurtenances shall be flushed, disinfected, and tested to the satisfaction of the Design Engineer, and the Westchester County Department of Health. This shall be done in accordance with the latest edition of AWWA Standard C651, except for section 4.4.2 "the tablet method" will not be allowed.*
9. *Water mains shall be laid at least 10 feet horizontally from any existing or proposed sanitary or storm sewer main. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10 foot separation, the Design Engineer and Westchester County Department of Health may allow deviation with prior approval on a case–by–case basis, if supported by data from the Design Engineer prior to the installation of the water line.*
10. *Water mains crossing sanitary or storm sewer mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. The vertical separation also applies to water service connections. In cases where it is not practical to maintain a 10 foot separation, the Design Engineer and Westchester County Department of Health may allow deviation with prior approval on a case–by–case basis, if supported by data from the Design Engineer prior to the installation of the water line.*
10. *The Design Engineer, Westchester County Department of Health, and Village of Ossining shall be notified forty eight (48) hours before construction is started.*
11. *The water mains shall not be placed into service until a certificate of construction compliance has been submitted to and accepted by the Westchester County Department of Health.*
12. *The Westchester County Department of Health and the Village of Ossining must be notified forty eight (48) hours prior to pressure testing the water main improvements.*
13. *Deflection of joints on water main shall not exceed 50% of the maximum deflection recommended by the manufacturer, or as ordered by the Design Engineer.*
14. *Exact location of all fittings shall be approved in the field by the Design Engineer.*
15. *The Design Engineer shall inspect all thrust blocks and sewer/drainage crossings prior to backfill.*
16. *The contractor shall notify the Design Engineer every day that water main construction shall occur.*



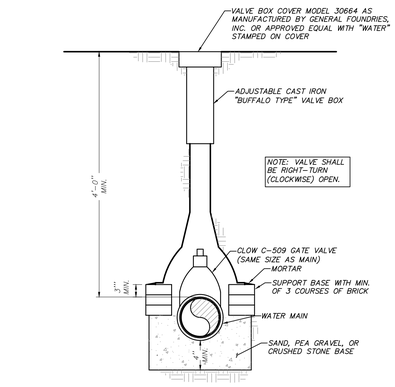
SEWER SERVICE LINE TRENCH DETAIL
(N.T.S.)



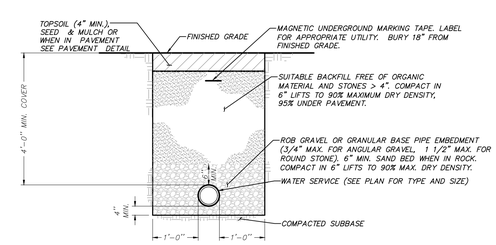
MANHOLE TROUGH DETAIL
(N.T.S.)



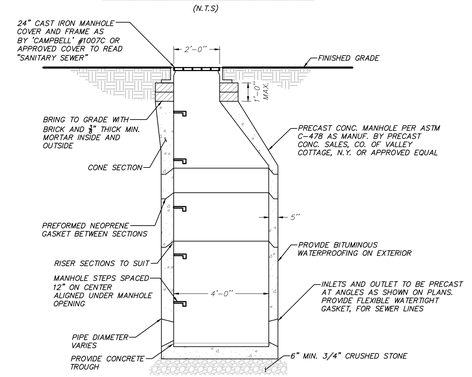
TAPPING SLEEVE, VALVE, AND THRUST BLOCK DETAIL
(N.T.S.)



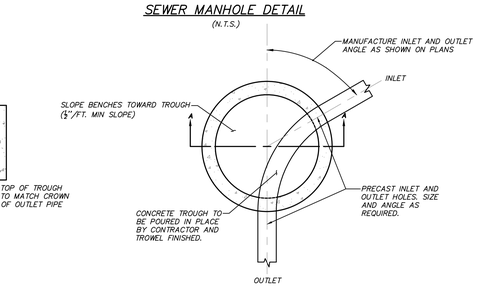
WATER MAIN GATE VALVE DETAIL
(N.T.S.)



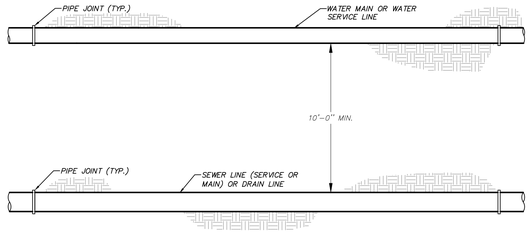
WATER SERVICE TRENCH DETAIL
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SEWER MANHOLE DETAIL
(N.T.S.)

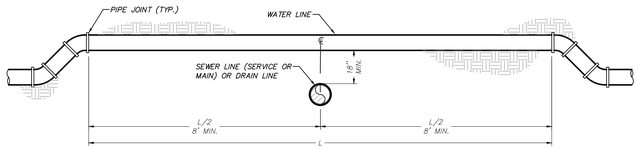


MANHOLE TROUGH DETAIL
(N.T.S.)

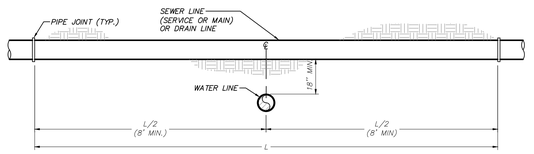


NOTES:
1. *WHEN THE 10' SEPARATION CANNOT BE MAINTAINED, THE WATER LINE SHALL BE ENCASED IN CONCRETE (SEE DETAIL) ONLY WITH PRIOR APPROVAL OF THE DESIGN ENGINEER AND DEPARTMENT OF HEALTH.*
2. *THE 10" SEPARATION APPLIES TO WATER MAINS AND WATER SERVICE CONNECTIONS.*

WATER LINE HORIZONTAL SEPARATION DETAIL
(N.T.S.)



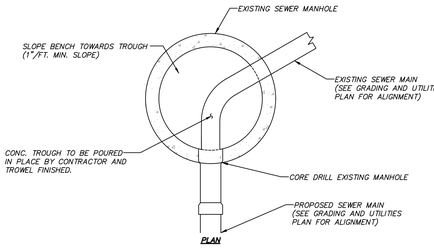
WATER LINE CROSSING OVER SANITARY SEWER LINE OR STORM DRAIN LINE



WATER LINE CROSSING UNDER SANITARY SEWER LINE OR STORM DRAIN LINE

NOTES:
1. *WHEN 18" SEPARATION CANNOT BE MAINTAINED, THE WATER LINE SHALL BE ENCASED IN CONCRETE (SEE DETAIL) ONLY WITH PRIOR APPROVAL OF THE DESIGN ENGINEER AND DEPARTMENT OF HEALTH.*
2. *PROVIDE PIPE AND FITTING RESTRAINT AS REQUIRED.*
3. *THE 18" SEPARATION APPLIES TO WATER MAINS AND WATER SERVICE CONNECTIONS.*

WATER LINE CROSSING DETAIL
(N.T.S.)

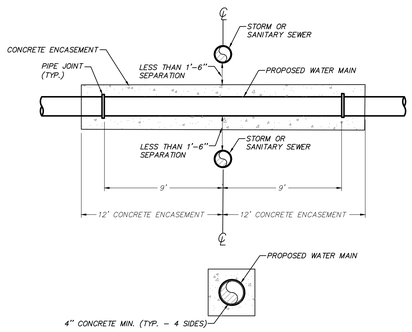


CONNECTION TO EXISTING SEWER MANHOLE CONSTRUCTION SEQUENCE

1. *Core drill existing manhole.*
2. *Install proposed sewer main and connect to existing sewer manhole.*
3. *Perform required acceptance testing of the sewer main.*
4. *Pour trough.*

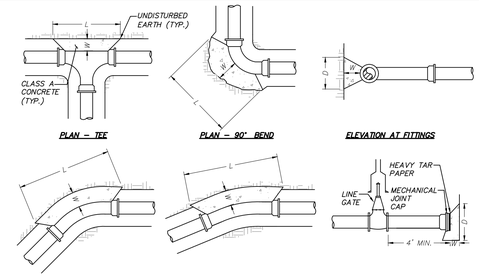
NOTE: *MANHOLE TO BE DESIGNED FOR H–20 LOADING*

PROPOSED SEWER CONNECTION TO EXISTING SEWER MANHOLE DETAIL
(N.T.S.)



WATER MAIN CONCRETE ENCASEMENT DETAIL
(N.T.S)

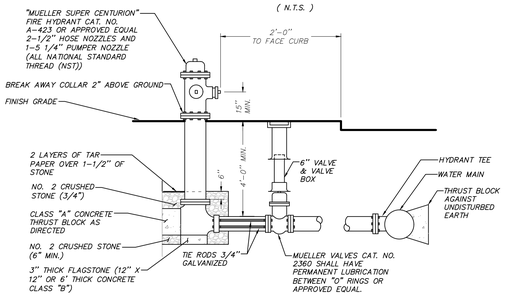
NOTE: *CONCRETE ENCASEMENT IS ONLY TO BE USED WHEN 18" MINIMUM SEPARATION IS NOT POSSIBLE. CONCRETE ENCASEMENT REQUIRES PRIOR APPROVAL BY THE DESIGN ENGINEER & THE DEPARTMENT OF HEALTH.*



THRUST BLOCK SCHEDULE

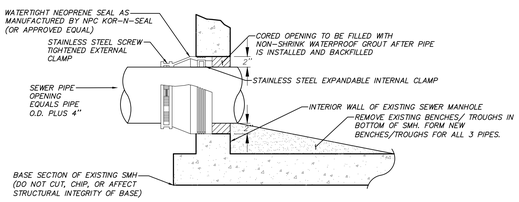
PIPE SIZE	CAP/TEE L	CAP/TEE D	22 1/2° L	22 1/2° D	45° L	45° D	90° L	90° D	W
4"	2'	1.5'	2'	1.5'	2'	1.5'	2'	1.5'	1.5'
6"	2'	1.5'	2'	1.5'	2'	1.5'	2'	1.5'	1.5'
8"	3'	2'	2'	2'	2'	2'	3'	2'	1.5'

THRUST BLOCK DETAILS
(N.T.S.)



HYDRANT NOTES:
1. PUMPER OUTLET SHALL FACE STREET.
2. HOSE OUTLETS SHALL BE PARALLEL TO STREET.
3. 1–1/2" STONE SHALL BE PLACED AROUND THE HYDRANT FROM THE BOTTOM OF THE TRENCH, BUT AT LEAST 6" BELOW THE BASE OF THE HYDRANT TO 6" ABOVE THE WASTE OPENING AND TO A DISTANCE OF 12" AROUND THE ELBOW.
4. IF GROUND WATER IS ENCOUNTERED WITHIN 7' OF SURFACE, THEN HYDRANT DRAINS SHOULD BE PLUGGED, THE BARRELS MUST BE PUMPED DRY AFTER USE DURING FREEZING WEATHER. WHERE HYDRANT DRAINS ARE NOT PLUGGED, A GRAVEL POCKET OR DRY WELL SHALL BE PROVIDED UNLESS THE NATURAL SOILS WILL PROVIDE ADEQUATE DRAINAGE. HYDRANT DRAINS SHALL NOT BE CONNECTED TO OR LOCATED WITHIN 10 FEET OF SANITARY SEWERS OR STORM DRAINS.

HYDRANT DETAIL
(N.T.S.)



PROPOSED SEWER CONNECTION TO EXISTING SEWER MANHOLE DETAIL
(N.T.S)

NO.	DATE	REVISION	BY
5	5–7–26	PLANNING BOARD REISSUE	HMF
4	4–9–26	PLANNING BOARD REISSUE	HMF
3	1–8–26	REVISED PER VILLAGE COMMENTS	HMF
2	11–6–25	REVISED PER VILLAGE COMMENTS	HMF
1	10–9–25	REVISED PER VILLAGE COMMENTS	HMF

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PROJECT:
34 STATE STREET
34 STATE ST, VILLAGE OF OSSINING, WESTCHESTER COUNTY NEW YORK

DRAWING:
DETAILS

STATE OF NEW YORK — RICHARD D. WILLIAMS — 25154 — LICENSED PROFESSIONAL ENGINEER

PROJECT NUMBER	25154.100	PROJECT MANAGER	R.D.W.
DATE	7–24–25	DRAWN BY	R.A.R.
SCALE	N.T.S.	CHECKED BY	E.J.P.

DRAWING NO. D–4 — SHEET 17 / 17

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APPENDIX B

FISH AND WILDLIFE RESOURCES IMPACT ANALYSIS DECISION KEY

Appendix 3C Fish and Wildlife Resources Impact Analysis Decision Key		If YES Go to:	If NO Go to:
1.	Is the site or area of concern a discharge or spill event?	13	2
2.	Is the site or area of concern a point source of contamination to the groundwater which will be prevented from discharging to surface water? Soil contamination is not widespread, or if widespread, is confined under buildings and paved areas.	13	3
3.	Is the site and all adjacent property a developed area with buildings, paved surfaces and little or no vegetation?	4	9
4.	Does the site contain habitat of an endangered, threatened or special concern species?	Section 3.10.1	5
5.	Has the contamination gone off-site?	6	14
6.	Is there any discharge or erosion of contamination to surface water or the potential for discharge or erosion of contamination?	7	14
7.	Are the site contaminants PCBs, pesticides or other persistent, bioaccumulable substances?	Section 3.10.1	8
8.	Does contamination exist at concentrations that could exceed ecological impact SCGs or be toxic to aquatic life if discharged to surface water?	Section 3.10.1	14
9.	Does the site or any adjacent or downgradient property contain any of the following resources? i. Any endangered, threatened or special concern species or rare plants or their habitat ii. Any DEC designated significant habitats or rare NYS Ecological Communities iii. Tidal or freshwater wetlands iv. Stream, creek or river v. Pond, lake, lagoon vi. Drainage ditch or channel vii. Other surface water feature viii. Other marine or freshwater habitat ix. Forest x. Grassland or grassy field xi. Parkland or woodland xii. Shrubby area xiii. Urban wildlife habitat xiv. Other terrestrial habitat	11	10
10.	Is the lack of resources due to the contamination?	3.10.1	14
11.	Is the contamination a localized source which has not migrated and will not migrate from the source to impact any on-site or off-site resources?	14	12
12.	Does the site have widespread surface soil contamination that is not confined under and around buildings or paved areas?	Section 3.10.1	12
13.	Does the contamination at the site or area of concern have the potential to migrate to, erode into or otherwise impact any on-site or off-site habitat of endangered, threatened or special concern species or other fish and wildlife resource? (See #9 for list of potential resources. Contact DEC for information regarding endangered species.)	Section 3.10.1	14
14.	No Fish and Wildlife Resources Impact Analysis needed.		

APPENDIX C

CITIZEN PARTICPATION PLAN

NEW YORK STATE | Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
for
Former Printex Corporation Site

December 2025

C360263
34 State Street
Ossining, NY 10562

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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: **WB 34 State LLC ("Applicant")**
Site Name: **Former Printex Corporation Site ("Site")**
Site Address: **34 State Street, Ossining, NY 10562**
Site County: **Westchester County**
Site Number: **C360263**

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 https://dec.ny.gov/regulatory/regulations/technical-assistance-grant-tag-guidance-handbook-der-14

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 (HASP) and Soil Management Plan (SMP) approved by NYSDEC, which will be designed to minimize these impacts. A Community Air Monitoring Plan (CAMP) will also be implemented to monitor dust and vapors to ensure the community is not impacted. Community Air Monitoring Plan 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.

Environmental justice is defined as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

Environmental justice efforts focus on improving the environment in communities, specifically minority and low-income communities, and addressing disproportionate adverse environmental impacts that may exist in those communities.

The Site is located in an Environmental Justice Area. There is a large Hispanic-American population nearby. Therefore, all future fact sheets will be translated into Spanish.

