



MOVE YOUR ENVIRONMENT FORWARD

SITE CHARACTERIZATION WORK PLAN

Astoria Steel Site – Off-Site – Site #C241155A

3-15 26th Avenue

Astoria, New York 10035

Prepared For:

Contract# D009808, Work Assignment No. 38
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Division of Environmental Remediation
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1.0 INTRODUCTION

On November 23, 2022, HRP Associates, Inc. (HRP) was authorized to complete this New York State Department of Environmental Conservation (NYSDEC) Work Assignment (WA) No. 38 (D009808-38) for Site Characterization (SC) for Astoria Steel Site – Off-Site (Site No. C241155A), which is located at 3-15 26th Avenue, Astoria, NY (the Site). The focus of this SC is to characterize potential impacts to off-site receptors related to polychlorinated biphenyl (PCB) and chlorinated volatile organic compound (CVOC) contamination which has been identified in on-site environmental media. The scope of work for the SC, discussed herein, was developed based on HRP's review of previous investigations and remedial actions conducted between 2018 and 2021 as well as discussions and planning with NYSDEC staff.

1.1 Purpose and Objectives

This site-specific SC Work Plan (Work Plan) describes the details of the scope of work, including all proposed field activities, laboratory analyses, and data QA/QC evaluation that will be associated with the Off-Site SC. This document is intended to supplement information provided in the NYSDEC-approved *Generic Field Activities Plan for Work Assignments*, completed by HRP on August 8, 2019.

The purpose of the SC is to determine whether the Site poses little or no threat to public health and the environment or if it poses a threat and whether the threat requires further investigation. In accordance with DER-10 *Technical Guidance for Site Investigation and Remediation (May 2010)*, the primary objectives of the SC scope of work are to:

- Investigate the identified areas of concern (AOCs) associated with the off-site area, determine if they have resulted in surface or subsurface contamination and evaluate the extent of the contamination.
- Obtain geologic and hydrogeologic data from the Site. The specific information that should be collected and/or verified includes soil types (or fill), depth to groundwater, groundwater flow direction, subsurface geology, bedrock characteristics, etc.
- Determine if applicable standards, criteria, and guidance contained in NYSDEC DER-10 and set forth for the Site are contravened.
- Preliminarily delineate the vertical and horizontal extent of contaminated soil and soil vapor if any.
- Establish a baseline for any remedial work that will be necessary to address impacted media.
- Determine if the off-site area represents a threat to public health or the environment.

1.2 Site Description and Background Information

The off-site area surrounding the Astoria Steel Site (#C241155), located at 3-15 26th Avenue, Astoria, NY (the "Site", **Figure 1**), is the focus of this investigation. The property is identified on the NYS Department of Finance (DOF) tax map as Queens block 911, lot 1. The 3.67-acre Site is currently vacant and is planned to be redeveloped for residential usage. The Site is depicted on **Figure 2**.

The property is zoned R7-3 (medium density apartment housing) with a C-4 commercial overlay on the NYC Zoning Tax Lot Database. Properties surrounding the Site consist of industrial, commercial, and residential properties. At present the areas surrounding the Site include:

North: The East River (0 ft).

South: 26th Avenue (0 ft), followed by multi-family residential properties, commercial properties, industrial properties, and the Former Andor Medical Systems Site (NYSDEC Site No. C241234), which is being redeveloped into multi-family residential buildings (270 ft), followed by 27th Avenue (590 ft).

East: Industrial properties, including a warehouse, two HVAC contractors, a lighting fixtures facility, a school bus/truck/automobile garage, and storage yards (0-500 ft).

West: A warehouse used by a live event production and lighting company and an airport supply chain company (0 ft), followed by Second Street (250 ft), Whitley Ford Field, a NYC Parks property (300 ft), and the East River (450 ft).

Site history was detailed in the Remedial Investigation Report (RIR) prepared by Stantec Consulting Services, Inc. (Stantec) dated July 2018. Past uses of the Site included the Astoria Steel Facility, Brooklyn Foundry Co., the Weisberg-Baer Co. (a sash and door factory and lumber yard), and Gas Purifying Materials Co., an iron aggregate supplier, a construction company, and a lumber yard.

Historic uses of the Site and adjacent properties, based on Sanborn Fire Insurance Maps obtained by Environmental Data Resources (EDR), are presented in **Table 1**. Current and historical property use is depicted on **Figure 3**.

1.3 Site Geology and Hydrogeology

The Site lies at an elevation of approximately 15 ft above mean sea level (amsl). Topography of the Site is relatively flat. The general topography of the surrounding area is gently sloping north-northwest towards the East River.

The New York State "Geologic Map of New York – Lower Hudson Sheet" indicates the bedrock underlying the Site is part of the Ravenswood Gneiss, an Ordovician biotite-hornblende-orthoclase banded gneiss (Fischer et al., 1970). Surficial geology is mapped as till, deposited by glacial ice with a variable texture consisting of poorly sorted mixtures of clay, sand, silt, and gravel (Caldwell et. al., 1986). According to the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey, the Site and surrounding area are mapped as Urban Land.

The general subsurface profile observed during previous subsurface investigations consists of fill material (ranging in thickness from 1-16 ft), organic-rich deposits or peat, native sand with some gravel, and gneiss bedrock. Bedrock was encountered at 11.5 to 27 feet below grade (ft bg) by Stantec during the on-site investigation.

Previous investigations encountered groundwater beneath the Site at depths of approximately 3 to 12 ft bg with a groundwater flow direction to the north-northwest.

1.4 Previous Investigations and Remedial Actions

In preparation of this work plan, HRP reviewed the following investigation reports and associated documents:

- RIR, prepared by Stantec, dated July 2018.
- Final Engineering Report (FER), prepared by Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan), dated December 2019.
- Periodic Review Report (PRR), prepared by Langan, dated August 2021.

Contaminants of concern at the Site were identified as PCBs in soil and CVOCs in groundwater and soil vapor. Remedial activities were completed as part of a Track 4 Restricted Residential Use (RRU) Soil Cleanup Objective (SCO) cleanup in 2019 as well as through several preceding Interim Remedial Measures (IRMs) and other remedial actions. Investigation results, remedial action activities, and remaining contamination are discussed by environmental media below.

Soil

- PCB impacts exceeding RRU SCO of 1 milligram per kilogram (mg/kg) and ranging as high as 460,000 mg/kg, were identified in soils, primarily along the western and eastern boundaries of the Site.
- Remedial action performed to address PCBs in Site soils included:
 - An emergency removal of Site surface soils, debris, and ground cover-vegetation and installation of a security fence following a fire set by trespassers in May 2016.
 - Demolition of Site buildings and off-site disposal of PCB-impacted building materials in 2018.
 - Excavation and off-site disposal of PCB and non-PCB impacted soils (including petroleum and lead impacted soils primarily along the eastern and western Site boundaries, but also during the removal of relic utilities and underground storage tanks (USTs). Excavations were completed to a maximum completion depth of 13 ft bg.
 - Installation of a Site cover system in areas where the upper two feet of exposed soil exceeded the RRU SCO.

- Residual PCB impacts to soil remains on-site, including at three excavation endpoint sidewall locations on the eastern and western boundaries of the Site. The sample locations are depicted on **Figure 4A** and described below.
 - 4.86 mg/kg of PCBs at 3.5 ft bg, located on the western property line.
 - 8.49 mg/kg of PCBs at 2 ft bg, located along the eastern property line.
 - 3.99 mg/kg of PCBs at 2 ft bg, located on the eastern property line.Due to the sample locations proximity to the property line, excavation could not continue at these locations.

Groundwater

- Groundwater samples collected during the 2018 RIR exhibited exceedances of NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1 Class GA criteria for the CVOCs tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE) and vinyl chloride, primarily in an area along the western Site boundary.
- Enhanced Reductive Chlorination (ERD) was implemented to treat CVOC impacts in groundwater. Sodium lactate was injected into the subsurface to mitigate contaminants in the western portion of the Site.
- In accordance with the SMP, groundwater sampling was completed on a quarterly basis for one year following the completion of groundwater remediation activities. The final sampling event was completed in August 2020. Results from this sampling event indicate biodegradation of CVOCs is occurring and overall CVOC concentrations are decreasing, with only 3 of 17 wells containing CVOC concentrations exceeding Class GA criteria. The CVOC groundwater results from the final round of post remedial groundwater sampling is depicted on **Figure 4B**.

Soil Vapor

- Limited soil vapor sampling was completed on the western portion of the Site by Stantec as part of a Supplemental RI. The sampling identified the presence of VOCs including PCE, TCE, benzene, cyclohexane, n-Hexane, 2-butanone, freon 11, and xylenes.
- Although the Site is currently vacant, the SMP requires the installation of sub-slab depressurization systems in all future buildings constructed to mitigate residual soil vapor contamination.

1.5 Areas of Concern

Based on the findings of previous investigations and discussion with NYSDEC and the New York State Department of Health (NYSDOH), the following AOCs were identified and require further investigation to preliminarily characterize off-site impacts and evaluate potential pathways of exposure to off-site receptors.

PCBs on Off-Site Soils: Previous investigation data indicates that residual PCB impacts remain in soils along eastern and western Site boundaries (**Figure 4A**), suggesting PCB impacts may be present in off-site soils.

Soil Vapor Intrusion (SVI) Exposure Pathways: Post-remediation groundwater sampling results indicate CVOCs are still present in on-site groundwater (**Figure 4B**). CVOCs and petroleum VOCs may be migrating off-site through soil vapor. Potential SVI exposure pathways have not been evaluated in the area surrounding the Site.

Additional AOCs warranting further characterization may be identified during the implementation of the SC.

2.0 SITE CHARACTERIZATION SCOPE OF WORK

This scope of work has been designed to gather data to evaluate each project objective listed in **Section 1.1**. The following sections provide specifics regarding the scope of work developed under this NYSDEC-approved Work Assignment (D009808-38) in support of the Former Astoria Steel – Off-Site (#C241155A) SC.

2.1 Preliminary Activities

As part of the scope of work, the following documents have been prepared under this Work Assignment:

- Project-specific Work Plan (this document) to accompany the generic Field Activities Plan (FAP);
- Site-specific Health and Safety Plan (HASP) (included as **Appendix A** of this Work Plan); and
- Generic Quality Assurance Project Plan (QAPP).

These NYSDEC-approved generic FAP, HASP, and QAPP are on file with the NYSDEC. The site-specific elements are provided below.

2.1.1 Work Plan

This Work Plan has been prepared for use in performing the SC and will serve as the “site-specific FAP.” This Work Plan identifies the components of the SC and a description of the tasks to be performed including the specific methods or procedures that will be used to conduct the field sampling. A proposed project schedule is included in **Section 4.1** of this Work Plan.

2.1.2 Health and Safety Plan

A site-specific HASP is provided in **Appendix A**. The site-specific HASP provides guidance to maximize health and safety of on-site workers during SC - specific tasks including media sampling, installation of wells, surveying and other field related activities.

2.1.3 Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) that details procedures for air monitoring during intrusive activities is included in **Appendix B**.

2.1.4 Quality Assurance Project Plan

A site-specific QAPP has been prepared and is included in **Section 4** of this Work Plan. The site-specific QAPP was prepared as a supplement to the Generic QAPP with necessary site-specific information. Deviations from the protocols specified in the QAPP will be subject to the NYSDEC approval.

The Generic QAPP provides general information related to QA/QC procedures associated with the collection and analysis of samples of environmental media and includes specific representative standard operating procedures (SOPs) applicable to sample handling and field instrumentation use. Information provided in the Generic QAPP includes definitions and generic goals for data quality and required types and quantities of QA/QC samples. The procedures address field documentation; sample handling, custody, and shipping; instrument calibration and maintenance; auditing; data reduction, validation, and reporting; corrective action requirements; and QA/QC reporting specific to the analyses performed by the laboratories that are used for analysis of environmental media collected under Standby Contract No. D009808.

All laboratory analytical work will be performed by a NYSDOH Environmental Laboratory Approval Program (ELAP) approved laboratory certified in all categories of Contract Laboratory Protocol (CLP) and Solid and Hazardous Waste analytical testing. A Data Usability Summary Report (DUSR) will be included in a SC Report (described in **Section 2.3** of this Work Plan) for each round of analytical work. Category B deliverables will be retained in the project files and available for full data validation by a qualified, independent third party.

2.2 Investigation, Environmental Sampling, and Implementation

The SC will involve the installation of off-site soil borings for the purpose of screening for PCB impacts on neighboring properties to the east and west, installation of off-site soil vapor points in the sidewalk along 26th Avenue, and completion of off-site sub-slab SVI structure sampling. Proposed investigation locations are depicted on **Figure 2**. Sample types and locations are summarized on **Table 2** and sample QA/QC details (analyses, containers, hold times, etc.) are summarized on **Table 3**. The field investigation tasks for the Site are listed below in the order that they are expected to be completed:

1. Property Access and Permit Acquisition
2. Underground Utility Identification and Clearance using Ground-Penetrating Radar (GPR)
3. Advancement of Soil Borings and Collection of Soil Samples
4. Soil Vapor Point Installation and Sampling
5. Soil Vapor Intrusion Investigation
6. Site Survey
7. Characterization and Disposal of Investigation Derived Waste
8. Analytical Data Quality Evaluation

The following sections describe procedures for investigation activities, generally organized by media to be investigated.

2.2.1 Property Access and Permit Acquisition

Prior to conducting field activities, HRP will work to obtain access from off-site property owners soil boring installation and sub-slab SVI investigations. HRP will identify and gather contact information for off-site property owners using available resources including online municipal databases. In

coordination with the NYSDEC and NYSDOH, HRP will prepare property access agreements for property owners including cover letters explaining investigation purposes and procedures. Property access solicitations will be reviewed and sent by NYSDEC. If sufficient responses are not received to the access letters, HRP may conduct a Site visit to solicit access from property owners.

All permits necessary to complete the intrusive work will be obtained by the drilling contractor or HRP prior to commencement of Site activities. This will include New York City Department of Transportation (NYCDOT) "sidewalk opening" permits.

2.2.2 Underground Utility Clearance and Ground Penetrating Radar (GPR)

Prior to implementing any intrusive activities, a utility clearance will be conducted. HRP will rely upon multiple lines of evidence to ensure to the maximum extent practicable that subsurface features are identified prior to commencement of intrusive work.

HRP will mark sampling locations prior to installation and contact public utility clearance services to mark out the utilities prior to the survey. The drilling contractor will request utility mark outs through NYS Code Rule 753/Dig Safe System. The dig safe system is limited to public right-of ways and will only identify utilities entering private property rather than utilities within property boundaries.

HRP requests that a knowledgeable party (property owner) provide all available utility information prior to the survey or drilling activities and that, if possible, that person clear each boring location prior to drilling.

HRP will utilize a qualified subcontractor to conduct a GPR survey to attempt to locate any privately installed underground structures or utilities to ensure boring areas are clear of obstructions and identify any other potential AOCs. The GPR survey and underground utility markout will be conducted across all accessible areas of the Site exterior, including 26th Avenue, the former 3rd and 4th Street ROWs, and sidewalks bordering Site buildings.

GPR is a non-destructive and non-intrusive geophysical exploration technique that uses radar waves to detect subsurface objects, such as tanks, drums and piping. The GPR is also capable of detecting discontinuities in the subsurface materials indicative of excavated and backfilled areas, such as those associated with possible UST graves. The objective of performing this survey is not only to make subsurface investigation as safe as possible for the field staff while protecting utilities, but also to identify possible sources and migration pathways (utility corridors, etc.). All anomalies identified during the GPR survey will be marked out in the field.

If necessary, the upper 5-feet of each soil boring location will be cleared of any underground utilities by hand clearing.

2.2.3 Advancement of Soil Borings and Collection of Soil Samples

To screen off-site properties for PCB impacts to soil, up to 12 soil borings will be installed for the collection of soil samples. The proposed boring locations are depicted on **Figure 2**. Proposed soil boring locations were selected based on the locations of the three on-site excavation endpoint

sidewall samples in which PCB concentrations exceeded RRU SCOs. Final locations may vary based upon the results from the GPR survey and Site access.

Soil borings will be advanced using a direct push drill rig to collect continuous soil samples and characterize subsurface conditions from surface grade to approximately 15 ft bg, refusal, or the groundwater interface, whichever comes first. HRP will inspect and log each soil sample interval to determine the characteristics of subsurface soils including grain size, moisture, compaction, odor, color. Soils will be screened for VOC impacts using a calibrated photoionization detector (PID).

Up to two soil samples will be collected from each of the 12 borings for laboratory analysis. Soil sample depth intervals will be biased towards evidence of contamination (odors, staining, elevated, PID readings). If no signs of contamination are present, samples will be collected from the upper 4 ft of soils, consistent with the depth of PCB impacts in on-site sidewall samples which exceeded RRU SCOs. Up to 30 soil samples (24 regular, 6 QA/QC) will be submitted to an ELAP accredited laboratory, under chain of custody procedures and analyzed for PCBs via EPA Method 8082. Duplicate and matrix/matrix spike duplicates will be collected at a frequency of 1 per 20 samples. The sample totals and laboratory analyses are summarized on **Table 2**.

Following the collection of soil samples, soil borings will be backfilled with soil cuttings, clean sand, and/or Portland cement. If soil cuttings are used to backfill the borehole, cuttings will be returned in order to maintain original stratigraphy (i.e. first soils out, last soils returned). Each backfilled boring will be finished at sidewalk grade with concrete, a minimum of 1-foot in thickness.

2.2.4 Soil Vapor Point Installation and Sampling

Install up to four soil vapor points in the 26th Avenue sidewalk along the southern boundary of the Site to screen for potential soil vapor contamination exposure pathways to the south of the Site. Proposed soil vapor point locations are depicted on **Figure 2**.

At each location, a direct push drill rig will be used to advance soil borings to a maximum depth of 10 ft bg. To determine depth to water (if present) and identifying potential sources of impacts to soil vapor quality, a continuous soil core samples will be collected, logged, and screened using a calibrated PID.

Soil vapor points are to be constructed using 6-inch steel screens and nylon, Teflon, or Teflon-lined tubing. Soil vapor points are to be backfilled with No. 0 filter sand and finished with a 2-foot bentonite seal and an 8-inch road box. Soil vapor points will be set at a depth of 1-foot above the water table or 10 ft bg, whichever comes first.

Soil vapor samples will be collected from each of the three soil vapor points for laboratory analysis. Up to ~~six~~ **4** air samples (4 regular, 1 ambient outdoor air, 1 duplicate soil vapor) will be analyzed for VOCs via EPA Method TO-15. Duplicate soil vapor samples will be collected at a frequency of one per 20 samples. Ambient outdoor air samples will be collected at a frequency of one sample per day. The sample totals and laboratory analyses are summarized on **Table 2**.

2.2.5 Soil Vapor Intrusion (SVI) Investigation

Sub-slab SVI investigations will be completed at up to five off-site properties. Three properties proposed for the initial round of solicitation are depicted on **Figure 2**. If deemed necessary following sampling the soil vapor points, additional off-site properties surrounding the Site will be solicited for further SVI.

Sub-slab SVI investigations will be completed in accordance with NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006* and will include collection of sub-slab soil vapor samples and air samples and the completion of a NYSDOH Indoor Air Quality Questionnaire and Building Inventory.

Sub-slab soil vapor points will be installed by advancing a 1/4-inch drill bit immediately below the slab (anticipated one foot or less) using a handheld electric hammer drill. Sub-slab soil vapor points will be installed, leak tested, and sampled in accordance with NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006*.

