



Sent via email to jess.laclair@dec.ny.gov

August 19, 2019
iPARK0118.28

Jessica LaClair
Environmental Engineer
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7013

Re: iPark 84
Former IBM East Fishkill Facility
Building 220 (Formerly Building 310) Proposed
Loading Docks Area
Soil Characterization Work Plan

Dear Ms. LaClair:

Walden Environmental Engineering, PLLC (Walden) is submitting this Soil Characterization Work Plan on behalf of National Resources (NR), the owner of Building 220 (formerly Building 310) at the iPark 84 Former IBM East Fishkill Facility located in Hopewell Junction, New York.

This Work Plan was prepared in support of NR's plans to install a loading docks area at Building 220 at iPark 84 (former IBM East Fishkill Facility, the "Facility") (refer to **Figure 1**). Building 220 is located within Operable Unit 5 (OU5) in "Area A" of the Facility, where the primary constituents of concern are perchloroethylene and its breakdown products and Freon TF (1,1,2-trichloro-1,2,2-trifluoroethane). The sampling presented herein will provide data needed to characterize and evaluate existing soil conditions in the area of the proposed loading docks to allow the appropriate arrangements for handling/disposal to be made prior to excavation activities. In addition, the data will document the nature of the soils and contaminants that will remain in place beneath any backfill, pavement or structures installed during construction of the proposed loading docks.

Pursuant to Section 9.0 and Appendix C of the Facility's Draft Interim Site Management Plan (ISMP), dated August 2017, Walden provided notice of this proposed project via email to the NYSDEC representative (Jessica LaClair) on Friday, March 8, 2019. As detailed below, this soil sampling program is being performed in step with the construction of four (4) loading docks and appurtenant paving, along the western face of Building 220. The existing grade adjacent to Building 220 is approximately five (5) feet higher than the pavement below in the southern portion of the proposed loading docks area. A concrete retaining wall supports the raised area. This wall slopes down in the middle portion of the



loading docks area as gradient changes between the building and meets the pavement below. Sections of the existing retaining wall will be removed and replaced as the area is excavated and regraded in step with the loading dock construction work.

The main loading area will be approximately 120 feet long, and the excavation/grading required to install the loading docks area is not expected to exceed 12 feet wide by 10 feet deep. The access driveway to the loading docks area will be approximately 130 feet long, and the excavation/grading required to install the pavement is not expected to exceed 40 feet wide by an average of approximately 5.5 feet deep. The total volume of material to be removed during construction is expected to be no more than approximately 1,600 cubic yards. The area will be paved with asphalt upon completion.

During the work, National Resources will protect the existing groundwater monitoring well (MW-200) near the northwest corner of Building 220. The existing fire hydrant in the proposed loading docks area will be relocated prior to construction. The soil disturbance associated with the fire hydrant will be appropriately monitored and characterized, as detailed below.

Pre-Construction Field Investigation

The following soil characterization activities will be conducted prior to construction within the proposed Building 220 loading docks area at the Facility upon NYSDEC approval of this Work Plan. It is expected that this soil investigation [anticipated to be completed in one (1) day of field work] will be completed in September 2019. No excavation will begin until the pre-construction field investigation results have been evaluated, summarized and submitted to NYSDEC and NYSDOH.

Soil Sampling

Soil coring will be conducted at twelve (12) locations (designated as SB-1 through SB-12) throughout the proposed area of excavation for the new loading docks, as shown on **Figure 2**. Note that the sampling locations will be modified in the field, as needed, to avoid interference with underground utilities and structures which will be marked out prior to the investigation. All sampling locations will be cleared by ground-penetrating radar before drilling commences.

The investigation will be conducted in general accordance with the NYSDEC Division of Environmental Resources (DER) Technical Guidance for Site Investigation and Remediation (DER-10), Appendix C [Intrusive Activities Work Plan (IAWP)] of the ISMP, and 29 CFR 1910.120. Field personnel will don the appropriate health and safety equipment, as outlined in the Health and Safety Plan (HASP), provided as **Appendix A**. Should grossly contaminated media be encountered during this process, all work activities will be suspended and the NYSDEC will be notified.

A Geoprobe with five (5) foot (ft) macrocores, or similar, will be utilized at each of the five (5) soil coring locations within the upper paved area located closer to the building (SB-8, SB-9, SB-10, SB-11 and SB-12) to retrieve a continuous soil core to fifteen (15) ft below grade (bg), extending approximately five (5) ft below the proposed maximum depth of excavation for the loading docks area construction. Those cores in the grassy sloped area and the lower paved area to be disturbed



(seven [7] locations: SB-1, SB-2, SB-3, SB-4, SB-5, SB-6 and SB-7) will extend to ten (10) ft bg as the anticipated depth of disturbance is less than four (4) feet in those areas. SB-7 will be installed in the vicinity of the existing fire hydrant to be relocated. The cores will be visually inspected, screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID) that has been properly calibrated according to manufacturer's instructions each day prior to sampling, and logged in the field book by field personnel. Should the core not contain enough material for sufficient screening, a second core shall be collected immediately adjacent to the first. Groundwater is not anticipated to be encountered during this process. Excess soils removed from each soil core location shall be placed back into the borehole before moving on to the next location.

Note that the scope of the sampling may be modified in the field as needed to collect additional site characterization information based on observations and conditions encountered during the investigation. Field adjustments may include installing additional soil cores or extending coring depths, depending on site conditions. All modifications to the sampling scope will be documented in the field book. Any additional samples shall be screened, logged and handled in the same manner as the other soil samples, as described herein.

Each of the 15-foot soil cores will be split into three (3) screening intervals and those drilled to ten (10) ft bg will be split into two (2) intervals:

- 0-5 ft bg (all cores);
- 5-10 ft bg (all cores); and
- 10-15 ft bg (deep cores).

Three (3) of the soil cores will be selected for laboratory sample analysis based on the cores exhibiting the greatest visual or olfactory evidence of contamination (odors/staining) and/or the highest PID screening measurement. If screening and observations show no evidence of contamination, samples from the cores closest (SB-11) and farthest from the building (SB-1 and SB-4) will be sent to the laboratory (see **Figure 2**).

From each of the three (3) selected soil cores, three (3) soil samples will be collected for laboratory analysis, one (1) from within the 0-5 ft bg, 5-10 ft bg, and 10-15 ft bg (deep cores only) intervals, for a total of nine (9) soil samples to be analyzed (at most). Should the selected borings all be shallow borings, two (2) samples will be collected from each, one from the 0-5 ft bg and one from the 5-10 ft bg intervals. Discrete samples will be collected for VOC analysis from intervals selected based on the highest screening results or evidence of contamination within that interval (when applicable). Composite samples from each interval will be submitted for laboratory analysis of semi-volatile organic compounds (SVOCs), target analyte list (TAL) metals, pesticides, herbicides and polychlorinated biphenyls (PCBs).

A project logbook/field notebook will be maintained to record all field activities and observations during the screening. Soil boring logs will be prepared for the final summary report.



Sample bottles, provided by the laboratory and appropriate for the analyses being performed, will be labeled in the field, placed into a sampling cooler and kept on ice for subsequent delivery to the laboratory. Each of the samples shall be sent under chain-of-custody protocol to a laboratory certified by the NYSDOH Environmental Laboratory Accreditation Program (ELAP) for analysis.

Laboratory Analysis

Soil samples will be sent under chain-of-custody protocol and on ice via overnight courier or hand delivery to Phoenix Environmental Laboratories, Inc., an ELAP certified laboratory (NYSDOH ELAP #11301) located in Manchester, CT. All analyses will be conducted on a standard turn-around time basis unless NR calls for expedited analysis. The laboratory results will be provided to Walden with NYSDEC ASP Category B deliverable packages.

The soil samples will be analyzed for NYCRR Part 375-6.8 VOCs, SVOCs, pesticides, herbicides, PCBs and target analyte list (TAL) metals, via USEPA Methods 8260/5035, 8270, 8081B, 8151A, 8082A and 6010, respectively.

The laboratory analytical data for the soil samples will be compared to the NYCRR Part 375-6.8(b) restricted use Soil Cleanup Objectives (SCOs) for various categories ranging from unrestricted to commercial use.

Decontamination Procedures

Non-disposable sampling equipment will be decontaminated between locations using the following procedures:

- Remove any large debris, such as clumps of soil, from the equipment by hand;
- Wash and scrub the equipment with a detergent solution, such as Alconox or equivalent, and potable water; and
- Rinse the equipment with potable water.

Waste Handling

Disposable sampling supplies will be bagged/containerized and properly disposed of as solid waste. Decontamination fluids will be containerized and discharged to the on-site industrial waste drainage system.

CAMP Air Monitoring

The Community Air Monitoring Plan (CAMP), presented in **Appendix B**, will be implemented during all ground intrusive activities (pre-construction soil sampling, excavation, and post-excavation sampling). The CAMP reports will be submitted to NYSDEC and NYSDOH upon completion of the project.



Post-Excavation Soil Sampling

In order to characterize the soils that will remain in place following the proposed loading docks area construction, post-excavation samples will be collected from the bottom and sidewalls of the excavation. The post-excavation samples will be collected from the top of the exposed soils to six (6) inches into the soil remaining in place.

- A total of four (4) sidewall samples will be collected, one (1) sample from the approximate midpoint along the north, south, east and west walls of the excavation; and
 - The sidewall samples will be collected from a depth midway between the ground surface and the bottom of the excavation.
 - If the foundation of Building 220 prevents collection of the west sidewall sample, a soil sample will be collected from the base of the excavation next to the foundation.
- Two (2) soil samples will be collected from the bottom of the excavation.