For additional information, visit: https://statisticalatlas.com/zip/10562/Race-and-Ethnicity

For additional information, visit: https://www.census.gov/acs/www/about/why-we-ask-each-question/language/

4. Site Information

Appendix C contains a map identifying the location of the site.

Site Description

- **Location - 34 State Street, Ossining, NY 10562, County of Westchester**
- **Setting - urban**
- **Site size - 4.53 acres**
- **Adjacent properties - residential, commercial**

History of Site Use, Investigation, and Cleanup

Historically, the site had a small factory building allegedly built in the 1830's, then houses were constructed in the 1840's and other houses were constructed on the site and remained present through the 1920's. Some historic records suggest that structures were added onto the large main historic house that remains present in about 1929, which served as a community center starting in the late 1920's. Other sources suggest that some early form of textile manufacturing was occurring on the Site in house and attached building additions added from 1920's to the 1940's. Printex Corporation was present from the 1940's through 1980's and officially took title in 1967. After the 1980's, the buildings were occupied by a specialty wood working company called Hudson River Inlay, Inc. (a/k/a Creative Designs), until approximately 2006.

Currently, the site is currently vacant but the historic house remains present along with some other structures.

The primary contaminants of concern are semi-volatile organic compounds (SVOCs), metals and polychlorinated biphenyls (PCBs) present in contaminated historic fill soil; and petroleum, chlorinated solvents and volatile organic compounds (VOCs) (i.e. flammable liquids used for solvents, paint and gasoline) in soil vapor. Therefore, soil and soil vapor have been impacted. Groundwater, which is only present very deep under the Site was not investigated before the site was deemed eligible for the program.

Previous environmental assessments and investigation activities performed at the site show evidence of impact from the Site's previous commercial and industrial uses, which can be linked to and caused Site contamination above the applicable cleanup standards.

5. Investigation and Cleanup Process

Application

The Applicant has applied for and been accepted into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant was not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and 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 if this is not feasible for restricted residential use.

To achieve this goal, the Applicant will conduct investigation 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 has submitted a Remedial Investigation Work Plan with the application. The planned site investigation has several goals:

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.

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 (FER) 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 FER. 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 (SMP).

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):

Caroline Jalanti, P.E.
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233
caroline.jalanti@dec.ny.gov

New York State Department of Health (NYSDOH):

Christine Vooris
Project Manager
New York State Department of Health
Bureau of Environmental Exposure Investigation
Empire State Plaza
Corning Tower, Room 1787
Albany, NY 12237
beei@health.ny.gov

Locations of Reports and Information

The facilities identified below are being used to provide the public with convenient access to important project documents:

NYSDEC DECinfo Locator (Maps and Information):
https://gisservices.dec.ny.gov/gis/dil/

NYSDEC DECinfo Locator (Documents):
https://extapps.dec.ny.gov/data/DecDocs/C360263/

Ossining Public Library Attn: Karen LaRocca-Fells, Director 53 Croton Avenue Ossining, NY 10562 (914) 941-2416 https://ossininglibrary.org/	Hours of Operation: MON: .....9:00 AM - 9:00 PM TUE: .....10:00 AM - 6:00 PM WED: .....1:00 PM - 9:00 PM THU: .....9:00 AM - 9:00 PM FRI:.....10:00 AM - 6:00 PM SAT:.....9:00 AM - 5:00 PM SUN: .....1:00 PM - 5:00 PM

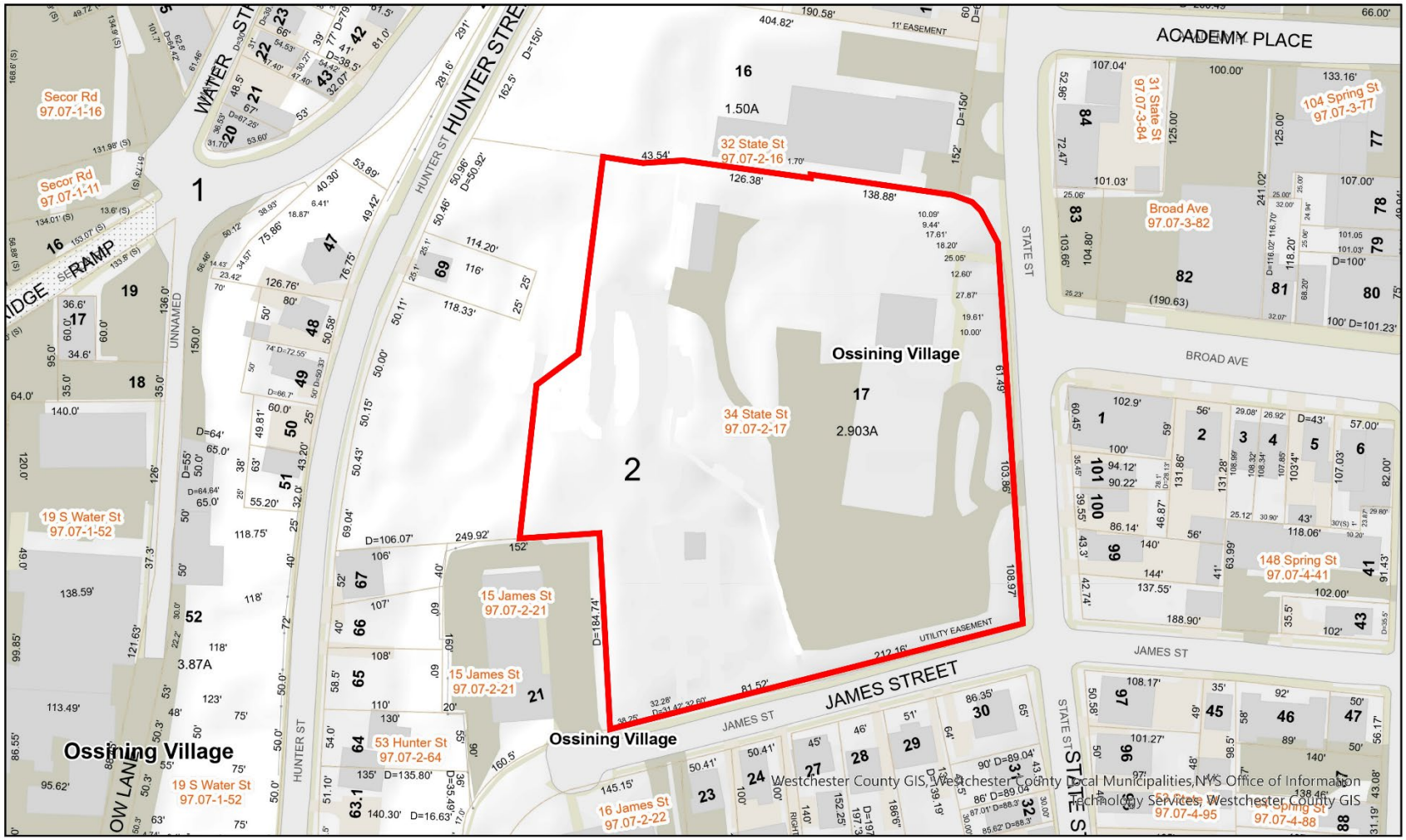
Appendix B - Site Contact List

GOVERNMENT / MUNICIPALITIES		
Charles E. Schumer U.S. Senator 11A Clinton Ave, Room 827 Albany, NY 12207	Kirsten E. Gillibrand U.S. Senator 11A Clinton Ave, Room 821 Albany, NY 12207	Michael Lawler U.S. House of Representatives, 17th District One Blue Hill Plaza, Third Floor, P.O. Box 1645 Pearl River, NY 10965
William Weber New York State Senator, 38th District 163 Airport Executive Park Nanuet, NY 10954	Kenneth Jenkins Westchester County, Executive 148 Martine Avenue White Plains, NY 10601	Richard Hyman Westchester County, Planning Board Chairperson 148 Martine Avenue White Plains, NY 10601
Elizabeth Feldman Town of Ossining, Town Supervisor 16 Croton Avenue Ossining, NY 10562	Carolyn Stevens Town of Ossining, Planning Board Chair 101 Route 9A - P.O. Box 1166 Ossining, NY 10562	Rika Levin The Village of Ossining, Mayor 16 Croton Avenue Ossining, NY 10562
PUBLIC WATER / SEWER AUTHORITIES		
Andrew Tiess Village of Ossining, Superintendent of Water/Sewer 16 Croton Avenue Ossining, NY 10562	Jeffrey Wynans Indian Brook Water Treatment Plant, Chief Filter Plant Operator 25 Fowler Ave Indian Brook Service Rd Ossining, NY 10562	
MEDIA		
The Journal News Media Outlet 1133 Westchester Avenue, Suite N110 White Plains, NY 10604		
PUBLIC SCHOOLS / DAYCARE CENTERS		
LaToya Langley, Principal Ossining High School 29 S Highland Ave Ossining, NY 10562	Marcela Levin, Parent Coordinator First Steps/Little School 34 S Highland Ave Ossining, NY 10562	Emilia Macias-Capellan, Principal 22 Edward St Park Elementary School Ossining, NY 10562
Howard Milbertr, Director Ossining Children's Center 32 State Street Ossining, NY 10562	Paul Avecillas, Director St. Ann's Peas and Karrots Child Care Center 16 Elizabeth Street Ossining, NY 10562	

ADJACENT PROPERTY OWNERS / OPERATORS		
Adjacent Property Owner of 31 State Street Top Stone Realty LLC 31 State Street Ossining, NY 10562	*Adjacent Property Owner of 5/7 Broad Ave* Broad Holding Corp P.O Box 1256 Ossining, NY 10562	*Adjacent Property Owner of 2 Broad Ave* T L C Holding Corp 2 Broad Ave Ossining, NY 10562
Adjacent Property Owner/Operator of 32 State Street Ossining Children's Center 32 State Street Ossining, NY 10562	*Adjacent Property Owner of 39 State Street* Judith Barrett 39 State Street Ossining, NY 10562	*Adjacent Property Owner of 41 State Street* Deborah Jean Roberts 41 State Street Ossining, NY 10562
Adjacent Property Operator of 37 State Street 37 State Street Ossining LLC 37 State Street Ossining, NY 10562	*Adjacent Property Owner of 45-47 State Street* Braulio E Galindo 83 Dale Ave Ossining, NY 10562	*Adjacent Property Owner of 46 State Street* Maria Yarasavich 46 State Street Ossining, NY 10562
Adjacent Property Owner/Operator of 148 Spring Street Trinidad DeDios Inc 148 Spring Street Ossining, NY 10562	*Adjacent Property Owner of 28 James Street* Viola C Copeland 28 James Street Ossining, NY 10562	*Adjacent Property Owner of 24 James Street* Bentley Lewis 24 James Street Ossining, NY 10562
Adjacent Property Owner of 30 James Street Lena R Pitt 89 Kasson Ave Bethlehem, CT 6751	*Adjacent Property Owner of 20 James Street* Luis Guzman 20 James Street Ossining, NY 10562	*Adjacent Property Owner of 16 James Street* 15-16 James Street LLC 707 Yonkers Ave Yonkers, NY 10704
Adjacent Property Owner of 22 James Street Wellington Knowles 22 James Street Ossining, NY 10562	*Adjacent Property Owner of 45 Hunter Street* Robert Daraio 45 Hunter Street Ossining, NY 10562	*Adjacent Property Owner of 25 Hunter Street* Monica Gibbons 25 Hunter Street Ossining, NY 10562
Adjacent Property Owner of 15 James Street 15-16 James Street LLC 707 Yonkers Ave Yonkers, NY 10704	*Adjacent Property Owner/Operator of 38 Hunter Street* 38 Hunter St Ossining NY LLC 38 Hunter Street Ossining, NY 10562	*Adjacent Property Owner of 34 Hunter Street* Virginia L Knowles 34 Hunter Street Ossining, NY 10562
Adjacent Property Owner/Operator of 19 S Water Street Metallized Carbon Corp 19 S Water Street Ossining, NY 10562	*Adjacent Property Owner of 30 Hunter Street* Fonda Wood 30 Hunter Street Ossining, NY 10562	*Adjacent Property Owner of Hunter Street (97.07.1-45)* Village of Ossining 16 Croton Avenue Ossining, NY 10562

Adjacent Property Owner of 32 Hunter Street Thomas J Petrovich 32 Hunter Street Ossining, NY 10562		

Appendix C - Site Location Map



December 23, 2025

1:1,500

0 70 140 280 ft

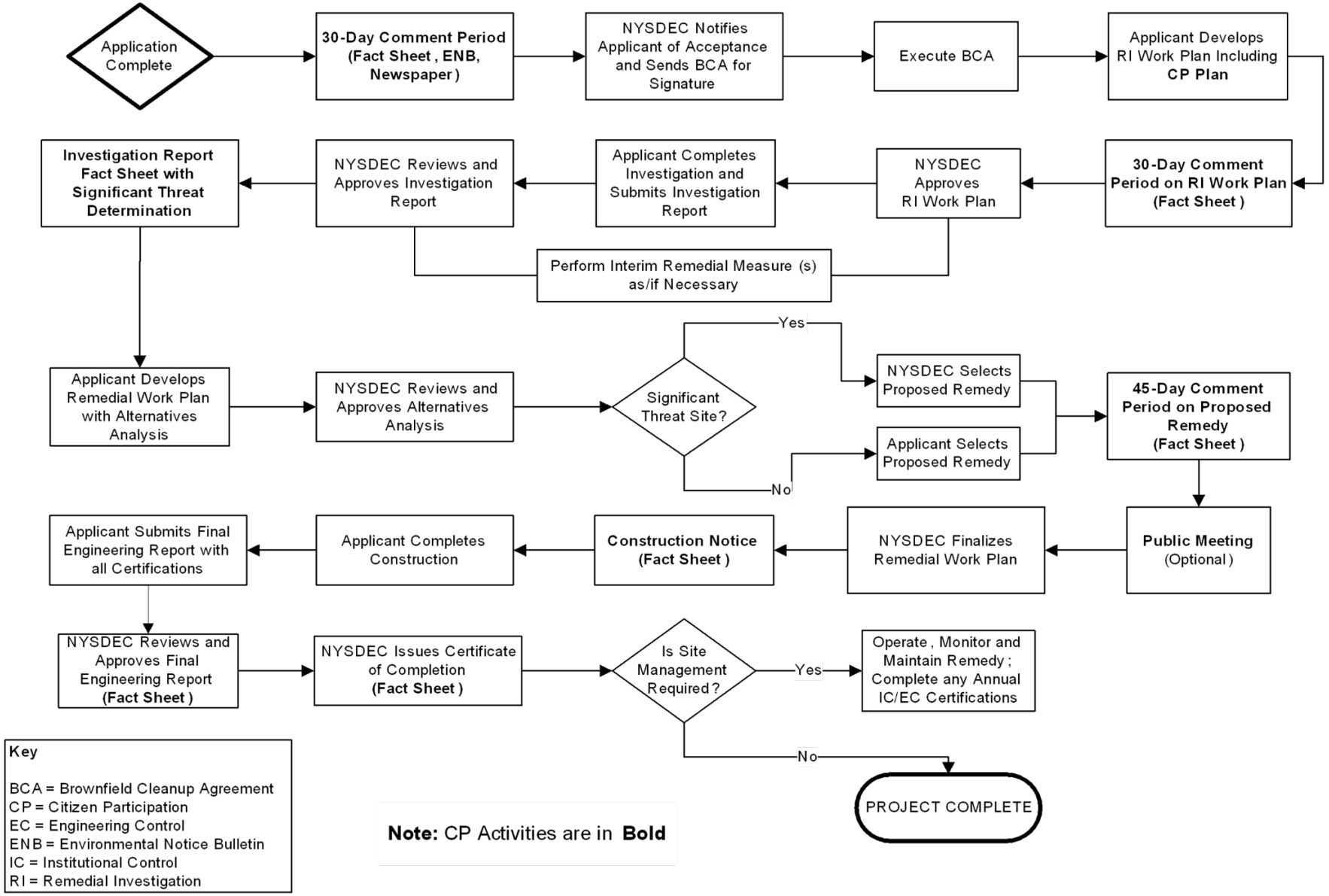
N

Westchester County GIS

http://giswww.westchestergov.com
Michaelian Office Building
148 Martine Avenue Rm 214
White Plains, New York 10601

Tax parcel data was provided by local municipality. This map is generated as a public service to Westchester County residents for general information and planning purposes only, and should not be relied upon as a sole informational source. The County of Westchester hereby disclaims any liability from the use of this GIS mapping system by any person or entity. Tax parcel boundaries represent approximate property line location and should NOT be interpreted as or used in lieu of a survey or property boundary description. Property descriptions must be obtained from surveys or deeds. For more information please contact local municipality assessor's office.