SVI air and sub-slab soil vapor samples will be collected using 6-liter summa canisters fitted with 8-hour regulators (for commercial or industrial use buildings) or 24-hour regulators (for buildings which include residential uses on any floor). All air and soil vapor samples will be analyzed for VOCs via EPA Method TO-15.

Up to two sets of SVI samples will be collected per structure. Each set of samples will include one sub-slab soil vapor sample, one basement indoor air sample (if applicable), and one first-floor indoor air sample.

Up to 37 air samples (10 sub-slab, 10 first floor indoor air, 10 basement indoor air, 5 outdoor air, 2 duplicate), will be analyzed for VOCs via EPA Method TO-15. Duplicate soil vapor samples will be collected at a frequency of one per 20 samples. Ambient outdoor air samples will be collected at a frequency of one sample per day.

Paired sub-slab soil vapor/indoor air locations will be determined in the field at the time of the building inspection. Locations will be selected in accordance with Section 2.6.2 of the NYSDOH's *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006*. Paired samples will be installed and collected in central locations away from building footing foundations and if possible, biased towards the Site/source of soil vapor impacts. Other factors which may impact SVI sample locations include presence of flooring (tile or wood flooring), building operations/traffic, and chemical storage locations.

Draft results from the sub-slab SVI sampling events, including completed Indoor Air Quality Questionnaires and Building Inventories and laboratory analytical data will be provided to NYSDEC and NYSDOH on receipt. Final results will be provided to NYSDEC and NYSDOH as part of the SC Report discussed in **Section 2.3** below.

2.2.6 Sample Handling Procedures

Nitrile gloves will be worn at all times by personnel collecting and handling the samples. All non-disposable equipment and tooling used for sampling will be properly decontaminated between sampling locations and intervals.

2.2.7 Decontamination Procedures

Non-dedicated sampling equipment (i.e., submersible pumps, water level indicators, etc.) will be subject to decontamination procedures prior to each sample collected to reduce the potential for cross-contamination, as described in the Generic FAP on file with NYSDEC. The decontamination procedures will include the use of a scrub wash with a solution consisting of Alconox® detergent and potable water followed by a rinse with DI water. The decontaminated equipment will be stored in clean environments (i.e., the manufacturer's storage case). Decontamination fluids will be properly labeled and securely stored in a designated waste-container staging area.

2.2.8 Disposal of Investigation Derived Waste

Investigation derived waste (IDW) that is generated from the monitoring well installation and the development of monitoring wells shall be handled in accordance with NYSDEC DER-10. HRP will be responsible for supplying the equipment and materials necessary for the proper handling and storage of the IDW, such as DOT-approved 55-gallon drums, roll-off containers and/or holding tanks. All containers will be labeled and stored in accordance with applicable NYSDEC regulations.

Soil shall be handled and disposed of in accordance with DER-10. If off-site disposal of IDW is required, it will be disposed of or treated according to applicable local, state, and federal regulations. Soils from the investigation may be disposed within the monitoring well borehole as backfill over the bentonite seal provided the cuttings do not exhibit staining, odors, or elevated PID readings.

It is anticipated that purge water generated during the development and sampling of the monitoring wells will require off-site disposal based on the previous off-site data. Decontamination fluids will be containerized separately from other IDW, and any decontamination fluids that do not exhibit evidence of contamination will be containerized separately from those exhibiting evidence of contamination.

2.2.9 Analytical Data Quality Evaluation

This Work Plan and the associated site-specific QAPP Section detail the data quality objectives and analytical requirements needed for this WA. All quality assurance protocols will be provided in the Generic QAPP.

During the final Work Plan review period, the site-specific QAPP Section and Work Plan will be reviewed and modified according to NYSDEC requirements and comments. Once the plans are finalized, deviations, if required, from protocols specified in the plans will be approved in advance by NYSDEC. As required, the selected analytical laboratory will maintain NYSDOH ELAP certification

in all categories of USEPA Contract Laboratory Program (CLP) and Solid and Hazardous Waste analytical testing for the duration of the project.

The ELAP certified laboratory will supply all required data deliverables (USEPA CLP and NYSDEC ASP deliverable format) to enable the data to be validated. All environmental data will be submitted electronically in a specified format named 'NYSDEC' in accordance with the data submission procedures outlined on the NYSDEC's website (<http://www.dec.ny.gov/chemical/62440.html>).

Upon receipt of the sample data, the validation contractor will quantitatively and qualitatively validate the laboratory data. The validation of the analytical data will be performed according to the protocols and QC requirements of the analytical methods, the CLP National Functional Guidelines for Organic and Inorganic Data Review (January 2017), the USEPA Region II CLP Data Review SOP, and the reviewer's professional judgment.

2.2.10 Site Survey

Locations of sub-slab soil vapor points will be surveyed at the Site using handheld global positioning system (GPS) equipment and by measuring off permanent structures and features (swing-ties). All location data collected by HRP will be included on site base maps and entered into the NYSDEC's EQuIS database.

2.3 Site Characterization Report

2.3.1 Electronic Data Delivery

In addition to appropriate data summary tables and boring logs included in the report, all environmental data will be submitted electronically in a specified Electronic Data Deliverable (EDD) format named in accordance with the data submission procedures outlined on the NYSDEC's website (<http://www.dec.ny.gov/chemical/62440.html>).

2.3.2 Site Characterization Report (SCR)

The Site Characterization Report (SCR) will provide a description of the field activities, present data collected during field characterization, present a physical description of the Site including geology and hydrogeology, and provide an analysis and interpretation of the available data in the context of existing Site conditions. The SCR will include tabulated laboratory analytical results, Site maps and a discussion of contaminant concentrations, including a comparison to NYSDEC Standards, Criteria and Guidelines as described in Section 3.13 of DER-10.

The SCR prepared as part of this assignment will also provide a summary of the general nature of contamination on the Site to the extent investigated by the SC including, without limitation, the numbers of AOCs requiring further investigation and/or remediation and any significant events or seasonal variation which may have influenced sampling procedures or analytical results. A description of each area of concern identified, including dimensions, suspected and actual contamination and suspected source of discharge or disposal recommendations for either additional

investigation in the SC, remediation or no further action for each area of concern. The submitted report will include the report text, appropriate tables, figures, photographs, data summary tables, and boring logs in a PDF format on a compact disc. The electronic file will contain 'bookmarks'. In addition, one hard copy of the report will be sent.

3.0 GREEN AND SUSTAINABLE REMEDIATION BEST MANAGEMENT PRACTICES (BMPS)

Through the course of the SC investigation, HRP will implement Green and Sustainable Best Management Practices (BMPs) to reduce negative impacts to air, water, solid waste, etc. (presented in Section 17.0 and Appendix C of the NYSDEC-approved Revised FAP, dated February 2, 2022).

In consultation with NYSDEC, quantifiable impact reductions achieved by green and sustainable remediation BMPs implemented during the SC investigation (e.g. tons of carbon reduced, gallons of fuel saved, pounds of waste reduced) may be included in Site fact sheets to promote public awareness of NYSDEC green and sustainable BMPs.

Green and Sustainable Remediation BMPs to be implemented as part of this project are summarized below, organized by BMPs implemented in project planning and field work phases of work.

Project Planning BMPs

- BMP 1) A well-conceived dynamic sampling plan has been developed for the Site to assure that the data collected at project on-set adequately addresses Site data gaps, consequently reducing remobilization of field crews and equipment. A conceptual site model (CSM) has been developed for the Site, incorporating the Site sampling data, Site history, and current and historical land use to identify data gaps and allows for refinement as additional data becomes available. Data visualization techniques such as concentration “heat maps” for contaminants of concern will be utilized to refine the CSM and project SOW. No alterations will be made to the SOW without NYSDEC approval. Refinement of the CSM and SOW will be performed with the primary goal of achieving the purposes and objectives of the SC as described in **Section 1.1**. Green and sustainable impact reductions will be a secondary goal of CSM/SOW refinement and care will be taken to ensure SOW changes do not impact the efficacy of the SC.
- BMP 2) Efforts will be made to schedule Site visits and field work to reduce energy consumption and air emissions associated with mobilizations to and from the Site. The following BMPs will be implemented related to HRP mobilization:
- BMP 2a) Field work schedules will be consolidated by coordinating with contractors. Specifically, the Site walkthrough, GPR work, Site survey, and sub-slab SVI will be completed within the same mobilization.
- BMP 2b) When two or more HRP personnel are involved in a trip to and from the Site which requires a passenger vehicle (i.e., cannot be completed by mass-transit), personnel will “car-pool” by sharing a vehicle, reducing energy consumption and emissions associated with taking multiple vehicles to the Site.

Field Work BMPs

- BMP 3) All soil borings and soil vapor points will be installed with direct push drilling methods instead of hollow stem auger methods to reduce the generation of waste drill cuttings and reduce drill rig operation time.
- BMP 4) Exterior soil vapor points will be installed as permanent points with protective road boxes so they may be utilized for potential future sampling events. This will reduce energy usage, air emissions, and mobilizations associated with installing new soil vapor points if re-sampling is required during a future investigation.
- BMP 5) When not in use, vehicles, trucks, drill rigs, and other equipment will be shut off to reduce energy consumption and emissions related to engine idling.
- BMP 6) Waste cardboard generated from labware (sample jars, bottle ware, and summa cannisters) will be reused or recycled to reduce waste.

4.0 SITE-SPECIFIC QUALITY ASSURANCE PROJECT PLAN

The Site specific QAPP has been prepared and is included below. Deviations from the protocols specified in the QAPP will be subject to approval by the NYSDEC.

The Generic QAPP (on file with the NYSDEC) provides general information related to QA/QC procedures associated with the collection and analysis of samples of environmental media and includes specific representative SOPs applicable to sample handling and field instrumentation use. Information provided in the Generic QAPP includes definitions and generic goals for data quality and required types and quantities of QA/QC samples. The procedures address field documentation; sample handling, custody, and shipping; instrument calibration and maintenance; auditing; data reduction, validation, and reporting; corrective action requirements; and QA/QC reporting specific to the analyses performed by the laboratories that are used for analysis of environmental media collected under Standby Contract No. D009808.

Laboratory analytical work will be performed by a NYSDOH ELAP approved laboratory certified in CLP and solid and hazardous waste analytical testing. A DUSR will be included in the SC for each round of analytical work. Category B deliverables will be retained in the project files and available for full data validation by a qualified, independent third party.

4.1 Site-specific Sampling

Soil and air samples will be collected during this SC Investigation. Detailed sampling procedures are detailed in Section 4.0 of the Generic QAPP. Matrix types, number of samples (including QA/QC) and analytical details are summarized in **Table 3**. Proposed sample locations are depicted on **Figure 2**.

4.2 Data Quality Assessment and Usability

Data quality objectives for the Former Astoria Steel Off-Site SC are focused on the characterization of releases of hazardous substances impacting environmental media at the Site and surrounding properties.

To achieve these objectives, QA/QC measures will be implemented throughout the Off-Site Investigation to provide input as to the validity and usability of data generated through soil, groundwater, soil vapor and indoor air sampling. The procedures for data QA/QC management includes field documentation; sample handling, custody, and shipping; instrument calibration and maintenance; auditing; data reduction, validation, and reporting; corrective action requirements; and QA reporting specific to the analyses performed by the laboratory under subcontract to HRP. **Table 3** lists the sample containers, preservation, and holding time requirements for the parameters specific to this Site. This table will be referenced by field personnel.

For all data generated during the SC Investigation, a Category B Data package and Data Usability Summary Report (DUSR) will be prepared to provide a thorough evaluation of analytical data utilizing third-party data validation. Environmental Data Services, Inc. WBE (EDS) will be the third-party data validator for this project.

5.0 **PROJECT MANAGEMENT**

HRP has the responsibility of the overall management of this project and will respond to any NYSDEC requests. A proposed project schedule, key milestones, key project personnel, and project-specific subcontractors follow.

5.1 **Project Schedule and Key Milestones**

The proposed project schedule for this work assignment is outlined below. Key milestones are identified to monitor work progress. Efforts will be made to consolidate field tasks into as few mobilizations as possible. It is anticipated that all work will be coordinated to be completed within the heating season, so drilling and sub-slab SVI investigations can be completed within the same mobilization. The following milestones will be applicable for this project:

CATEGORY	TASK	START	END
Task 1 – Preliminary Activities	Work Plan, QAPP, HASP (Includes Department Review and Approval)	02/05/2024	08/01/2024
Task 2 – Investigation, Environmental Sampling, and Implementation	Off-site Property Access and NYCDOT Permit Acquisition	7/01/2024	11/15/2024
	Drilling and SVI Sampling to be Completed During Heating Season	11/15/2024	11/20/2024
Task 3 – Site Characterization Report (SCR)	Report Preparation and Submittal	12/01/2024	02/01/2025

5.2 Key Project Personnel

A list of the project personnel of the prime consultant and subcontractors responsible for performance of the investigation has been submitted to the NYSDEC for approval. Primary project staffs are listed in the table below.

Personnel	Company	Title for this Work Assignment	Responsibility
<u>Patrick Montuori, PG</u> (Project Manager)	HRP Associates, Inc. (Prime Consultant)	Project Manager	Overall management of the WA
<u>Bryan Sherman, ASP</u> (Office Health and Safety Manager)	HRP Associates, Inc.	Office Health and Safety Manager	Approval of HASP and responsible for overall health and safety issues with the WA
<u>Michael Varni</u> (Senior Project Geologist)	HRP Associates, Inc.	Corporate QA/QC Officer	Responsible for QA/QC on the WA
<u>Elliott Jackson, GIT</u> (Project Consultant)	HRP Associates, Inc.	Field Manager and Site Health & Safety Officer	Responsible for the on-site sampling and investigative tasks

Subcontractors for this project will include:

- GPR – American Geophysics
- Drilling – AARCO Environmental Services Corp. (AARCO)
- Laboratory – ELAP certified laboratory selected through NYSDEC call-out contract
- Data Validation – Environmental Data Services, Inc. WBE
- IDW Disposal – AARCO

6.0 REFERENCES

Caldwell, D.H., et.al., 1986, Surficial Geologic Map of New York, New York State Museum – Geological Survey, Map and Chart series No. 40.

Fisher, D.W., et. al., 1970, Geologic Map of New York, New York State Museum and Science Service, Map and Chart Series No. 15.

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FIGURES

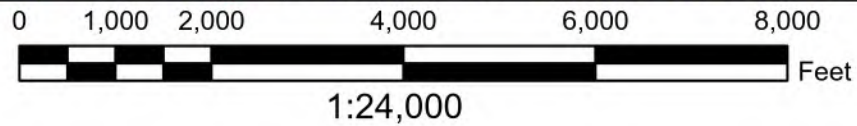


Figure 1
Site Location
Former Astoria Steel Off-site
Site #C241155A
3-15 26th Avenue
Queens, New York
HRP # DEC1038.P2

USGS Quadrangle Information
 Quad ID: 42078-G3
 Name: Queens, New York
 Date Rev: 1976
 Date Pub: 1995

ONE FAIRCHILD SQUARE
 SUITE 110
 CLIFTON PARK, NY 12065
 (518) 877-7101
 HRPASSOCIATES.COM

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Legend

Site Boundary

Groundwater Flow Direction

Proposed Soil Boring Investigation Location

Proposed Soil Vapor Point Investigation Location

Proposed SVI Investigation Locations

HRP

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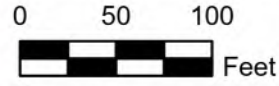
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

North

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Feet

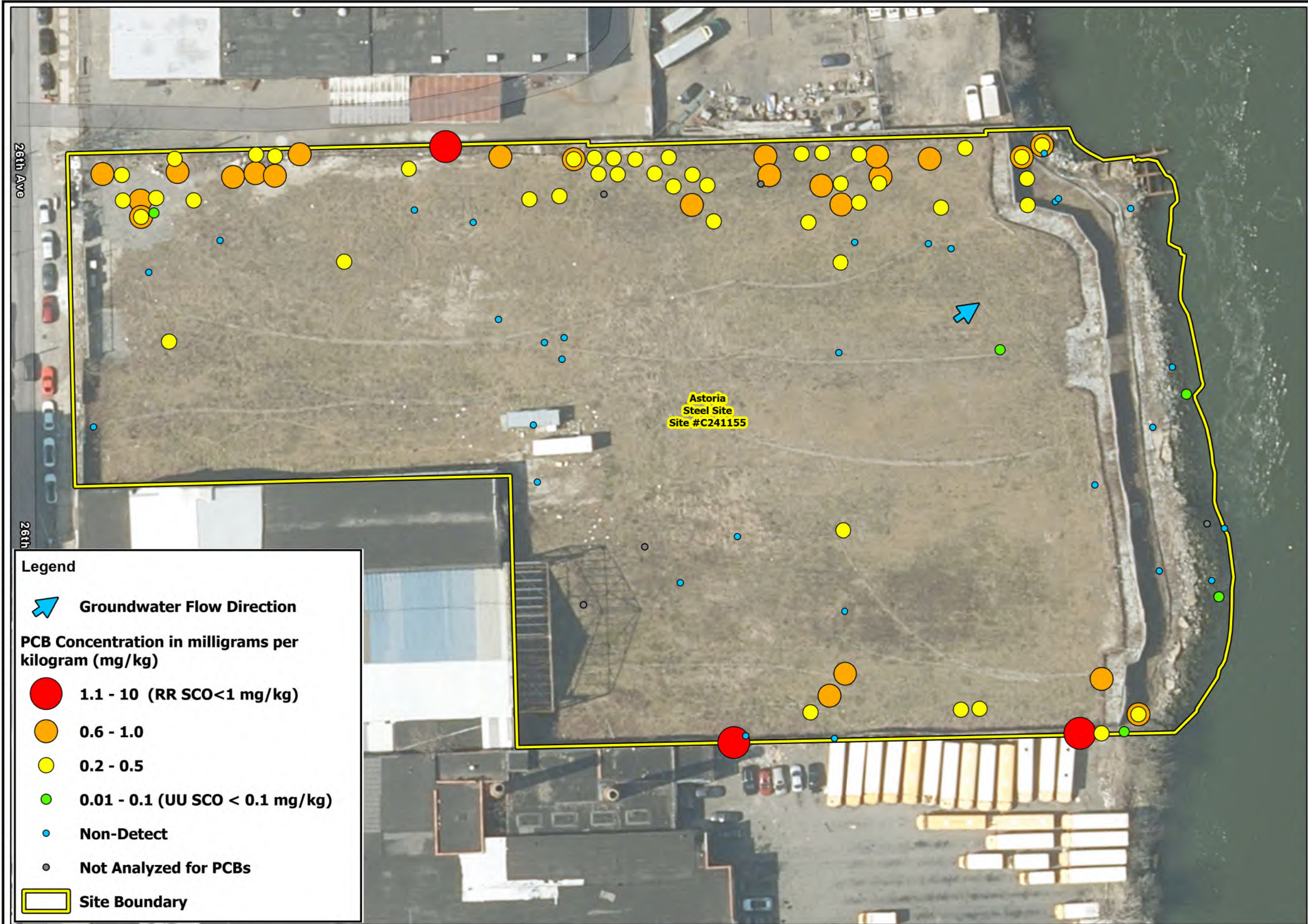
Revisions	No.	Date			
Designed By:	CMS		Drawn By:	EWJ	
Issue Date:	7/2/2024		Project No:	DEC1038.P2	
Site Plan and Proposed Investigation Locations			Sheet Size:	11x17	
	Former Astoria Steel Off-site Site #C241155A 3-15 26th Avenue Queens, New York				
Figure No. 2					



Surrounding Property Use

Former Astoria Steel Off-site
Site #C241155A
3-15 26th Avenue
Queens, New York

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Revisions				
	No.	Date	Designed By:	Drawn By:
			CMS	CMS
			Reviewed By:	PWM
			Issue Date:	2/23/2023
			Project No:	DEC1038.P2
			Sheet Size:	11x17

Polychlorinated
Biphenyls (PCBs) in
Post Excavation
Soil Samples
Former Astoria Steel Off-site
Site #C241155A
3-15 26th Avenue
Queens, New York

Figure No.