The post-excavation sidewall and bottom samples will be screened, logged and submitted for laboratory analysis of VOCs, SVOCs, TAL metals, pesticides, herbicides and PCBs as described for the pre-construction field investigation.

Excavated Soil Handling and Backfilling

Soils excavated during loading docks construction will be stockpiled on plastic and covered with anchored tarps. The stockpiles will be surrounded with hay bales, silt fencing or other erosion and sedimentation control measures. The soil sampling results from the pre-construction field investigation will be compared to the NYCRR Part 375-6.8(b) restricted use SCOs to characterize the excavated soils for disposal. If the soil meets the SCOs for commercial use, it will be returned to the subsurface as backfill or taken to Lot 3 where it will be stockpiled for future re-use on-site.

Any soils that do not meet the SCOs for commercial use will be disposed of off-site in accordance with Sections 8.0 and 9.0 of the Intrusive Activities Work Plan (Materials Transport Off-site and Materials Disposal Off-site).

A geotextile fabric liner will be placed in the excavation as a demarcation layer prior to backfilling to provide a visual reference to the top of the "Remaining Impacted Media Zone" in accordance with Section 12.0 of the Intrusive Activities Work Plan (Cover System Restoration).

Reporting

Upon completion of the Building 220 loading docks area site characterization activities, excavation work, construction and site restoration, Walden will prepare a report of findings that will document all of the fieldwork described herein, including tables of analytical results, field logs, photographs, figures and recommendations. This report will be submitted to NYSDEC and NYSDOH for review.

Ms. Jessica LaClair
Bldg. 220 Proposed Loading Docks Area - 6 -
August 19, 2019



If you have any questions or require any additional information, please call (516) 624-7200.

Very truly yours,
Walden Environmental Engineering, PLLC

A handwritten signature in black ink, reading "Nora M. Brew". The signature is fluid and cursive, with the first name "Nora" being the most prominent.

Nora M. Brew, P.E.
Senior Project Manager

cc: J. Kenney, NYSDOH
M. Buckley, National Resources
C. Monheit, National Resources

Figure 1 – Site Plan

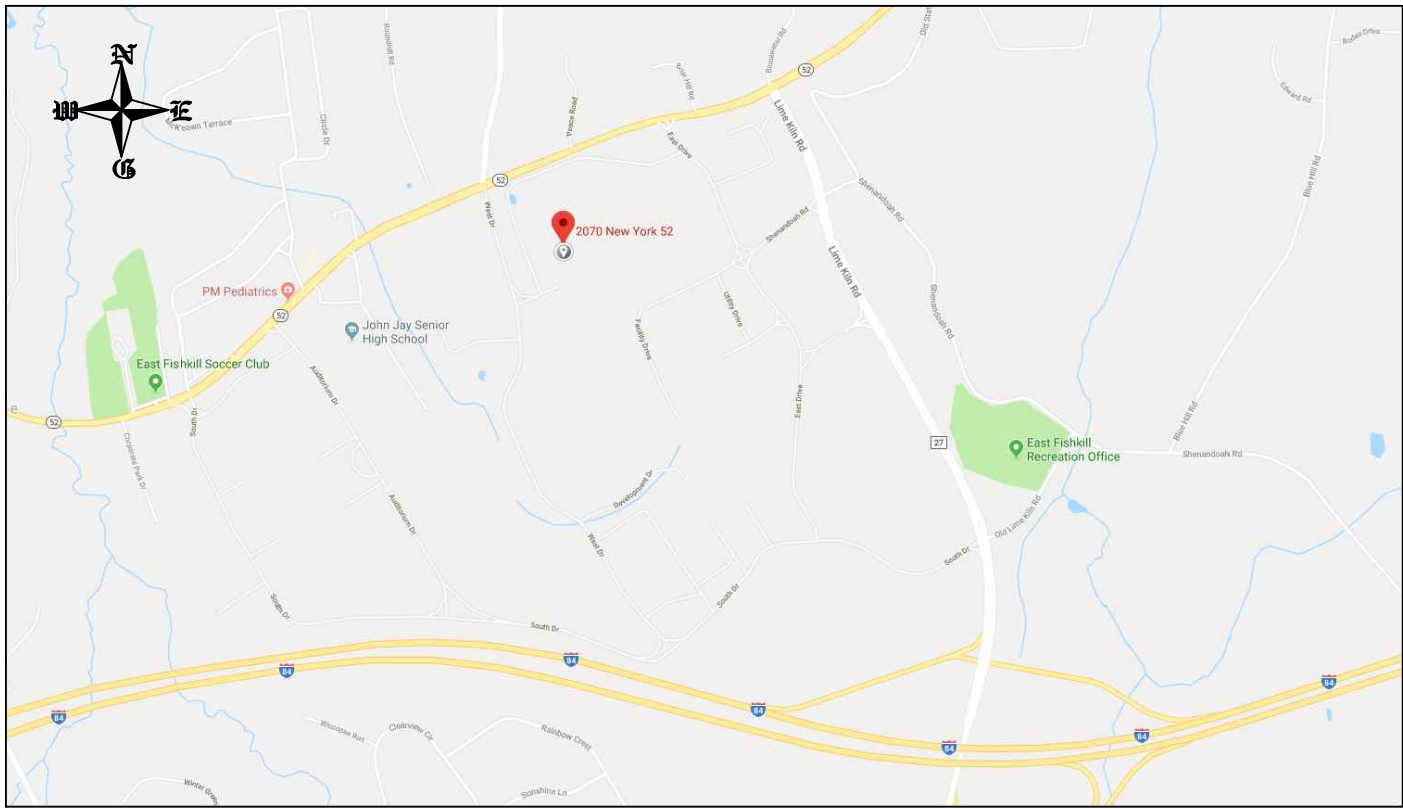
Figure 2 – Proposed Sampling Plan Building 220 Loading Docks Area

Appendix A – Health and Safety Plan

Appendix B – Community Air Monitoring Plan

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FIGURES



SITE LOCATION

NOT TO SCALE
SOURCE: GOOGLEMAPS.COM



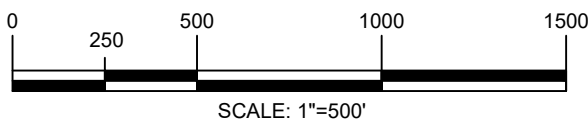
BUILDING 330C

LEGEND

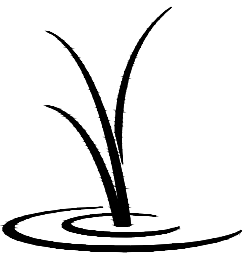
PROPERTY LINE

SITE PLAN

1" = 500'-0"



SITE BASEMAP: CHAZAN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE CO. D.P.C. POUGHKEEPSIE, NY (XBASE-SVY_51421-00.DWG 8/10/15); PARCELS: XSUBD_51539-00.DWG.



WALDEN ENVIRONMENTAL ENGINEERING, PLLC

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REVISION		
NO.	DATE	COMMENTS
0	1/22/19	BUILDING 330C HASP

LOCATION:

IPARK CAMPUS
2070 ROUTE 52
HOPEWELL JUNCTION, NEW YORK

FOR:

HEALTH AND SAFETY PLAN
BUILDING 330C
IPARK CAMPUS

DRAWING TITLE:

SITE PLAN

DRAWING NO:

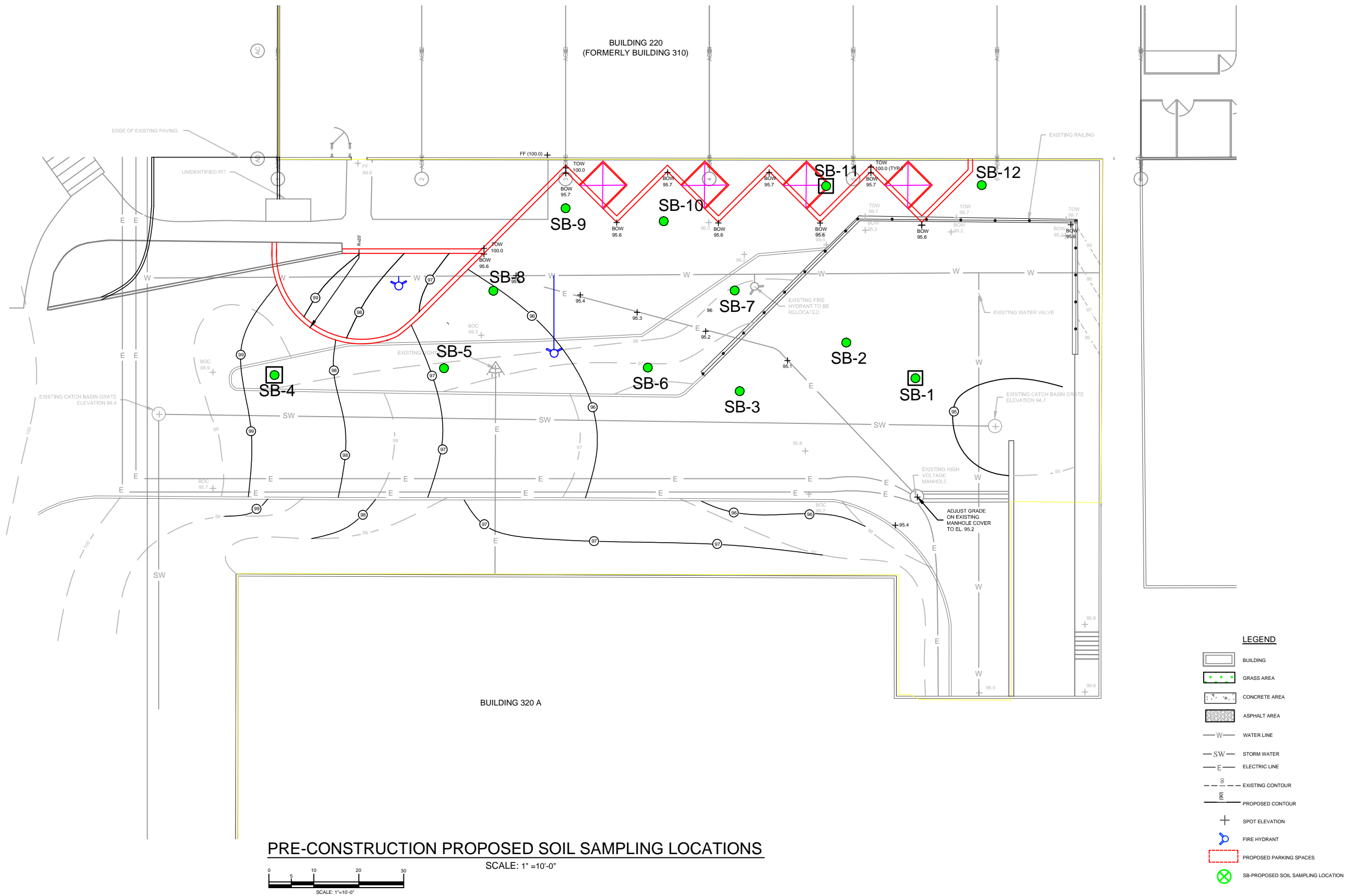
1

ISSUED

REVISION NO:

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DESIGNED BY: LL	DRAWN BY: LTG	JOB NO: iPARK0118.23	DATE: January 22, 2019	SHEET NO: 1 OF 1	24" x 36"
APPROVED BY: JMH	SCALE: AS NOTED	CAD FILE NAME: Z:\iPark0118\iPark0118.23 - HASP for slab cutting - Country Produce 330C\HASP\Site Plan.dwg			



APPENDIX A
HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

AT

IPARK 84

FORMER IBM EAST FISHKILL FACILITY

AUGUST 2019

PREPARED FOR:

**NATIONAL RESOURCES
200 NORTH DRIVE
HOPEWELL JUNCTION, NEW YORK 12533**

PREPARED BY:

**WALDEN ENVIRONMENTAL ENGINEERING, PLLC
2070 ROUTE 52
HOPEWELL JUNCTION, NEW YORK 12533**

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1.0 INTRODUCTION

Walden Environmental Engineering, PLLC (Walden) employees may be exposed to risks from site-related hazardous conditions while performing field activities at the iPark 84 Site owned by National Resources (the Former IBM East Fishkill Facility, the “Site” or “Facility”) located in Hopewell Junction, New York (refer to **Attachment A**). Walden’s policy is to minimize the possibility of work-related injury through aware and qualified supervision, health and safety training, medical monitoring and the use of appropriate personal protective equipment (PPE). Walden has established a guidance program to implement this corporate policy in a manner that protects personnel to the maximum reasonable extent.

This Health and Safety Plan (HASP) applies to all Walden personnel, National Resources representatives, subcontractors, the New York State Department of Environmental Conservation (NYSDEC), the New York State Department of Health (NYSDOH), and any other individuals on the jobsite where operations involve actual or potential physical and chemical hazards that have been identified by Walden or others during activities including but not limited to the following:

- Shallow soil sampling;
- Sediment sampling;
- Groundwater sampling;
- Construction or demolition work that disturbs surface or subsurface soils, groundwater, sediment, etc. at the Facility; and
- Construction or demolition work involving equipment, piping, etc. currently or formerly containing hazardous materials or wastes at the Facility.

This HASP is also intended to inform and guide all personnel (Walden employees and/or owner representatives, subcontractors or State/local regulatory agency representatives) entering the exclusion zone, ensuring that each person sign and acknowledge the Site hazards on the Acknowledgement Form provided in Section 9.0. Walden and/or the owner’s subcontractors are retained as independent contractors and, as such, are responsible for ensuring the safety of their employees.

Walden may require that its personnel take certain precautions in accordance with this HASP, and Walden requests that others protect their personnel in a manner that they deem necessary or sufficient.

This HASP is based on the best available information to date. Should a conflict occur between this document and any other related Health and Safety Plans, Operating Procedures, regulations, etc., workers shall follow the most stringent/protective requirements. HASP Supplements will be generated, as necessary, to address any new information, change in conditions, or activities. While it is not possible to discover, evaluate, and protect in advance against all possible hazards which may be encountered throughout the course of this project, adherence to the requirements of this HASP will significantly reduce the potential for occupational injury.

2.0 SCOPE

2.1 Generic Scope

This HASP is intended to be utilized during intrusive work performed at the Facility, including but not limited to the following:

- Collection of soil samples via hand auger or similar methods;
- Installation of soil borings;
- Collection of groundwater samples;
- Collection of soil gas and sub-slab vapor samples;
- Collection of air samples;
- Non-hazardous and hazardous soil/solids management;
- Non-hazardous and hazardous liquid management;
- Real-time air monitoring using instrumentation;
- Cutting and handling of concrete slabs;
- Construction, installation and maintenance of engineering controls to reduce chemical exposure;
- Excavation;
- Stockpiling;
- Grading;
- Trenching;
- Removal/installation/modification of piping and drainage structures;
- Interior building renovations;
- Installation of pavement and concrete; and
- General site construction and building activities.

Previous site investigations have identified soil, soil vapor and groundwater contamination at various locations at the Facility associated with historic site activities. Contaminants associated with the site include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and inorganics. Therefore, precautions shall be taken to prevent exposure to contaminants and ensure that appropriate and safe procedures are followed when potentially contaminated media and hazardous materials and wastes may be encountered and handled during the work. Work at the Facility shall be performed by employees who are properly trained and experienced in dealing with the hazards which may arise from these types of tasks, which are defined as toxic effects, including threshold limit values (TLVs), immediately dangerous to life

and health (IDLH), reactivity, stability, flammability, and operational hazards with sampling, decontaminating, etc.

2.2 Project-Specific Scope of Work

This HASP is intended to be utilized during intrusive soil investigation at the Facility at Building 220, including collection of soil samples via hand auger and/or Geoprobe®. National Resources desires to install a loading dock and appurtenant pavement for the building, thus soil excavation/grading is required. The area to be exposed is not expected to exceed 20 feet wide by 200 feet long, nor exceed five feet deep. Groundwater is not anticipated to be encountered during these activities. The total anticipated volume of material to be removed during construction is expected to be approximately 100 cubic yards. The area will be paved with asphalt upon completion. Specific details of the work to be performed at the site are provided in the *Building 220 (Formerly Building 310) Proposed Loading Dock Area Soil Characterization Work Plan* (dated June 28, 2019).

2.3 Equipment

The following equipment may be utilized for this task:

1. Hand auger;
2. Scrub brush;
3. Photoionization detector (PID);
4. MultiRAE multi-gas meter;
5. 55-gallon drums, both metal and plastic;
6. Excavation machinery (e.g. mini-excavator);
7. Hand shovels;
8. Plastic sheeting;
9. Soil/solids sampling containers;
10. Chemical-resistant, leather, and/or cut-resistant gloves; and
11. Miscellaneous hand tools (screwdriver, socket driver).

2.4 Site Access

The topography in the area of Building 220 is relatively flat and mostly covered by buildings and asphalt parking areas. In the event of an emergency, personnel and subcontractors should assemble at a predetermined assembly area, designated by the Site Safety Officer (SSO) for the task.

Access to work areas will be denied to the general public via the SSO or designated personnel, thus establishing the perimeter of controlled work areas, minimizing potential exposure to

unauthorized individuals, protecting the public from hazards and preventing vandalism. All equipment and materials will be secured during non-work hours. Continuous communication (via portable radios, hand signals, telephones, etc.) shall be maintained between the SSO and key personnel associated with this project at all times during field operations.

2.5 Controlled Work Areas

Controlled work areas will be established prior to and for each work area, depending on the task, and shall float (move around) depending on the tasks being performed on any given day. Each controlled work area will consist of three (3) zones: the exclusion zone, the contaminant reduction zone and the support zone, based on the degree of danger present. To the extent possible, the support and contaminant reduction zones will be established outside of the exclusion zone.

2.5.1 Exclusion Zone

The exclusion zone consists of the primary activity area, as defined by the SSO. Only personnel directly involved with performance of a job task within that area and meeting the required qualifications (40 Hour HAZWOPER trained) may be allowed entry. Before entering the exclusion zone, all personnel must be familiar with emergency response procedures, Site safety locations, first aid and communication equipment, and the locations of the map to the hospital and the list of emergency telephone numbers. Attempts will be made so that equipment and Site activities taking place in the exclusion zone are situated so that personnel are upwind of potential contaminant sources.

2.5.2 Contaminant Reduction Zone

The contaminant reduction zone shall be located between the exclusion zone and the support zone. In this area authorized personnel (those with 40 Hour HAZWOPER training) will don protective equipment, as needed in the exclusion zone. When exiting the restricted area, personnel will remove contaminated PPE.

2.5.3 Support Zone

The support zone shall extend beyond the exclusion and contaminant reduction zones, where other support activities shall occur, such as first aid, equipment supply, etc., and where vendors, subcontractors and inspectors, and the like, shall be allowed. The support zone shall be established prior to commencement of activities and shall serve as the entry point for controlling access.

Trespassers shall be immediately escorted outside of these established areas and all work within these areas shall halt until the trespasser has been removed.

3.0 ORGANIZATIONAL STRUCTURE

The following Walden personnel are the main parties involved with the project at hand.