Appendix D – Brownfield Cleanup Program Process



Division of Environmental Remediation

Remedial Programs
Scoping Sheet for Major Issues of Public Concern

Site Name: Former Printex Corporation Site

Site Number: C360263

Site Address and County: 34 State Street, Ossining, NY 10562, Westchester County

Remedial Party: WB 34 State LLC

Note: For Parts 1. – 3. the individuals, groups, organizations, businesses and units of government identified should be added to the site contact list as appropriate.

Part 1. List major issues of public concern and information the community wants. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and information needs.
Major issues of public concern are standards issues communities are concerned with in relation to brownfield site remediation projects.

How were these issues and/or information needs identified?
Concerns in relation to dust, noise and possible odors are standards issues of concern for communities within relation to brownfield site remediation projects.

Part 2. List important information needed from the community, if applicable. Identify individuals, groups, organizations, businesses and/or units of government related to the information needed.
No information is needed at this time from the community.

How were these information needs identified?
N/A

Part 3. List major issues and information that need to be communicated **to** the community. Identify individuals, groups, organizations, businesses and/or units of government related to the issue(s) and/or information.
The major issues that need to be communicated to the community are summarized in this CPP. The community will receive periodic fact sheets that will update them in relation to the work being performed on the site so they can communicate any issues they may observed or may experience to the DEC or DOH.

How were these issues and/or information needs identified?
These issues and/or information needs are standard for all brownfield sites.

Part 4. Identify the following characteristics of the affected/interested community. This knowledge will help to identify and understand issues and information important to the community, and ways to effectively develop and implement the site citizen participation plan (mark all that apply):

a. Land use/zoning at and around site:
☒ **Residential** ☐ **Agricultural** ☐ **Recreational** ☒ **Commercial** ☐ **Industrial**

b. Residential type around site:
☒ **Urban** ☐ **Suburban** ☐ **Rural**

c. Population density around site:
☐ **High** ☒ **Medium** ☐ **Low**

d. Water supply of nearby residences:
☒ **Public** ☐ **Private Wells** ☐ **Mixed**

e. Is part or all of the water supply of the affected/interested community currently impacted by the site?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

f. Other environmental issues significantly impacted/impacting the affected community?
☐ **Yes** ☒ **No**

Provide details if appropriate:
Click here to enter text.

g. Is the site and/or the affected/interested community wholly or partly in an Environmental Justice Area?
☒ **Yes** ☐ **No**

h. Special considerations:
☒ **Language** ☐ **Age** ☐ **Transportation** ☐ **Other**

Explain any marked categories in **h:**
Spanish

Part 5. The site contact list must include, at a minimum, the individuals, groups, and organizations identified in Part 2. of the Citizen Participation Plan under 'Site Contact List'. Are *other* individuals, groups, organizations, and units of government affected by, or interested in, the site, or its remedial program? (Mark and identify all that apply, then adjust the site contact list as appropriate.)

☐ **Non-Adjacent Residents/Property Owners:** Click here to enter text.

☒ **Local Officials:** Click here to enter text.

☒ **Media:** Click here to enter text.

☐ **Business/Commercial Interests:** Click here to enter text.

☐ **Labor Group(s)/Employees:** Click here to enter text.

☐ **Indian Nation:** Click here to enter text.

☐ **Citizens/Community Group(s):** Click here to enter text.

☐ **Environmental Justice Group(s):** Click here to enter text.

☐ **Environmental Group(s):** Click here to enter text.

☐ **Civic Group(s):** Click here to enter text.

☐ **Recreational Group(s):** Click here to enter text.

☐ **Other(s):** Click here to enter text.

Prepared/Updated By: Linda R. Shaw **Date:** 12/25/26

Reviewed/Approved By: Click here to enter text. **Date:** Click here to enter text.

APPENDIX D

HEALTH AND SAFETY PLAN

SESI
CONSULTING ENGINEERS

Geotechnical
Environmental
Site Civil

959 Route 46E, Fl 3, Ste 300
Parsippany, NJ 07054
973.808.9050
www.sesi.org

HEALTH AND SAFETY PLAN
For

Former Printex Corporation Site
Ossining, Westchester County, NY
BCP Site No. C360263

Prepared for:

WB 34 State LLC
February 2026

SESI Project No:
13968

SITE-SPECIFIC HEALTH AND SAFETY PLAN

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

WB 30 State LLC
SESI Project NO.: 13968

Prepared by:

_____

MaryKate Chorazak
SESI - Asst Project Manager

Approved by:

_____

Fuad Dahan, PE
SESI – Principal Engineer

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

HEALTH AND SAFETY PLAN SUMMARY

The chemical hazards associated with site operations are related to inhalation, ingestion, and skin exposure to site Chemicals of Concern (COCs). COCs at the site include Metals and Pesticides. Concentrations of airborne COCs during site tasks may be measurable and will require air monitoring during certain operations.

The potential for inhalation of site COCs is low. The potential for dermal contact with soils containing site COCs during remedial operations is moderate.

The following table summarizes airborne contaminant action levels that will be used to determine the procedures and protective equipment necessary based on conditions as measured at the site.

Parameter	Reading	Action
Dust	0 to .5 mg/m3	Normal operations
	0.5 to 1 mg/m3	Begin soil wetting procedure (Level C protection would be needed beyond this point)
	> 1 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

The level of personal protection selected will be based on air monitoring of the work environment and an assessment by the Field Supervisor and Site Safety Officer. The following table presents a selection matrix to determine appropriate Personal Protective Equipment.

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

1.0 INTRODUCTION

1.1 OBJECTIVE

The objective of this Health and Safety Plan (HASP) is to provide a mechanism for establishing safe working conditions during remedial action activities. 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 incident.

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

This document presents the health and safety plan (HASP) for the Remedial Investigation Work Plan (RIWP) for the proposed development of the property located at 34 State Street, Ossining, Westchester County, New York (the Site). The Site consists of a 4.530-acre area parcel and is identified as Block 2, Lot 17 on the Westchester County tax map. The Site is located in a residential and commercial area and is bounded by a day care center to the north, residential to the south, residential/commercial uses to the east, and residential to the west.

The Site is improved with an asphalt lot, former building footprints, demolition debris, one (1) large three (3) story residential historic house building, one (1) shed and wooded areas. These buildings are currently vacant and abandoned. The Site has been developed since prior to 1892 and historically has been residences, a community center (circa 1929), and a printing company (Printex Corporation of America circa 1940-1981).

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/Sample location stakeout;
- Soil Borings and Monitoring Well Installation;
- Sub-Slab Soil Vapor, Soil Vapor, and Ambient Air Sample Collection;
- Excavation of contaminated soil “hot spots”;
- Earthwork and grading;
- Chemical sampling of soil and groundwater; and
- Decontamination and demobilization/site restoration.

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 1** on page 7.

3.2 KEY SAFETY PERSONNEL

3.2.1 PROJECT OFFICER (PO)

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, the health and safety manager (HSM), 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.).

3.2.6 FIELD PERSONNEL (FP)

All SESI field personnel are responsible for following the Health and Safety procedures specified in this HASP and work practices specified in applicable operation procedures. Some specific responsibilities include, but are not limited to:

- Reading and understanding the HASP;
- Reporting all accidents, incidents, injuries, or illnesses to the FS;
- Complying with the requests of the SSO;
- Immediately communicating newly identified hazards or noncompliance issues to the FS or SSO; and
- Stopping work in cases of immediate danger.

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 constituents 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 1 – Key Safety Personnel

SESI Personnel		
Role	**Name**	**Address/Telephone No.**
Project Officer (PO)		Parsippany, NJ/973-808-9050
Project Manager (PM)	MaryKate Chorazak	Parsippany, NJ/973-808-9050
Senior Project Engineer (SPE)		Parsippany, NJ/973-808-9050
Health and Safety Manager (HSM)	Justin Protasiewicz	Parsippany, NJ/973-808-9050
Site Safety Officer (SSO)	MaryKate Chorazak	Parsippany, NJ/973-808-9050
Field Supervisor (FS)	MaryKate Chorazak	Parsippany, NJ/973-808-9050
Field Personnel	TBD	
Subcontractors		
Company/Role	**Name**	**Address/Telephone No.**
Drilling Subcontractor - TBD	TBD	TBD
Analytical Lab - TBD	TBD	TBD

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 2** on page 11.

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
- 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 RESPIRATORY 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 7, 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 2** below. This matrix is based on information available at the time this plan was written. The Airborne Contaminant Action Levels in **Table 3** on page 12, Airborne Contaminant Action Levels, should be used to verify that the PPE prescribed in these matrices is appropriate.

Table 2 – 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 3 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 3 – 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

Parameter	Reading	Action
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
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 ENTRY 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 (SZ) 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.

6.1.12 SITE INSPECTIONS

The FS will conduct a daily inspection of site activities, equipment, and procedures to verify that the required elements are in place.

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 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-hour refresher course within the past 12 months. The FS must have completed an additional eight 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 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 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 6 to 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 4** below.

Table 4 – 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
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 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 5** below.

Table 5 – 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 PRACTICES

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 found throughout the United States. There is a distinctive red hourglass marking on the underside of the black widows body. 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. The brown recluse is more prevalent in the southern United States. The brown recluse has a distinctive violin shape on the top of its body. 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.

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 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 __X__ Tank _____ Pit _____ Debris
_____ Pond _____ Lagoon Other:

Hazardous Material Characteristics:
__X__ Volatile _____ Corrosive _____ Reactive _____ Radioactive
_____ Ignitable __X__ Toxic _____ Unknown

Routes of Exposure:
__X__ Oral __X__ Dermal __X__ Eye __X__ Respiratory

9.1.2 POTENTIAL HEALTH AND SAFETY HAZARDS

__X__ Heat
__X__ Cold
_____ Confined space entry
_____ Oxygen depletion
_____ Asphyxiation
__X__ Excavation
__X__ Cave-ins
__X__ Falls, slippage
__X__ Heavy equipment
_____ Other: Potential Ignition Hazard.

_____ Congested areas
__X__ General Construction
__X__ Physical injury
__X__ Electrical hazards
__X__ Handling and product transfer
__X__ Fire
__X__ Explosion
__X__ Biological Hazards
__X__ Plants – Poison Ivy, Poison Oak
__X__ Insects – Ticks
__X__ Insects – Mosquitoes
__X__ Insects – Bees and Wasps
__X__ Rats and Mice
_____ Non-ionizing Radiation (i.e. UV, IR, etc.)

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 4.9.

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 offsite 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. 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 follows:

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 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. 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

Working in confined spaces in not anticipated for this project.

Hazard Identification

Hazard identification such as the entrance into confined spaces will be evaluated if necessary.

Controls

All personnel required to enter into 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.

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. COCs at the site include PAHs, Metals and PCBs..

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 6 lists the primary contaminants that have been identified at the Site and the media in which they are present.

Table 6 – List of Primary Contaminants

Media: Soil		
PAHs	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
benzo(a)anthracene	6.0	Not Applicable
benzo(a)pyrene	6.2	Not Applicable
benzo(b)fluoranthene	8.2	Not Applicable
chrysene	5.8	Not Applicable
dibenzo(a,h)anthracene	0.94	Not Applicable
indeno(1,2,3-cd)pyrene	4.2	Not Applicable
PCBs	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
Aroclor 1260	2.48	Not Applicable
Total PCBs	2.48	Not Applicable
PAHs	**Maximum Concentration (mg/kg)**	**Applicable Monitoring Instrument**
Barium	1,160	Not Applicable
Cadmium	4.99	Not Applicable
Copper	3,840	Not Applicable
Lead	2,180	Not Applicable
Manganese	19,400	Not Applicable
Mercury	1.5	Not Applicable

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 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

The 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 7** below.

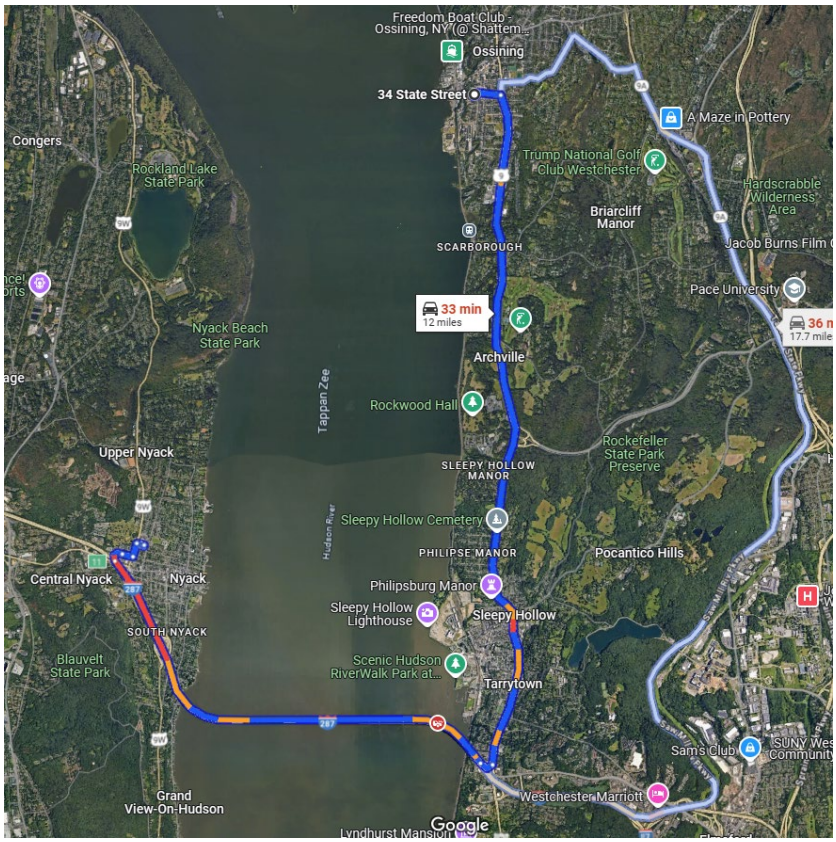
Table 7 – Emergency Contacts

Local Emergency Contacts	**Telephone No.**
EMERGENCY	911
Montefiore Nayak Hospital	(845) 348-2000
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

Montefiore Nayak Hospital
160 N Midland Ave, Nyack, NY 10960
(845) 348-2000

Fig-1: Direction to Hospital


Freedom Boat Club - Ossining, NY (@ Shattem...
Ossining
34 State Street
A Maze in Pottery
Congers
Rockland Lake State Park
Trump National Golf Club Westchester
Hardscrabble Wilderness Area
Briarcliff Manor
SCARBOROUGH
Jacob Burns Film
Pace University
33 min
12 miles
36 m
17.7 mile
Nyack Beach State Park
Archville
Tappan Zee
Rockwood Hall
Upper Nyack
Rockefeller State Park Preserve
SLEEPY HOLLOW MANOR
Sleepy Hollow Cemetery
Hudson River
PHILIPSE MANOR
Pocantico Hills
Central Nyack
Nyack
Philipsburg Manor
Sleepy Hollow Lighthouse
Sleepy Hollow
SOUTH NYACK
Blauvelt State Park
Scenic Hudson RiverWalk Park at...
Tarrytown
Sam's Club
SUNY Wes Community
Grand View-On-Hudson
Westchester Marriott
Google
Lyndhurst Mansion

34 State St
Ossining, NY 10562

Take Broad Ave to US-9 S/Albany Post Rd/S Highland Ave

2 min (0.3 mi)

1. Head south toward State St

295 ft

2. Turn left onto State St

135 ft

3. Turn right onto Broad Ave

0.2 mi

Follow US-9 S and I-287 W/I-87 N to Nyack

21 min (11.6 mi)

4. Turn right onto US-9 S/Albany Post Rd/S Highland Ave
   - Continue to follow US-9 S
   - Pass by KeyBank (on the right in 5.6 mi)

6.6 mi

5. Slight right onto the I-287 N ramp

0.2 mi

6. Merge onto I-287 W/I-87 N

4.5 mi

7. Take exit 11 toward US-9W/Nyack

0.1 mi

8. Continue onto High Ave

0.1 mi

9. Turn left onto N Highland Ave

0.1 mi

Drive to your destination

59 sec (0.1 mi)

10. Turn right

289 ft

11. Turn right

62 ft

12. Turn left

82 ft

13. Turn left

62 ft

14. Turn left
    - Destination will be on the right

39 ft

Montefiore Nyack Hospital
160 N Midland Ave, Nyack, NY 10960

11.0 LOGS, REPORTS, AND RECORD KEEPING

The following is a summary of required health and safety logs, reports, and record keeping for the operations at the subject site.