4A

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Legend

Site Boundary

Groundwater Flow Direction

Existing Groundwater Monitoring Well with CVOC Exceeding NYSDEC Class GA

Existing Groundwater Monitoring Well with No CVOC Exceeding NYSDEC Class GA

NE - No CVOC Concentrations Exceeding NYSDEC Class GA Criteria
ug/L - Micrograms per Liter
ug/m3 - Micrograms per cubic meter
CVOCs - Chlorinated Volatile Organic Compounds

Name	Abbreviation	NYSDEC Class GA Groundwater Criteria
Tetrachloroethene	PCE	<5 (ug/l)
Trichloroethene	TCE	<5 (ug/l)
cis-1,2-Dichloroethene	cis-1,2-DCE	<5 (ug/l)
Vinyl Chloride	VC	<2 (ug/l)

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197 SCOTT SWAMP ROAD
FARMINGTON, CT 06032
(860) 674-9570
HRPASSOCIATES.COM

North

02550

Feet

Revisions		
	No.	Date
Designed By:	PWM	
Drawn By:	BOB	
Reviewed By:	PWM	
Issue Date:	04/15/2024	
Project No:	DEC1038.P2	
Sheet Size:	11x17	

Chlorinated Volatile Organic Compounds (CVOCs) in Post Remedy Groundwater Samples August 2020

Former Astoria Steel Off-site Site #C241155A
3-15 26th Avenue
Queens, New York

Figure No.

4B

New York State, Maxar, Microsoft

TABLES

Table 1
Historical Property Use and Relevant Regulatory Findings
Astoria Steel Site
NYSDEC Site No. C241155A
3-15 26th Avenue
Astoria, New York 11221

Map ID	Distance from Site Boundary (ft)	Address	Historic Use	Years Listed	Relevant Regulatory Findings
On-Site					
SITE	-	3-15 26th Avenue	Lumber Yard	1915-2006	NYSDEC Site No. C241155
			Woodworking/Sash Door Factory	1915-1928	
			Foundry	1915-1950	
			Gas Purifying Materials Co.	1928-2006	
Off-Site					
1	0	215 26th Avenue	Instant Coffee Manufacturing	1967	-
			Manufacturing (Unspecified)	1977-2006	
2	0	3-17 26th Avenue	Foundry	1915-1950	-
			Warehouses	1977-2006	
3	0	4-05 26th Avenue	Sash Door Factory	1915-1950	-
			Gas Purifying Materials Co.	1936-2006	
			Lumber Yard	1915-2006	
			Machine Shop	1977-2006	
			Woodworking	1977-2006	
4	0		Truck Storage	2011-2024	-

Table 2
Sampling Summary
Site Characterization

Astoria Steel Site - Offsite
NYSDEC Site #C241155A
3-15 26th Avenue
Astoria, NY

Activity/ Matrix	Number of Sample Locations	Proposed Sample Locations	Number of Samples to be Collected	Analyses
Soil	12	12 Proposed soil boring 2 soil samples collected from each soil boring	30 (24 regular, 6 QA/QC)	PCBs by EPA Method 8082 QA/QC: 1 duplicate, 1 MS, 1 MSD per 20 samples
Soil Vapor	4	Up to 4 soil vapor points installed in the right of way	6 (4 soil vapor samples, 1 duplicate soil vapor sample, 1 outdoor ambient air)	VOCs by EPA Method TO-15 QA/QC: 1 duplicate soil vapor sample per 20 samples
	4	Soil Vapor Intrusion (SVI) investigations on up to 5 properties. 1 sub-slab soil vapor sample, 1 basement indoor air sample, 1 first floor indoor air sample collected per structure; 1 outdoor air sample per day of sampling	37 (10 sub-slab soil vapor, 20 indoor air; 5 outdoor air, 2 duplicate)	VOCs by EPA Method TO-15 QA/QC: 1 duplicate sub-slab soil vapor sample per 20 samples

Acronym:
MS/MSD: Matrix spike/matrix spike duplicate
VOCs= Volatile organic compounds



Table 3
Analytical Methods/Quality Assurance Summary
Site Characterization

Astoria Steel Site - Offsite/Former Astoria Boatyard
NYSDEC Site #C241155A/#241186
3-15 26th Avenue
Astoria, NY

					Containers per Sample			Preservation Requirements			
Parameter	Matrix	Number of Samples (including Field QC)	Preparation Method	Analytical Method	No.	Size	Type	Temp.	Light Sensitive	Chemical	Maximum Holding Time
Soil											
PCBs by GC	Soil/Sediment	30	3546	SW-846 Method 8082	1	8oz	clear glass jar	2-6° C	No	NA	14 days
SOIL VAPOR/AMBIENT AIR											
VOCs	Soil Vapor, Air	6	NA	EPA TO-15	1	6-Liter	summa canister, 2-hour regulators	NA	No	NA	30 days (summa canister)
VOCs	Soil Vapor, Air	37	NA	EPA TO-15	1	6-Liter	summa canister, 8-hour or 24-hour regulator	NA	No	NA	30 days (summa canister)

Acronyms:

PCBs = Polychlorinated biphenyls

VOCs= Volatile organic compounds

Notes:

Reporting limits for all VOC samples in soil vapor/ambient air will meet minimum thresholds defined in the NYSDOH Decision Matrices

APPENDIX A

Site-Specific Health and Safety Plan



MOVE YOUR ENVIRONMENT FORWARD

SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP)

Astoria Steel Site - Offsite – Site #C241155A

3-15 26th Avenue
Astoria, New York 11102

Prepared For:

Contract# D009808, Work Assignment No. 38
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233

Prepared By:

HRP Associates, Inc.
1 Fairchild Square, Suite 110
Clifton Park, NY 12065

HRP #: DEC1038.P3

Issued On: July 17, 2024



Addendum Number	Date Issued	Reason For Modification

Disclaimer

HRP Associates does not guarantee the health or safety of any person entering this site. Due to the potential hazards of this site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards which may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury at this site. The health and safety guidelines in this plan were prepared specifically for this site for use and should not be used on any other site.

CERTIFICATION

This Addendum to HRP's Generic Health and Safety Plan has been prepared under the supervision of, and has been reviewed by, an Associate Safety Professional (ASP) certified by the Board of Certified Safety Professionals.



Bryan Sherman, ASP
ASP # 31838

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Table 1b	Physical Hazards Known or Suspected On-Site
Table 2	HASP Acceptance and Site Visitor Log

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Appendix A	Safety and Logistics Planning Call Log
Appendix B	Personnel Log
Appendix C	Supervisor's Investigation Report
Appendix D	Daily Job Brief Record
Appendix E	Equipment Calibration Log
Appendix F	COVID-19 Health and Safety Guidelines
Appendix G	Safety Data Sheets (for chemicals brought to the site)

1.0 **EMERGENCY CONTACTS/PLANNING**

The Health and Safety Officer will coordinate the entry and exit of response personnel in the event of an emergency. The following information, including directions to the nearest hospital shall be posted at the Site. When contacting the local authorities, be sure to provide: your name, facility name, full address, telephone number, and the nature of the emergency.

<u>Emergency Phone Numbers</u> 3-15 36th Street Astoria, Queens NY	
Emergency Contact	Phone Number
Fire, Ambulance, Police Emergency:	911
NYCPD 114 th Precinct (Sector D) Police Department (routine calls):	718-626-9311
FDNY EMS Station 32- Fire Department (routine calls):	718-222-1290
Mount Sinai Queens:	718-932-1000
Poison Control Center:	1-800-222-1222
DEC spills hotline:	1-800-457-7362
NYCDEP	212-639-9675
National Response Center:	800-424-8802
Project Manager: Patrick Montuori	845-531-9490
Site Safety Officer: Elliott Jackson	518-877-7101
NYSDEC Project Manager: Javier Perez-Maldonado	518-402-9767

Map and directions to the following medical facilities are provided in **Figure 3**:

- **Mount Sinai Queens** - located at 25-10 30th Avenue, Queens, NY (approximately 1.0 miles from the work site)

First Aid, Fire Protection, Emergency Response Equipment Storage Locations	
First Aid Kit:	In Vehicle
Fire Extinguisher:	In Vehicle
Eye Wash (Bottle):	In Vehicle

A Safety and Logistics Planning call will be held prior to conducting any intrusive activities at the site. Representatives from HRP and each subcontractor will attend the call to discuss logistical and safety challenges general to the scope of work and specific to the Site. This call is documented on the Safety and Logistics Planning Call Log in **Appendix A**.

2.0 INTRODUCTION

Purpose and Scope

This Health and Safety Plan (HASP) addresses the health and safety practices that will be employed by HRP Associates, Inc. personnel and our subcontractors participating in the Site Characterization (SC) that will be performed at the site. The SC will be comprised of several tasks to evaluate the environmental condition of the Site and the surrounding area, including installation of soil borings, soil vapor points, and monitoring wells to collect soil and air samples.

This HASP has been developed in accordance with HRP's Generic Safety and Health Program as required under OSHA's Hazardous Waste Operations Standard (29 CFR 1910.120). This Plan has been developed to establish minimum standards necessary for onsite investigation activities to protect the health and safety of HRP personnel. HRP site personnel have received the required level of training and field experience as required under subpart (e) of the Standard and have received medical examinations in accordance with HRP's medical surveillance program as required under subpart (f) of the Standard. No other personnel will be permitted in the Exclusion Zone unless they have received training and medical surveillance under the Standard.

HRP personnel and associated contractors shall be familiar with this HASP prior to conducting proposed site work. This plan must be present on site and be available for reference/inspection when the subject site work is being conducted.

Site Information and Areas of Environmental Concern

2.1.1 Site Information and Description

Site Name: Astoria Steel Site Off-Site
Site Address: 3-15 26th Avenue, Astoria, Queens NY
Site Contact: Javier Perez-Maldonado, NYSDEC
Phone Number: 518-402-9767

Background and Project Description

The Astoria Steel Site Off-Site SC will focus on the area surrounding one active Brownfield Cleanup Program (BCP) Site (referred to hereinafter as "the Site") located at 3-15 26th Avenue in the Astoria neighborhood of Queens, New York. The 3.67-acre Site (Block 911, Lots 1) is a vacant lot and is planned to be redeveloped for residential usage.

The location of the Site is depicted on **Figure 1**.

According to available historical records and previous environmental reports (discussed below), the Site operations at the Site included the following (dates are approximate based on available listings):

- Steel Facility (1906)
- Foundry/Scrap yard (1915-1970)
- Lumber Yard (1991-2014)

Previous investigations identified the presence of PCBs in soil solids and CVOCs in soil solids and soil vapor on the Site above applicable NYSDEC standards, criteria, and guidance (SCGs).

The purpose of the SC is to determine soil gas/vapor quality in this area to determine whether the Site conditions pose a risk to public health and the environment. In accordance with DER-10 *Technical Guidance for Site Investigation and Remediation (May 2010)*, the primary objectives of the SC scope of work are to:

- Investigate the identified areas of concern (AOCs) associated with the Site and determine if they have resulted in surface or subsurface contamination and evaluate the extent of the contamination, if any;
- Obtain geologic and hydrogeologic data from the Site. The specific information that should be collected and/or verified includes: soil types (or fill), depth to groundwater, groundwater flow direction, subsurface geology, bedrock characteristics, etc. Determine if applicable standards, criteria, and guidance contained in NYSDEC DER-10 and set forth for the Site are contravened;]
- Preliminarily delineate the vertical and horizontal extent of contaminated groundwater, if any;
- Establish a baseline for any remedial work that will be necessary to address impacted media; and
- Determine if the site represents a threat to public health or the environment.

2.1.2 Personnel Designations

The following personnel are designated to perform the stated project activities and to ensure that the requirements of this HASP are met. The same person may fill more than one role, and/or serve as an alternate in the absence of the designated team member.

The following personnel are designated to perform the stated project activities and to ensure that the requirements of this HASP are met. The same person may fill more than one role, and/or serve as an alternate in the absence of the designated team member. All subcontractors must have received the required level of training and field experience as required under subpart (e) of OSHA 29 CFR 1910.120 and OSHA 29 CFR 1926.65 for Hazardous Waste Operations and Emergency Response (HAZWOPER).

Project Team Member	Responsibilities and Tasks
Elliott Jackson (or Qualified Alternate Safety Officer)	<p>HSO – HRP Associates, Inc.</p> <ul style="list-style-type: none"> - Ensuring all site work is being performed in accordance with HRP Associates, Inc. Safety Program, as well as in accordance with local, state and federal regulations. - Directing and implementing HRP's HASP. - Reviewing the Subcontractor's HASP and being aware of the hazards detailed therein. - Conduct a job orientation meeting and routine safety meetings for HRP Associates, Inc. employees and subcontractors, as applicable. - Provide copies of these inspections, recordkeeping/personnel logs to the engineer/contractor as required. - Ensuring all project personnel have been adequately trained in the recognition and avoidance of unsafe conditions. - Authorizing Stop Work Orders that shall be executed upon the determination of an imminent health and safety concern, and will notify the appropriate contacts upon issuance of this order. - Authorizing work to resume, upon approval from the Contractor. - Directing activities, as defined in the HRP's and the Contractor's written HASP, during emergency situations. - Providing personnel monitoring where applicable. - Ensuring that adequate personal protective equipment and first aid supplies are available. - Ensure site security, to the extent practicable. - Ensure accident victims are promptly cared for, and the incident is investigated and properly reported.
Patrick Montuori (Site Supervisor/ Project Manager) Mark Wright (Alternate Site Supervisor)	<p>Site Supervisor/Project Manager – HRP Associates, Inc.</p> <ul style="list-style-type: none"> - Monitor and assist the site Health and Safety officer. - Maintain appropriate rules, regulations and codes at the job site. - Provide advance safety planning for all activities through the use of scheduling and administrative controls. - Obtain site-specific health and safety information and communicate that information with the appropriate personnel (i.e. contractors, client, etc.) - Report all injuries, illnesses and other incidents to the Director of Safety. - Ensure all HRP personnel are trained and qualified to perform site work.
Site Workers (Subcontractors)	<p>Site Workers</p> <ul style="list-style-type: none"> - Read and work in accordance with this HASP. - Report all unsafe work practices to the HSO. - Report all incidents, including near-misses to the HSO. - Work in a safe manner. - Provide Designated Competent Person
<p>A complete list of HRP employee and subcontractor responsibilities (as applicable) can be found in the HRP Generic Health and Safety Plan.</p> <p><u>1</u> A list of site workers will be maintained in the Personnel Log (Appendix B)</p> <p><u>2</u> Supervisors Investigation Report included as (Appendix C)</p>	

3.0 AREAS OF ENVIRONMENTAL CONCERN

Scope of Work

The SC will involve the installation of off-site soil borings for the purpose of screening for PCB impacts on neighboring properties to the east and west, installation of off-site soil vapor points in the sidewalk along 26th Avenue, and completion of off-site sub-slab SVI structure sampling. The field investigation tasks for the Site are listed below in the order that they are expected to be completed:

1. Property Access and Permit Acquisition
2. Underground Utility Identification and Clearance using Ground-Penetrating Radar (GPR)
3. Advancement of Soil Borings and Collection of Soil Samples
4. Soil Vapor Point Installation and Sampling
5. Soil Vapor Intrusion Investigation
6. Site Survey
7. Characterization and Disposal of Investigation Derived Waste
8. Analytical Data Quality Evaluation

The scope is presented in further detail in the SC Work Plan.

4.0 HAZARD ANALYSIS

The project hazard analysis below identifies the hazards that are anticipated to be encountered by the project team.

Physical Hazards Present	<input type="checkbox"/> Electricity <input checked="" type="checkbox"/> Trips/Falls/Floor openings <input checked="" type="checkbox"/> Holes/Pits <input checked="" type="checkbox"/> Inclement weather <input checked="" type="checkbox"/> Heat <input checked="" type="checkbox"/> Cold <input type="checkbox"/> Vibration <input checked="" type="checkbox"/> Flying particles	<input type="checkbox"/> Ionizing radiation <input type="checkbox"/> Non-Ionizing radiation <input type="checkbox"/> Lasers <input checked="" type="checkbox"/> Overhead hazards <input checked="" type="checkbox"/> Noise <input type="checkbox"/> Visible dust <input checked="" type="checkbox"/> Falling objects <input type="checkbox"/> Other _____
Health/Chemical Hazards Present ¹	<input checked="" type="checkbox"/> Dust/Fumes/Particulates <input checked="" type="checkbox"/> Flammable/Combustible <input type="checkbox"/> Compressed gas <input type="checkbox"/> Explosive <input type="checkbox"/> Water reactive <input type="checkbox"/> Unstable <input checked="" type="checkbox"/> Contact with contaminated media	<input type="checkbox"/> Oxidizer <input type="checkbox"/> Corrosive <input type="checkbox"/> Toxic <input type="checkbox"/> Highly Toxic <input type="checkbox"/> Irritant <input type="checkbox"/> Sensitizer <input type="checkbox"/> Carcinogen/Mutagen <input type="checkbox"/> Other _____
Environmental/Equipment Hazards Present	<input checked="" type="checkbox"/> Heavy machinery <input checked="" type="checkbox"/> Drilling <input type="checkbox"/> Water operations <input checked="" type="checkbox"/> Mobile equipment <input checked="" type="checkbox"/> Road work <input type="checkbox"/> Railroad work <input type="checkbox"/> Forklifts <input checked="" type="checkbox"/> Power tools <input type="checkbox"/> Welding <input type="checkbox"/> Gas cylinders <input checked="" type="checkbox"/> Overhead/underground utilities	<input type="checkbox"/> Trenching/excavation <input type="checkbox"/> Elevated heights/man lifts <input type="checkbox"/> Scaffolding <input type="checkbox"/> Ladders <input type="checkbox"/> Confined spaces <input type="checkbox"/> Energized equipment <input checked="" type="checkbox"/> Overhead hazards <input checked="" type="checkbox"/> Drums/container handling <input checked="" type="checkbox"/> Insects/rodents/snakes <input type="checkbox"/> Biological hazards <input type="checkbox"/> Other _____
Personal Safety Considerations	<input type="checkbox"/> Security Issues <input type="checkbox"/> Remote setting <input type="checkbox"/> Employees working alone <input type="checkbox"/> Limited lighting	<input type="checkbox"/> Off hour shifts <input type="checkbox"/> Dangerous wildlife/animals <input type="checkbox"/> Limited cell phone service <input type="checkbox"/> Other _____

¹ **Table 1** (following the text of this HASP) provides a list of chemical substances for reference, along with odor threshold, permissible exposure limit (PEL), threshold limit value (TLV), OSHA ceiling, IDLH concentration, route of exposure and symptoms of acute exposure, if any.

Details of specific hazards associated with individual tasks will be discussed in the Daily Job Brief Record (**Appendix D**).