<u>POSITION/TITLE</u>	<u>NAME/AFFILIATION</u>	<u>PHONE NUMBER/PAGER</u>
Project Manager(s)	Joseph M. Heaney III, P.E.	516-624-7200 (Office)
	Larry LePere, P.E.	845-745-0888 (Mobile)
Site Safety Officer(s)	Greta White	518-698-3012 (Mobile)
	Erica Johnston	631-521-1266 (Mobile)
	Louis Goldstein	845-406-8242 (Mobile)

3.1 Project Manager

The Project Manager has the responsibility and authority to direct all operations related to this project. The Project Manager is responsible to observe and provide guidance to employees, subcontractors and visitors with regard to safe work behavior and safety training, discuss deviations from the work plan and any safety issues that arise, assist the SSO with the development and implementation of corrective actions for Site safety deficiencies, the implementation of this HASP, and ensuring compliance.

3.2 Site Safety Officer

A qualified SSO will be continuously on the jobsite during the period of work and will have the authority to receive and execute any directions given by the owner representative in the absence of the Project Manager. The SSO will establish the necessary controlled work areas. The SSO will ensure that task areas are kept in a clean condition, free of rubbish and all undue accumulations and surplus materials while the work progresses. The SSO and/or Project Manager shall guarantee that all employees are fit for duty and that material and equipment is protected to prevent damage to employees and visitors, as well as, at the end of each work day, all rubbish and unused materials are removed and any damage done is repaired. These individuals will enforce this HASP, ensuring required safety equipment is on-site, clean and operable.

The SSO will coordinate all relevant health and safety issues, and may conduct specialized training and compliance inspections, as required. It will be the duty of the SSO to provide emergency training to associated personnel and, in the event of an emergency situation, to inform the local authorities as to the nature of the incident. In case of an emergency incident, the SSO

will be contacted immediately. The SSO is to work with the Project Manager to develop and implement any corrective actions that may be necessary.

The Project Manager and the SSO are responsible for periodically reviewing the HASP and its Attachments and any Supplements and, as necessary, amending them to keep current with new or changing conditions.

3.3 Employees

Employees are responsible for understanding and abiding by the policies and procedures specified in this HASP and other applicable safety policies, and clarifying those areas where understanding is incomplete; providing feedback to health and safety management relating to omissions and modifications in the HASP or other safety policies; and, notifying the SSO, in writing, of unsafe conditions and acts. Each employee shall sign this HASP (Section 9.0) in acknowledgement of such.

The health and safety authority of each employee assigned to the Facility includes the right to refuse to work and/or stop work authority when the employee feels that the work is unsafe (including subcontractors), or where specified safety precautions are not adequate or fully understood; the right to refuse to work on any task where the safety procedures specified in this HASP or other safety policies are not being followed; the right to contact the SSO at any time to discuss potential concerns; the right and duty to stop work when conditions are unsafe, and to assist in correcting these conditions.

3.4 Subcontractors

Subcontractors shall submit to the SSO a copy of their own health and safety plan or shall review and sign this document acknowledging acceptance and understanding of the information contained herein. Subcontractors are responsible for assigning specific work tasks to their employees. Subcontractors shall provide qualified employees equipped with the necessary PPE and training required for the task. Each subcontractor is responsible for compliance with the regulatory requirements that pertain to those services. Each subcontractor is expected to perform operations in accordance with their own unique safety policies and procedures, or those documented herein, in order to ensure that hazards associated with the performance of the work activities are properly controlled. Copies of any required safety documentation/certification for a subcontractor's work activities will be provided to Walden for review prior to the start of on-site activities, if required. Hazards not listed herein but known to any subcontractor must be identified to Walden prior to commencing any on-site activity. The Project Manager and SSO have the authority to halt any subcontractor operations, and to remove any subcontractor or

subcontractor employee for failure to comply with established health and safety procedures or for operating in an unsafe manner.

3.5 Visitors

Authorized visitors requiring entry to any work location on-site shall be briefed by the SSO on the hazards present prior to entry and acknowledge receipt of this briefing by signing this HASP. Visitors shall be escorted at all times within the controlled zones and shall be responsible for compliance with all health and safety policies. All visitors shall hold the appropriate qualifications, training and PPE which are required for entry to any controlled work area. Should a visitor requiring entry to an exclusion zone fail to meet the qualifications for that zone, all work activities within the exclusion zone shall halt while the visitor is within the controlled zone.

4.0 EMERGENCY RESPONSE

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms including: illnesses, injuries, chemical exposure, fires, spills, leaks, releases of harmful contaminants, or sudden changes in the weather. Walden employees shall not participate in any emergency response where there are potential safety or health hazards (i.e., fire, explosion or chemical exposure); their actions will thus be limited to evacuation. Predetermined safe areas shall be determined and relayed by the SSO to all on-site personnel at the start of each shift and will be based on prevailing wind direction. Evacuation routes established by work area locations will be highlighted on a Site map and periodically reviewed. As the work areas change, the evacuation route and map will be altered accordingly, and the new route will be reviewed.

Emergency telephone numbers and a map to the nearest hospital shall be on-hand at the Facility. The hospital with an emergency room closest to the Facility is St. Luke's Cornwall Hospital at 70 Dubois Street, Newburgh, New York 12550. A map of the route to St. Luke's Cornwall Hospital is provided herein as **Attachment B**. Personnel shall be familiar with the emergency procedures, and the locations of safety, first aid and communication equipment.

4.1 Emergency Facilities and Telephone Numbers

<u>COMPANY</u>	<u>NAME</u>	<u>PHONE #</u>
Walden Project Manager(s)	Joseph M. Heaney III, P.E. Larry LePere, P.E.	516-624-7200 (Office) 845-745-0888 (Mobile)
Walden Site Safety Officer(s)	Greta White Erica Johnston Louis Goldstein	518-698-3012 (Mobile) 631-521-1266 (Mobile) 845-406-8242 (Mobile)
National Resources	Mike Buckley	203-430-9211 (Mobile)
Emergency Response	Police/Fire/Medical	911
St. Luke's Cornwall Hospital		845-568-2305
NYSDEC Spill Hotline		518-457-7362
American Association of Poison Control Centers		800-222-1222

First Aid Kit Locations: Within work vehicles on-site; Walden office on Facility grounds.

Fire Extinguishers: Walden office on Facility grounds and various locations throughout the Facility; the fire extinguisher location nearest to the work area will be identified before work commences.

4.2 Response Procedures

A communication network shall be established prior to commencement of any on-site tasks. At least one (1) on-site person shall have a phone accessible and in good working order at all times. Hand signals shall be used in instances when verbal communication is not feasible. The Project Manager, followed by the SSO, will immediately coordinate any and all emergency situations with the proper local medical/emergency organizations and personnel at the Facility. In the event of a fire, use of fire-fighting equipment available on-site may be administered, if appropriate; removing or isolating flammable or other hazardous materials that may contribute to the fire will be performed. The personnel on-site will coordinate evacuation procedures (if necessary) and remain a safe distance away from the area of health and safety concern. Personnel on-site may need to perform basic first aid as warranted by the emergency situation. Personnel with suspected neck or back injuries must not be moved. A detailed written report of the emergency situation will be provided within 24 hours to Walden by the Project Manager or SSO. Site security and control will be enforced by the SSO with consent for undertaken measures from the Project Manager. The SSO is responsible for pre-emergency planning, as well as emergency recognition and prevention.

4.3 First Aid Kit and Medical Emergencies

A basic first aid kit will be maintained and readily available (never locked up) at the Facility and within easy access to work areas (in personnel vehicles on-site). At a minimum, the first aid kit will include the following, as per ANSI Z308.1-1978: aspirin, bandage compresses, adhesive/triangular bandages (to keep wounds clean), medical tape, gauze, scissors, tweezers, sterilization lotion/cream, eye dressing, and antibacterial lotion/soap or pads. Items are to be replaced as they are used. Sterile items must be wrapped, sealed and used only once. Reusable items, such as scissors and tape, shall be kept clean. Should plentiful amounts of clean water not be available, eye flush shall be utilized. The number of first aid kits on-site shall be:

<u>Number of Persons Assigned to the Facility</u>	<u>Minimum First Aid Supplies</u>
1-5	10 Package Kit
6-15	16 Package Kit
16-30+	24 Package Kit

Professional medical assistance is to be called in the event of a medical emergency. In the event of a medical emergency:

- Stay calm and seek help, do not delay in calling for more assistance;
- Do not provide medical assistance unless you are trained to do so;
- Do not move the injured party unnecessarily;
- Do not attempt to remove any object that may have impaled the victim;
- Check to ensure the victim has an open airway, is breathing and has a heartbeat (if not, immediate action is required prior to taking care of any additional injuries);
- Promptly control any bleeding;
- Treat the injured party gently and keep them calm and quiet, reassuring them that additional help is on the way;
- Do not administer any food or drink and never provide the injured party with alcohol;
- Gather as much information as you can about the accident/injury and the victim's condition and be prepared to report that to first responders, as well as any medical actions already taken; and
- Let emergency responders do their job and aid them in keeping others out of their way.

4.3.1 Burns

For minor burns (redness or blisters over a small area), flush the wound with cold water and apply a sterile dressing; do not use butter or similar substance on any burn and do not break open blisters.

For major burns (white or charred skin; redness or blisters over a large area; burns on face, hands or genital area), cover the wound with sterile dressing and seek immediate emergency medical attention.

In the event of a chemical burn (spilled liquid or dry chemical on skin), promptly seek medical attention. For a liquid chemical burn, flush the wound with large amounts of water immediately and keep the water at a gentle flow. For dry chemical burns, brush off as much as possible before flushing with water. In both instances, flush the wound for at least five (5) minutes before covering with sterile dressing. Never use anything but water on a burned area and do not break open blisters.

4.3.2 Eye Wounds

Should an individual find/feel they have a foreign object in their eye, do not rub the eye; have them pull their upper eyelid over their lower eyelid or run plain water over the eye. If the object

persists, cover both eyes with a gauze dressing and aid them in seeking immediate emergency medical attention.