11.1 HASP FIELD CHANGE REQUEST

To be completed for initiating a change to the HASP. PM approval is required. The original will be kept in the project file (See 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 the 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 LOGBOOKS

The HSM or designee will maintain an on-site health and safety log book 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 SAFETY DATA SHEETS

Safety Data Sheets (SDS) 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-19 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 (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 (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 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

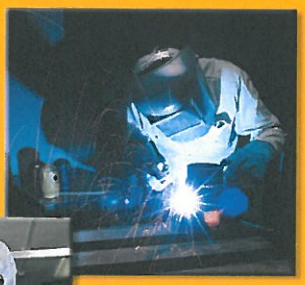
Attachment 2:
OSHA Poster

Job Safety and Health

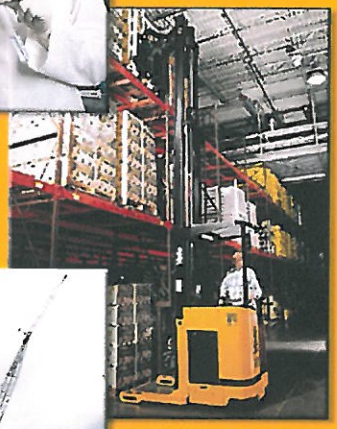
It's the law!

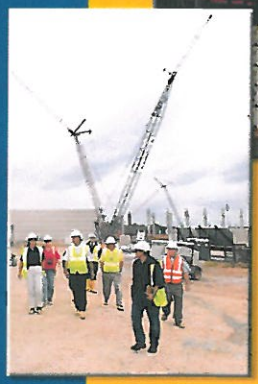
OSHA®

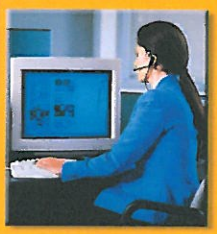
Occupational Safety and Health Administration
U.S. Department of Labor











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	☐	☐	☐	☐	☐	☐
Page totals ➤						____	____	____	____	____	____	____	____	____	____	____	____

Be sure to transfer these totals to the Summary page (Form 300A) before you post it.

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.

Injury (1) Skin disorder (2) Respiratory condition (3) Poisoning (4) Hearing loss (5) All other illnesses (6)

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:

Material Safety Data Sheets

SAFETY DATA SHEET

Version 6.6
Revision Date 12/07/2023
Print Date 01/28/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : 1,2,4-Trimethylbenzene

Product Number : T73601
Brand : Aldrich
Index-No. : 601-043-00-3
CAS-No. : 95-63-6

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 ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 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
Eye irritation (Category 2A), H319
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Aspiration hazard (Category 1), H304
Short-term (acute) aquatic hazard (Category 2), H401
Long-term (chronic) aquatic hazard (Category 2), H411

For the full text of the H-Statements mentioned in this Section, see Section 16.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Danger

Hazard Statements

H226	Flammable liquid and vapor.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H411	Toxic to aquatic life with long lasting effects.

Precautionary Statements

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/ vapors/ 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.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P331	Do NOT induce vomiting.
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.
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

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SECTION 3: Composition/information on ingredients

3.1 Substances

Formula	:	C_9H_{12}
Molecular weight	:	120.19 g/mol
CAS-No.	:	95-63-6
EC-No.	:	202-436-9
Index-No.	:	601-043-00-3

Component	Classification	Concentration
1,2,4-Trimethylbenzene		
	Flam. Liq. 3; Acute Tox. 4; Skin Irrit. 2; Eye Irrit. 2A; STOT SE 3; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 2; H226, H332, H315, H319, H335, H304, H401, H411	<= 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 material 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

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SECTION 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.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors 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.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.

Advice on protection against fire and explosion
Keep away from sources of ignition - No smoking.Take measures to prevent the build up of electrostatic charge.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

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For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
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
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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
1,2,4-Trimethylbenzene	95-63-6	TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Not classifiable as a human carcinogen		
		TWA	25 ppm 125 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	25 ppm 125 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: Fluorinated rubber
Minimum layer thickness: 0.7 mm

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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: 30 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 EC 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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: liquid, clear Color: colorless
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	-43.7 °C (-46.7 °F)
f)	Initial boiling point and boiling range	168.0 - 169.0 °C 334.4 - 336.2 °F
g)	Flash point	48.0 °C (118.4 °F) - closed cup
h)	Evaporation rate	No data available

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i)	Flammability (solid, gas)	No data available
j)	Upper/lower flammability or explosive limits	Upper explosion limit: 6.4 %(V) Lower explosion limit: 0.9 %(V)
k)	Vapor pressure	2.3 hPa at 20.0 °C (68.0 °F)
l)	Vapor density	No data available
m)	Density	0.88 g/cm3
	Relative density	No data available
n)	Water solubility	0.057 g/l at 25 °C (77 °F) - slightly soluble
o)	Partition coefficient: n-octanol/water	No data available
p)	Autoignition temperature	515.0 °C (959.0 °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

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
Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male - 6,000 mg/kg
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
Remarks: No data available

Serious eye damage/eye irritation
Remarks: No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
Test Type: in vitro test
Test system: S. typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: In vivo micronucleus test
Species: Rat
Cell type: Bone marrow
Application Route: Intraperitoneal
Method: Mutagenicity (micronucleus test)
Result: negative

Carcinogenicity

IARC:	No ingredient 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 ingredient 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

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11.2 Additional Information

RTECS: DC3325000
prolonged or repeated exposure can cause:, narcosis, Bronchitis., Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Central nervous system -

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Pimephales promelas (fathead minnow) - 7.72 mg/l - 96.0 h
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - 3.6 mg/l - 48 h (OECD Test Guideline 202)

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 Endocrine disrupting properties

No data available

12.7 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.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
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

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igniting as this material is highly flammable. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

DOT (US)
UN number: 3295 Class: 3 Packing group: III
Proper shipping name: Hydrocarbons, liquid, n.o.s.
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 3295 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: HYDROCARBONS, LIQUID, N.O.S.

IATA
UN number: 3295 Class: 3 Packing group: III
Proper shipping name: Hydrocarbons, liquid, n.o.s.

SECTION 15: Regulatory information

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
1,2,4-Trimethylbenzene	95-63-6	2007-07-01

SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
1,2,4-Trimethylbenzene	95-63-6	2007-07-01

	CAS-No.	Revision Date
1,2,4-Trimethylbenzene	95-63-6	2007-07-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
1,2,4-Trimethylbenzene	95-63-6	2007-07-01

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1,2,4-Trimethylbenzene	CAS-No. 95-63-6	Revision Date 2007-07-01

New Jersey Right To Know Components

1,2,4-Trimethylbenzene	CAS-No. 95-63-6	Revision Date 2007-07-01

SECTION 16: Other information

Further information

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The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. 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: 6.6 Revision Date: 12/07/2023 Print Date: 01/28/2024

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1.Identification

Product name:	1,3,5-Trimethylbenzene
Catalog#:	X8424
IUPAC name:	1,3,5-trimethylbenzenef
Product use restrictions:	Only for research and development use by, or directly under the supervision of, a technically qualified individual.
Company:	AK Scientific, Inc. 30023 Ahern Ave. Union City, CA 94587
Telephone:	(510) 429-8835
Fax:	(510) 429-8836
Website:	www.aksci.com
Emergency contact number:	1-800-633-8253 United States & Canada 1-801-629-0667 International

2.Hazard Identification:

GHS Classification (United States)

Skin Corrosion/Irritation (Category 2)
Eye Damage/Irritation (Category 2B)
Specific Target Organ Toxicity (Single Exposure) (Category 3)
Aspiration Hazard (Category 1)
Flammable Liquids (Category 3)
Aquatic Hazard (Acute) (Category 2)
Aquatic Hazard (Long-Term) (Category 2)

Pictogram(s)



Signal word:

Danger!

Hazard statement(s)

H226	Flammable liquid and vapor.
H315	Causes skin irritation.
H320	Causes eye irritation.
H304	May be fatal if swallowed and enters airways.
H401	Toxic to aquatic life.
H411	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/vapors/spray.
P271	Use only outdoors or in a well-ventilated area.
P273	Avoid release to the environment.
P264	Wash skin thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310+P330	If swallowed: Immediately call a poison center or doctor. Rinse mouth.

P331	Do NOT induce vomiting.
P352	Wash with plenty of soap and water.
P332+P313	If skin irritation occurs: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P304+P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a poison center or doctor if you feel unwell.
P351	Rinse cautiously with water for several minutes.
P338	Remove contact lenses, if present and easy to do. Continue rinsing.
P331	Do NOT induce vomiting.
P337+P313	If eye irritation persists: Get medical advice/attention.
P370+P378	In case of fire: Use dry sand, dry chemical, CO2, water spray or alcohol-resistant foam for extinction.
P391	Collect spillage.
P403	Store in a well-ventilated place.
P233	Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal plant.

Hazards not otherwise classified (HNOC) or not covered by GHS:

None

3.Composition/Information on Ingredients

Synonyms:	Not available.
CAS#:	108-67-8
Purity:	99.5% (GC)
EC:	Not available.

4. First Aid Measures

General Information: Immediately remove any clothing contaminated by the product. Move out of dangerous area. Consult a physician and show this safety data sheet.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical aid.

Skin contact: Immediately flush skin with running water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Obtain medical aid immediately.

Eye contact: Immediately flush open eyes with running water for at least 15 minutes. Obtain medical aid immediately.

Ingestion: Do NOT induce vomiting without medical advice. Rinse mouth with water. Never administer anything by mouth to an unconscious person. Obtain medical aid immediately.

Most important symptoms and effects, both acute and delayed: No further information available. Please see sections 2 and 11.

Indication of any immediate medical attention and special treatment needed: No further information available.

5. Fire Fighting Measures

Suitable extinguishing media: Use water spray, dry chemical, carbon dioxide, or chemical foam.

Specific hazards arising from the chemical: Carbon oxides.

Advice for firefighters: As in any fire, wear a NIOSH-approved or equivalent, pressure-demand, self-contained breathing apparatus and full protective gear. During a fire, irritating and highly toxic

gases may be generated by thermal decomposition or combustion.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Wear protective equipment and keep unprotected personnel away. Ensure adequate ventilation. Remove all sources of ignition. Prevent further leak or spill if safe to do so. For personal protective equipment, please refer to section 8.

Environmental precautions: Do not let product enter drains, other waterways, or soil.

Methods and materials for containment and cleaning up: Prevent further leak or spill if safe to do so. Vacuum, sweep up, or absorb with inert material and place into a suitable disposal container. Consult local regulations for disposal. See section 13 for further disposal information.

7. Handling and Storage

Precautions for safe handling: Avoid contact with skin, eyes, and personal clothing. Wash hands thoroughly after handling. Avoid breathing fumes. Use only with adequate ventilation. Wear suitable protective clothing, gloves, and eye/face protection. Keep away from sources of ignition. Minimize dust generation and accumulation. Keep container tightly closed. Open and handle container with care. Do not eat, drink, or smoke while handling.

Conditions for safe storage, including any incompatibilities: Store in a tightly-closed container when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from sources of ignition. ,Store long-term in a cool, dry place.

8. Exposure Controls/Personal Protection

Exposure limits:

OSHA PEL: none
NIOSH REL: TWA 25 ppm (125 mg/m3)
ACGIH TLV: Not available.

Appropriate engineering controls: Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling the product. Facilities storing or utilizing this material should be equipped with an eyewash fountain. Use adequate general and local exhaust ventilation to keep airborne concentrations low.

Personal protection

Eyes:	Based on an evaluation of the eye or face hazards present, wear chemical splash-resistant safety glasses or goggles with side protection. A face shield may be appropriate in some workplaces. Use eyewear tested and approved under appropriate government standards such as OSHA 29 CFR 1910.133 or EU EN166.
Hands:	Wear gloves selected based on an evaluation of the possible hazards to hands and skin, the duration of use, the physical conditions of the workplace, and the chemical resistance and physical properties of the glove material.
Skin and body:	Protective clothing must be selected based on the hazards present in the workplace, the physical environment, the duration of exposure, and other factors. No fabric can provide protection against all potential hazards; therefore it is important to select the appropriate protective clothing for each specific hazard. At the minimum, wear a laboratory coat and close-toed footwear.
Respiratory:	Respirators are not a substitute for accepted engineering control measures such as enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials. When respiratory personal protective equipment is appropriate based on an assessment of respiratory hazards in the workplace, use a NIOSH- or CEN-certified respirator.

9. Physical and Chemical Properties

Physical State:	Colorless clear liquid
Molecular Formula:	C9H12
Molecular Weight:	120.19
Odor:	Not available.
pH:	Not available.
Boiling Point Range:	164°C
Freezing/Melting Point:	Not available.
Flash Point:	50°C
Evaporation Rate:	Not available.
Flammability(solid,gas):	Please see section 2.
Explosive limits:	Not available.
Vapor Pressure:	Not available.
Vapor Density:	Not available.
Solubility:	Water: Insoluble (48.2mg/L, 25°C)
Relative Density:	0.865
Refractive Index:	1.5
Volatility:	Not available.
Auto-ignition Temperature:	Not available.
Decomposition Temperature:	Not available.
Partition Coefficient:	Not available.

10. Stability and Reactivity

Reactivity:	Not available.
Chemical stability:	Stable under recommended temperatures and pressures.
Possibility of hazardous reactions:	Not available.
Conditions to avoid:	Dust generation.
Incompatible materials:	Strong oxidizing agents.
Hazardous decomposition products:	Carbon oxides.

11. Toxicological Information

RTECS#	OX6825000
Acute toxicity:	ihl-hmn TCLo:10 ppm;ihl-rat LC50:24000 mg/m3/4H ipr-gpg LDLo:1303 mg/kg;orl-rat LD50:5000 mg/kg;
Routes of exposure:	Inhalation,eye contact,skin contact,ingestion.
Symptoms related to the physical,chemical and toxicological characteristics:	Skin contact may result in inflammation characterized by itching, scaling, reddening, blistering, pain or dryness. Eye contact may result in redness, pain or severe eye damage. Inhalation may cause irritation of the lungs and respiratory system. Overexposure may result in serious illness or death.