Hazard Analysis Summary/Minimization

HRP's Corporate Health & Safety Plan (in conjunction with this HASP) will be cross-referenced in order to obtain the safe work practice procedures for mitigating and preventing project site hazards identified in the table above. Job site hazard prevention and minimization information can be found in Section 3 of HRP's Generic Health & Safety Plan.

Confined Spaces

Only properly trained HRP personnel are authorized to enter confined spaces. Confined space entry may be performed by subcontractors who have the proper training and experience to conduct this work. Confined space entry is not anticipated during the SC.

Excavations

It is HRP's policy to ensure that for excavation projects the subcontracted environmental contractor will provide a competent person to perform daily and as needed inspections of excavation sites. This policy will be conveyed through the subcontract agreement with the environmental contractor. At a minimum HRP will provide our employees involved with construction projects with awareness level training regarding excavation hazards and notify the subcontracted firm if any obvious excavation safety hazard exists during on-site activities.

Chemical Hazards

Hazardous chemicals known or suspected to be onsite are listed in **Table 1a** (follows text). **Table 1a** includes Chemical name, odor threshold OSHA PEL, ACGIH TLV, OSHA STEL, IDLH Concentrations, routes of exposure and symptoms of acute exposure. Chemicals likely to be encountered during site work are highlighted.

Changes in Conditions or Scope

Should conditions or the scope of work described herein change significantly; a HASP Addendum will be completed.

Monitoring Procedures

Air monitoring will be used to determine the concentrations of various chemicals while working in the exclusion zone to evaluate worker exposure to contaminated media. In order to determine potential health hazards and to determine the level of personal protection needed during sampling activities within the areas of concern, a Photoionization Detector (PID) will be periodically operated to monitor air quality for the purpose of ensuring minimal exposure to volatile organic compounds. Monitoring of atmospheres adjacent to on-going excavations and around the treatment area shall also be conducted with a PID.

The following environmental monitoring instruments/procedures shall be used on-site at the specified intervals.

Instrument/Procedure

Photoionization Detector (PID)
in the breathing zone

Sampling Interval

Periodically as deemed by HSO

Background ambient air levels will be established outside the exclusion zone prior to commencement of site work. Ambient air sampling will occur in the breathing zone of site workers for comparison to the action levels (described below). Additionally, air sampling will be conducted in the vicinity of any intrusive exploration (i.e., near excavations, trenches, etc.) to determine if any contaminants are present.

The following *Action Levels* will be used:

Instrument	Action Level	Level of Protection or Action Required
PID	No reading above background	<ul style="list-style-type: none">▪ No action required.▪ Continue PID monitoring.▪ (Modified) Level D protection.
PID	Up to 5 ppm above background	<ul style="list-style-type: none">▪ Evacuate exclusion zone.▪ Recheck levels after 15 minutes.▪ If levels are sustained, reassess.▪ Use engineering controls to lower breathing zone vapors.▪ Level C protection (at the HSO direction).
PID	>5 ppm above background	<ul style="list-style-type: none">▪ Evacuate exclusion zone.▪ Recheck levels after 15 minutes.▪ Use engineering controls to lower breathing zone vapors.▪ If levels are sustained, contact Safety Manager, and re-evaluate HASP.

When an action level is equaled or exceeded, the work area should be evacuated, and the area re-tested with the sampling device. If the appropriate action level continues to be exceeded, the HSO will have to assess the use of engineering controls to lower vapor levels or availability of required increased personal protection equipment before authorizing re-entry.

Calibration of all instruments will occur at least once per day, when in use. An equipment calibration log is included in **Appendix E**.

In addition to the air monitoring for on-site receptors described above, a Community Air Monitoring Plan (CAMP) will be implemented to monitor potential impacts to off-site receptors. The CAMP is included as Appendix B of the SC Work Plan.

5.0 ENGINEERING CONTROL MEASURES/GENERAL SAFETY

Air Monitoring

In order to determine potential health hazards and to determine the level of personal protection needed during drilling, excavation and sampling activities within the areas of concern, a PID will be periodically operated to monitor air quality for the purpose of ensuring minimal exposure to volatile organic compounds. Please refer to Section 4 of this plan for specific air monitoring procedures/action levels.

Protective Zones

Prior to commencement of work in area of suspected contamination, protective zones specific for each phase of the Plan will be established by the HSO if necessary, prior to the start of field work. The purpose of the protective zones is to prevent potential cross-contamination of adjacent areas as well as to protect project personnel from exposure to contaminated areas.

Protective zones shall be delineated as follows:

- Exclusion Zone: This is the contaminated area in which intrusive activities are performed. The "Area of Environmental Concern" (AOEC) is located within this area. A single access point for entrance and exit should be established and maintained, if possible. This zone should be delineated from the Contaminant Reduction Zone via perimeter cones or caution tape, or other applicable method. The Exclusion Zone delineation and any necessary modifications will be based on site conditions.
- Contaminant Reduction Zone: This zone is a transition zone located between the Exclusion Zone and the Support Zone and is utilized to decontaminate personnel and equipment.
- Support Zone: This zone will be utilized by equipment and vehicle storage and will be kept free of contaminated material. The HSO will determine the location of this zone. In the event of a site evacuation, the rally point will be at the Site entrance of 26th Avenue (**Figure 2**). The designated rally point may be relocated by the HSO based on project or site conditions. All site workers will be notified of any relocation prior to implementation.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Level of Protection

As identified in Section 4.0, the overall health and safety risk associated with chemical hazards for HRP and associated contractors is considered significant. This is primarily due to the moderate concentrations of chemical contaminants expected based on minimal contact personnel will have with any potentially contaminated media. Therefore, the minimal level of protection for HRP personnel during the conduct of all the environmental work performed at the site will be Level D PPE, and will generally consist of the PPE listed below:

- Steel toe/shank work boots
- Hard hat, as necessary
- Safety vest, as necessary
- Coveralls/tyvek, as necessary
- Safety glasses/goggles/face shield, as necessary
- Hearing protection, as necessary

If site conditions warrant, an upgrade to Level C PPE may be required (refer to Section 4.3 for the appropriate *Action Levels*) then the contractors will make Level C personal protective equipment (PPE) readily available. Level C PPE generally includes:

- Full face, air purifying respirator with organic vapor cartridges
- Same as Level D, but also includes tyvek taped pant/boot and glove/shirt

If it is determined protection beyond Level C is required, HRP will re-evaluate the HASP as well as the site conditions, and will revise the HASP as required. The following table provides a summary of the minimum level of PPE required on site:

Description	Level of Protection ¹	
	D	C
Body		
Work Clothes	R	R
Chemical Protective Suit (Tyvek)	O	R
Visibility Vest	O ²	O ²
Apron	O	O
Fall Protection	O ²	O ²
Head		
Hard Hat	R	R
Head Warmer	O	O
Eyes & Face		
Safety Glasses	R	R
Goggles (based on hazard)	O	R
Face Shield	O	O
Ears		
Plugs or Muffs	R ²	R ²
Hands & Arms		
Work Gloves	R	O ²

Description	Level of Protection ¹	
	D	C
Chemical Resistant Gloves (Nitrile)	O	R
Insulated Gloves	O	O
Foot		
Work Boots/Steel Toe Boots	R	R
Chemical Resistant Boots	O	O
Disposable Boot Covers	O	O
Respiratory Protection ³		
½ Mask Air Purifying Respirator (APR) or Full face APR	NA	R
Dust Protection	O	NA
Powered APR	NA	NA
SCBA/Supplied Air Respirator	NA	NA

R = Required, **O** = Optional, **NA** = Not Applicable
¹ The level of protection identified here does not include the necessary equipment for entering confined spaces. Refer to Moran Environmental Recovery's Safety Manual Confined Space Program for atmospheric sampling protocols and breathing and rescue equipment necessary for those operations.
² The use of this PPE may or may not be required depending on site conditions/location and will be addressed at the time of task assignment by the HSO.
³ Respiratory protection necessary to protect against VOC, dusts/particulates and not oxygen deficient atmospheres.

The following table provides a general description of potential field activity tasks to be performed and associated (recommended) PPE. The use of this PPE may or may not vary depending on site conditions and will be addressed at the time of task assignment by the HSO.

Task Description	Invasive (Y/N)	Protection Level
<u>Site Mobilization</u> - Surveying, fence and barrier installation, hay bale installation, decon and work zone set up, soil staging areas preparation	N	Level D
<u>Soil and Water Sampling</u> - Drilling, sampling, soil moving as needed.	Y	Modified Level D or Level C – Respirator as needed based on monitoring. Eye protection required during collection of any liquid sample
<u>Soil Excavation, Staging and Load-Out</u>	Y	Modified Level D – or Upgrade to Level C dependent on monitoring
<u>Decontamination</u> - Truck dry sweeping, decon pressure wash of equipment, PPE change out	Y	Modified Level D – or Upgrade to Level C dependent on monitoring
<u>Waste Management</u> - Soil load-out for off-site disposal, water removal for disposal, PPE disposal	Y	Modified Level D – or Upgrade to Level C dependent on monitoring
<u>Site Control (Exclusion, Decontamination, Support Zones)</u>	N	Modified Level D – or Upgrade to Level C dependent on monitoring
<u>Communications</u> - Use of hand signals, backup alarms, and voice	N	NA
<u>Site Restoration</u>	Y	Level D

7.0 DECONTAMINATION

Decontamination Procedures

All personnel and equipment leaving the exclusion zone must be properly cleaned and decontaminated. When there is evidence of chemical contamination during the site operations, all personnel will be decontaminated under the direction of the HSO. Clean-up and/or decontamination of personnel shall consist of washing off excessively soiled PPE with a disinfectant detergent scrub and water. At the very least, all personnel should wash their hands and face before leaving the exclusion zone. After washing, all disposable clothing (tyvek, gloves, etc.) will be removed and placed in a double lined plastic bag.

Sampling tools and any other non-disposable items will be decontaminated between sampling points, and at the direction of HRP personnel, to prevent cross-contamination of work areas or environmental samples, as applicable.

Emergency Decontamination

If immediate medical attention is required in an emergency, decontamination will be performed after the victim has been stabilized. If a worker has been exposed to an extremely toxic or corrosive material, then emergency decontamination will consist of flushing with copious amounts of water. If the victim cannot be decontaminated because it will interfere with emergency medical aid being administered, then the victim should be wrapped with plastic or other available items (i.e. an uncontaminated coverall) to reduce potential contamination of other personnel or medical equipment.

If a site worker has been overcome by heat related illness, then any protective clothing should be removed immediately. In the case of non-medical emergency evacuation, decontamination should be performed as quickly as possible, unless instant evacuation is necessary to save life or prevent injury.

Personal Hygiene

All employees will be required to wash hands and face prior to eating, smoking, drinking and going to the bathroom. Workers will be required to remove contaminated PPE and clothing prior to leaving the Contaminant Reduction Zone. All field personnel should avoid contact with potentially contaminated substances such as puddles, pools, mud, etc.

Additional personal hygiene requirements, intended to prevent the spread of the novel corona virus to site workers will be in effect during site activities. These procedures include mobile handwashing stations and the requirement for site workers to wear face coverings. Additional details are included in **Appendix H**.

8.0 EMERGENCY ACTION PLAN/SPILL RESPONSE

In the event of a worker injury, fire, explosion, spill, flood, or other emergency that threatens the safety and health of site workers, the following procedure will be followed:

1. If the emergency originates within the work area covered by this Plan, the HRP HSO shall act as the Emergency Coordinator. The emergency evacuation signal is an air horn or a loud yell. All emergency situations (including worker injuries, no matter how small) will be reported to the HSO, who will determine the appropriate emergency response, up to and including evacuation. Only the HSO may initiate evacuation of the work area. The HSO will be responsible for reporting any emergency situation to the appropriate authorities, using a telephone or other appropriate method.
2. In the case of an evacuation, site workers will exit the site along the safest route(s) and assemble with team members at a safe rally point. Those workers in the Exclusion Zone will follow the emergency decontamination procedures outlined in Section 7.2. Accounting of all site personnel will be conducted by the HSO using the personnel log at a location determined by the HSO.
3. HRP personnel are not permitted to participate in handling the emergency. Fire and medical emergencies will be handled by the local fire department and ambulance service. In the case of a spill of hazardous materials the NYSDEC will be contacted.

In addition, the HSO/Project Manager must advise the site contact that the New York Spill Hotline should be contacted and, if the spill quantity is greater than the Reportable Quantity (RQ) under CERCLA and/or SARA, the National Response Center (NRC) and Local Emergency Planning Committee should also be contacted. If the spill begins to flow overland and threatens to contaminate a storm drain or surface water, HRP personnel may attempt to contain and isolate the spill using any available resources, but only if, in the judgment of the HSO, such action will not expose the workers to dangerous levels of hazardous substances and is necessary to preserve life or property. In the event that a spill of material of any amount threatens to reach navigable waters, the NRC shall be contacted.

4. Once initial emergency procedures to protect worker safety and health have been addressed, and control of emergency has been completed, the HSO will complete an Investigation Report and submit this form to the appropriate personnel (HRP and/or client contact).
5. All site workers will be familiarized with the above procedures during the pre-entry briefing to be conducted before site work begins.

9.0 TRAINING/MEDICAL SURVEILLANCE

Training Requirements

All HRP and HRP subcontractor personnel who enter the work zone and/or Exclusion Zone must have successfully completed the 40-hour or 24-hour training requirement outlined in 29 CFR 1910(e). If the 40-hour or 24-hour training of any person occurred more than 12 months prior to commencement of work, then that person must have attended an 8-hour refresher course within the 12 months prior to commencement of work. If respirators are in use in the Exclusion Zone, then all personnel must have undergone respirator training and a fit test within the last 12 months. Training certificates and records for HRP employee(s) are on file at HRP. All other contractors will be required to supply written proof of training before being allowed into the Exclusion Zone.

Pre-Entry Briefing

Prior to commencement of work in an area of suspected contamination, HRP's Health and Safety Officer will conduct a pre-entry briefing with on-site contractors, which will include the following:

- Name of the HSO and person responsible for the visitor log.
- Description of the parcel as well as location of emergency telephones and the location/boundaries of the Exclusion Zone, Contamination Reduction Zone, and Support Zone, if established.
- Review of hospital locations and directions.
- Review of tasks to be conducted within the parcel by the site workers.
- Review of the Emergency Action Plan and rally point, including the nearest emergency communications and telephone numbers.
- The nature, level, and degree of anticipated hazards (physical and chemical) involved in the site work.
- Required personal protective equipment.
- Decontamination procedures.

The HSO should also, at this time, ensure that all on-site HRP and HRP subcontractor personnel have read the HASP and signed the last page of the original (Section 11.0). If additional information on the site becomes available, the HSO will call additional briefings as necessary.

Morning Safety (Tailgate) Meeting

The HRP HSO will conduct a safety overview meeting at the beginning of each workday on the site. The meeting will be given in addition to any tailgate meetings that the subcontractor conducts. A summary of the meeting topics signed by the personnel attending the meeting is included in **Appendix D**.

Medical Surveillance

All HRP and HRP subcontractor personnel entering the Exclusion Zone must have had a physical within the 12 months prior to commencement of site work. A physician's written opinion regarding fitness for work for each employee including work limitations, if any, is on file at HRP, as applicable. A written opinion for all other site personnel must be supplied prior to commencement of site work to the HRP HSO. Any work limitations for site personnel, or relevant medical information (i.e. allergic reactions to medication) should be included in this Plan.

10.0 AUTHORIZATIONS

Personnel authorized to enter the Exclusion Zone include the personnel listed in Section 2.1.2. Persons not listed in Section 21.2 may enter the Exclusion Zone only if the appropriate training and medical fitness certifications have been supplied to either the HRP Project Manager or Health and Safety Manager and the HSO or his/her designee on site has approved site entry. All personnel entering or leaving the Exclusion Zone must sign in and sign out with the recordkeeper.

11.0 FIELD TEAM REVIEW

All HRP personnel shall sign below after reading this HASP and shall agree with the following statement:

"I have read and understand this site specific Health and Safety Plan. I will comply with the provisions set forth therein."

[illegible]

12.0 APPROVALS

This plan meets the minimum requirements of 29 CFR 1910.120 and 29 CFR 1929.65 and has been written for specified site conditions, dates, and personnel, and must be amended if conditions change. By their signature, the undersigned certify that this HASP is approved and will be utilized during activities at the project.



Elliott Jackson
On-Site Health and Safety Officer

4/17/24

Date



Patrick Montuori, PG
Project Manager

4/17/24

Date



Bryan Sherman, ASP
Office Health and Safety Manager

4/17/24

Date

Subcontractor:

I have been provided a copy of this HASP for review.

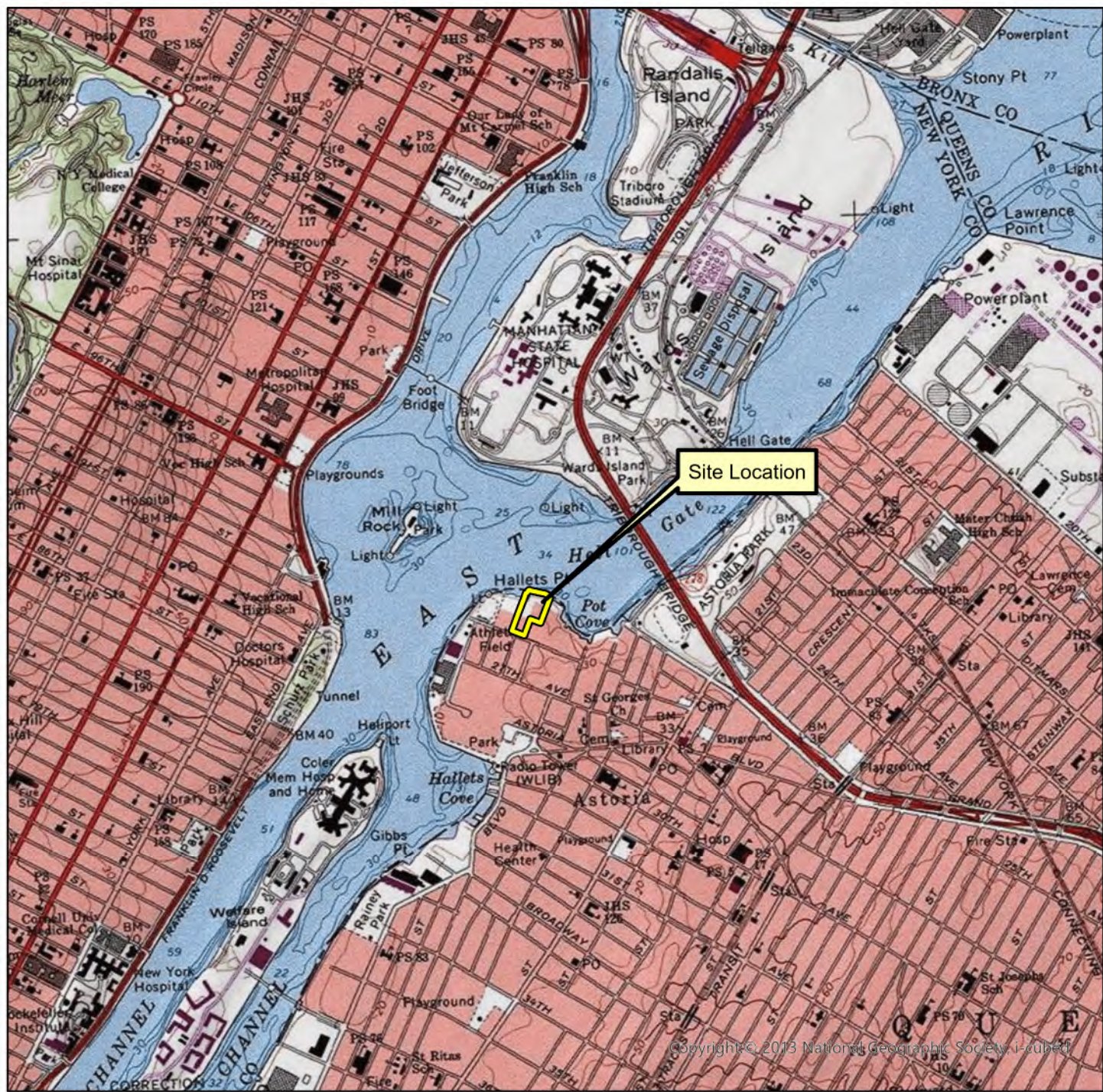
Name

Date

Representing _____

[illegible]

FIGURES



0 500 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000
Feet

1:24,000



Figure 1
Site Location
Former Astoria Steel
Site #C241155
3-15 26Th Avenue
Queens, New York
HRP # DEC1038.P2

USGS Quadrangle Information
Quad ID: 42078-G3
Name: Queens, New York
Date Rev: 1976
Date Pub: 1995



ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

Issue Date: 7/2/2024	Designed By: CMS	Revisions	
		No.	Date
Project No: DEC1038.P2	Drawn By: EWJ		
Sheet Size: 11x17	Reviewed By: PWM		

Site Plan and Proposed
Investigation Locations

Figure No.