If the eye is wounded (eyelid or eyeball; pain; history of blow to eye area; discoloration), seek immediate emergency medical attention and apply loose sterile dressing over both eyes. For bruising, a cold compress or ice pack should be used to relieve pain and reduce swelling. Do not try to remove any imbedded object or apply any pressure to an injured eye.

If the eye has sustained a chemical burn, seek immediate emergency medical attention. Flush the open eye (it may be necessary to hold the patient's eyelid open) immediately with water for at least ten (10) minutes, twenty (20) minutes if the substance was alkali. Cover both eyes with sterile dressing. Never put anything but water in the eye.

4.4 Fire: Hazards, Prevention, Protection and Extinguishers

Many potential ignition hazards may exist on-site, including internal combustion engines, combustible materials and smoking. Combustible materials shall be kept well away from the exhaust of any internal combustion engine powered equipment. Smoking is prohibited except in designated areas, as determined by the SSO. Operations which constitute a fire hazard shall be identified as such, with signs conspicuously posted, stating: "No Smoking or Open Flame". Flammable gases and liquids shall be stored and handled in approved containers, places and as per the requirements described on the applicable Safety Data Sheet (SDS).

All employees who will use a fire extinguisher shall be trained on the use and hazards involved with firefighting initially and annually thereafter. All fire extinguishers shall be visually inspected monthly for general condition and adequate charge and serviced, tested, and certified by qualified personnel at least annually. Fire extinguisher inspection and maintenance are the responsibility of the Facility owner. Records of the annual maintenance check must be maintained. Only those employees designated as capable of using fire extinguishers shall be allowed to do so. Extinguishers shall be located and identified for easy accessibility.

It is imperative to use the proper extinguisher for a fire, as using the wrong one can spread the fire. Portable extinguishers shall be suitable for ABC class fires. The following table provides further information on types of fire extinguishers and their use:

Class	Distribution	Notes
A ("A" on a green triangle)	75' or less travel distance between the employee and the extinguisher	Use on wood, paper, trash
B ("B" on a red square)	50' or less travel distance between hazard area and the employee	Use on flammable liquid, gas
C ("C" on a blue circle)	Based on the appropriate pattern for the existing Class A or Class B hazards	Use on electrical fires
D ("D" on a yellow star)	75' or less travel distance between the combustible metal working area and the extinguisher or other containers of Class D extinguishing agent	Use on combustible metals

4.4.1 Fire Prevention

The best method of protection against fire is prevention. The following rules are to be adhered to in an effort to prevent fire:

- Smoking is prohibited except in designated areas, as determined by the SSO. All smoking materials are to be totally extinguished and placed in appropriate receptacles;
- SDS's shall be referred and adhered to prior to the moving, handling and storage of any chemical product;
- In order to prevent accidental ignition of combustible materials, heat producing equipment is to be properly maintained and operated as per the manufacturer's instructions;
- All chemicals and combustibles must be stored in approved containers;
- Materials that severely react or combust when mixed must not be stored near each other;
- Chemical spills must immediately be cleaned, particularly in the case of spilled combustible or reactive materials. Damaged containers and cleaning materials must be properly disposed;
- Combustible materials and refuse must be segregated and kept from sources of ignition;
- All employees shall be made aware of the locations of fire extinguishers and hydrants and access to those resources shall be kept clear;
- The SSO shall notify all employees of any unusual fire hazard condition; and
- Good housekeeping practices are to be followed.

4.4.2 *Fire Protection*

All personnel shall be notified if a fire occurs; the local fire department shall also be notified. When notifying the local fire department: remain calm and speak clearly and slowly; give the exact location of the fire and describe the situation; give a phone number for the location you are calling from; and, do not hang up until you are told to do so.

4.5 **Evacuation Procedures**

In the event of an emergency which necessitates evacuation of the work area, personnel will notify other personnel verbally or otherwise. All personnel will immediately evacuate the work area, keeping upwind of smoke, vapors or spill location, to a predetermined safe area, without regard for equipment. The predetermined safe area will be specified to all personnel by the SSO prior to the start of field work. Personnel will not re-enter the area until all health and safety issues return to a satisfactory level. The SSO is responsible for selecting the most effective evacuation route, as well as designating safe distances and places of refuge. The SSO shall conduct a roll call to ensure that all personnel have been evacuated safely.

Evacuation procedures in case of personal injury of personnel will be conducted as follows:

- Another team member (buddy) should signal the SSO that the injury has occurred;
- A field team member trained in first aid can administer treatment to an injured worker;
- The victim should then be transported to the nearest emergency room (see **Attachment B**). If necessary, an ambulance should be called to transport the victim; and
- The SSO is responsible for making certain that an Accident Report Form is completed. This form is to be submitted to the Project Manager. Follow-up action should be taken to correct the situation that caused the accident.

If a member of the field crew demonstrates symptoms of chemical exposure, the procedures outlined below shall be followed:

- Another team member (buddy) is to remove the individual from the immediate area of contamination if it is safe for them to do so. The buddy shall communicate to the SSO (via voice/hand signals) about the chemical exposure. The SSO will then contact the appropriate emergency response agency;
- Precautions must be taken to avoid exposure of other individuals to the chemical;
- If the chemical is on the individual's clothing, the chemical shall be neutralized or removed if it is safe to do so;

- If the chemical has contacted the skin, the skin shall be washed with copious amounts of water; and
- In case of eye contact, an emergency eye wash is to be used. Eyes should be washed for at least fifteen (15) minutes.

All chemical exposure incidents must be reported in writing to the Project Manager. The SSO is responsible for completing the accident report.

4.6 Spill Containment

In an effort to prevent spills, all hazardous material will be stored in appropriate containers and the tops/lids will be placed back on the containers after use. Hazardous materials brought on-site shall come with the appropriate SDS (the SDS sheets for chemicals that are most likely to be encountered on-site are attached to this HASP in **Attachment C**), will be stored appropriately, with labels, and away from moving equipment. Containers will be lifted/moved utilizing equipment appropriate for the task and secured and handled in a manner which minimizes spillage and reduces the risk of personal injury. At least one (1) spill response kit shall be available at the Facility.

All environmental spills or releases of hazardous materials are to be immediately reported to the SSO and dealt with according to the chemical manufacturers recommended procedures, which can be found on the SDS. The SDS for chemicals/contaminants identified during historic Site investigations and known to be associated with the Facility are provided in **Attachment C**. If any materials brought on-site during the work come with an SDS, that SDS will be added to **Attachment C**.

4.7 Incident Reporting

If an accident, fire, or release of toxic materials occurs during the course of work, the Project Manager shall be telephoned immediately and receive written notification within 24 hours. That notification shall include the following information:

- Name, organization, telephone number, and location of the Contractor;
- Name and title of the person(s) reporting;
- Date and time of the accident/incident;
- Location of the accident/incident (i.e. site location, facility name);
- Brief summary of the accident/incident giving pertinent details including type of operation ongoing at the time of the accident/incident;
- Cause of the accident/incident, if known;

- Casualties (fatalities, disabling injuries);
- Details of any existing chemical hazard or contamination;
- Estimated property damage and effect on contract schedule;
- Action taken by Contractor to ensure safety and security; and
- Other damage or injuries sustained, public, or private.

If any employee of a subcontractor is injured, documentation of the incident will be recorded in accordance with the subcontractor's procedures; however, copies of all documentation (which at a minimum must include the OSHA Form 301 or equivalent) must be provided to the SSO within 24 hours after the accident has occurred. All accidents/incidents will be investigated. Copies of all subcontractor accident investigations will be provided to the SSO within five (5) days of the accident/incident.

5.0 GENERAL HEALTH AND SAFETY REQUIREMENTS

All Site personnel shall conduct themselves in a safe manner and maintain a working environment that is free of additional hazards.

5.1 Qualifications and Training

All personnel performing work at the Facility must be qualified for their assigned project task, as determined by the Project Manager. They must meet the training and medical monitoring requirements necessary for the task and as described herein. If possible exposure above an OSHA permissible exposure limit (PEL) has or is expected to occur, employees must be required to receive supplemental medical testing to document any symptoms that may be specific to the particular materials present.

Training programs instruct employees on the intent of the OSHA standards, health and safety principles and procedures, proper operation of monitoring instruments, use of personal protective equipment, decontamination, and specific emergency plans. All personnel are required to remain current in all of their required training and evaluate their need for additional training when there is a change in work. In addition to the general health and safety training programs, personnel will be required to complete any supplemental task specific training (e.g. OSHA 40 Hour HAZWOPER training) developed for the tasks to be performed. Administration and compliance with the requirements for additional task-specific training will be the responsibility of the Project Manager. Any additional required training that is completed will be documented and tracked in the project files. Additional training will be provided to any employees responsible for responding to emergencies.

A copy of this HASP will also be made available to all personnel for review. All employees on-site will sign the Record of HASP Acknowledgement form (refer to Section 9.0) to verify they have reviewed this Plan. Any subcontractors involved in implementing the work plan will be required to acknowledge that their employees have received adequate training.

All on-site personnel involved with the project will attend a pre-entry briefing on the contents of this HASP, including chemical and physical hazards associated with the Facility. The initial health and safety briefing will consist of the following information:

- Names of personnel and alternates responsible for worker safety and health;
- Injury, illness, and other potential project hazards;
- Safe use of engineering controls and equipment on-site;

- Work practices by which the employee can minimize risks from hazards;
- Selection, use, care, and maintenance of PPE; and
- Standard operation safety procedures.

Documentation of all training, testing and medical monitoring certificates (if applicable) will be maintained by Walden.