Carcinogenicity

IARC:	Not classified.
NTP:	Not listed.
OSHA:	Not listed.
Acute toxic effects:	Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

12. Ecological Information

Ecotoxicity:	Toxicity to Fish: 48h LC50:8.6 ppm (Oryzias latipes);
Persistence and degradability:	Not available.
Bioaccumulative potential:	Not available.

Mobility in soil: Not available.
Other adverse effects: Not available.

13. Disposal Considerations

Disposal of waste: Chemical waste generators must determine whether a discarded chemical is classified as hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. Observe all federal, state and local regulations when disposing of the substance.

Disposal of packaging: Do not reuse containers. Dispose of as unused product.

14. Transportation Information

DOT (United States)

UN number:	UN2325
Proper shipping name:	1,3,5-Trimethylbenzene
Transport hazard class:	3;Flammable Liquid
Packing group:	III

IATA

UN Number:	UN2325
Proper shipping name:	1,3,5-Trimethylbenzene
Transport hazard class:	3;Flammable Liquid
Packing group:	III

15. Regulatory Information

TSCA (United States)

This product is on the EPA Toxic Substance Control Act (TSCA) inventory. The product is supplied solely for use in research and development by or under the supervision of a technically qualified individual as defined in 40 CFR § 720 et seq. The health risks have not been fully determined. Any information that is or becomes available will be supplied on the SDS.

California Proposition 65:	Not Available..	
NFPA Rating:	Health:	2
	Flammability:	2
	Instability:	0

16. Additional Information

Revision Date: 09/14/2021
Printed Date: 09/14/2021

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 AK Scientific 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 AK Scientific has been advised of the possibility of such damages.

Safety Data Sheet
acc. to OSHA HCS

Printing date 03/24/2019 Version Number 2 Reviewed on 03/24/2019

*

1 Identification

· **Product identifier**

· **Trade name: 2-Butanone (MEK)**

· **Part number:** RCC-205
· **CAS Number:**
78-93-3
· **EC number:**
201-159-0
· **Index number:**
606-002-00-3
· **Application of the substance / the mixture** Reagents and Standards for Analytical Chemical Laboratory Use

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Agilent Technologies, Inc.
5301 Stevens Creek Blvd.
Santa Clara, CA 95051 USA

· **Information department:**
Telephone: 800-227-9770
e-mail: pdl-msds_author@agilent.com
· **Emergency telephone number:** CHEMTREC®: 1-800-424-9300

2 Hazard(s) identification

· **Classification of the substance or mixture**


GHS02 Flame

Flam. Liq. 2 H225 Highly flammable liquid and vapor.


GHS07

Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H336 May cause drowsiness or dizziness.

· **Label elements**
· **GHS label elements** The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**



GHS02 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**
butanone
· **Hazard statements**
Highly flammable liquid and vapor.
Causes serious eye irritation.

(Contd. on page 2)

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Trade name: 2-Butanone (MEK)

(Contd. of page 1)

May cause drowsiness or dizziness.

· **Precautionary statements**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting/equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/fume/gas/mist/vapors/spray
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call a poison center/doctor if you feel unwell.
If eye irritation persists: Get medical advice/attention.
In case of fire: Use for extinction: CO2, powder or water spray.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 2
Fire = 3
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
78-93-3 butanone
· **Identification number(s)**
· **EC number:** 201-159-0
· **Index number:** 606-002-00-3

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4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:** Supply fresh air; consult doctor in case of complaints.
· **After skin contact:** Immediately rinse with water.
· **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:** If symptoms persist consult doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
· **For safety reasons unsuitable extinguishing agents:** Water with full jet
· **Special hazards arising from the substance or mixture** No further relevant information available.
· **Advice for firefighters**
· **Protective equipment:** No special measures required.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**
200 ppm
· **PAC-2:**
2700* ppm
· **PAC-3:**
4000* ppm

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7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Store in a cool location.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in cool, dry conditions in well sealed receptacles.
· **Specific end use(s)** No further relevant information available.

*
8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
78-93-3 butanone	
PEL	Long-term value: 590 mg/m³, 200 ppm
REL	Short-term value: 885 mg/m³, 300 ppm Long-term value: 590 mg/m³, 200 ppm
TLV	Short-term value: 885 mg/m³, 300 ppm Long-term value: 590 mg/m³, 200 ppm BEI

· **Ingredients with biological limit values:**	
78-93-3 butanone	
BEI	2 mg/L Medium: urine Time: end of shift Parameter: MEK

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
When used as intended with Agilent instruments, the use of the product under normal laboratory conditions and with standard practices does not result in significant airborne exposures and therefore respiratory protection is not

(Contd. on page 5)

(Contd. of page 4)

needed.
Under an emergency condition where a respirator is deemed necessary, use a NIOSH or equivalent approved device/equipment with appropriate organic or acid gas cartridge.

· **Protection of hands:**
Although not recommended for constant contact with the chemicals or for clean-up, nitrile gloves 11-13 mil thickness are recommended for normal use. The breakthrough time is 1 hr. For cleaning a spill where there is direct contact of the chemical, butyl rubber gloves are recommended 12-15 mil thickness with breakthrough times exceeding 4 hrs. Supplier recommendations should be followed.

· **Material of gloves**
For normal use: nitrile rubber, 11-13 mil thickness
For direct contact with the chemical: butyl rubber, 12-15 mil thickness
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· **Penetration time of glove material**
For normal use: nitrile rubber: 1 hour
For direct contact with the chemical: butyl rubber: >4 hours

· **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Fluid
Color:	Colorless
· **Odor:**	Pleasant
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	-87 °C (-124.6 °F)
Boiling point/Boiling range:	90 °C (194 °F)
· **Flash point:**	-3 °C (26.6 °F)
· **Flammability (solid, gaseous):**	Not applicable.
· **Ignition temperature:**	514 °C (957.2 °F)
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Not determined.
· **Danger of explosion:**	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· **Explosion limits:**	
Lower:	1.8 Vol %
Upper:	11.5 Vol %

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Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 5)

· **Vapor pressure at 20 °C (68 °F):**	95 hPa (71.3 mm Hg)
· **Density at 20 °C (68 °F):**	0.8 g/cm³ (6.676 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with Water at 20 °C (68 °F):**	290 g/l
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic at 20 °C (68 °F):	0.4 mPas
Kinematic:	Not determined.
Organic solvents:	100.0 %
VOC content:	100.00 % 800.0 g/l / 6.68 lb/gal
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
· **Possibility of hazardous reactions** No dangerous reactions known.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** No further relevant information available.
· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**		
ATE (Acute Toxicity Estimate)		
Oral	LD50	2,737 mg/kg (rat)

78-93-3 butanone		
Oral	LD50	2,737 mg/kg (rat)
Dermal	LD50	6,480 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** Irritating effect.
· **Sensitization:** No sensitizing effects known.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 6)

· **Additional toxicological information:**

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**
Substance is not listed.

· **NTP (National Toxicology Program)**
Substance is not listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **UN-Number**	
· **DOT, IMDG, IATA**	UN1193

· **UN proper shipping name**	
· **DOT**	Ethyl methyl ketone
· **IMDG, IATA**	ETHYL METHYL KETONE (METHYL ETHYL KETONE)

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

(Contd. of page 7)

· **Transport hazard class(es)**

· **DOT, IMDG, IATA**



· **Class**	3 Flammable liquids
· **Label**	3
· **Packing group**	
· **DOT, IMDG, IATA**	II
· **Environmental hazards:**	Not applicable.
· **Special precautions for user**	Warning: Flammable liquids
· **Danger code (Kemler):**	33
· **EMS Number:**	F-E,S-D
· **Stowage Category**	B
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **Hazardous substance:**	5000 lbs, 2270 kg
· **IMDG**	
· **Limited quantities (LQ)**	1L
· **Excepted quantities (EQ)**	Code: E2 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 1193 ETHYL METHYL KETONE (METHYL ETHYL KETONE), 3, II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**

Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**

Substance is listed.

· **TSCA (Toxic Substances Control Act):**

Substance is listed.

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

Trade name: 2-Butanone (MEK)

(Contd. of page 8)

· **Proposition 65**

· **Chemicals known to cause cancer:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**

Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**

Substance is not listed.

· **Chemicals known to cause developmental toxicity:**

Substance is not listed.

· **Carcinogenic categories**

· **EPA (Environmental Protection Agency)**

I

· **TLV (Threshold Limit Value established by ACGIH)**

Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

Substance is not listed.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*
16 Other information

The information contained in this document is based on Agilent's state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

· **Department issuing SDS:** Document Control / Regulatory
· **Contact:** regulatory@ultrasci.com
· **Date of preparation / last revision** 03/24/2019 / 1
· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 2: Flammable liquids – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
· *** Data compared to the previous version altered.**

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 5.6
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 6.0
Revision Date 06/17/2019
Print Date 07/17/2019

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : AROCLOR 1260

Product Number : CRM48736
Brand : Supelco

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)

Carcinogenicity (Category 1B), 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)
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.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

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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

3.2 Mixtures

Component		Classification	Concentration
Distillates (petroleum), hydrotreated middle			
CAS-No. EC-No. Index-No.	64742-46-7 265-148-2 649-221-00-X	Carc. 1B; H350	>= 90 - <= 100 %
Baseoil - unspecified			
CAS-No. EC-No. Index-No.	64742-53-6 265-156-6 649-466-00-2	Carc. 1B; H350	>= 30 - < 50 %
2,6-di-tert-Butyl-p-cresol			
CAS-No. EC-No. Registration number	128-37-0 204-881-4 01-2119565113-46-XXXX	Aquatic Chronic 1; H410 M-Factor - Aquatic Acute: 1 M-Factor - Aquatic Chronic: 1	>= 0.1 - < 1 %

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.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.

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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
Nature of decomposition products not known.

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
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.

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.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
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 at room temperature.
Storage class (TRGS 510): 6.1C: Combustible, acute toxic Cat.3 / toxic compounds or compounds which causing chronic effects

7.3 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

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Distillates (petroleum), hydrotreated middle	64742-46-7	TWA	500.000000 ppm 2,000.000000 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	Remarks	The value in mg/m3 is approximate.		
		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 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		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
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		As sampled by method that does not collect vapor.		
Baseoil - unspecified	64742-53-6	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		

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		TWA	5 mg/m3	USA. NIOSH Recommended Exposure Limits
		ST	10 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		As sampled by method that does not collect vapor.		
2,6-di-tert-Butyl-p-cresol	128-37-0	TWA	2 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		Upper Respiratory Tract irritation Not classifiable as a human carcinogen		
		TWA	10 mg/m3	USA. NIOSH Recommended Exposure Limits
		PEL	10 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
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
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.

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SECTION 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	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

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No data available

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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. - Nature of decomposition products not known.
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

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

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

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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
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
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. 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

SECTION 15: Regulatory information

SARA 302 Components

The life science business of Merck KGaA, Darmstadt, Germany
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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
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Distillates (petroleum), hydrotreated middle	64742-46-7	1989-08-11
Baseoil - unspecified	64742-53-6	2016-09-09

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: 06/17/2019 Print Date: 07/17/2019

The life science business of Merck KGaA, Darmstadt, Germany
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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 6.7
Revision Date 02/07/2023
Print Date 02/17/2023

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : BENZO(GHI)PERYLENE

Product Number : 12740
Brand : Sigma-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 ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

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.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

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 - 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		
	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 material 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

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

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 vapors, 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

Advice on 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.

Advice on protection against fire and explosion
Provide appropriate exhaust ventilation at places where dust is formed.

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Keep container tightly closed in a dry and well-ventilated place.

Light sensitive. Store under inert gas.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Storage class
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

Ingredients with workplace control parameters

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)

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

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

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 EC 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)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point/range: 276 - 279 °C (529 - 534 °F)
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)	Vapor pressure	No data available
l)	Vapor density	No data available

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m)	Density	No data available
	Relative density	No data available
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	log Pow: 6.22 at 25 °C (77 °F)
p)	Autoignition 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
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
Oral: No data available
Inhalation: No data available
Dermal: No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

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operates as MilliporeSigma in the US and Canada

Respiratory or skin sensitization
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 ingredient 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 ingredient 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

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: Ecological information

12.1 Toxicity

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
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 Endocrine disrupting properties
No data available

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operates as MilliporeSigma in the US and Canada

12.7 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
Marine pollutant : no

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.Packages smaller than or equal to 5 kg / L , not dangerous goods of Class 9

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	2020-07-14

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components

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	CAS-No.	Revision Date
Benzo[ghi]perylene	191-24-2	2020-07-14

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
Benzo[ghi]perylene	191-24-2	2020-07-14

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.

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 6.7 Revision Date: 02/07/2023 Print Date: 02/17/2023

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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 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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operates as MilliporeSigma in the US and Canada

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.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

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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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 6.6
Revision Date 09/06/2022
Print Date 01/13/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

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 ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

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 2), H300
Acute toxicity, Dermal (Category 1), H310
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Oral (Category 1), H372
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



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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.
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

SECTION 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

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, H400, H410 M-Factor - Aquatic Acute: 100	<= 100 %

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	M-Factor - Aquatic Chronic: 10	

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
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible.

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
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture

Carbon oxides
Hydrogen chloride gas
Combustible.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

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5.4 Further information

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
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

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

Tightly closed. Dry. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Storage class

Storage class (TRGS 510): 6.1A: 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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

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Component	CAS-No.	Value	Control parameters	Basis
Dieldrin	60-57-1	TWA	0.1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	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 Potential for dermal absorption		
		TWA	0.25 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		Skin designation		
		PEL	0.25 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		Skin		

8.2 Exposure controls

Appropriate engineering controls

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

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). Safety glasses

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 EC 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

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customers. It should not be construed as offering an approval for any specific use scenario.

Body Protection
protective clothing

Respiratory protection
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odor	No data available
c)	Odor 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	()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)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	No data available
	Relative density	No data available
n)	Water solubility	slightly soluble
o)	Partition coefficient: n-octanol/water	No data available
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available

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s) Explosive properties No data available

t) Oxidizing properties none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
The following applies in general to flammable organic substances and mixtures: in correspondingly fine distribution, when whirled up a dust explosion potential may generally be assumed.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Violent reactions possible with:
Strong oxidizing agents

10.4 Conditions to avoid
no information 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
LD50 Oral - Rat - 38.3 mg/kg
Remarks: (RTECS)
Inhalation: No data available
Acute toxicity estimate Dermal - 5.1 mg/kg
(Expert judgment)
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
Suspected of causing cancer.

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IARC: 2A - Group 2A: Probably carcinogenic to humans (Dieldrin)

NTP: No ingredient 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

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.Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

Aspiration hazard
No data available

11.2 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

Stomach - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	static test LC50 - Lepomis cyanellus - 0.011 mg/l - 96 h Remarks: (ECOTOX Database)

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 Endocrine disrupting properties
No data available

12.7 Other adverse effects
Discharge into the environment must be avoided.

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SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 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: yes 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

SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

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.

SECTION 16: Other information

Further information
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

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Version: 6.6 Revision Date: 09/06/2022 Print Date: 01/13/2024

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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

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

	CAS-No.	Revision Date
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 6.1
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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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 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 6.10
Revision Date 09/06/2024
Print Date 09/07/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Nickel

Product Number : 203904
Brand : Aldrich
Index-No. : 028-002-01-4
CAS-No. : 7440-02-0

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Skin sensitization (Category 1), H317
Carcinogenicity (Category 2), H351
Specific target organ toxicity - repeated exposure, Inhalation (Category 1), Lungs, H372

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Short-term (acute) aquatic hazard (Category 3), H402
Long-term (chronic) aquatic hazard (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 Statements

H317	May cause an allergic skin reaction.
H351	Suspected of causing cancer.
H372	Causes damage to organs (Lungs) through prolonged or repeated exposure if inhaled.
H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing must 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.
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

Formula	:	Ni
Molecular weight	:	58.69 g/mol
CAS-No.	:	7440-02-0
EC-No.	:	231-111-4
Index-No.	:	028-002-01-4

Component	Classification	Concentration
nickel powder; [particle diameter < 1 mm]		
	Skin Sens. 1; Carc. 2;	<= 100 %

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	STOT RE 1; Aquatic Acute 3; Aquatic Chronic 3; H317, H351, H372, H402, H412	

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
Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). 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 extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Nickel/nickel oxides
Not combustible.
Ambient fire may liberate hazardous vapours.