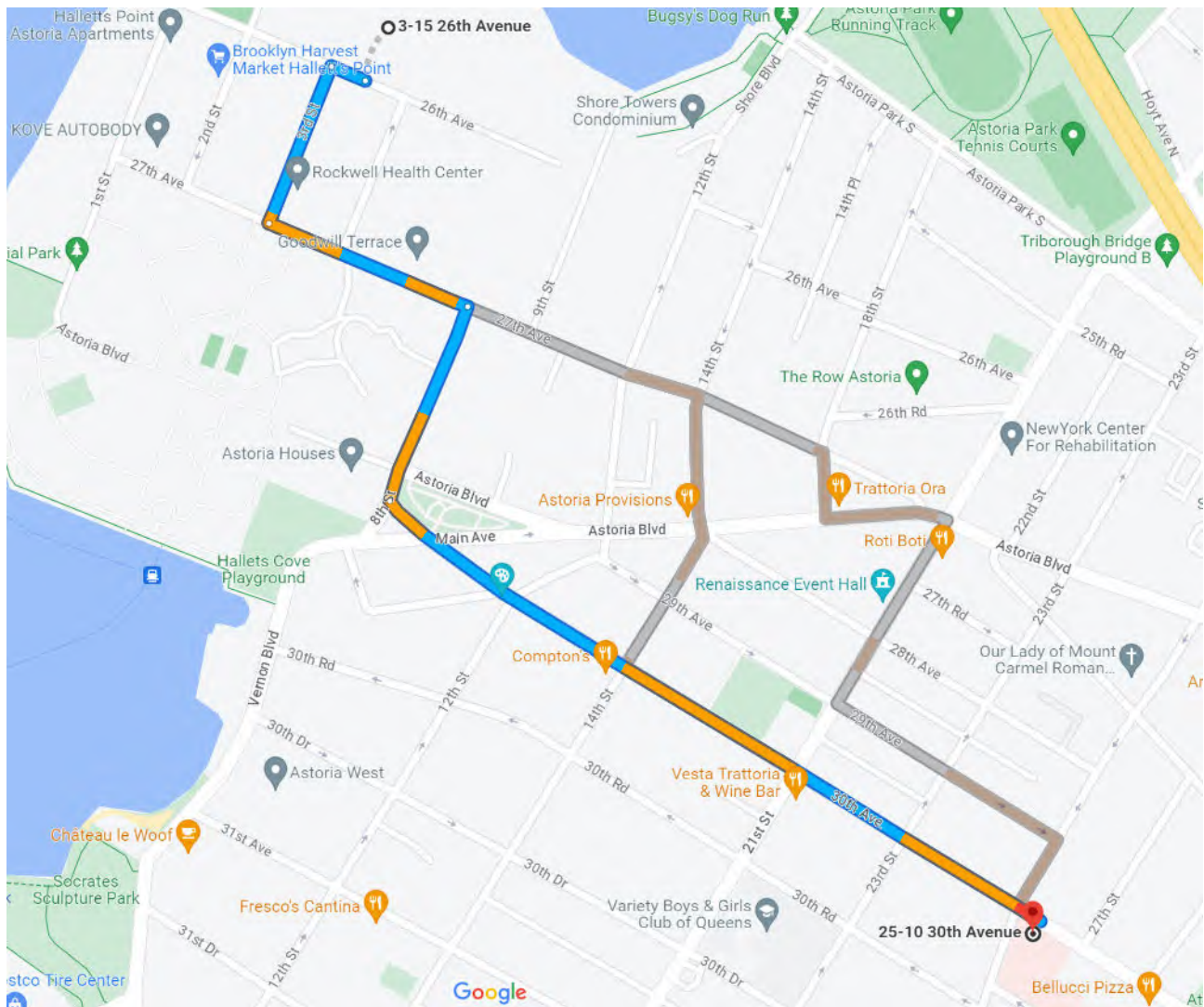
2

Figure 3: Route and Map to Nearest Hospital and Medical Center

Directions to Mount Sinai Queens

Total Estimated Time: 7 minutes
Total Estimated Distance: 1.0 miles

Begin at 3-15 26th Avenue, Astoria, NY
End at Mount Sinai Queens
25-10 30th Avenue, Queens, NY



TABLES

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL ¹	TLV (ACGIH)	OSHA CEILING ² /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE ³
1,1,1 Trichloroethane	44 ppm	350 ppm	350 ppm	---	700 ppm	Inh, Ing, Con	Head, Lass, CNS, Derm
1,1,2-Trichloroethane	---	10 ppm	10 ppm	----	[100 ppm]	Inh, Ing, Abs, Con	Eyes, Nose Irrit, Resp Irrit, CNS, Liver, Kidney Damage, Derm, [Carc]
1,2,4 Trimethylbenzene 1,3,5 Trimethylbenzene		25 mg/m ³	25 ppm	25 mg/m ³	ND	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Resp Sys, Bron, Hyprochronic Anemia, Head, Drow, Ftg, Dizz, Nau, Inco, Vomit, Conf, Chemical Pneu (aspir lig)
1,1' Biphenyl	0.0062 mg/m ³	0.2 ppm	0.2 ppm	---	100 mg/m ³	Inh	
1,1-Dichloroethane	120 ppm	100 ppm	100 ppm	---	3,000 ppm	Inh, Ing, Con	CNS Depres, Skin Irrit, Liver, Lung and Kidney Damage
1,1-Dichloroethylene	500 ppm	---	5 ppm	---	---	Inh, Con	CNS depress, Resp, [Carc]
1,2-Dichlorobenzene	50 ppm	50 ppm	25 ppm		200 ppm	Inh, Ing, Abs, Con	Irrit, Resp
1,2-Dichloroethylene	26-87 ppm	200 ppm	200 ppm	---	1,000 ppm	Inh, Ing, Con	Vomit, Irrit Eyes, Resp Sys; CNS Depres
1,2-Dichloropropane	130-190 ppm	75 ppm	75 ppm	---	[400 ppm]	Inh, Con, Ing	Eye irritation, Drow, light-headedness; irritated skin, [Carc]
1,3-Dichlorobenzene	---	----	---	----	---	----	----
1,4-Dichlorobenzene	20 ppm	75 ppm	10 ppm	----	[150 ppm]	Inh, Ing	[Carc], Eye Irrit, swelling around eye, headache, nausea, vomiting
1-Methylnaphthalene	0.02 ppm	---	---	---	---	---	---
2,4-Dichlorophenol	1.4007 mg/m ³	---	---	---	---	---	---
2,4-Dimethylphenol	0.001 mg/m ³	---	---	---	---	---	---
2-Methylnaphthalene	0.01 ppm	---	---	---	---	---	---
2-Methylphenol (o-cresol) [skin]	1.4 mg/L	5 ppm	5 ppm	---	250 ppm	Inh, Abs, Ing, Con	Confusion, depression, Resp Fail; difficulty breathing, irregular rapid respiration, weak pulse; skin, eye burns; dermatitis

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL ¹	TLV (ACGIH)	OSHA CEILING ² /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE ³
3, 3'-Dichlorobenzidine	---	None	---	---	---	Inh, Abs, Ing, Con	Sens, Derm, Head, Dizz, Burns, GI Upset, [Carc]
4-Isopropyltoluene	---	---	---	---	---	Con, Inh, Ing	Defat, Eryt
Acenaphthene	0.5048 mg/m ³	---	---	---	---	---	---
Acenaphthylene	---	---	---	---	---	---	---
Acetone	47.5 mg/m ³	1,000 ppm	500 ppm	---	2,500 ppm	Ing, Inh, Con	Head, Dizz; Irrit Eyes, Nose, Throat; Derm, CNS, Depress, Derm
Acetonitrile	70 mg/m ³	40 ppm	20 ppm	---	500 ppm	Inh, Ing, Abs, Con	Asphy; Nau, Vomit; Chest Pain; Weak, Stupor, Convuls; Eye Irrit
Aldrin	---	0.25 mg/m ³	0.25 mg/m ³	---	25 mg/m ³	Inh, Abs, Ing, Con	Head, Dizz, Nau, Vomit, Mal, Myo, [Carc]
Anthracene (Coal Tar Pitch)	---	0.2 mg/m ³	---	---	[80 mg/m ³]	Inh, Con	Derm, bron, [carc]
Antifreeze	---	50 ppm	100 mg/m ³ (aerosol)	---	ND	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Nau, Vomit, Abdom Pain, Lass, Dizz, Stup, Conv, CNS, Depres, Skin Sen
Arsenic	----	0.010 mg/m ³	0.01 mg/m ³	----	[5 mg/m ³]	Abs, Inh, Con, Ing	Derm; GI; Resp Irrit; ulceration of nasal septum; Resp, Irrit, Hyper Pig of Skin, [Carc]
Barium (elemental)	---	0.5 mg/m ³	0.5 mg/m ³	---	50 mg/m ³ (barium components)	Inh, Ing, Con	Resp. Irrit, GI, Muscle Spasm, Eye Irrit, Slow Pulse; skin burns
Benzene*	4.7 ppm	1 ppm	0.5 ppm	5 ppm	[500 ppm]	Inh, Ing, Abs, Con	Irrit Eyes, Nose, Throat; Head, Nau, Derm, Ftg, Anor, Lass, [Carc]
Benzo(a)anthracene (coal tar pitch)	---	0.2 mg/m ³	---	---	[80 mg/m ³]	Inh, Con	[Carc], Derm, Bron
Benzo(a)pyrene (coal tar pitch)	---	0.2 mg/m ³	---	---	[80 mg/m ³]	Inh, Con	[Carc], Derm, Bron
Benzo(b)fluoranthene (coal tar pitch)	---	0.2 mg/m ³	---	---	[80 mg/m ³]	Inh, Con	[Carc], Derm, Bron

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL ¹	TLV (ACGIH)	OSHA CEILING ² /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE ³
Benzo(g,h,i)perylene (coal tar pitch)	---	0.2 mg/m ³			[80 mg/m ³]	Inh, Con	[Carc], Derm, Bron
Benzo(k)fluoranthene (coal tar pitch)	---	0.2 mg/m ³			[80 mg/m ³]	Inh, Con	[Carc], Derm, Bron
Bis (2-ethylhexyl) Phthalate**	N/A	5 mg/m ³	5 mg/m ³	10 mg/m ³	[5,000 mg/m ³]	Inh, Ing, Con	[Carc], Irrit Eyes
Cadmium (dust)	---	0.005 mg/m ³	Lowest concentration feasible 0.01 mg/m ³	---	[9 mg/m ³]	Inh, Ing	CNS, Resp, Irrit, Vomit, Cough, Head, Chills, Nau, Diarr, Pulm Edema, Dysp, Chest Tight, [Carc]
Carbazole	---	---	---	---	---	Inh	---
Carbon disulfide	0.1-0.2 ppm	20 ppm	1 ppm	30 ppm	500 ppm	Inh, Abs, Ing, Con	Diz, Head, Ftg, Ner, anorexia, trembling hands, loss of fine motor coord, gastritis, eye, skin burns, Derm
Carbon Tetrachloride***	21.4 ppm	10 ppm	5 ppm	25 ppm	[200 ppm]	Inh, Abs, Con, Ing	CNS Depres, Nau, Vomit, Irrit, Irrit Eyes, Skin, Drow, Dizz, [Carc]
Chlorobenzene***	0.98 mg/m ³	75 ppm	10 ppm	---	1,000 ppm	Inh, Ing, Con	Irrit, Drow, CNS, Depres, Eyes, Skin, Nose, Inco.
Chloroform***	85 ppm	50 ppm	10 ppm	50 ppm	[500 ppm]	Inh, Ing, Con, Abs	Dizz, Dullness, Nau, Head, Ftg, Irrit Eyes, Skin, Conf, [Carc]
Chromium	---	1 mg/m ³	0.5 mg/m ³	---	250 mg/m ³	Inh, Ing, Con	Irrit Eyes, Sens Derm
Chrysene (coal tar pitch)		0.2 mg/m ³	---		[80 mg/m ³]	Inh, Con	Derm, Bron, [Carc]
Cis-1-2-Dichloroethylene	---	200 ppm	200 ppm	----	1000 ppm	Inh, Con, Ing	Irrit Eyes, Resp, CNS Depress
Copper (dusts and mists) (fumes)		1 mg/m ³ 0.1 mg/m ³	1 mg/m ³ 0.2 mg/m ³	----	100 mg/m ³	Inh, Ing, Con	Vomit, Derm, CNS, Irrit, Derm, Nau, Taste (metallic)
Cyanide	0.9 mg/m ³	5 mg/m ³	5 mg/m ³ (10 min)	5 mg/m ³	25 mg/m ³	Inh, Ing, Abs, Con	Weak, Head, Nau, Conf, Cyan
Dibenzo(a,h)anthracene						Inh, Ing	

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL ¹	TLV (ACGIH)	OSHA CEILING ² /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE ³
Dichloromethane	540 mg/m ³	25 ppm	50 ppm	125 ppm	[2,300 ppm]	Inh, Abs, Ing, Con	Irrit Eyes, Skin, lass, drow, dizz, Numb, tingl, Nau, [Carc]
Diethylphthalate**	---	None	5 mg/m ³	---	N.D.	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Head, Dizz, Nau, Lac, Possible Polyneur, Vestibular Dysfunc, Pain, Numb, lass, Spasms in Arms and Legs
Di-n-octylphthalate	---	---	---	---	---	Inh, Ing, Con	---
Dimethylphthalate	---	5 mg/m ³	5 mg/m ³	---	2,000 mg/m ³	Inh, Ing, Con	Irrit, Resp, Abdom
Ethyl Benzene*	8.7 mg/m ³	100 ppm	100 ppm	125 ppm	700 ppm	Inh, Abs, Con	Head. Irrit, Derm, Narc., Irrit Eyes, Skin; Coma
Fluoranthene		0.2 mg/m ³	0.2 mg/m ³			Ing, Inh	[Carc]
Fluorine*	6 mg/m ³	0.1 ppm	1 ppm	2 ppm	25 ppm	Inh, Con	
Fuel Oil/#2	----	----	300 ppm	----		Inh, Abs, Ins, Con	Irrit Eyes, Skin, Derm, Head, Ftg, Blurred Vision, Dizz, Conf
Ideno(1,2,3-cd)pyrene		0.2 mg/m ³				Ing, Inh	
Lead (inorganic forms and dust as Pb)****		0.05 mg/m ³	0.05 mg/m ³		100 mg/m ³	Inh, Ing, Con	Irrit, Cns, Vomit, Narco, Weak, Pall, Insom, Lass, Abdom, Constip
Mercury (organic alkyl compounds) [skin]		0.01 mg/m ³	0.01 mg/m ³	0.03 mg/m ³	2 mg/m ³	Inh, Abs, Ing, Con	Irrit Eyes, Skin; Cough & Chest Pain, Bron Pneu, Tremor, Insom, Irrty, Indecision, Head, Ftg, Weak, Stomatitis, Salv, GI Dist, Anor, Low-wgt, Ataxia
Mercury (compounds)	----	0.1 mg/m ³	0.025 mg/m ³	0.1 mg/m ³	10 mg/m ³	Inh, Abs, Ing, Con	Irrit Eyes, Skin; Cough & Chest Pain, Bron Pneu, Tremor, Insom, Irrty, Indecision, Head, Ftg, Weak, Stomatitis, Salv, GI Dist, Anor, Low-wgt, Ataxia
Methanol	13.1150 mg/m ³	200 ppm	200 ppm	---	6,000 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Resp, Head, drow, dizz, Nau, Vomit, vis dist, Optic, derm

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL ¹	TLV (ACGIH)	OSHA CEILING ² /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE ³
Methyl Ether	----	----	---	----	---	Inh	Poison
Methyl Ethyl Ketone (2-Butanone)***	0.7375 mg/m ³	200 ppm	200 ppm	300 ppm	3,000 ppm	Inh, Con, Ing	Irrit Eyes, Skin, Nose, Throat, Head, Dizz, Vomit, Derm
Methylene Chloride	540 mg/m ³	25 ppm	50 ppm	125 ppm	[2,300 ppm]	Inh, Ing, Con, Abs	Ftg, Weak, dizz, drow, Numb, Tingle [carc], Irrit Eyes, Skin, Nau
Mineral Spirit	20 ppm	500 ppm	100 ppm	---	20,000 mg/m ³	Inh, Ing, Con	Irrit Eyes, Nose, Throat, Dizz, Derm, Chemical pneu
Methyl tert butyl ether (MTBE)	---	---	50 ppm	---		Inh, Abs	
Naphtha	0.86 ppm	100 ppm	400 ppm	---	1,000 ppm	Inh, Con, Ing	Light Head, Drow, Irrit, Derm, Irrit Eyes, Skin, Nose
Naphthalene*	0.084 ppm	10 ppm	10 ppm	15 ppm	250 ppm	Inh, Abs, Ing, Con	Eye irritation; headache; confusion, excitement, malaise (vague feeling of ill-being); nausea, vomiting, abdominal pain; irritated bladder; profuse sweating; renal shutdown; dermatitis
Nickel (metal)	---	1 mg/m ³	1.5 mg/m ³	---	[10 mg/m ³]	Inh, Ing, Con	Head, Verti, Nau, Vomit, Pain, Cough, Weak, Convuls, Delirium, Pneu, ,[Carc]
Nitrobenzene	0.0235 mg/m ³	1 ppm	1 ppm	---	200 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Anoxia, Derm, Anem, Methem
n-Butylbenzene	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---
PCBs 42% chlorine (Aroclor 1242)	---	1 mg/m ³ (skin)	1 mg/m ³ (skin)	---	[5 mg/m ³]	Inh, Abs, Ing, Con	Irrit Eyes, Chloracne, Liver Damage [carc]
PCBs 54% chlorine (Aroclor 1254)	---	0.5 mg/m ³ (skin)	0.5 mg/m ³ (skin)	---	[5 mg/m ³]	Inh, Abs, Ing, Con	Irrit Eyes; Chloracne, Liver Damage [carc]