5.1.1 Hazardous Communication Training (29 CFR 1910.1200)

Hazardous materials that may be encountered as existing on-site environmental or physical/health contaminants during the work activities are addressed in this HASP and their properties, hazards and associated required controls will be communicated to all affected employees and subcontractors, as per OSHA's Hazard Communication Standard. All personnel shall be briefed on the hazards of any chemical product they use and shall be aware of and have access to all SDS; these employees must be 40 Hour HAZWOPER trained.

All containers on-site shall be properly labeled in compliance with the Globally Harmonized System to indicate their contents. Labeling on any containers not intended for single day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.). SDS for chemicals/contaminants known to be associated with the Facility are provided in **Attachment C**. If any materials brought on-site during the work come with an SDS, that SDS will be added to **Attachment C**.

5.1.2 Visitor Training

All visitors to work areas will be informed of the hazards and necessary personal protective equipment associated with those areas, should they require entry to controlled work areas. Visitors shall also be briefed on emergency procedures.

5.2 General Safety

The SSO shall inspect work areas prior to commencement of daily activities. The SSO will take all corrective measures necessary to perform safe work at the Facility. All inspections and corrective measures will be documented and communicated to Site workers at the initial safety meeting and subsequent safety meetings.

Employees will practice contamination avoidance to include not walking through puddles or mud unnecessarily, avoiding kneeling on the ground or leaning on equipment whenever possible, or setting equipment on the ground. Weather conditions that may escalate potential hazards such as lightning, rain or extreme temperatures, will be recorded in the project files.

Employees will use extreme caution in inclined areas. Ground surfaces may be wet and slippery and may have hazardous objects protruding from the surface.

Dependent on the season in which the work will be performed, employees should exercise caution when encountering animals (e.g. snakes, spiders, bees, wasps, ticks, mosquitoes, ants, etc.) at the Facility. Employees who are known to be highly sensitive to insect stings should carry a “sting kit” and notify the SSO. All employees are encouraged to use permethrin (0.5%) clothing repellent and DEET (30%) skin repellent for protection against ticks and mosquitoes.

Hearing protection devices will be available to be worn by all field personnel in work areas where noise levels are at or above 85 decibels (dBA). The use of hearing protection devices when the noise levels exceed 85 dBA on an 8-hour average is a condition of employment.

5.2.1 Tailgate Safety Meetings

The SSO will conduct an informational safety meeting at the start of each workday to ensure that all on-site personnel (those entering the exclusion, contaminant reduction and support zones) understand changing conditions and daily operating procedures, and to address safety questions and concerns; these topics shall typically require ten (10) minutes to discuss and shall be recorded in the field notebook. Additional meetings may be conducted, as required. Attendance is mandatory and an attendance record shall be kept by the SSO. Any person who observes safety concerns or potential hazards that have not been addressed in the daily safety meeting should immediately report observations/concerns to the SSO. Meetings will include pertinent information regarding the day’s work and include, but will not be limited to, the following:

- The whereabouts of any hazardous chemicals near specific work areas;
- Methods used to detect the presence or release of hazardous chemicals;
- The physical and chemical health hazards of the Facility;
- Protective measures such as safe work practices, emergency procedures, and PPE;
- Details regarding the proper use of protective measures and SDS’s;
- Target activities for the day’s work;
- Changes in observed exposure levels; and
- Staff changes (e.g., due to vacations, reassignments, etc.) and responsibilities.

5.2.2 Housekeeping

During project activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess trash and debris will be collected and stored in an

appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. All electrical equipment must be grounded.

5.2.3 Hazardous, Solid or Municipal Waste

If hazardous, solid, and/or municipal wastes are generated, the waste shall be accumulated, labeled, and disposed of in accordance with all applicable Federal, State and/or local regulations. If equipment or materials that will be used (i.e., calibration gases, lithium batteries, etc.) need to be shipped but fall under criteria that define them as hazardous materials under Department of Transportation (DOT) regulations 49 Code of Federal Regulations (CFR) Parts 171-177, then they must be shipped in accordance with those regulations by an individual who is certified as having been “function-specific” trained, as required under the DOT regulations.

5.2.4 Smoking, Eating and Drinking

Eating, drinking, or smoking is permitted only in designated areas in the support zone. An exception is made for the replacement of fluids as a preventive measure for heat stress. Workers will first wash hands and face immediately after leaving controlled work areas (and always prior to eating or drinking).

5.2.5 Personal Hygiene

The following personal hygiene requirements will be observed:

- No contact lenses shall be worn in the exclusion zone without the use of additional eye protection;
- If work is to be performed outdoors on a building perimeter, protective clothing that is loose fitting and covers arms and legs to protect against sunlight during times of high levels of ultraviolet exposure (May through September) shall be worn; hats, sunscreen that provides UVA and UVB protection and sunglasses shall also be donned, as appropriate;
- A water supply meeting the following requirements will be utilized:
 - *Potable Water* - An adequate supply of potable water will be available for personnel consumption. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Where drinking fountains are not available, individual-use cups will be provided as well as adequate disposal containers. Potable water containers will be properly identified in order to distinguish them from non-potable water sources; and
 - *Non-Potable Water* - Non-potable water may be used for job tasks and cleaning activities only. Non-potable water will not be used for drinking purposes or for

hand washing. All containers of non-potable water will be marked with a label stating: “***Non-Potable Water - Not Intended for Drinking Water Consumption***”.

- Access to nearby toilet facilities shall be maintained; and
- Employees will be provided washing facilities (e.g., buckets with water and soap). The use of water and hand soap (or similar substance) will be required by all employees following exit from the exclusion zone, prior to breaks, and at the end of daily work activities.

5.2.6 Stop Work Authority

All employees have the right and duty to stop work when conditions are unsafe and to assist in correcting these conditions. Whenever the SSO determines that workplace conditions present an uncontrolled risk of injury or illness to employees, immediate resolution shall be sought. Stop work shall be immediately binding on all affected employees and subcontractors. Upon issuing the stop work order, the SSO shall implement corrective actions so that operations may be safely resumed. Resumption of safe operations is the primary objective; however, operations shall not resume until the SSO and Project Manager concur that workplace conditions meet acceptable safety standards.

5.2.7 Severe Weather

Severe weather can occur with little warning. Employees will be vigilant for the potentials for storms, lightning, high winds, and flash flood events. The SSO will be attentive to daily weather forecasts for the project area each morning. For activities occurring outdoors, the following conditions will be observed:

- Condition #1 – Storm threat within 24 hours: stow non-essential gear indoors and maintain a six (6) hour weather watch; and
- Condition #2 – Storm threat within 12 hours: securely lash down all moveable gear, drums, pipes, tools, etc. and maintain a three (3) hour weather watch.

5.3 Communication Procedures

Personnel will be informed of all known Facility hazards during an initial safety meeting and will be kept informed of hazards discovered during work activities.

- Personnel within the exclusion zone will remain in constant communication or within sight of other personnel. Failure of communication requires evacuation of the exclusion zone until communication is reestablished;

- The emergency signal will be one of the following:
 - Any blast from a pressurized air horn or vehicle horn; and
 - Verbal notification.
- The following standard hand signals will be used:
 - Hand gripping throat -- Out of air and cannot breathe;
 - Grip buddy's wrist -- Leave area immediately;
 - Both hands on buddy's waist -- Leave area immediately;
 - Hands on top of head -- Need assistance;
 - Thumb down -- No/negative; and
 - Thumb up -- Yes/I am OK/I am alright.

5.4 Hazard Communication

SDSs, along with a list of those materials covered by the SDSs, will be available to all personnel (including subcontractors) for all hazardous substances brought on-site. SDS for chemicals/contaminants known to be associated with the Facility are provided in **Attachment C**. SDS's for materials later brought on-site shall come with an SDS, which is to be included in **Attachment C**. Any employee or subcontractor intending to bring a hazardous material onto the jobsite must first provide a copy of the SDS to the SSO for review and filing. Should an SDS be necessary but not available for the material in question, the material may not be brought onto the Facility.

All containers on-site shall be properly labeled to indicate their contents. Labeling on any containers not intended for single-day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.). Prior to starting work, personnel, including any subcontractors, will be briefed by the SSO regarding hazardous chemicals and their properties, hazards and associated required controls present at the work-site that personnel could use or be exposed to.

5.5 Medical Monitoring

OSHA has established requirements for a medical surveillance program designed to monitor and reduce health risks for employees who may potentially be exposed to hazardous materials. The medical surveillance program has been designed to provide baseline medical data for each employee involved in hazardous material operations. Each employee must undergo testing and training, and a determination of his/her ability to wear PPE and carry out certain tasks. Medical examinations must be administered during pre-employment, on an annual basis, upon employment termination, and as warranted for potential chemical exposure. These examinations shall be provided by employers without cost or loss of pay to the employee. In accordance with 29 CFR 1910.1020, medical surveillance records should be maintained for thirty (30) years past employment and shall be available to the employee, owner, or regulatory agencies, as required.

Due to potential exposure to hazardous materials, all contractors, employees, subcontractors and other prime contractors involved in Facility activities within the exclusion zone will be informed about the medical monitoring program meeting specifications of 29 CFR Part 1926.1153. Each contractor shall assume the responsibility of maintaining a medical surveillance program (if needed) as well as maintaining personnel medical records, as regulated by 29 CFR 1910.1020, for all personnel, including subcontractors, who will be on-site. Subcontractors working on the job must provide the SSO with documentation on their medical monitoring programs.

5.6 Logs, Reports and Record Keeping

Walden shall keep a permanently bound logbook containing as a minimum the following information:

- Agency property number, facility name, address, location and project duration;
- Contractor name, address, phone number;
- A list of Contractor personnel assigned to the project; and
- A day-to-day record of personnel entering the work area, short description of the day's work, and a record of any significant or unusual events occurring during the course of work, including but not limited to inspections, observations, unusual incidents, (e.g. damage, unexpected visitors, etc.). The project narrative is to be kept by the Project Manager.