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5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid generation and inhalation of dusts in all circumstances. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.Take precautionary measures against static discharge.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.

Keep in a dry place. Handle and store under inert gas.

Storage class
Storage class (TRGS 510): 4.1B: Flammable solid hazardous materials

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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

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
nickel powder; [particle diameter < 1 mm]	7440-02-0	TWA	1.5 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Not suspected as a human carcinogen		
		PEL	0.5 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		TWA	1 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
		TWA	0.015 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen		

Biological occupational exposure limits

Component	CAS-No.	Parameters	Value	Biological specimen	Basis
nickel powder; [particle diameter < 1 mm]	7440-02-0	Nickel	5 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
	Remarks	End of shift at end of workweek			
		Nickel	30 µg/l	Urine	ACGIH - Biological Exposure Indices (BEI)
		End of shift at end of workweek			

8.2 Exposure controls

Appropriate engineering controls

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

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). Safety glasses

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Skin protection
Handle with impervious gloves.

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
Recommended Filter type: Filter type P3
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Color: gray
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point: 1,455 °C (2,651 °F)
f)	Initial boiling point and boiling range	2,730 °C 4,946 °F

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g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	The substance or mixture is a flammable solid with the category 2.
j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	1 hPa at 1,810 °C (3,290 °F)
l)	Vapor density	No data available
m)	Density	8.9 g/mL at 25 °C (77 °F)
	Relative density	No data available
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	Not applicable for inorganic substances
p)	Autoignition temperature	No data available
q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
acids, Oxidizing agents, Sulfur compounds, Hydrogen gas, Oxygen, Methanol, organic solvents, Aluminum, Fluorine, Ammonia

10.6 Hazardous decomposition products
In the event of fire: see section 5

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SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - > 9,000 mg/kg
(OECD Test Guideline 401)
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 4 h
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(OECD Test Guideline 405)

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available
Test Type: gene mutation test
Test system: Chinese hamster fibroblasts
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: Micronucleus test
Test system: Chinese hamster fibroblasts
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 487
Result: negative

Carcinogenicity
Suspected of causing cancer.

IARC: 2B - Group 2B: Possibly carcinogenic to humans (nickel powder; [particle diameter < 1 mm])

1 - Group 1: Carcinogenic to humans (nickel powder; [particle diameter < 1 mm])

2B - Group 2B: Possibly carcinogenic to humans (nickel powder; [particle diameter < 1 mm])

IARC: 2B - Group 2B: Possibly carcinogenic to humans (nickel powder; [particle diameter < 1 mm])

1 - Group 1: Carcinogenic to humans (nickel powder; [particle diameter < 1 mm])

2B - Group 2B: Possibly carcinogenic to humans (nickel powder; [particle

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diameter < 1 mm])

NTP: RAHC - Reasonably anticipated to be a human carcinogen (nickel powder; [particle diameter < 1 mm])

RAHC - Reasonably anticipated to be a human carcinogen (nickel powder; [particle diameter < 1 mm])

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

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Inhalation - Causes damage to organs through prolonged or repeated exposure.
- Lungs

Aspiration hazard
No data available

11.2 Additional Information

Repeated dose toxicity - Rat - male and female - Oral - 728 d - NOAEL (No observed adverse effect level) - 2.2 mg/kg - LOAEL (Lowest observed adverse effect level) - 6.7 mg/kg

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

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	semi-static test LC50 - Oncorhynchus mykiss (rainbow trout) - 15.3 mg/l - 96 h Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates	static test LC50 - Ceriodaphnia dubia (water flea) - 0.074 mg/l - 48 h Remarks: (ECHA)
Toxicity to algae	static test EC50 - Pseudokirchneriella subcapitata (green algae) - > 81.5 - 148 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to daphnia	semi-static test EC10 - Ceriodaphnia dubia (water flea) - > 2.8 - 53.6

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and other aquatic invertebrates(Chronic toxicity)	µg/l	- 7 d (US-EPA)

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 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14: Transport information

DOT (US)
UN number: 3089 Class: 4.1 Packing group: II
Proper shipping name: Metal powders, flammable, n.o.s.
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 3089 Class: 4.1 Packing group: II EMS-No: F-G, S-G
Proper shipping name: METAL POWDER, FLAMMABLE, N.O.S. (nickel powder; [particle diameter < 1 mm])
Marine pollutant : yes

IATA
UN number: 3089 Class: 4.1 Packing group: II

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Proper shipping name: Metal powder, flammable, n.o.s.

SECTION 15: Regulatory information

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard
Chronic Health Hazard

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.

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

nickel powder; [particle diameter < 1 mm]	7440-02-0	>= 90 - <= 100 %

This product contains the following priority pollutants related to the U.S. Clean Water Act:

nickel powder; [particle diameter < 1 mm]	7440-02-0	>= 90 - <= 100 %

US State Regulations

Massachusetts Right To Know

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know

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nickel powder; [particle diameter < 1 mm] 7440-02-0

Maine Chemicals of High Concern

nickel powder; [particle diameter < 1 mm] 7440-02-0

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

California Prop. 65

WARNING: This product can expose you to chemicals including nickel powder; [particle diameter < 1 mm], which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

The ingredients of this product are reported in the following inventories:

TSCA : All substances listed as active on the TSCA inventory

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16: Other information

Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. 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: 6.10 Revision Date: 09/06/2024 Print Date: 09/07/2024

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SAFETY DATA SHEET

Version 8.10
Revision Date 08/08/2024
Print Date 08/29/2024

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Phenanthrene

Product Number : 73338
Brand : Sigma-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

Uses advised against : The product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by MilliporeSigma.

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

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
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.

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2.2 GHS Label elements, including precautionary statements

Pictogram



Signal Word Warning

Hazard Statements

H302	Harmful if swallowed.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements

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 - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Formula : $C_{14}H_{10}$
Molecular weight : 178.23 g/mol
CAS-No. : 85-01-8
EC-No. : 201-581-5

Component	Classification	Concentration
phenanthrene		
	Acute Tox. 4; Aquatic Acute 1; Aquatic Chronic 1; H302, H400, H410 M-Factor - Aquatic Acute: 1 - Aquatic Chronic: 1	<= 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

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

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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
Nature of decomposition products not known.
Combustible.

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
Storage stability Recommended storage temperature
15 - 25 °C
Handle and store under inert gas. Moisture sensitive.

Storage class
Storage class (TRGS 510): 11: Combustible Solids

7.3 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

8.1 Control parameters

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
phenanthrene	85-01-8	TWA	0.2 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
	Remarks	OSHA specifically regulated carcinogen		
		TWA	0.1 mg/m3	USA. NIOSH Recommended Exposure Limits
		Potential Occupational Carcinogen		
		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 specimen	Basis
phenanthrene	85-01-8	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

Personal protective equipment

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

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This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Control of environmental exposure
Prevent product from entering drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: powder Color: white
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	98.0 °C (208.4 °F)
f)	Initial boiling point and boiling range	No data available
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)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Density	1.179 g/cm3 at 25 °C (77 °F)
	Relative density	No data available
n)	Water solubility	0.00115 g/l at 25 °C (77 °F)
o)	Partition coefficient: n-octanol/water	log Pow: 4.46 - (Lit.), A remarkable bioaccumulation potential is expected (log Po/w >3).
p)	Autoignition temperature	No data available

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q)	Decomposition temperature	No data available
r)	Viscosity	No data available
s)	Explosive properties	No data available
t)	Oxidizing properties	none

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
Violent reactions possible with:
Oxidizing agents

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
LD50 Oral - Mouse - 700 mg/kg
Remarks: (RTECS)
Inhalation: No data available
Dermal: No data available
No data available

Skin corrosion/irritation
Remarks: No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity

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Test Type: Ames test
Test system: Escherichia coli
Result: negative
Remarks: (Lit.)
(National Toxicology Program)

Carcinogenicity

IARC: No ingredient 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 ingredient 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

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12: Ecological information

12.1 Toxicity

Toxicity to fish	flow-through test LC50 - Lepomis macrochirus (Bluegill sunfish) - 0.234 mg/l - 96 h Remarks: (ECOTOX Database)
Toxicity to daphnia and other aquatic invertebrates	EC50 - Daphnia magna (Water flea) - 0.212 mg/l - 48 h Remarks: (ECOTOX Database)
Toxicity to fish(Chronic toxicity)	flow-through test NOEC - Oncorhynchus mykiss (rainbow trout) - 0.005 mg/l - 90 d Remarks: (ECOTOX Database)

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Toxicity to daphnia and other aquatic invertebrates(Chronic toxicity)	NOEC - Daphnia magna (Water flea) - 0.048 mg/l - 21 d Remarks: (ECOTOX Database)

12.2 Persistence and degradability

No data available

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

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties

No data available

12.7 Other adverse effects

Discharge into the environment must be avoided.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

No data available

SECTION 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

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

Marine pollutant : no

IATA

UN number: 3077 Class: 9 Packing group: III

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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.

SECTION 15: Regulatory information

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
phenanthrene	85-01-8	5000	5000

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Acute Health Hazard

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

phenanthrene 85-01-8 >= 90 - <= 100 %

US State Regulations

Massachusetts Right To Know

phenanthrene 85-01-8

Pennsylvania Right To Know

phenanthrene 85-01-8

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

California Prop. 65

WARNING: This product can expose you to chemicals including phenanthrene, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

The ingredients of this product are reported in the following inventories:

TSCA : All substances listed as active on the TSCA inventory

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TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16: Other information

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.

Version: 8.10 Revision Date: 08/08/2024 Print Date: 08/29/2024

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SAFETY DATA SHEET

Version 8.3
Revision Date 05/11/2021
Print Date 03/01/2022

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Silver

Product Number : GF88646383
Brand : Aldrich
CAS-No. : 7440-22-4

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 ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

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

Molecular weight : 107.87 g/mol
CAS-No. : 7440-22-4

Component	Classification	Concentration

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Silver		
		<= 100 %

SECTION 4: First aid measures

4.1 Description of first-aid measures

If inhaled
After inhalation: fresh air.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most). Consult doctor if feeling unwell.

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 extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Silver/silver oxides
Not combustible.
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

5.4 Further information
Prevent fire extinguishing water from contaminating surface water or the ground water system.

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SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid inhalation of dusts. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert. 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

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

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

Ingredients with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Silver	7440-22-4	TWA	0.1 mg/m3	USA. ACGIH Threshold Limit Values (TLV)
		PEL	0.01 mg/m3	California permissible exposure limits for chemical contaminants (Title 8, Article 107)
		TWA	0.01 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants

8.2 Exposure controls

Appropriate engineering controls

Change contaminated clothing. Wash hands after working with substance.

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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). Safety glasses

Skin protection
Handle with impervious gloves.

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Respiratory protection
required when dusts are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Appearance	Form: solid
b)	Odor	No data available
c)	Odor Threshold	No data available
d)	pH	No data available
e)	Melting point/freezing point	Melting point: 960.5 °C (1760.9 °F)
f)	Initial boiling point and boiling range	2,000 °C 3,632 °F
g)	Flash point	()Not applicable
h)	Evaporation rate	No data available
i)	Flammability (solid, gas)	The product is not flammable.

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j)	Upper/lower flammability or explosive limits	No data available
k)	Vapor pressure	No data available
l)	Vapor density	No data available
m)	Relative density	No data available
n)	Water solubility	insoluble
o)	Partition coefficient: n-octanol/water	No data available
p)	Autoignition 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
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
Strong oxidizing agents

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
Oral: No data available
Oral: No data available

Inhalation: No data available

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Inhalation: No data available
Dermal: No data available

Dermal: No data available
No data available
No data available

Skin corrosion/irritation
No data available

No data available

Serious eye damage/eye irritation
No data available
No data available

Respiratory or skin sensitization
No data available
No data available

Germ cell mutagenicity
No data available
No data available

Carcinogenicity

IARC: No ingredient 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 ingredient 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

11.2 Additional Information

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
No data available

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

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
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

DOT (US)
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s.
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.
Marine pollutant : yes

IATA
UN number: 3077 Class: 9 Packing group: III
Proper shipping name: Environmentally hazardous substance, solid, n.o.s.

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

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

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
Silver	7440-22-4	2007-07-01

SARA 311/312 Hazards
No SARA Hazards

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

Further information
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: 8.3 Revision Date: 05/11/2021 Print Date: 03/01/2022

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the US and Canada

Chemical Safety Data Sheet MSDS / SDS

Polychlorinated Biphenyls (PCBs)

Revision Date:2025-01-11 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name	: Polychlorinated Biphenyls (PCBs)
CBnumber	: CB7160460
CAS	: 1336-36-3
EINECS Number	: 215-648-1
Synonyms	: PYRANOL,polychlorinated biphenyls

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	: 010-86108875

SECTION 2: Hazards identification

Classification of the substance or mixture

Specific target organ toxicity – repeated exposure, Category 2

Hazardous to the aquatic environment, short-term (Acute) - Category Acute 1

Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 1

Label elements

Pictogram(s)

Signal word	Warning

Hazard statement(s)

H373 May cause damage to organs through prolonged or repeated exposure

H410 Very toxic to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P273 Avoid release to the environment.

Response

P319 Get medical help if you feel unwell.

P391 Collect spillage.

Storage

none

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: Polychlorinated Biphenyls (PCBs)
Synonyms	: PYRANOL,polychlorinated biphenyls
CAS	: 1336-36-3
EC number	: 215-648-1
MF	: N/A
MW	: 0

SECTION 4: First aid measures

Description of first aid measures

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

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

no data available

Indication of any immediate medical attention and special treatment needed

If PCB-containing substances have been ingested recently, gastric decontamination may be reasonable. Activated charcoal has not been proven beneficial, but is not contraindicated.

SECTION 5: Firefighting measures

Extinguishing media

Use dry chemical, carbon dioxide, or alcohol foam extinguishers. Vapors are heavier than air and will collect in low areas. Vapors in confined areas may explode when exposed to fire. Containers may explode in fire. Storage containers and parts of containers may rocket great distances, in many directions. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Notify local health and fire officials and pollution control agencies. From a secure, explosion-proof location, use water spray to cool exposed containers. If cooling streams are ineffective (venting sound increases in volume and pitch, tank discolors, or shows any signs of deforming), withdraw immediately to a secure position ... The only respirators recommended for fire fighting are self-contained breathing apparatuses that have full facepieces and are operated in a pressure-demand or other positive pressure mode.

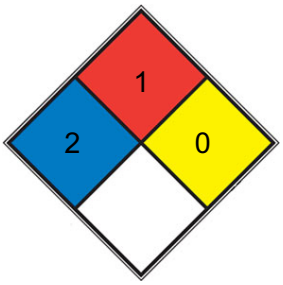
Specific Hazards Arising from the Chemical

no data available

Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

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	1	Materials that require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Includes some finely divided suspended solids that do not require heating before ignition can occur. Flash point at or above 93.3 °C (200 °F). (e.g. mineral oil, ammonia)
■	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

Avoid dust formation. Avoid breathing mist, gas or vapours.Avoid contacting with skin and eye. Use personal protective equipment.Wear chemical impermeable gloves. Ensure adequate ventilation.Remove all sources of ignition. Evacuate personnel to safe areas.Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Dry sand or earth should be spread on the leak, or spill area. ...