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL ¹	TLV (ACGIH)	OSHA CEILING ² /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE ³
Petroleum Distillates	---	500 ppm	100 ppm		[1,100 ppm]	Inh, Ing, Con	Dizz, Drow, Head, Dry Skin, Nau, Irrit Eyes, Nose, Throat, [Carc]
Phenanthrene (Coal Tar Pitch)		0.2 mg/m ³	0.2 mg/m ³		[80 mg/m ³]	Inh, Con	Derm, bron, (carc)
Phenol**	0.1786 mg/m ³	5 ppm	5 ppm	---	250 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Nose, Throat, Anor, Low Wgt, Weak Musc Ache, Pain, Dark Urine, Cyan, Liver, Kidney Damage, Skin, Burns, Derm, Ochronosis, Tremor, Convuls, Twitch
Pyrene		0.2 mg/m ³			[80 mg/m ³]	Inh, Con	[Carc]
Sec-Butylbenzene	---	---	---	---	---	---	---
Selenium	N/A	0.2 mg/m ³	0.2 mg/m ³	Unknown	1 mg/m ³	Inh, Ing, Con	Irrit, Head, Fever, Chills, Skin/Eye Burns, Metallic Taste, GI, Dysp, Bron
Silver (metal and soluble compounds as Ag)	----	0.01 mg/m ³	Metal = 0.1 mg/m ³ Soluble 0.01 mg/m ³		10 mg/m ³	Inh, Ing, Con	Blue-gray Eyes, Nasal Septum, Throat, Skin; Irrit, Ulcer, Skin, GI Dist
Tetrachloroethylene (a.k.a. perchloroethylene)***	4.68 ppm	100 ppm	25 ppm	200 ppm	[150 ppm]	Inh, Ing, Con, Abs	Irrit Eyes, Skin, Nose, throat, Resp. Nau, flush face, Neck, dizz, inco, head, drow, eryth, [Carc]
Toluene*	2.14 ppm	200 ppm	50 ppm	300 ppm	500 ppm	Inh, Abs, Ins, Con	Resp, Irrit, Ftg, Conf, Dizz, Head, Derm, Euph, Head, Dilated Pupils, Lac, Ner, Musc FTg, Insom, Pares, Derm, lass
Petroleum Distillates (naphtha)	10 ppm	100 ppm	400 ppm	---	1,000 ppm	Con, Inh, Ing	---
Trans 1,2-Dichloroethylene	0.3357 mg/m ³	200 ppm	200 ppm	---	1,000 ppm	Inh, Con	Irrit, Resp, CNS depress
Trichloroethylene	21.4 ppm	100 ppm	50 ppm	200 ppm	[1,000 ppm]	Inh, Con, Abs, Ing	Head, Vert, Nau, Vomit, Derm, Vis Dist, Tremors, Som, Nau, Irrit Eyes, Skin, Card Acc., Ftg, [Carc]

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL ¹	TLV (ACGIH)	OSHA CEILING ² /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE ³
Trichlorofluoromethane	28 mg/m ³	1,000 ppm	1,000 ppm		2,000 ppm	Inh, Con, Ing	Inco, trem, derm, card, asph, frost
Trichlorotrifluoroethane	45 ppm	1,000 ppm	1,000 ppm	1,250 ppm	2,000 ppm	Inh, Con, Ing	Irrit Skin, throat, Drow, Derm, CSN, Depress
Vinyl Chloride***	10-20 ppm	1 ppm	1 ppm	5 ppm	ND	Inh, Con	Lass, Abdom, Gi Bleeding; Hepatomegaly; Pallor or Cyan of Extremities; Liq: Frostbite; [Carc]
VM&P Naphtha (petroleum naphtha)	---	---	300 ppm	---	ND	Con, Ing, Inh	Irrit Eyes, Nose, Throat, Dizz, drow, head, nau, dry skin, chem. Pneumonitis
Xylene*	4.5 mg/m ³	100 ppm	100 ppm	150 ppm	900 ppm	Inh, Ing, Abs, Con	Dizz, Drow, Irrit, Excite, Nau, Vomit, Eyes, Skin, Nose, Throat
Zinc (oxide)	---	5 mg/m ³	2 mg/m ³	---	500 mg/m ³	Inh	Dry Throat, Cough, Chills, Tight Chest, Blurred Vision
4,4' DDD	---	---	---	---	---	Ing, Inh, Con	---
4,4' DDE	---	---	---	---	---	Ing, Inh, Con	---
4,4' DDT	5.0725 mg/m ³	1 mg/m ³	1 mg/m ³	---	[500 mg/m ³]	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Pares, Tongue, Lips, Face, Trem, Anxi, Dizz, Conf, Mal, Head, Lass, Conv, Paresi Hands, Vomit, [Carc]
Aldrin		0.25 mg/m ³	0.25 mg/m ³	---	[25 mg/m ³]	Inh, Abs, Ing, Con	Head, Dizz, Nau, Vomit, Mal, Myo [Carc]
Chlordane [skin]	0.0084 mg/m ³	0.5 mg/m ³	0.5 mg/m ³		[100 mg/m ³]	Inh, Abs, Ing, Con	Blurred vision, confusion, delirium, cough; abdominal pian, nausea, vomiting diarrhea; irritability, tremor, convulsions [Carc]
EDB	76.8 mg/m ³	20 ppm		30 ppm	[100 ppm]	Inh, Abs	Resp. Irr, Eye Irr. [Carc]
Endosulfan I Endosulfan II	---	0.1 mg/m ³	0.1 mg/m ³	---	N.D.	Inh, Abs, Ing, Con	Irrit, Skin, Nau, Conf, Agit, Flush, Dry, Trem, Conv, Head
Endosulfan Sulfate		---	0.1 mg/m ³	---	---	Ing, Con	---

TABLE 1a
CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

CONTAMINANT	ODOR THRESHOLD	OSHA PEL ¹	TLV (ACGIH)	OSHA CEILING ² /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE ³
Endrin	1.8 x 10 ⁻² ppm	0.1 mg/m ³	0.1 mg/m ⁻³	---	2 mg/m ³	Inh, Abs, Ing, Con	Epil Conv, Stup, Head, Dizz, Abdom, Nau, Vomit, Insom, Agress, Conf, Drow, Lass, Anor
Endrin Aldehyde	1.8 x 10 ⁻² ppm	---	---	---	---	Inh, Con	---
Endrin Ketone	---	---	---	---	---	---	---
Heptachlor	0.02 ppm	0.5 mg/m ³	0.05 mg/m ³	---	[35 mg/m ³]	Inh, Abs, Ing, Con	In animals, Trem, Conv, [Carc]
Heptachlor epoxide	0.02 ppm	---	0.05 mg/m ³	---	---	Ing, Inh	Trem, Conv, [Carc]
Hydrogen Cyanide(Hydrocyanic Acid)	0.9 mg/m ³	10 ppm (11 mg/m ³)	4.7 ppm	4.7 ppm	50 ppm	Con, Inh, Ing, Abs	Asphy & death at high levels; Weak, Head, Conf, Nau, Vomit, Incr. Rate and Depth of Respiration or Respiration Slow and Gasping

NOTES

* = Constituent found in ETPH

**=Constituent found in Acid/Base/Neutral Extractable Compounds

***=Constituent found in Volatile Organic Compounds

****=Constituent found in Leaching Lead

¹PEL = Permissible Exposure Limit. If no PEL is available, then the NIOSH Threshold Limit Value (TLV) should be used, if available.

²Ceiling limit or Short Term Exposure Limit (STEL), if available. Again, the NIOSH TLV may be used if no OSHA standard exists.

³Abbreviations are contained on the next page

[] = Potential Occupational Carcinogen

ND = Not Been Determined

ABBREVIATIONS

abdom = Abdominal
abs = Absorption
aggress = Aggressiveness
agit = Agitation
anor = Anorexia
anos = Anosmia (loss of the sense of smell)
Anxi = anxiety
anem – Anemia
aspir = Aspiration
asph – asphyxia
bron = Bronchitis
bron pneu = Bronchitis pneumonitis
[carc] = Potential occupational carcinogen
Card = Cardiac arrhythmias
CNS = Central nervous system
conf = Confusion
constip = Constipation
con = Skin and/or eye contact
conv = Convulsions
corn = Corneal
cyan = Cyanosis
defat = Defatting
depres = Depressant/Depression
derm = Dermatitis
diarr = Diarrhea
dist = Disturbance
dizz = Dizziness
drow = Drowsiness
dry = Dry mouth
dysp = Dyspnea (breathing difficulty)
emphy = Emphysema
epil-conv = Epileptiform convulsions
eryth = Erythema
euph = Euphoria
fib = Fibrosis
frost = frostbite
ftg = Fatigue
flush = Flushing
GI = Gastrointestinal
head = Headache
hyperpig = Hyperpigmentation
inco = Incoordination
ing = Ingestion
inh = Inhalation
inj = Injury
insom = Insomnia
irrit = Irritation

irrt = Irritability
lac = Lacrimation (discharge of tears)
lass = Lassitude (weakness, exhaustion)
li-head = Lightheadedness
liq = Liquid
low-wgt = Weight loss
mal = Malaise (vague feeling of discomfort)
malnut = Malnutrition
methem = Methemoglobinemia
myo = Myoclonic (jerks of limbs)
mg/m = milligrams/cubic meter
muc memb = Mucous membrane
mus ftg = Muscle fatigue
narco = Narcosis
nau = Nausea
ner = Nervousness
numb = Numbness
optic = Optic nerve damage (blindness)
pall = Facial pallor
parap = Paralysis
ppm = Parts per million
pares = Paresthesia
paresi = Paresis
peri neur = Peripheral neuropathy
pneu = Pneumonitis
prot = Proteinuria
pulm = Pulmonary
peri neur = Peripheral neuropathy
pneu = Pneumonia
prot = Proteinuria
pulm = Pulmonary
repro = Reproductive
resp = Respiratory
skin sen = skin sensitization
salv = Salvation
som = Somnolence (sleepiness unnatural drowsiness)
subs = Substernal (occurring beneath the sternum)
stup = Stupor
sys = System
tingle = tingle limbs
trem – Tremors
verti = Vertigo
vis dist = Visual disturbance
vomit = Vomiting
weak = Weakness

TABLE 1b: Physical Hazards Known or Suspected On-Site

TABLE 1b
PHYSICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Description of Hazard	Methods to Identify and Minimize	Potential for Occurrence	Potentially Affected Tasks
1. Operating Heavy Equipment	<ul style="list-style-type: none"> Utilizing proper equipment operation methods Maintain safe clearance distances Wear appropriate eye/ear protection according to manufacturer's recommendations 	Moderate	Observation of Excavation/Sampling
2. Inclement weather	<ul style="list-style-type: none"> Determine probable weather conditions prior to arrival at site Avoid working during hurricanes, blizzards, persistent heavy rain or snow, close thunderstorms 	Moderate	Observation of Excavation/Sampling
3. Heat/cold Stress	<ul style="list-style-type: none"> Determine probable weather conditions prior to arrival at site Wear proper clothing Monitoring of yourself and team mates Drink plenty of fluids Utilize work breaks as often as necessary Avoid working in extreme cold conditions 	Moderate	Observation of Excavation/Sampling
4. Slip, trip, and fall hazards caused by irregular and loose rocky topography	<ul style="list-style-type: none"> Wear appropriate footwear to increase traction when possible Be aware of surroundings 	Low	Observation of Excavation/Sampling

TABLE 1b
PHYSICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Description of Hazard	Methods to Identify and Minimize	Potential for Occurrence	Potentially Affected Tasks
5. Utilities	<ul style="list-style-type: none"> • Complete a Call Before You Dig markout prior to the work start date • Obtain buried private lines information from and clear sampling locations with Site Contact • Avoid using heavy equipment or drill rig in close proximity to overhead utilities • Inspect sampling areas for Call Before You Dig markings; inspect catch basins and manholes to determine buried pipeline directions prior to sampling • Avoid sampling within area of pavement cuts that may be indicative of buried lines 	Moderate	Observation of Excavation/Sampling
6. Vehicle Traffic	<ul style="list-style-type: none"> • Wear appropriate high visibility clothing • Block off the work area to prevent vehicles from entering 	Moderate	High Traffic areas
7. Inhalation of Volatiles	<ul style="list-style-type: none"> • Implement and adhere to action levels stipulated in air monitoring program for volatile organics • Wear appropriate protective equipment • Report potential exposure symptoms immediately • Utilize engineering controls such as fans 	Low	Observation of Excavation/Sampling
8. Skin contact with volatile organic compounds, semi volatile organic compounds, metals, TPHs, PCBs, pesticides, cyanide	<ul style="list-style-type: none"> • Wear appropriate protective clothing • Follow proper decontamination procedures • Report potential exposure symptoms immediately 	Low	Observation of Excavation/Sampling

APPENDIX A

Safety and Logistics Planning Call Log

Safety and Logistics Call Log
DEC009808

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Date of Call _____
Work Assignment Number / Task _____
DEC Site Name and Number _____

Names of Attendees (and phone #s):

HRP

HRP PM _____
HRP SSO _____
HRP Other _____
HRP Other _____
HRP Other _____

Subcontractors

Driller Contact _____
Utility Survey _____
Surveyor _____
Construction _____
Other _____

DEC DEC PM _____
DEC Other _____

Other _____

Brief Description Scope of Work (Task Specific):

Use additional forms for additional tasks.

Logistics:

Date of Work: _____
Time to Meet: _____
Site Contact (phone): _____
Notification of Site Contact made by: _____
Describe any unusual site-specific conditions/logistics here (if any): _____

Notes below as needed:

Water Needed? Source Confirmed? Y / N
Electricity Needed? Source Confirmed? Y / N
Water Storage Needed? Y / N
Water Discharges? Permits Needed/Attained? Y / N
Air Monitoring - CAMP? Y / N

Will there be intrusive work? Y / N
Locations marked in the field? Y / N
NYS Code Rule 753/Dig Safe System: Ticket Number: _____
Confirmed that mark-out complete? Y / N

Anticipated Subsurface Conditions (Geology, Utilities, etc.): _____
Anticipated Depth to Groundwater: _____
Will NAPL/Product be Present: Y / N Describe: _____

Safety and Logistics Call Log
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Will there be any other parties entering the work zones? Describe control measures:

Lab and Equipment:

Equipment: Y / N PID IP Water Level Indicator CAMP Pumps controllers Survey Eq. GPS
Other: _____

Lab Analytical Required: Y / N VOCs SVOCs Metals PFAS 1,4D PCBs Pest/Herb
Other: _____

Media Tested: Soil Sediment Groundwater Surface Water Sub-slab[soil] Vapor Indoor Air
Notes of sample collection methods: _____

Bottle Order Received/ Checked? Y / N

How will samples be conveyed to lab? _____

Sample TAT? Standard 24 hr TAT 48 hr TAT Other: _____

Review Site - Specific Hazards (per Site-Specific HASP to be provided prior to all parties):

Site Constituents of Concern: VOCs SVOCs PFAS 1,4-Dioxane
(circle) HVOCs
AVOCs
metals pesticides herbicides
Asbestos PCBs
Lead Other: _____
Biologicals

Site Setting: Urban Suburban Unoccupied
Traffic Bystanders Crime Plants Animals Vectors
Overhead Utilities Underground Utilities Large Equipment
High Voltage Flood/Tidal Limited Access
Confined Spaces

Task-Specific Chemicals and Hazards (describe): _____

PPE Level (circle): D C B A Modifications: _____

Glove types: _____ Face covering needed? Y/ N

Other specialty PPE: _____

Safe to Work Alone: Y / N

Other Precautions: Y / N Describe: _____

COVID 19 Protocols to be Observed: Y / N

Waste Containment:

How/ where will materials be contained, labelled, stored, or disposed? _____

Miscellaneous:

APPENDIX B

Personnel Log

[illegible]

APPENDIX C

Supervisor's Investigation Report



INCIDENT REPORT

Section 1.0: Complete By Employee and Project Manager (provide to Human Resources Manager)

Incident Case No. _____

Employee Name:	Age:	Time employee began work:	Weather Conditions:
Employee Title/Position:	Sex: <input type="checkbox"/> Female	Date of Incident:	Date of Report:
Department:	<input type="checkbox"/> Male	Time of Incident:	Time Report Completed:
Office Location:			
Supervisor:			
Employee Address:	Location of Incident:		
Street:	Address:		
City/Town:	City/Town:		
Zip Code:	State:		
Phone Number:			
Type of Incident: <input type="checkbox"/> Motor Vehicle Accident or <input type="checkbox"/> Near Miss or <input type="checkbox"/> Injury occurred during routine work <input type="checkbox"/> Company or <input type="checkbox"/> Personal Vehicle? First-Aid performed on-site? Yes / No Other Medical Attention Provided? Yes / No			
Time lost from work? Yes / No Number of Hours: or Number of Days:			
If injuries occurred, list names and describe nature, degree, and body part injured: Number of injured: _____ 1. 2. 3. 4.			
Complete Section 3.0			
WITNESS STATEMENT:			
WHAT HAPPENED AND WHAT WAS THE EMPLOYEE DOING BEFORE THE INCIDENT OCCURRED?		Describe what took place?	
WHAT WAS THE EMPLOYEE DOING WHEN THE INCIDENT OCCURRED?		Who was at fault for vehicle accidents, citation?	
WHAT WAS THE EMPLOYEE DOING AFTER THE INCIDENT OCCURRED?		Was power equipment involved, if so, describe?	

WHAT WAS THE NATURE OF THE INJURY OR ILLNESS?		Tell us the body part that was affected and how it was affected – be specific Examples: strained lower back; chemical burn on hand
WHAT WAS THE ROOT CAUSE OF THE INCIDENT? List other individual involved in Section 3. COULD INCIDENT HAVE BEEN AVOIDED? HOW?		Get all the facts by studying the Job and situation involved. Question by use of WHY - WHAT – WHERE – WHEN – WHO – HOW Were there other factors (e.g., noise, ventilation, illumination, fatigue, age, medical conditions) that contributed to the accident?
WAS TRAINING FOR THE WORK ACTIVITY PROVIDED: TYPE: DATES:		WERE WARNING SIGNS OR LABELS POSTED:
WHAT SHOULD BE DONE? HOW CAN INCIDENT BE AVOIDED IN THE FUTURE?		WAS PERSONAL PROTECTIVE EQUIPMENT USED? NEEDED: AVAILABLE: CONTRIBUTED TO INJURY:
WHAT HAVE YOU DONE THUS FAR?		Take or recommend action, depending upon your authority. Follow up – was action effective?
HOW WILL THIS IMPROVE OPERATIONS?		OBJECTIVE Eliminate job hindrances
Completed by:	Reviewed by:	Date

Section 2.0: Complete By Supervisor or Human Resources Manager

Name: Role (witness, observer, injured, participant, etc.):	Address: Phone Number
Name: Role:	Address: Phone Number
Name: Role:	Address: Phone Number
Name: Role:	Address: Phone Number
Name: Role:	Address: Phone Number
Name: Role:	Address: Phone Number

Section 3.0: Corrective Actions (To be Completed by OHSM and CHSO)

Are corrective actions warranted? ☐ Yes ☐ No If so, proceed with corrective action list

Corrective Actions. List long term actions to be taken as a result of incident (use additional sheets if needed)	How was the corrective action implemented?	Target date of completion

OHSM Name:	CHSO Name:
OHSM Signature:	CHSO Signature:

End of incident report. Section 4.0 is to be completed and maintained by the Human Resources Department.

Section 4.0: Complete By Human Resources Manager

Incident Report Case No. _____

The information on this page is considered CONFIDENTIAL and must be treated as such. This page will only be available to Human Resources Department or the employee's supervisor.