The SSO and Project Manager will ensure that all records are kept up to date and maintained in accordance with applicable regulations. The following items will be recorded in the daily field log in waterproof, permanent ink:

- Daily list of field personnel;
- Record of all visitors;
- Training logs;
- Levels of PPE worn by workers and, as appropriate, visitors;
- Exposure work-hours and a log of occupational injuries and illnesses;
- Accident investigations;
- Daily record of all first aid treatments not otherwise reportable; and
- Daily health and safety inspection report.

6.0 HAZARD ASSESSMENT

This section identifies the general and activity-specific hazards associated with Facility operations and what should be implemented to reduce the hazards; identifies general physical hazards that can be expected; and presents a summary of documented or potential chemical hazards that may be encountered during the soil investigation work, as well as biological hazards. Every effort must be made to reduce or eliminate these hazards. Those which cannot be eliminated must be guarded against by using engineering controls and/or personal protective equipment.

6.1 Physical Hazards

The following physical hazards may be associated with the project at hand:

6.1.1 Site Mobilization/Demobilization

Mobilization and demobilization activities may cause health injuries during traffic accidents. Manual materials handling and manual site preparation may cause blisters, sore muscles and joints, and skeletal injuries. It may also present the potential for eye hazards, contusions and lacerations. Slippery work surfaces can increase the likelihood of back injuries, overexertion injuries, slips and falls.

Underground utilities must be identified before commencing any subsurface work.

6.1.2 General Work Activities

Tasks required for this project may involve exposure to slipping/tripping/falling, manual lifting, noise, heat/cold stress, electrical, hand and power tools, operation of motorized vehicles, and other physical hazards associated with soil investigation activities. All work at this Facility will be conducted during daylight hours.

Slipping/Falling: Slips, trips and falls are the most common workplace incidents and can result in serious injuries, even death. General housekeeping of the Site, PPE, attention to your surroundings, minimizing distractions and warding off fatigue can all help to minimize risk of slips, trips and falls. Work areas shall be kept free of any materials, obstructions and substances that could cause a hazardous situation. Workers shall ensure clear footing and avoid obstructions, holes, protruding objects or other tripping hazards and look out for uneven, unstable and slippery terrain. Designated routes shall be taken, not shortcuts, and makeshift substitutes of equipment must not be used. Workers are prohibited from horse-play and shall ensure a clear path prior to carrying/moving equipment.

Manual Lifting: Lifting/carrying of equipment and materials may cause strains, particularly back injuries, fatigue and over-exertion. Proper lifting techniques should be exercised; bend at the knees, let your legs do the lifting, do not twist while lifting, bring the load as close to you as possible prior to lifting, be sure there is a clear walking path, use mechanical devices for heavier objects, team lift.

Noise: The operation of certain equipment (e.g., generator, nearby construction work, etc.) may result in momentary high noise levels which could result in temporary to permanent hearing loss and interference in communication. Hearing protection (e.g. ear plugs, ear muffs) will be used as necessary; as a rule of thumb, if it becomes necessary to shout at someone three (3) feet away, hearing protection should be worn.

Eye Protection: All Facility-related operations involving possible eye injury (chemical splash, etc.), must have approved eye wash units readily available. Protective eyewear shall be donned in Level D, when directed by the SSO.

Heat Stress: Monitoring of personnel wearing personal protective clothing should commence when the ambient temperature is 72°F or above. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. Heat stress monitoring should be performed by the SSO, who shall be able to recognize symptoms of heat stress; refer to **Attachment D**.

Proper training and preventive measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat-related illness. To avoid heat stress, the following steps should be taken:

- Adjust work schedules;
- Mandate work slowdowns as needed;
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided;
- Provide shelter (air conditioned, if possible) or shaded areas to protect personnel during rest periods; and
- Maintain workers' body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e. eight (8) fluid ounces (0.23 liters) of water must be ingested for approximately every eight (8) ounces (0.23 kg) of weight lost. When heavy

sweating occurs, encourage workers to drink more. The following strategies may be useful:

- Maintain water temperature between 50° and 60°F (10° to 16.6°C);
- Provide small disposal cups that hold about four ounces (0.1 liter);
- Have workers drink sixteen (16) ounces (0.5 liter) of fluid (preferably water or dilute drinks) before beginning work;
- Urge workers to drink one (1) or two (2) cups every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight; and
- Train workers to recognize the symptoms of heat-related illness.

Should an employee display signs of heat exhaustion (fatigue, weakness, profuse sweating, normal temperature, pale clammy skin, headache, cramps, vomiting, fainting), they are to be immediately removed from the hot area and lay down with their feet raised. Their clothing should be loosened or removed and cool, wet clothes applied. If the victim is not vomiting, they should be encouraged to take small sips of water.

Should an employee display signs of heat stroke (dizziness, nausea, severe headache, hot and dry skin, confusion, collapse, delirium, coma and death), seek immediate emergency medical attention. Remove the victim from the hot area and remove clothing, lay them down and cool their body (shower, cool wet clothes); do not give stimulants to the victim. Refer to **Attachment D** for further instruction.

Cold Stress: Cold stress is a result of cold, wetness, and wind. A worker's susceptibility to cold stress can vary according to their physical fitness, degree of acclimatization to cold weather, age, and diet. If work on this project occurs during winter months, thermal injury due to cold exposure can become a problem for on-site personnel. A cold-stress monitoring program shall be implemented, as appropriate. Workers should be aware of the local cold exposure hazard (frostbite) and the overall cold exposure hazard (hypothermia). Refer to **Attachment E** for further information on Cold Stress.

To prevent cold-related illness:

- Educate workers to recognize the symptoms of frostbite and hypothermia;
- Identify and limit known risk factors;
- Assure the availability of enclosed, heated environments on or adjacent to the Site;
- Assure the availability of dry changes of clothing;
- Assure the availability of warm drinks; and

- Start oral temperature recording at the Site:
 - At the SSO or Project Manager's discretion when changes in a worker's performance or mental status are suspected;
 - At a worker's request;
 - As a screening measure, two (2) times per shift, under unusually hazardous conditions (e.g. wind chill less than 20°F or wind chill less than 30°F with precipitation); and
 - As a screening measure whenever any worker at the Facility develops hypothermia.

Electrical: Hazards associated with electricity include shock, electrocution, burns, fires and explosions, as well as trip and fall hazards from power cords, and including electrical hazards and exposure to carbon monoxide from the use of portable generators. No work is to be performed on electrical equipment or near any part of an electrical circuit unless the worker is protected against shock by guarding or de-energizing and grounding the circuit. Ground Fault Circuit Interrupters (GFCIs) are required for portable tools. Extension cords shall be rated for hard or extra hard use and must be capable of grounding. All cords shall be inspected prior to use for wear and exposed wiring, strain, rips, tears, cuts or burns; defective cords shall be taken out of commission. Generators shall be fueled only after being shut down and allowed to cool, in addition, portable generators shall not be utilized indoors; the exhaust is to pointed downwind from workers.

Hand and Power Tools: The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, sparks, fire, abrasions, contusions and electrocution, or being exposed to harmful dusts, fumes, mists, vapors or gases. Ground Fault Circuit Interrupters are required for portable tools. Workers shall confirm that all tools are in proper operating condition and that they are used in accordance with applicable manufacturers' recommendations. All appropriate PPE must be provided and utilized throughout the duration of applicable tasks.

Operation of Motorized Vehicles: Moving vehicles can be a danger whether one is within or outside of a vehicle. Distracted drivers, drivers under the influence of drugs/alcohol, tired drivers can all lead to injury, damage or death. Only authorized workers may operate motorized vehicles. Site conditions may include off-road surfaces and operation should be performed according to ground conditions. Authorized drivers must comply with all applicable state laws while operating the vehicle and possess the appropriate qualifications. Loads shall be secured and within the appropriate weight limit for the vehicle (including the number of passengers). Vehicles shall be inspected prior to use and taken out of commission if deemed unsafe. The vehicles shall be properly maintained. Operators are not to be distracted, should wear seatbelts anytime a vehicle is in motion and headlights shall be used during operation. Operation by an

employee who has recently partaken in consumption of alcoholic beverages and/or illegal drugs is prohibited.

6.2 Chemical Hazards

Previously identified chemicals used at various locations throughout the Facility, thus potentially contained in soil and groundwater, include:

Chemical	OSHA Permissible Exposure Limit (PEL), 8-Hour Time-Weighted Average (TWA)	OSHA Short-term Exposure Limit (STEL)
Tetrachloroethylene	25 ppm*	100 ppm
Trichloroethylene	25 ppm	100 ppm
1,2-Dichloroethene	200 ppm	n/a
Vinyl Chloride	1 ppm	n/a
Freon-113	500 ppm	n/a

*ppm = parts per million

The major route of exposure to these contaminants will be respiratory in nature, however dermal exposure is also possible. Inhalation of vapors and contaminated dusts would provide the mechanism for respiratory exposure. Skin contact with soils and groundwater would result in dermal exposure. Facility-related work will use engineering controls, work practices, air monitoring and personnel protective equipment to reduce the amount of potential exposure. Restricting access to controlled work areas, staying upwind of potential sources, adhering to personal hygiene practices and wearing proper safety equipment will reduce risk of injuries.

During construction, excavation, sampling and soil management activities, air monitoring shall be performed with a PID and/or multi-gas meter to determine if workers are at risk for chemical exposure. Air monitoring equipment shall be calibrated daily and noted in a log book. Air monitoring shall be performed by trained Walden individuals, only. If concentrations exceed time-weighted average (TWA), the SSO shall immediately instruct the workers to stop work. Once everyone is removed from the work area, the SSO shall consider the following measures, listed in order from most desirable to least desirable:

- Installation of engineering controls (e.g. ventilation, containment of source);
- Administrative controls; and
- Donning of PPE; upgrading PPE.