SECTION 7: Handling and storage

Precautions for safe handling

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

PCB material should be stored in closed containers, in ventilated areas ... PCB's should be handled in isolated areas of the plant, where efficient ventilation systems remove airborne PCB's. ...

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

Component	1,1'-Biphenyl, chloro derivs.			
CAS No.	1336-36-3			
	Limit value - Eight hours		**Limit value - Short term**	
	ppm	**mg/m^3**	**ppm**	**mg/m^3**
Canada - Ontario	?	0,05 (1)	?	?
Denmark	?	0,01	?	0,02
Finland	?	0,003 (1)	?	?
Germany (DFG)	?	0,003 (1)(2)(3)(5)	?	0,024 (1)(2)(3)(4)(5)
Hungary	?	POP	?	?
Ireland	?	0,1	?	?
Japan	?	0,01	?	?
Japan - JSOH	?	0,01	?	?
Latvia	?	1	?	?
New Zealand	?	0,1	?	?
Poland	?	1	?	?
Sweden	?	0,01	?	0,03 (1)
Switzerland	0,05	0,5	0,4	4
United Kingdom	?	0,1	?	?
	Remarks			
Canada - Ontario	(1) as sum of components assayed by chromatographic procedure with reference of the bulk sample			
Finland	(1) Total PCB = 5*([PCB 28] + [PCB 52] + [PCB 101] + [PCB 138] + [PCB 153] + [PCB 180])			

Germany (AGS)	(1) 42% Chlorine (CAS-No. 53469-21-9) (2) 54% Chlorine (CAS-No. 11097-69-1)
Germany (DFG)	(1) Only for chlorinated biphenyls with Cl
Hungary	POP Persistent Organic Pollutant
Sweden	(1) Short-term value, 15 minutes average value

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 tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	no data available
Colour	Vary from mobile oily liquids to white crystalline solids and hard noncrystalline resins.
Odour	Practically odorless; mild aromatic odor
Melting point/freezing point	no data available
Boiling point or initial boiling point and boiling range	340～375
Flammability	no data available
Lower and upper explosion limit/flammability limit	no data available
Flash point	195(O.C)
Auto-ignition temperature	no data available
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	Solubility in water is extremely low; soluble in oils and organic solvents.
Partition coefficient n-octanol/water	... literature Kow values will vary. These increase with increasing chlorination. log Kow values at 25 deg C: 3.76 (biphenyl); 5.7 (Cl4-PCB's); 6.0 (Cl5-PCB's); 7.0 (Cl6-PCB's); 8.26 (Cl10-PCB's).

Vapour pressure	2.04E-07mmHg at 25°C
Density and/or relative density	1.44(30°C)
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

NIOSH considers chlorodiphenyl containing 54% chlorine to be a potential occupational carcinogen. Aroclor 1254

NIOSH considers chlorodiphenyl containing 54% chlorine to be a potential occupational carcinogen. Aroclor 1254

Chemical stability

PCB's are chemically very inert and are stable to conditions of hydrolysis and oxidation in industrial use. Photochemical degradation may be one route of their breakdown in the environment. ...

Possibility of hazardous reactions

Flame resistant.

Conditions to avoid

no data available

Incompatible materials

Liquid chlorine reacts exothermically with polychlorinated biphenyl heat transfer liquid. Polychlorinated biphenyl

Hazardous decomposition products

When heated to decomposition it emits toxic fumes of Chloride.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 Mouse (C57B1/6J) male oral 19 mg/kg/28 day
- Inhalation: no data available
- 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

EPA: Possibly carcinogenic to humans, IARC: Probably carcinogenic to humans, NTP: Known to be a human carcinogen

Reproductive toxicity

An epidemiological study of women occupationally exposed to high levels of PCBs suggested a relationship between PCB exposure and reduced birth weight and shortened gestational age of their babies; however, limitations of the study limit the strength of the conclusion. Two series of human studies that investigated exposure to PCBs through the consumption of contaminated fish suggest that exposure to PCBs may cause developmental effects in humans. Both studies reported an association between consumption of fish with high PCB levels by pregnant women and an increased incidence of neurodevelopmental effects, such as motor deficits at birth, impaired psychomotor index, impaired visual recognition, and deficits in short-term memory in infants. Human studies are not conclusive on the reproductive effects of PCBs. One study of men who were occupationally exposed to PCBs showed no fertility abnormalities, while another study of men with low sperm counts found elevated levels of PCBs in the blood and an association between certain PCB compounds in semen and decreased sperm motility. Animal studies have reported developmental effects, such as learning deficits, impaired immune functions, focal liver necrosis, and cellular alterations of the thyroid, in the offspring of animals exposed orally to PCBs. Reproductive effects, such as decreased fertility, decreased conception, and prolonged menstruation have also been noted in animal studies of dietary PCB exposures.

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: EC50; Species: Pseudokirchneriella subcapitata (green algae); Conditions: freshwater, static, 22 deg C; Concentration: 182 nmol/L for 48 hr; Effect: decreased population biomass />98% pure

Toxicity to microorganisms: no data available

Persistence and degradability

AEROBIC: The microbial mineralization of three chlorophenols and a PCB mixture was studied using natural bacterial assemblages in laboratory model systems. The systems consisted of water and surface sediment from two lake types: one with a high content of humic substances and the other with a low content. Final PCB concentration in the model systems was 38 ug/L. Aerobic mineralization of the (14)C-ring-labelled compounds was determined as production of (14)CO2 in the systems over the course of 60 days. Mineralization of PCBs in the systems was low compared to the aromatics. The breakdown of PCB was 0.047 nM in the humic cultures and 0.052 nM in cultures from the clear water lake. The avg mineralization rates of PCBs over the 60 day test period for the clear-water and humic cultures were 1.1 and 1.2

pM/day. More than 90% of the PCBs adsorbed to the sediment, while <1% was found in the water phase.

Bioaccumulative potential

Polychlorinated biphenyls (PCBs) are highly lipophilic and bioconcentrate in tissue from concentrations in water ...

Mobility in soil

PCB mobility in aqueous soil-sediment systems has reported experimental Koc values ranging from 510 to 13,300,000 for a variety of Aroclors and PCB congeners; reported Koc values were mostly above 5000(1). Reviews of the PCB mobility literature have found that adsorption of PCBs to soil and sediment generally increases with an increase in the degree of chlorination(2,3). Organic solvents, found at hazardous waste sites, will also increase the solubility and mobility of PCBs(3). Using soil TLC, column leaching and five different soils, PCBs were found to be generally immobile when leached with water or aqueous landfill leachate, but highly mobile when leached with organic solvents(4). PCB fluids can penetrate and travel through the cracks and other connected void spaces found in soil formations(5). In the presence of organic material dissolved from soil, the water solubility of PCBs increases which may augment its leachability. Environmental releases of PCBs often accompany releases of carrier materials from utility equipment. The PCBs that are present in the mineral oil-PCB mixture become even less water soluble than before. This is due to the PCB partitioning into the mineral oil and the reduced interaction of the PCBs with precipitation or groundwater caused by the hydrophobic nature of the oil matrix. The volatility of PCBs also affects their migration through the soil profile. Researchers have carried out simulations that indicate that PCBs can volatilize beneath the soil surface and potentially migrate through several meters of soil cover(5).

Toxics Screening Level

The Initial Risk Screening Level (IRSL) for polychlorinated biphenyls is 0.01 µg/m3 based on an annual averaging time.

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: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)

IMDG: Not dangerous goods. (For reference only, please check.)

IATA: Not dangerous goods. (For reference only, please check.)

Environmental hazards

ADR/RID: Yes

IMDG: Yes

IATA: Yes

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

Not Listed.

New Zealand Inventory of Chemicals (NZIoC)

Not 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/

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 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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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: 05/28/2017 Print Date: 06/28/2019

APPENDIX E

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

Former Printex Corporation Site
Ossining, Westchester County, NY
BCP Site No. C360263

Prepared for:
WB 34 State LLC

SESI Project No:
13968

Date:
July 2026

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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
RAWP	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 Action Workplan (RAWP) for the proposed development of the property located at 34 State Street, Ossining, Westchester County, New York (the Site). The Site consists of a 4.53-acre area parcel and is identified as proposed Block 2, Lot 17 of the Westchester County tax map. The Site is located in a residential and commercial area and is bounded a day care center to the north, residential to the south, residential/commercial uses to the east, and residential to the west.

The Site is improved with a vacant light industrial space at the east and vacant forested area at the west. The Site has historically been occupied by residences and a community center (circa 1929), and a printing company (Printex Corporation of America circa 1940-1981).

2.0 PROJECT ORGANIZATION

The RAWP will be conducted by Soils Engineering Services, Inc. (SESI), on behalf of WB 34 State LLC. The organization of SESI's key project management and field staff, and respective areas of responsibility, is presented below.

2.1 PROJECT PRINCIPAL

Fuad Dahan, PE

Provide 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

Fuad Dahan, PE

Provide technical guidance and review of reports, analytical data. Will have key involvement in screening and development of remedial alternatives.

2.3 PROJECT MANAGER

MaryKate Chorazak

Responsible for maintaining the day-to-day schedule for completing the fieldwork and deliverables according to BCP program requirements and client expectations.

2.4 REMEDIAL INVESTIGATION PROGRAM MANAGER

MaryKate Chorazak

Responsible for coordinating and directing field efforts of SESI staff and subcontractors, and for maintaining that work is done according to QAPP specifications.

2.5 FIELD TEAM LEADER

TBD

Responsible for overseeing field work during the RA, including observing subcontractors, maintaining field notes, and collecting samples of various environmental media, in accordance with the NYSDEC-approved Work Plan.

2.6 QUALITY ASSURANCE OFFICER

MaryKate Chorazak

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 laboratories performing analysis in connection with this project will have appropriate NYSDOH ELAP Certification. Analytical Service Protocol (ASP, January 2005) Category B deliverables are required for all samples.

Detection limits set by NYSDEC-ASP (January 2005) 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 ARARs), then ASP Special Analytical Services (SAS) or other appropriate methods will be utilized.

The quality assurance/quality control 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 Alconox® detergent, 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 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 October 2016.

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 (GC), colorimetry, atomic spectroscopy, gravimetric and titrimetric 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 (June 2000). Data will be 100 percent compliant with NYSDEC-ASP requirements.

The number of duplicate, spiked and blank samples analyzed will a minimum of 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 per every 20 samples (soil) with no fewer than one per day but not more than one per day. For the aqueous matrix field blanks will be collected at a frequency of one 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). All samples will be stored on ice following collection.

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 depend 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 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. Soil vapor samples will be collected from vapor points screened in the vadose zone using Summa Canisters.

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.

Samples of the encountered overburden materials shall be collected continuously during drilling so that a complete soil profile is examined and described by the SESI field 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 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 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 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 ensure 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 of two 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 contained in drums and properly disposed off-site.

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, which will be drummed, to extent possible, for disposal.

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 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 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. QED bladder pumps or peristaltic pumps are used for this method. 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 minutes during low flow purging using a flow through cell. When three 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.

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, amended in May 2017 and February 2024). Soil vapor samples will be collected in the vadose zone from shallow (5 feet) well 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 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 1 to 2 feet of porous coarse sand or glass beads, and at least three 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.

Each designated soil vapor sampling location will be purged of a minimum of three volumes using a low volume pump, and then attached to a regulator, and secured with a clamp. The regulator will then be attached to a 6-liter summa canister.

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/m^3 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 Soil Vapor Intrusion in New York State (October 2006 amended in May 2017 and February 2024).

Weather conditions in the 48 hours prior to the test, and during the test, will be noted, including average wind speed, precipitation, temperature, and barometric pressure.

4.4 AMBIENT AIR SAMPLING

Ambient (outdoor) air sampling will be conducted in accordance with NYSDOH Guidance for Evaluating Soil Vapor Intrusion in New York State (October 2006, amended in May 2017 and February 2024). Ambient air samples will be collected in the breathing zone (3-6 feet above grade). A regulator will be attached to a 6-liter summa canister and be set to collect an ambient 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/m^3 or less.

Weather conditions in the 48 hours prior to the test, and during the test, will be noted, including average wind speed, precipitation, temperature, and barometric pressure.

4.5 SAMPLE PRESERVATION AND SHIPMENT

Since all bottles will contain the necessary preservatives as shown in Table 4.1, 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 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 copies of this record follow the samples to the laboratory. The laboratory maintains one 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 24-48 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.
- The samples are stored in a secured area at a temperature of approximately 4°C until analyses are to commence.
- A laboratory chain-of-custody record accompanies the sample or sample fraction through final analysis for control.
- 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 Table 7.1. 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 1 to 5 times. 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 (VOA)

For the analysis of water samples for Target Compound List (TCL), volatile organic compounds (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 8260C 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 COMPOUNDS

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 8270D will be used, plus tentatively identified compounds (TICs).

Instrument calibration, compound identification, and quantitation are performed as described in Section 6 of this document and in the NYSDEC-ASP.

7.3 PESTICIDE AND PCB COMPOUNDS

The sample preservation procedures for gas chromatography for pesticides and PCB's 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 41 PFAS Analytes List on Table 7.1 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 July 2023 guidance on emergent contaminant sampling, the analytical procedure for soil and groundwater sampling of PFAS is Modified 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.

7.6 SITE SPECIFICITY OF ANALYSES

Work plans prepared for remedial investigation waste 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 Target Compound List (TCL) analytes will be performed on all samples.

TABLE 4.1 – SAMPLE CONTAINERIZATION

PARAMETER & ANALYTICAL METHOD	NO.	BOTTLE TYPE	PRESERVATIVE(1)	HOLDING TIME
Aqueous Samples				
SVOCs (BNAs) – USEPA 8270D or E	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)
VOCs – USEPA 8260C or D	2	40 mL, glass vial with septum cap	Hydrochloric Acid to pH <2 Ice to 4°C	14 days
Metals(2) – 6010C or D, Mercury 7470A	1	1-liter, plastic bottle	Nitric acid to pH <2 NaOH for cyanide Ice to 4°C	180 days Mercury: 28 days
Cyanide – SM 4500-CN-E	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	Chilled to 0 - 6 °C	14 days
Soil, Sediment, Solid Waste Samples				
VOCs – USEPA 8260C or D	3	15-gram EnCore samplers	Chilled to 0 - 6°C	14 days
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(2) – 6010C or D, Mercury 7471B	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	Chilled to 0 - 6°C	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 to 0-6 degrees C.
(2) From verified time of sample receipt by the analytical laboratory (within 24 to 48 hours of collection).
(3) A complete list of compounds is provided on Table 7.1.

TABLE 4.2 – SAMPLING PROCEDURE FOR MONITORING WELLS USING VOLUME AVERAGED PURGING

1. Initial static water level recorded with an electric contact probe accurate to the nearest 0.1 foot.

2. Sampling device and electric contact probe decontaminated.
    a. Sampling device and probe are rinsed with pesticide-grade methanol and distilled water.
    b. Methanol is collected into a large funnel which empties into a five- gallon container.

3. Sampling device lowered into well.
    a. Bailer lowered by dedicated PVC or polypropylene line.

4. Sample taken.
    a. Sample is poured slowly from the open end of the bailer with the sample bottle tilted so that aeration and turbulence are minimized.
    b. Duplicate sample is collected when appropriate.

5. Samples are capped, labeled and placed in laboratory coolers with ice packs or bagged ice.

6. All equipment is cleaned with successive rinses of pesticide-grade methanol and distilled water.
    a. Dedicated line is disposed of or left at well site.

7. Equipment/wash blanks are collected when non-dedicated sampling equipment is used.

8. Chain-of-custody forms are completed in triplicate.
    a. The original and one carbon copy are put into a zip-lock bag and placed into the cooler.

9. The original will be returned following sample analysis.
    a. A second carbon copy is kept on file.

10. Cooler is sealed with strapping tape and chain-of-custody seals to assure integrity and to prevent tampering of sample.