Insured Name:	Employee Hire Dates: Start at Company: Current Position:
Policy Number:	Is employee a company: Owner, Officer, Neither.
Employee Soc. Sec. No.:	Marital Status: Spouse Name:
Was Employee Pay Interrupted, or paid in full for time:	Employee Pay Period: Weekly, Bi-Weekly, Monthly, Other (specify)
Employee Compensated by hourly or salary? Wage Information: (tips, bonuses, commission)	Typical No. of hours worked per day____, hours per week____. Typical Start of day time_____, end of day time_____.
Date of Stop Work: Date Returned to Work:	How often has employee visited doctor/hospital?
Doctor: Authorized by Co.: Y / N Street: City/Town: Zip Code: Phone Number: Authorized by Co.: Y / N	Hospital: Street: City/Town: Zip Code: Phone Number: Authorized by Co.: Y /N
Was the employee treated in an emergency room? <input type="checkbox"/> Yes <input type="checkbox"/> No	Was employee hospitalized overnight as an in-patient? <input type="checkbox"/> Yes <input type="checkbox"/> No If so, for how many days? _____

APPENDIX D

Daily Job Brief Record

JOB BRIEF RECORD

Person Conducting	3-15 26 th Avenue Astoria, Queens NY 11102 Site Name/Address	DEC1038.P2 HRP Client Name/Job #
Javier Perez-Maldonado		Patrick Montuori
(518) 402-9767		
Client Contact/Phone	HRP H&S Rep.	HRP Supervisor
Date/Time	Number Attending	Weather
Designated Competent Person:		
Description of Work:		

Attendees (use additional sheets as needed):

Name	Company	Signature

Emergency Telephone Numbers

Hospital Name & Location:

NYSDEC Spill Line: 1-518-457-7362

Health & Safety Manager:

FIRE / POLICE / AMBULANCE: 911

Mount Sinai Queens, 25-10 30th Avenue, Queens, NY

National Response Center: 800-424-8802

CBYD: 800-922-4455

Bryan Sherman: 518-877-7101 1415

HAZARDS

- | | | | | |
|--------------------------------------|---|---|---|---|
| <input type="checkbox"/> Toxic | <input checked="" type="checkbox"/> Extreme Cold/Heat | <input type="checkbox"/> Soil Excavation | <input checked="" type="checkbox"/> Vehicle Traffic | <input type="checkbox"/> Powerwashing |
| <input type="checkbox"/> Corrosive | <input checked="" type="checkbox"/> Drains/Sumps | <input type="checkbox"/> Tank Excavation | <input type="checkbox"/> Hot Work | <input type="checkbox"/> Elevated Work Area |
| <input type="checkbox"/> Flammable | <input type="checkbox"/> Sharp Objects | <input type="checkbox"/> Trenching | <input type="checkbox"/> Vac Truck | <input type="checkbox"/> Live Electrical Circuits |
| <input type="checkbox"/> Combustible | <input checked="" type="checkbox"/> Drilling in Soil | <input checked="" type="checkbox"/> Floor Holes | <input type="checkbox"/> Ladders | <input type="checkbox"/> Pneumatic Tools |
| <input type="checkbox"/> Reactive | <input type="checkbox"/> Lighting | <input type="checkbox"/> Working on/near Water | <input checked="" type="checkbox"/> Noise | <input checked="" type="checkbox"/> Drum Handling |
| <input type="checkbox"/> Path Waste | <input checked="" type="checkbox"/> Slips/Trips/Falls | <input type="checkbox"/> Underground/Overhead Utilities | <input type="checkbox"/> Lifting | <input type="checkbox"/> Abrasive Blasting |
| <input type="checkbox"/> Asbestos | <input type="checkbox"/> Lead | | | |

PERSONAL SAFETY

- | | | | |
|--|--|---|--|
| <input type="checkbox"/> Supplied Air Respirator | <input type="checkbox"/> SAR w/Egress Bottle | <input type="checkbox"/> SCBA | <input type="checkbox"/> Air Purifying Respirator Cartridge: _____ |
| <input type="checkbox"/> Fully Encapsulating Suit | <input type="checkbox"/> Flash Suit | <input type="checkbox"/> NOMEX (flam resistant) | <input type="checkbox"/> Protected Coveralls, Type: _____ |
| <input type="checkbox"/> Overboots | <input type="checkbox"/> Lifebelt/Lanyard | <input checked="" type="checkbox"/> Hardhats | <input type="checkbox"/> Outer Gloves, Type: _____ |
| <input checked="" type="checkbox"/> Safety Glasses | <input type="checkbox"/> Chemical Goggles | <input type="checkbox"/> Face Shield | <input type="checkbox"/> Inner Gloves, Type: _____ |
| <input type="checkbox"/> Reflective Vests | <input type="checkbox"/> Eye Wash | <input type="checkbox"/> Safety Shower | <input type="checkbox"/> First Aid Kit |
| | | | <input type="checkbox"/> PFD's |

☒ Hearing Protection ☐ Evacuation Plan ☐ Communications ☐ Properly Sloped ☐ Excavation/ ☐ Ventilation
Trench

FIRE SAFETY

- ☐ Fire Extinguishers ☐ Hot Work Permit ☐ Fire Blanket ☐ Explosion-Proof Equipment
☐ Equipment Grounded & Bonded ☐ Non-Sparking Tools ☐ Eliminate Ignition Sources ☐ Area Kept Wet
☐ Smoking Area Designated Location: _____ ☐ Alarm Box in Area, Location: _____
☐ Fire Hose Laid Out

ISOLATE EQUIPMENT

- ☐ Establish Exclusion Zone/Traffic Cones ☐ Work Signs
☐ Stop Transfers ☐ Caution Tape Area
☐ GFCIS ☐ Temporary Fencing

ELECTRICAL EQUIPMENT

- ☐ LockOut/TagOut ☐ Non-Conductive Tools
☐ Equipment Grounded ☐ FR Suits/Coveralls

AIR MONITORING

Type of Meter: _____ Date last calibrated: _____

SUBSTANCE	LEVEL B MAX.	ACTION LEVEL/LEVEL C MAX.	LEVEL D MAX.

Health & Safety Comments / Topics & Safety Rules Reviewed / Questions / Concerns:

Contaminants of Concern: _____

HEALTH & SAFETY SIGNATURE: _____ Date: _____

Is there a Site-Specific or Generic Health & Safety Plan available on-site? Yes ☐ No ☐

☐ HAZARD ZONES NOT APPLICABLE, GENERAL WORK AREA

Level D ☐ Modified Level D ☐ Level C ☐

Anything above Level C, foreman should use a Confined Space Permit/Form.

Note: HOT WORK requires a hot work permit and minimum 20# fire extinguisher. Foreman or HSM must record at least one contaminant of concern above. Toxic plants may be considered a COC if no chemical hazards are expected.

LEVEL C

Respirator Type: _____

Name	Zone	Time In	Time Out	Decon Type

Before performing Level C work, ALL employees must review HRP's Respiratory Protection Program - a copy of which must be on-site along with a HASP.

APPENDIX E

Equipment Calibration Log

[illegible]

APPENDIX F

COVID-19 Health and Safety Guidelines

COVID19

SITE SPECIFIC HASP ADDENDUM

This addendum will remain in effect until what time the CDC, NIAID, and/or Surgeon General guidance is provided that removes the heightened awareness of social distancing, hand washing, and other protocols in response to COVID-19.

NECESSARY ADDITIONAL SUPPLIES

- Hand sanitizer (minimum 60% alcohol)
- Squeeze bottles of water (if no running water at job site)
- Soap
- Disinfectant (for tools, vehicles, common areas, etc.)
- Caution tape, cones or similar to set up social distancing boundaries as needed

EMPLOYEE HEALTH PROTECTION – ZERO TOLERANCE

The following applies to both HRP employees and contracted staff working on behalf of the HRP or the client.

- ZERO TOLERANCE FOR SICK WORKERS REPORTING TO WORK. IF YOU ARE SICK, STAY HOME! IF YOU FEEL SICK, GO HOME! IF YOU SEE SOMEONE SICK, SEND THEM HOME!
- If you are exhibiting any of the symptoms below, you are to report this to your supervisor (via phone, text or email) right away, and head home from the job site or stay home if already there.

If you notice a co-worker showing signs or complaining about such symptoms, he or she should be directed to their supervisor (via phone, text or email) and asked to leave the project site immediately.

COVID-19 Typical Symptoms:

- Fever
 - Cough
 - Shortness of Breath
 - Sore Throat
 - Loss of taste or smell
- Prior to starting a shift, each employee will verbally self-certify to their supervisor that they:
 - Have no signs of a fever or a measured temperature above 100.3 degrees or greater, a cough or trouble breathing within the past 24 hours.
 - Have not had "close contact" with an individual diagnosed with COVID-19. "Close contact" means living in the same household as a person who has tested positive for COVID-19, caring for a person who has tested positive for COVID-19, being within 6 feet of a person who has tested positive for COVID-19 for about 15 minutes, or coming in direct contact with secretions (e.g., sharing utensils, being coughed on) from a person who has tested positive for COVID-19, while that person was symptomatic.
 - Have not been asked to self-isolate or quarantine by their doctor or a public health official.
 - These self-certifications may be documented at the request of the site owner
- Workers that are working in a confined space or inside a closed building envelope will have to be temperature screened by a Medical Professional or designated individual. Such screening shall be performed out of public view to respect privacy and results are kept private.
- Employees exhibiting symptoms or unable to self-certify should be directed to leave the work

site and seek medical attention and applicable testing by their health care provider. They are not to return to the work site until cleared by a medical professional.

GENERAL ON-THE-JOB GUIDANCE TO PREVENT EXPOSURE & LIMIT THE TRANSMISSION OF THE VIRUS

All Job Sites

- No touching or direct contact with other individuals, including handshaking.
- Wash hands often with soap and water for at least 20 seconds or alternatively when soap and water are not available, use an alcohol-based hand sanitizer with at least 60% ethanol or 70% isopropanol
- A "No Congregation" policy is in effect, individuals must implement social distancing by maintaining a minimum distance of 6-feet from all other individuals
- Avoid face to face meetings – critical situations requiring in-person discussion must follow social distancing
- Conduct all meetings via conference calls, if possible. Do not convene meetings of more than 10 people. Recommend use of cell phones, texting, web meeting sites and conference calls for project discussion
- Be sure to use your own water bottle, and do not share
- To avoid external contamination, bring food from home
- Maintain Social Distancing separation during breaks and lunch.
- To avoid sharing germs, please clean up after yourself. DO NOT make others responsible for moving, unpacking and packing up your personal belongings
- If you or a family member is feeling ill, stay home!

Multi-person job sites (i.e. HRP and subcontractors, etc.)

- Contractor and Field Offices are to be locked down to all but authorized personnel
 - Each jobsite should develop cleaning and decontamination procedures that are posted and shared (if multi-person job site). These Procedures must cover all areas including trailers, gates, equipment, vehicles, etc. and shall be posted at all entry points to the sites, and throughout the project site.
 - All individual work crew meetings/tailgate talks should be held outside and follow social distancing
 - Please keep all crews a minimum of 6' apart at all times to eliminate the potential of cross contamination
 - At each job briefing/tool box talk, employees are asked if they are experiencing any symptoms, and are sent home if they are
 - Each jobsite should have laminated COVID-19 safety guidelines and handwashing instructions (last page of this addendum)
 - All restroom facilities/porta-potties should be cleaned and handwashing stations must be provided with soap, hand sanitizer and paper towels
 - All surfaces should be cleaned at least twice a day, including desk, work stations, door handles, laptops, etc.
 - All common areas and meeting areas are to be regularly cleaned and disinfected at least once a day but preferably twice a day
- Single person job sites (just one HRP employee, no subs, vendors, etc.)
 - It is that person's responsibility to clean and disinfect all tools and reusable supplies upon return to the office

- Cover coughing or sneezing with a tissue, then throw the tissue in the trash and wash hands, if no tissue is available then cough into your elbow
- Avoid touching eyes, nose, and mouth with your hands

WORK SITE RISK PREVENTION PRACTICES

- At the start of each shift, confirm with all employees that they are healthy.
- All employees will be required to wear gloves (either latex or cut resistant depending on the task at hand)
- Use of eye protection is required (Safety glasses or goggles at a minimum with or without face shields).
- In work conditions where required social distancing is impossible to achieve, affected employees shall be supplied PPE including as appropriate a standard face covering, gloves, and eye protection.
- All employees shall drive to work site/parking area in a single occupant vehicle. No one should ride together in the same vehicle
- When entering a machine or vehicle which you are not sure you were the last person to enter, make sure that you wipe down the interior and door handles with disinfectant prior to entry
- In instances where it is possible, workers should maintain separation of 6' from each other per CDC guidelines.
- Multi person activities will be limited where feasible (two person lifting activities)
- Large gathering places on the site such as shacks and break areas will be eliminated and instead small break areas will be used with seating limited to ensure social distancing.
- Contact the cleaning person for your office trailer or office space and ensure they have proper COVID- 19 sanitation processes. Increase their cleaning visits to daily
- Clean all high contact surfaces a minimum of twice a day in order to minimize the spread of germs in areas that people touch frequently. This includes but is not limited to desks, laptops and vehicles

Wash Stations: All sites without ready access to an indoor bathroom or running water MUST install Wash Stations or provide other means for handwashing

- Install hand wash stations with hot water, if possible, and soap at fire hydrants or other water sources to be used for frequent handwashing for all onsite employees.
- All onsite workers must help to maintain and keep stations clean
- If a worker notices soap or towels are running low or out, immediately notify supervisors
- Garbage barrels will be placed next to the hand wash station for disposal of tissues/towels
- If no other alternative exists, bring squeeze bottles with water and soap (only authorized for single employee job sites)

Please Note: This document is not intended to replace any formalized procedures currently in place within the site specific HASP or any job related contracts.

Where this guidance does not meet or exceed the standards put forth by the state, municipality, site owner, contractor or subcontractor, everyone shall abide by the most stringent procedure.

A site-specific COVID-19 Officer (also known as the Health and Safety Officer) shall be designated for every site.

Print and post at each job site

COVID-19/ Health and Safety Officer Name: _____

Phone Number: _____



Any issue of non-compliance with these guidelines shall be a basis for pausing the work. The Health and Safety Officer will address corrective actions with the subcontractor. Any additional issues of non-conformance may be subject to action against the subcontractor's prequalification and certification status.

APPENDIX G

Safety Data Sheets

(for chemicals brought to the site)

Safety Data Sheet

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

Effective date: 12.08.2015**Revision :** 12.10.2015**Trade Name:** Alconox**1 Identification of the substance/mixture and of the supplier****1.1 Product identifier****Trade Name:** Alconox**Synonyms:****Product number:** Alconox**1.2 Application of the substance / the mixture :** Cleaning material/Detergent**1.3 Details of the supplier of the Safety Data Sheet****Manufacturer**Alconox, Inc.
30 Glenn Street
White Plains, NY 10603
1-914-948-4040**Supplier**

Not Applicable

Emergency telephone number:**ChemTel Inc**

North America: 1-800-255-3924

International: 01-813-248-0585

2 Hazards identification**2.1 Classification of the substance or mixture:**

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

Hazard-determining components of labeling:Tetrasodium Pyrophosphate
Sodium tripolyphosphate
Sodium Alkylbenzene Sulfonate**2.2 Label elements:**

Skin irritation, category 2.

Eye irritation, category 2A.

Hazard pictograms:**Signal word:** Warning**Hazard statements:**

H315 Causes skin irritation.

H319 Causes serious eye irritation.

Precautionary statements:

P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302+P352 If on skin: Wash with soap and water.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

P321 Specific treatment (see supplemental first aid instructions on this label).

P332+P313 If skin irritation occurs: Get medical advice/attention.

P362 Take off contaminated clothing and wash before reuse.

P501 Dispose of contents and container as instructed in Section 13.

Safety Data Sheet

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

Effective date: 12.08.2015**Revision :** 12.10.2015**Trade Name:** Alconox**Additional information:** None.**Hazard description****Hazards Not Otherwise Classified (HNOC):** None**Information concerning particular hazards for humans and environment:**

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

Classification system:

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

3 Composition/information on ingredients**3.1 Chemical characterization :** None**3.2 Description :** None**3.3 Hazardous components (percentages by weight)**

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

3.4 Additional Information : None.**4 First aid measures****4.1 Description of first aid measures****General information:** None.**After inhalation:**

Maintain an unobstructed airway.

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

After skin contact:

Wash affected area with soap and water.

Seek medical attention if symptoms develop or persist.

After eye contact:

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

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

Seek medical attention if irritation persists or if concerned.

After swallowing:

Rinse mouth thoroughly.

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

Safety Data Sheet

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

Effective date: 12.08.2015**Revision :** 12.10.2015**Trade Name:** Alconox**4.2 Most important symptoms and effects, both acute and delayed**

None

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

No additional information.

5 Firefighting measures**5.1 Extinguishing media****Suitable extinguishing agents:**

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

For safety reasons unsuitable extinguishing agents : None**5.2 Special hazards arising from the substance or mixture :**

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

5.3 Advice for firefighters**Protective equipment:**

Wear protective eye wear, gloves and clothing.

Refer to Section 8.

5.4 Additional information :

Avoid inhaling gases, fumes, dust, mist, vapor and aerosols.

Avoid contact with skin, eyes and clothing.

6 Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures :**

Ensure adequate ventilation.

Ensure air handling systems are operational.

6.2 Environmental precautions :

Should not be released into the environment.

Prevent from reaching drains, sewer or waterway.

6.3 Methods and material for containment and cleaning up :

Wear protective eye wear, gloves and clothing.

6.4 Reference to other sections : None**7 Handling and storage****7.1 Precautions for safe handling :**

Avoid breathing mist or vapor.

Do not eat, drink, smoke or use personal products when handling chemical substances.

7.2 Conditions for safe storage, including any incompatibilities :

Store in a cool, well-ventilated area.

7.3 Specific end use(s):

No additional information.

Safety Data Sheet

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

Effective date: 12.08.2015**Revision :** 12.10.2015**Trade Name:** Alconox**8 Exposure controls/personal protection****8.1 Control parameters :**

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

8.2 Exposure controls**Appropriate engineering controls:**

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

Respiratory protection:

Not needed under normal conditions.

Protection of skin:

Select glove material impermeable and resistant to the substance.

Eye protection:

Safety goggles or glasses, or appropriate eye protection.

General hygienic measures:

Wash hands before breaks and at the end of work.

Avoid contact with skin, eyes and clothing.

9 Physical and chemical properties

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

Safety Data Sheet

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

Effective date: 12.08.2015**Revision :** 12.10.2015**Trade Name:** Alconox

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

10 Stability and reactivity**10.1 Reactivity :** None**10.2 Chemical stability :** None**10.3 Possibility hazardous reactions :** None**10.4 Conditions to avoid :** None**10.5 Incompatible materials :** None**10.6 Hazardous decomposition products :** None**11 Toxicological information****11.1 Information on toxicological effects :****Acute Toxicity:****Oral:**

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

Chronic Toxicity: No additional information.**Skin corrosion/irritation:**

Sodium Alkylbenzene Sulfonate: Causes skin irritation. .

Serious eye damage/irritation:

Sodium Alkylbenzene Sulfonate: Causes serious eye irritation .