TABLE 4.3 – SAMPLING PROCEDURE FOR MONITORING WELLS USING LOW-STESS (LOW-FLOW) METHODS

1. Initial static water level recorded with an electric contact probe accurate to the nearest 0.1 foot.

2. Sampling device is lowered 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. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.

5. Monitor Indicator Parameters: 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

6. Dissolved oxygen and turbidity usually require the longest time to achieve stabilization. The pump must not be removed from the well between purging and sampling.

7. 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 tubing gently down the inside of the container.

8. 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.

9. 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.

10. Measure and record well depth.

11. Close and lock the well.

12. Samples are capped, labeled and placed in laboratory coolers with ice packs or bagged ice.

13. All equipment is cleaned with successive rinses of pesticide-grade methanol and distilled water.

    a. Dedicated line is disposed of or left at well site.

14. Equipment/wash blanks are collected when non-dedicated sampling equipment is used.

15. Chain-of-custody forms are completed in triplicate.

    a. 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.
    b. A second carbon copy is kept on file.

16. Cooler is sealed with strapping tape and chain-of-custody seals to assure integrity and to prevent tampering of sample.

Table 7-1 – PFAS Compound List and Reporting and Method Detection Limits for Soil and Groundwater

	PFAS	Reporting Limit — Groundwater (ng/l)
1	Perfluorobutanesulfonic acid (PFBS)	1.6
2	Perfluoropentanesulfonic acid (PFPeS)	1.6
3	Perfluorohexanesulfonic acid (PFHxS)	1.6
4	Perfluoroheptanesulfonic acid (PFHpS)	1.6
5	Perfluorooctanesulfonic acid (PFOS)	1.6
6	Perfluorononanesulfonic acid (PFNS)	1.6
7	Perfluorodecanesulfonic acid (PFDS)	1.6
8	Perfluorododecanesulfonic acid (PFDoS)	1.6
9	Perfluorobutanoic acid (PFBA)	6.4
10	Perfluoropentanoic acid (PFPeA)	3.2
11	Perfluorohexanoic acid (PFHxA)	1.6
12	Perfluoroheptanoic acid (PFHpA)	1.6
13	Perfluorooctanoic acid (PFOA)	1.6
14	Perfluorononanoic acid (PFNA)	1.6
15	Perfluorodecanoic acid (PFDA)	1.6
16	Perfluoroundecanoic acid (PFUnA)	1.6
17	Perfluorododecanoic acid (PFDoA)	1.6
18	Perfluorotridecanoic acid (PFTrDA)	1.6
19	Perfluorotetradecanoic acid (PFTeDA)	1.6
20	Hexafluoropropylene oxide dimer acid (HFPO-DA)	6.4
21	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6.4
22	Perfluoro-3-methoxypropanoic acid (PFMPA)	3.2
23	Perfluoro-4-methoxybutanoic acid (PFMBA)	3.2
24	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	3.2
25	4:2 Fluorotelomer sulfonic acid (4:2-FTS)	6.4
26	6:2 Fluorotelomer sulfonic acid (6:2-FTS)	6.4
27	8:2 Fluorotelomer sulfonic acid (8:2-FTS)	6.4
28	3:3 Fluorotelomer carboxylic acid (3:3 FTCA)	8.0
29	5:3 Fluorotelomer carboxylic acid (5:3 FTCA)	40
30	7:3 Fluorotelomer carboxylic acid (7:3 FTCA)	40
31	Perfluorooctane sulfonamide (PFOSA)	1.6
32	N-methylperfluorooctane sulfonamide (NMeFOSA)	1.6
33	N-ethylperfluorooctane sulfonamide (NEtFOSA)	1.6
34	N-methylperfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	1.6
35	N-ethylperfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	1.6
36	N-methylperfluorooctane sulfonamidoethanol (NMeFOSE)	16
37	N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	16
38	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major) (9CL-PF3ONS)	6.4
39	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor) (11CL-PF3OUDS)	6.4
40	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)	3.2
41	Perfluorohexadecanoic acid (PFHxDA)[1]	~
	1,4-dioxane	5

	PFAS	Reporting Limit — Soil (ng/g)
1	Perfluorobutanesulfonic acid (PFBS)	0.2
2	Perfluoropentanesulfonic acid (PFPeS)	0.2
3	Perfluorohexanesulfonic acid (PFHxS)	0.2
4	Perfluoroheptanesulfonic acid (PFHpS)	0.2
5	Perfluorooctanesulfonic acid (PFOS)	0.2
6	Perfluorononanesulfonic acid (PFNS)	0.2
7	Perfluorodecanesulfonic acid (PFDS)	0.2
8	Perfluorododecanesulfonic acid (PFDoS)	0.2
9	Perfluorobutanoic acid (PFBA)	0.8
10	Perfluoropentanoic acid (PFPeA)	0.4
11	Perfluorohexanoic acid (PFHxA)	0.2
12	Perfluoroheptanoic acid (PFHpA)	0.2
13	Perfluorooctanoic acid (PFOA)	0.2
14	Perfluorononanoic acid (PFNA)	0.2
15	Perfluorodecanoic acid (PFDA)	0.2
16	Perfluoroundecanoic acid (PFUnA)	0.2
17	Perfluorododecanoic acid (PFDoA)	0.2
18	Perfluorotridecanoic acid (PFTrDA)	0.2
19	Perfluorotetradecanoic acid (PFTeDA)	0.2
20	Hexafluoropropylene oxide dimer acid (HFPO-DA)	0.8
21	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.8
22	Perfluoro-3-methoxypropanoic acid (PFMPA)	0.4
23	Perfluoro-4-methoxybutanoic acid (PFMBA)	0.4
24	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.4
25	4:2 Fluorotelomer sulfonic acid (4:2-FTS)	0.8
26	6:2 Fluorotelomer sulfonic acid (6:2-FTS)	0.8
27	8:2 Fluorotelomer sulfonic acid (8:2-FTS)	0.8
28	3:3 Fluorotelomer carboxylic acid (3:3 FTCA)	1.0
29	5:3 Fluorotelomer carboxylic acid (5:3 FTCA)	5.0
30	7:3 Fluorotelomer carboxylic acid (7:3 FTCA)	5.0
31	Perfluorooctane sulfonamide (PFOSA)	0.2
32	N-methylperfluorooctane sulfonamide (NMeFOSA)	0.2
33	N-ethylperfluorooctane sulfonamide (NEtFOSA)	0.2
34	N-methylperfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	0.2
35	N-ethylperfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	0.2
36	N-methylperfluorooctane sulfonamidoethanol NMeFOSE)	2.0
37	N-ethylperfluorooctane sulfonamidoethanol (NEtFOSE)	2.0
38	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major) (9CL-PF3ONS)	0.8
39	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor) (11CL-PF3OUdS)	0.8
40	Perfluoro(2-ethoxyethane) sulfonic acid (PFEESA)	0.4
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

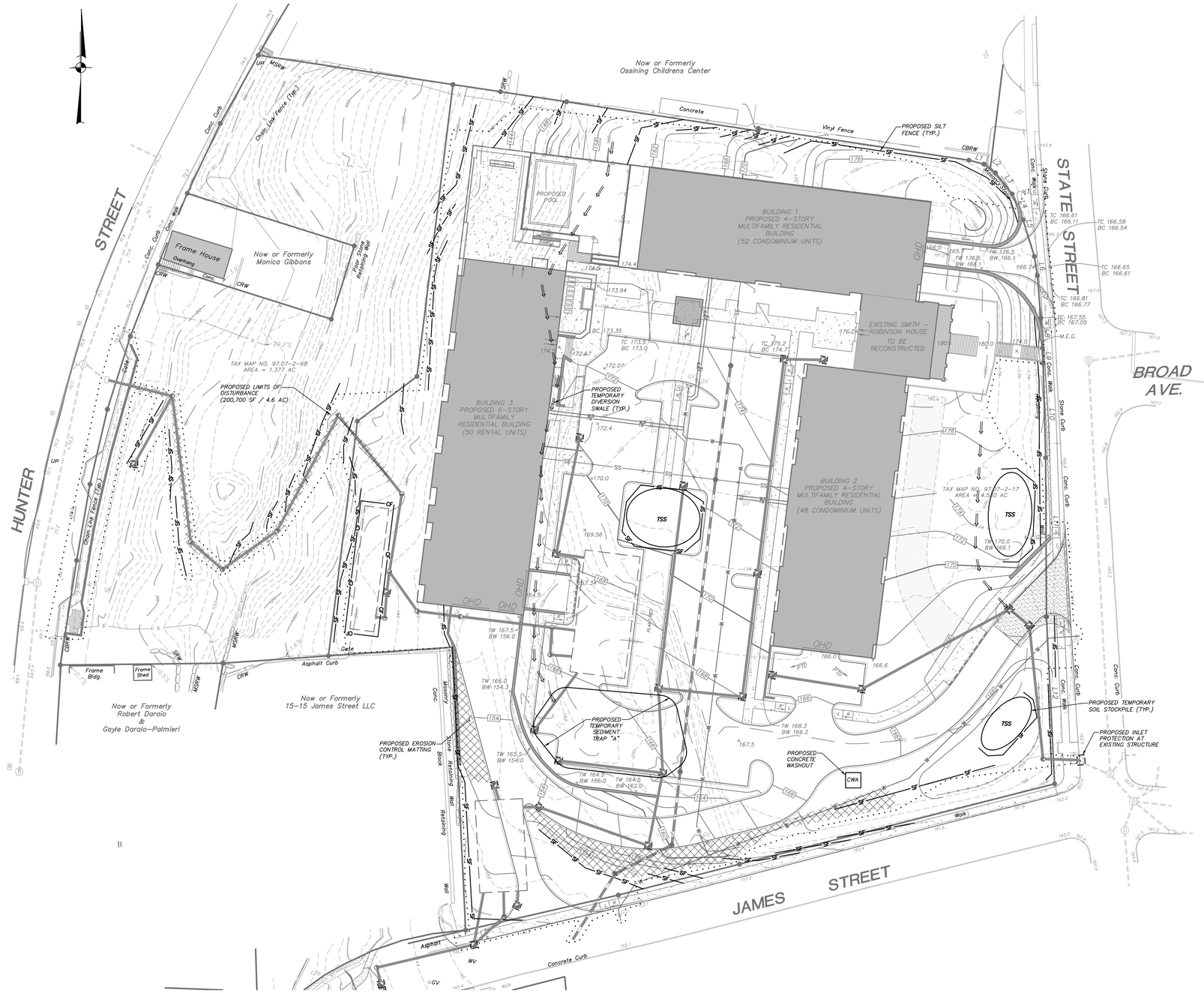
Data for this table are derived from the single-laboratory validation study and are only provided as examples for this draft method. The data will be updated to reflect the interlaboratory study

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

APPENDIX F

SOIL EROSION AND SEDIMENT CONTROL PLAN


STATE STREET
HUNTER STREET
BROAD AVE.
JAMES STREET
Now or Formerly Ossining Childrens Center
Now or Formerly Monica Gibbons
Frame House
Overhang
Now or Formerly Robert Daraio & Gayle Daraio-Palmieri
Frame Bldg.
Frame Shed
Now or Formerly 15-15 James Street LLC
BUILDING 1 PROPOSED 4-STORY MULTIFAMILY RESIDENTIAL BUILDING (52 CONDOMINIUM UNITS)
BUILDING 2 PROPOSED 4-STORY MULTIFAMILY RESIDENTIAL BUILDING (48 CONDOMINIUM UNITS)
BUILDING 3 PROPOSED 6-STORY MULTIFAMILY RESIDENTIAL BUILDING (50 RENTAL UNITS)
EXISTING SMITH - ROBINSON HOUSE TO BE RECONSTRUCTED
PROPOSED POOL
TAX MAP NO. 97.07-2-68 AREA = 1.377 AC
TAX MAP NO. 97.07-2-17 AREA = 4.520 AC
PROPOSED LIMITS OF DISTURBANCE (200,700 SF / 4.6 AC)
PROPOSED TEMPORARY DIVERSION SWALE (TYP.)
PROPOSED TEMPORARY SEDIMENT TRAP "A"
PROPOSED CONCRETE WASHOUT
PROPOSED EROSION CONTROL MATTING (TYP.)
PROPOSED SILT FENCE (TYP.)
PROPOSED TEMPORARY SOIL STOCKPILE (TYP.)
PROPOSED INLET PROTECTION AT EXISTING STRUCTURE
PROPOSED STONE RIP-RAP
Vinyl Fence
Chain Link Fence (Typ.)
Concrete
Asphalt Curb
Asphalt
Concrete Curb
Conc. Curb
Stone Curb
Conc. Walk
Masonry Wall
Retaining Wall
Gate
Cedar
Stone Retaining Wall
Overhang
Conc.
CRW
MSRW
UP
OHD
TSS
CWA
CF
SF
GV
W
SS
SD
CBRW
Conc. Walk
Asphalt
Walk
Curb
Conc. Curb
Stone Curb
Retaining Wall
Masonry Wall
Chain Link Fence (Typ.)
Vinyl Fence
Concrete
Asphalt Curb
Asphalt
Concrete Curb
Conc. Walk

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

Former Printex Corporation Site
Ossining, Westchester County, NY
BCP Site No. C360263

Prepared for:

WB 34 State LLC

March 2026

SESI Project No:
13968

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LIST OF ACRONYMS

Acronym	Definition
CAMP	Community Air Monitoring Plan
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
RAWP	Remedial Action Work Plan
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This document presents a Community Air Monitoring Plan (CAMP) for the Remedial action Workplan (RAWP) for the proposed development of the property located at 34 State Street, Ossining, Westchester County, New York (the Site). The Site consists of a 4.530-acre area parcel and is identified as proposed Block 2, Lot 17 on the Westchester County tax map. The Site is located in a residential and commercial area and is bounded by a day care center to the north, residential to the south, residential/commercial uses to the east, and residential to the west.

The Site is improved with an asphalt lot, former building footprints, demolition debris, one (1) large three (3) story residential historic house building, one (1) shed and wooded areas. These buildings are currently vacant and abandoned. The Site has been developed since prior to 1892 and historically has been residences, a community center (circa 1929), and a printing company (Printex Corporation of America circa 1940-1981).

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 volatile organic compounds 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 demolition and remediation activities. Monitoring will consist of one (1) upwind and two (2) downwind CAMP monitors. Any CAMP exceedances will be reported to the NYSDEC and 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. CAMP reports will be provided daily as part of project daily status reports to the following NYSDEC and NYSDOH personnel.

Name	Contact Information
NYSDEC Project Manager	Caroline Jalanti, PE caroline.jalanti@dec.ny.gov (518) 402-9650
NYSDOH Project Manager	Kari Pollard beei@health.ny.gov (518) 486-1443

3.1 CONTINUOUS MONITORNG

Continuous monitoring for particulates and VOCs will be conducted during all ground intrusive activities including soil borings, monitoring well installations, and soil vapor probe installations.

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.

3.3 VOC MONITORNG, RESPONSE LEVELS, AND ACTIONS

VOC Monitoring, Response Levels, and Actions Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. 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 the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.
- 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 shutdown.

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

3.4 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 visual dust is observed at the site, dust-suppression actions will be implemented even if the PM-10 particulate level is below 100 micrograms per cubic meter greater than background.
- 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/m3 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 (DEC and DOH) personnel to review.

4.0 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 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/m3 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

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								
	5								
	10								
	15								
	20								
	25								
	30								
	35								
	40								

Depth (feet below grade)

Top of Casing: #

Ground Surface 0

Top of Riser #

Top of Seal #

Top of Sand Pack

Top of Screen

Bottom of Screen

Bottom of Boring

Remarks:

Casing Type:

Well Cap:

Grout Type:

Well Key:

Riser Pipe:

Sand/Gravel Pack Size:

Screen Size:

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 #