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

Respiratory or skin sensitization: No additional information.**Carcinogenicity:** No additional information.**IARC (International Agency for Research on Cancer):** None of the ingredients are listed.**NTP (National Toxicology Program):** None of the ingredients are listed.**Germ cell mutagenicity:** No additional information.**Reproductive toxicity:** No additional information.**STOT-single and repeated exposure:** No additional information.**Additional toxicological information:** No additional information.**12 Ecological information**

Safety Data Sheet

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

Effective date: 12.08.2015**Revision :** 12.10.2015**Trade Name:** Alconox**12.1 Toxicity:**

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

Sodium Alkylbenzene Sulfonate: Aquatic invertebrates, EC50 Daphnia 2.4 mg/l, 48 hours.

Sodium Alkylbenzene Sulfonate: Aquatic Plants, EC50 Algae 29 mg/l, 96 hours.

Tetrasodium Pyrophosphate: Fish, LC50 - other fish - 1,380 mg/l - 96 h.

Tetrasodium Pyrophosphate: Aquatic invertebrates, EC50 - Daphnia magna (Water flea) - 391 mg/l - 48 h.

12.2 Persistence and degradability: No additional information.**12.3 Bioaccumulative potential:** No additional information.**12.4 Mobility in soil:** No additional information.**General notes:** No additional information.**12.5 Results of PBT and vPvB assessment:****PBT:** No additional information.**vPvB:** No additional information.**12.6 Other adverse effects:** No additional information.**13 Disposal considerations****13.1 Waste treatment methods (consult local, regional and national authorities for proper disposal)****Relevant Information:**

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

14 Transport information

14.1 UN Number: ADR, ADN, DOT, IMDG, IATA	None
14.2 UN Proper shipping name: ADR, ADN, DOT, IMDG, IATA	None
14.3 Transport hazard classes: ADR, ADN, DOT, IMDG, IATA	Class: None Label: None LTD. QTY: None
<hr/>	
US DOT Limited Quantity Exception:	None
Bulk: RQ (if applicable): None Proper shipping Name: None Hazard Class: None Packing Group: None Marine Pollutant (if applicable): No additional information.	Non Bulk: RQ (if applicable): None Proper shipping Name: None Hazard Class: None Packing Group: None Marine Pollutant (if applicable): No additional information.

Safety Data Sheet

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

Effective date: 12.08.2015**Revision :** 12.10.2015

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

15 Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture.**
North American**SARA****Section 313 (specific toxic chemical listings):** None of the ingredients are listed.**Section 302 (extremely hazardous substances):** None of the ingredients are listed.**CERCLA (Comprehensive Environmental Response, Clean up and Liability Act) Reportable****Spill Quantity:** None of the ingredients are listed.**TSCA (Toxic Substances Control Act):****Inventory:** All ingredients are listed.**Rules and Orders:** Not applicable.**Proposition 65 (California):****Chemicals known to cause cancer:** None of the ingredients are listed.**Chemicals known to cause reproductive toxicity for females:** None of the ingredients are listed.**Chemicals known to cause reproductive toxicity for males:** None of the ingredients are listed.**Chemicals known to cause developmental toxicity:** None of the ingredients are listed.**Canadian****Canadian Domestic Substances List (DSL):**

All ingredients are listed.

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

Safety Data Sheet

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

Effective date: 12.08.2015**Revision :** 12.10.2015**Trade Name:** Alconox**Germany MAK:** Not classified.**Asia Pacific****Australia****Australian Inventory of Chemical Substances (AICS):** All ingredients are listed.**China****Inventory of Existing Chemical Substances in China (IECSC):** All ingredients are listed.**Japan****Inventory of Existing and New Chemical Substances (ENCS):** All ingredients are listed.**Korea****Existing Chemicals List (ECL):** All ingredients are listed.**New Zealand****New Zealand Inventory of Chemicals (NZOIC):** All ingredients are listed.**Philippines****Philippine Inventory of Chemicals and Chemical Substances (PICCS):** All ingredients are listed.**Taiwan****Taiwan Chemical Substance Inventory (TSCI):** All ingredients are listed.**16 Other information****Abbreviations and Acronyms:** None**Summary of Phrases****Hazard statements:**

H315 Causes skin irritation.

H319 Causes serious eye irritation.

Precautionary statements:

P264 Wash skin thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302+P352 If on skin: Wash with soap and water.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

P321 Specific treatment (see supplemental first aid instructions on this label).

P332+P313 If skin irritation occurs: Get medical advice/attention.

P362 Take off contaminated clothing and wash before reuse.

P501 Dispose of contents and container as instructed in Section 13.

Manufacturer Statement:

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

NFPA: 1-0-0

Safety Data Sheet

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

Effective date: 12.08.2015

Revision : 12.10.2015

Trade Name: Alconox

HMIS: 1-0-0

SAFETY DATA SHEET

Version 5.2
Revision Date 02/24/2014
Print Date 11/13/2016

1. PRODUCT AND COMPANY IDENTIFICATION**1.1 Product identifiers**

Product name : Distilled water

Product Number : 07-6061

Brand : Katayama OEM Partner

REACH No. : A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

CAS-No. : 7732-18-5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63103
USA

Telephone : +1 800-325-5832

Fax : +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture**

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

3. COMPOSITION/INFORMATION ON INGREDIENTS**3.1 Substances**

Formula : H₂O H₂O

Molecular Weight : 18.02 g/mol

CAS-No. : 7732-18-5

EC-No. : 231-791-2

No ingredients are hazardous according to OSHA criteria.
No components need to be disclosed according to the applicable regulations.

4. FIRST AID MEASURES**4.1 Description of first aid measures****If inhaled**

If not breathing give artificial respiration

- 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 extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- 5.2 Special hazards arising from the substance or mixture**
no data available
- 5.3 Advice for firefighters**
no data available
- 5.4 Further information**
The product itself does not burn.

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**
Wipe up with absorbent material (e.g. cloth, fleece).
- 6.4 Reference to other sections**
For disposal see section 13.

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 special storage conditions required.
- 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.
- Personal protective equipment**
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.

Respiratory protection

No special protective equipment required.

Control of environmental exposure

Prevent product from entering drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance	Form: liquid Colour: colourless
b) Odour	no data available
c) Odour Threshold	no data available
d) pH	6.0 - 8.0 at 25 °C (77 °F)
e) Melting point/freezing point	0.0 °C (32.0 °F)
f) Initial boiling point and boiling range	100 °C (212 °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	1.000 g/cm ³ at 3.98 °C (39.16 °F)
n) Water solubility	completely miscible
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
no data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
no data available

Inhalation: no data available

Dermal: no data available
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitisation
no data available

Germ cell mutagenicity
no data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
no data available

no data available

Specific target organ toxicity - single exposure
no data available

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard

no data available

Additional Information

RTECS: ZC0110000

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

not applicable

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**

Taking into account local regulations the product may be disposed of as waste water after neutralisation.

14. TRANSPORT INFORMATION**DOT (US)**

Not dangerous goods

IMDG

Not dangerous goods

IATA

Not dangerous goods

15. REGULATORY INFORMATION

REACH No. : A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

No SARA Hazards

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Water	CAS-No. 7732-18-5	Revision Date
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New Jersey Right To Know Components

Water	CAS-No. 7732-18-5	Revision Date
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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

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: 5.2

Revision Date: 02/24/2014

Print Date: 11/13/2016

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Hydrochloric Acid,ACS

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : Hydrochloric Acid,ACS

Manufacturer/Supplier Trade name:

Manufacturer/Supplier Article number: S25358

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number:

Fisher Science Education Emergency Telephone No.: 800-535-5053

SECTION 2 : Hazards identification

Classification of the substance or mixture:



Corrosive

Serious eye damage, category 1
Corrosive to metals, category 1
Skin corrosion, category 1B



Irritant

Specific target organ toxicity following single exposure, category 3

Corr. Metals 1
Corr. Skin 1B
Eye Damage 1
STOT. SE 3

Signal word :Danger

Hazard statements:

May be corrosive to metals
Causes severe skin burns and eye damage
May cause respiratory irritation

Precautionary statements:

If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
Keep only in original container
Do not get in eyes, on skin, or on clothing
Wash skin thoroughly after handling
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting

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IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do.
Continue rinsing
Immediately call a POISON CENTER or doctor/physician
Specific treatment (see supplemental first aid instructions on this label)
Wash contaminated clothing before reuse
Absorb spillage to prevent material damage
Store in a well ventilated place. Keep container tightly closed
Store locked up
Store in corrosive resistant stainless steel container with a resistant inner liner
Dispose of contents and container to an approved waste disposal plant

Other Non-GHS Classification:

WHMIS



NFPA/HMIS



NFPA SCALE (0-4)

Health	3
Flammability	0
Physical Hazard	1
Personal Protection	X

HMIS RATINGS (0-4)

SECTION 3 : Composition/information on ingredients

Ingredients:		
CAS 7647-01-0	Hydrochloric Acid, ACS	30-50 %
CAS 7732-18-5	Water	50-70 %
Percentages are by weight		

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position. Seek medical attention if irritation or coughing persists.

After skin contact: Wash affected area with soap and water. Immediately remove contaminated clothing and shoes. Rinse thoroughly with plenty of water for at least 15 minutes. Immediately seek medical attention.

After eye contact: Protect unexposed eye. Flush thoroughly with plenty of water for at least 15

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Hydrochloric Acid,ACS

minutes.Remove contact lenses while rinsing.Continue rinsing eyes during transport to hospital.

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink sips of water. Immediately seek medical attention.

Most important symptoms and effects, both acute and delayed:

Inhalation may cause irritation to nose and upper respiratory tract, ulceration, coughing, chest tightness and shortness of breath. Higher concentrations cause tachypnoea, pulmonary oedema and suffocation . Ingestion may cause corrosion of lips, mouth, oesophagus and stomach, dysphagia and vomiting.Pain, eye ulceration, conjunctival irritation, cataracts and glaucoma may occur following eye exposure.Erythema and skin irritation, as well as chemical burns to skin and mucous membranes may arise following skin exposure.;Potential sequelae following ingestion of hydrochloric acid include perforation, scarring of the oesophagus or stomach and stricture formation causing dysphagia or gastric outlet obstruction. In some cases, RADS may develop. Respiratory symptoms may take up to 36 hours to develop.Symptoms of burning sensation, cough, wheezing, laryngitis, shortness of breath, spasm, inflammation, edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

Indication of any immediate medical attention and special treatment needed:

Provide SDS to Physician.Physician should treat symptomatically.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors.If in contact with metals toxic fumes may be released.

Advice for firefighters:

Protective equipment: Wear protective eyeware, gloves, and clothing. Refer to Section 8. Wear respiratory protection.

Additional information (precautions): Thermal decomposition can produce poisoning chlorine. Hydrochloric acid reacts also with many organic materials with liberation of heat.Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation. Ensure that air-handling systems are operational.

Environmental precautions:

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

Methods and material for containment and cleaning up:

Always obey local regulations. If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Containerize for disposal. Refer to Section 13. Keep in suitable closed containers for disposal. Soak up with inert absorbent material and dispose of as hazardous waste. Cover spill with soda ash or calcium carbonate. Mix and add water to form slurry.Wear protective eyeware, gloves, and clothing. Refer to Section 8.

Reference to other sections:

SECTION 7 : Handling and storage

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Hydrochloric Acid,ACS

Precautions for safe handling:

Prevent formation of aerosols. Never use hot water and never add water to the acid. Do not allow contact between hydrochloric acid, metal, and organics. Follow good hygiene procedures when handling chemical materials. Refer to Section 8. Prevent contact with skin, eyes, and clothing. Follow proper disposal methods. Refer to Section 13. Do not eat, drink, smoke, or use personal products when handling chemical substances. Use only in well ventilated areas. Avoid splashes or spray in enclosed areas.

Conditions for safe storage, including any incompatibilities:

Store in a cool location. Keep away from food and beverages. Protect from freezing and physical damage. Store away from incompatible materials. Provide ventilation for containers. Keep container tightly sealed. Containers for hydrochloric acid must be made from corrosion resistant materials: glass, polyethylene, polypropylene, polyvinyl chloride, carbon steel lined with rubber or ebonite.

SECTION 8 : Exposure controls/personal protection



Control Parameters:

7647-01-0, Hydrochloric Acid, ACGIH: 2 ppm Ceiling
7647-01-0, Hydrochloric Acid, NIOSH: 5 ppm Ceiling; 7 mg/m³ Ceiling

Appropriate Engineering controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits-OELs) indicated above. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of handling.

Respiratory protection:

Not required under normal conditions of use. 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. When necessary use NIOSH approved breathing equipment.

Protection of skin:

Select glove material impermeable and resistant to the substance. Select glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves. Wear protective clothing.

Eye protection:

Faceshield (8-inch minimum).Tightly fitting safety goggles.

General hygienic measures:

Perform routine housekeeping. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes, and clothing. Before rewearing wash contaminated clothing.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	Clear, colorless liquid.	Explosion limit lower: Explosion limit upper:	Non Explosive Non Explosive
Odor:	Pungent odor	Vapor pressure:	5.7mmHg @ 0C
Odor threshold:	0.3 - 14.9 mg/m ³	Vapor density:	1.27 (Air=1)
pH-value:	< 1	Relative density:	1.0 - 1.2

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Melting/Freezing point:	- 74 C	Solubilities:	Miscible
Boiling point/Boiling range:	81.5 - 110 C	Partition coefficient (n-octanol/water):	Not Determined
Flash point (closed cup):	Not Applicable	Auto/Self-ignition temperature:	Not Determined
Evaporation rate:	>1.00	Decomposition temperature:	Not Determined
Flammability (solid,gaseous):	non combustible	Viscosity:	a. Kinematic:Not Determined b. Dynamic: Not Determined
Density: Not Determined Hydrochloric Acid: MW is36.46			

SECTION 10 : Stability and reactivity

Reactivity:Reacts violently with bases and is corrosive.

Chemical stability:No decomposition if used and stored according to specifications.

Possible hazardous reactions:Attacks many metals in the presence of water forming flammable explosive gas (hydrogen).Reacts violently with oxidants forming toxic gas (chlorine).

Conditions to avoid:Incompatible materials.

Incompatible materials:Bases, Amines, Alkali metals, Metals, permanganates (potassium permanganate), Fluorine, Metal acetylides, Hexalithium disilicide.

Hazardous decomposition products:Hydrogen chloride gas.Carbon oxides.

SECTION 11 : Toxicological information

Acute Toxicity:		
Inhalation:	7647-01-0	LD50 Rat 3124 ppm/hour
Oral:	7647-01-0	LD50 Rat 238 - 277 mg/kg
Dermal:	7647-01-0	LD50 Rabbit >5010 mg/kg
Chronic Toxicity: No additional information.		
Corrosion Irritation:		
Dermal:	7647-01-0	Skin - rabbit Result: Causes burns.
Ocular:	7647-01-0	Eyes - rabbit Result: Corrosive to eyes
Sensitization:		No additional information.
Single Target Organ (STOT):		7647-01-0: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.
Numerical Measures:		No additional information.
Carcinogenicity:		No additional information.
Mutagenicity:		No additional information.

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Reproductive Toxicity:

No additional information.

SECTION 12 : Ecological information

Ecotoxicity

7647-01-0: Toxicity to fish LC50 - Gambusia affinis (Mosquito fish) - 282 mg/l - 96 h (Hydrochloric acid)

Persistence and degradability:

Bioaccumulative potential:

Mobility in soil:

Other adverse effects:

SECTION 13 : Disposal considerations

Waste disposal recommendations:

Do not allow product to reach sewage system or open water. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities (US 40CFR262.11). Contact a licensed professional waste disposal service to dispose of this material. Dispose of empty containers as unused product. Product or containers must not be disposed together with household garbage. Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

SECTION 14 : Transport information

UN-Number

1789

UN proper shipping name

HYDROCHLORIC ACID

Transport hazard class(es)



Class:

8 Corrosive substances

Packing group:II

Environmental hazard:

Transport in bulk:

Special precautions for user:

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings):

Acute

SARA Section 313 (Specific toxic chemical listings):

7647-01-0 Hydrochloric Acid

RCRA (hazardous waste code):

None of the ingredients is listed

TSCA (Toxic Substances Control Act):

All ingredients are listed.

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CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7647-01-0 Hydrochloric Acid 5000 lbs

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL):

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

7647-01-0 Hydrochloric Acid

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations. Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods

PNEC: Predicted No-Effect Concentration (REACH)

CFR: Code of Federal Regulations (USA)

SARA: Superfund Amendments and Reauthorization Act (USA)

RCRA: Resource Conservation and Recovery Act (USA)

TSCA: Toxic Substances Control Act (USA)

NPRI: National Pollutant Release Inventory (Canada)

DOT: US Department of Transportation

IATA: International Air Transport Association

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

ACGIH: American Conference of Governmental Industrial Hygienists

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

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HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

DNEL: Derived No-Effect Level (REACH)

Effective date : 01.08.2015

Last updated : 03.20.2015

APPENDIX B

Community Air Monitoring Plan (CAMP)

Community Air Monitoring Plan

This Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress during remedial activities at the site. The CAMP is not intended for use in establishing action levels for workers respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air. The CAMP was developed in accordance with Appendices 1A & 1B of DER-10, included at the end of this CAMP.

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

Depending on the nature of known or potential contaminants at the site, real-time air monitoring for VOCs and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary.

Continuous monitoring will be required for all ground intrusive activities. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and groundwater samples. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuing monitoring may be required during sampling activities.

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than the background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques 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 will be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures

and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m³ of the upwind level and in preventing visible dust migration.

- All readings will be recorded and be available for State (DEC and DOH) personnel to review.

VOC Monitoring, Response Levels, and Actions

VOCs will 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 will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using a photo ionization detector (PID) equipped with a 10.2 eV bulb. The PID will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the 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 will be halted, the source of the 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 will be shutdown.
- All 15-minute readings will be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or 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 predetermined). 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/m³, 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.

Special Requirements for Indoor Work with Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under "Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures" except that in this instance "nearby/occupied structures" would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

Daily CAMP reports will be provided to the NYSDEC and NYSDOH Project Managers for review. Daily CAMP reports will include a site figure depicting work zones, wind direction, locations of CAMP monitoring stations and data downloads. Exceedances of CAMP action levels will be corrected and communicated to the NYSDEC and NYSDOH within one business day.

Appendix 1A

New York State Department of Health Generic Community Air Monitoring Plan

Overview

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

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

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

Community Air Monitoring Plan

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

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

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

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

VOC Monitoring, Response Levels, and Actions

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \text{ mcg}/\text{m}^3$ 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 $150 \text{ mcg}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

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

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Appendix 1B

Fugitive Dust and Particulate Monitoring

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

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.
2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.
3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:
 - (a) Objects to be measured: Dust, mists or aerosols;
 - (b) Measurement Ranges: 0.001 to 400 mg/m³ (1 to 400,000 :ug/m³);
 - (c) Precision (2-sigma) at constant temperature: +/- 10 :g/m³ for one second averaging; and +/- 1.5 g/m³ for sixty second averaging;
 - (d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
 - (e) Resolution: 0.1% of reading or 1g/m³, whichever is larger;
 - (f) Particle Size Range of Maximum Response: 0.1-10;
 - (g) Total Number of Data Points in Memory: 10,000;
 - (h) Logged Data: Each data point with average concentration, time/date and data point number
 - (i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
 - (j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
 - (k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
 - (l) Operating Temperature: -10 to 50° C (14 to 122° F);
 - (m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.
4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.
5. The action level will be established at 150 ug/m³ (15 minutes average). While conservative,

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

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

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

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

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

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