The SSO shall decide which of the above options are feasible and make a rational decision based on available resources. Workers shall not be allowed back into the work zone until the chemical hazard is properly mitigated, with no exceptions. Refer to Section 7.2 below for further information.

6.3 Biological Hazards

Potential biological hazards include illnesses and/or injuries transmitted by plants, insects, animals, and pathogenic agents.

6.3.1 Plants

Contact with poisonous plants, such as ivy, oak and sumac, can cause skin irritation referred to as contact dermatitis, which may appear as a red, itchy rash consisting of small bumps, blisters or swelling, caused by the urushiol on the leaves, stems, roots and vines. These vines/shrubs/ground cover grow in woods and fields alike, as well as in both wet and dry areas. Workers will avoid contact with these plants. If work is to take place in a field or wooded area where poisonous plants may exist, precautions shall be implemented to avoid contact including wearing protective clothing, using TyvecTM coveralls and nitrile gloves, or using a barrier cream. If contact is suspected, workers will immediately wash all exposed skin/materials with a strong soap and water to remove the oil. Personnel that believe they may have been in contact with such plants during work at the Facility should notify the SSO or Project Manager of such an incident immediately.

6.3.2 Animals

During operations at the Facility, animals such as dogs, pigeons, sea gulls, mice, and rats may be encountered. Contact with such animals can cause rabies (dog's or squirrel's bite); Hantavirus (rat and mice droppings); psittacosis, cryptococcosis, and histoplasmosis (dried bird droppings). Workers will use discretion and avoid all contact with animals.

6.3.3 Insects

Bees, wasps, hornets, mosquitoes, ticks and spiders may be present at the Facility. Some individuals may have severe allergic reactions to an insect bite or sting that can result in a life-threatening condition. In addition, mosquito bites may lead to St. Louis encephalitis or West Nile encephalitis. Personnel that have been bitten or stung by an insect during work at the Facility should notify the SSO or Project Manager of such an incident immediately. Workers will wear protective clothing and footwear, apply insect repellent prior to work, and avoid contact with bushes, tall grass, or brush to the extent possible. Field personnel who may have

insect allergies should provide this information to the SSO or Project Manager in advance and will have allergy medication on-hand.

6.3.4 Blood-borne Pathogens

Blood-borne pathogens (BBPs) include diseases that can be transmitted by contact with blood or other bodily fluids as well as contaminated items which may be encountered (e.g., used syringes, medical pads, etc.). Universal precautions shall be used when administering first aid. Good hygiene practices and proper decontamination of non-disposable PPE will minimize potential for transmission of BBPs.

7.0 EXPOSURE MONITORING

The following is a discussion of the hazards presented to worker personnel during work at this Facility from on-site physical and chemical hazards known, suspected or anticipated to be present on-site at the time this HASP was prepared.

7.1 Noise

Noise levels are measured in units of dBA, which matches the response of the human ear, and are measured on the A-scale of a standard sound level meter at slow response. Normal conversation produces a noise level of 60 dBA, while power tools often produce levels between 90-110 dBA. If two people standing an arm's length apart must raise their voices to talk, the noise level is over 85 dBA. Noise levels above 140 dBA cause pain immediately and produce hearing damage. Decibels are a logarithmic scale, meaning that 100 dBA is ten (10) times as loud as 90 dBA, 100 times as loud as 80 dBA, and 1,000 times as loud as 70 dBA.

Hearing protection (disposable or reusable type) will be utilized by any on-site personnel potentially exposed to either continuous or impact noise levels exceeding 90 dBA (slow response) for an 8-hour work shift. Should employees be exposed to such sound levels, all feasible administrative and engineering controls shall be utilized. If such controls fail to reduce sound levels within the specified sound levels provided in the table below, PPE shall be provided and used to reduce sound levels within the levels provided in the table. A sound is considered if the variations in noise level involve maxima intervals of one (1) second or less. Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

Permissible Noise Exposure Table

<u>Duration Per Day (Hours)</u>	<u>Sound Level (dBA)</u>
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

7.1.1 Hearing Conservation Program

In all cases where the sound levels exceed the values shown in the table above, a continuing, effective hearing conservation program shall be administered. The program shall equip employees with the knowledge and hearing protection devices necessary to safeguard themselves from occupational hearing loss. The program shall consist of the following elements:

- Monitoring of employee noise exposures;
- The institution of engineering, work practice, and administrative controls for excessive noise;
- The provision of each overexposed employee with an individually fitted hearing protector with an adequate noise reduction rating;
- Employee training and education regarding noise hazards and protection measures;
- Baseline and annual audiometry;
- Procedures for preventing further occupational hearing loss by an employee whenever such an event has been identified; and
- Record keeping.

7.2 Chemical Contaminants

OSHA Permissible Exposure Limits (PEL) and American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV) may be exceeded during soil and groundwater investigative activities or when contaminated media are exposed or disturbed during construction or other activities. These activities will be closely monitored and evaluated to determine potential for exceeding standards and the need to implement control measures to protect personnel and the environment.

7.2.1 Air Monitoring

Direct reading instruments will be used in active work areas in order to enable rapid field decisions regarding levels of respiratory protection, as well as indicate the need for increased monitoring frequency at the edge of the exclusion zone. Walden staff will conduct air monitoring during all intrusive activities.

A MiniRAE or equivalent PID, which is calibrated daily and adjusted to give maximum sensitivity to the contaminants of concern will be used to monitor the air on a continuous basis while intrusive activities are performed. Should the meter read 0.5 parts per million (ppm) or greater above background in the breathing zone for more than one (1) minute and the source of the reading is unknown, work will be stopped until PPE is upgraded; the same holds true if the

meter reads greater than five (5) ppm above background levels in the breathing zone for more than thirty (30) continuous seconds.

PPE requirements and upgrade thresholds are summarized in the tables presented below:

Personal Protective Equipment Requirements Table

Location	Level of Protection/Tasks	Description
Support Zone	D	Steel toe boots and work clothes
Exclusion Zone and Contaminant Reduction Zone	<p>To be determined by the site safety officer based on contamination present</p> <p>D (modified)</p> <p>C</p> <p>B</p>	<p>Steel toe boots, nitrile or latex gloves, hard hat, safety glasses</p> <p>Full face respirator fitted with organic vapor cartridge and Level D PPE.</p> <p>Positive pressure, pressure demand self-contained breathing apparatus or positive pressure, pressure demand supplied air and Level C PPE.</p>

Air Monitoring Action Levels Table

Instrument	Hazard Monitored	Instrument Reading	Action Required
PID	Organic Vapors	0.5 ppm or greater above background in the breathing zone for 1 minute and the source of the reading is unknown. 5 ppm or greater above background in the breathing zone for 30 continuous seconds	PPE will be upgraded to Level C. Stop work. Evaluate the source and upgrade Level C to Level B.
Combustible Gas Indicator	Explosive Vapors	>10% LEL	Explosion hazard! Withdraw from the area immediately until LEL <10%.
Oxygen Meter	Oxygen	<19.5% O ₂	Stop work and withdraw from area until oxygen levels increase.

The following are examples of actions that can be implemented in addition to PPE upgrades to reduce the potential for contaminant release and exposure:

- Cover areas of exposed soils;
- Increase ventilation; and
- Install measures to contain areas of contaminant release.

7.3 Calibration

Any exposure monitoring instruments used will be calibrated at the beginning of each work shift, in accordance with the manufacturer's recommendations. If the owner's manual is not available, the personnel operating the equipment will contact the applicable office representative, rental agency or manufacturer for technical guidance for proper calibration. If equipment cannot be pre-calibrated to specifications, operations requiring monitoring for worker exposure will be postponed or temporarily ceased until this requirement is completed.

8.0 PERSONAL PROTECTIVE EQUIPMENT

The purpose of PPE is to provide a barrier, which will shield or isolate individuals from the chemical and/or physical hazards that may be encountered during work activities. The level of worker protection can be increased or reduced if determined by an employee exposure assessment. Until an employee exposure assessment is complete, the following procedures and PPE shall be made available:

- Head protection;
- Foot protection;
- Hand protection;
- Eye protection;
- Hearing protection; and
- Respiratory protection.

By signing this HASP (Section 9.0) the employee agrees to having been trained in the use, limitations, care and maintenance of the PPE to be used by the employee at this project. If training has not been provided, request same of the SSO for the proper training before signing.

8.1 Head Protection

Workers and individuals within work areas where overhead work is being performed must wear protective helmets. The protective helmets will reduce the potential for permanent injury to the head from falling and/or sharp edged objects. The head protection shall comply with the ANSI and the International Safety Equipment Association (ISEA) latest standard ANSI/ISEA Z89.1-2014, "Industrial Head Protection".

8.2 Foot Protection

All personnel and individuals in the work areas will wear steel-toed or equivalent protective footwear to help prevent foot injuries from falling or rolling objects, objects piercing the footwear sole, and/or exposure to electrical hazards. The footwear will be properly secured to the feet at all times. Protective footwear will comply with the American National Standard for Safety-Toe Footwear, Z41.1-1967.

8.3 Hand Protection

All workers entering the work areas will use hand protection to prevent injuries caused from exposure, abrasions, lacerations, and burns of any type. The performance characteristics of the

hand protection will reflect the task(s) of the individual worker. If worn, protective disposable clothing will cover the hand protection as much as possible.

8.4 Eye Protection

All workers and individuals within the work areas will use appropriate eye protection to reduce the potential of damage caused by splashing, falling or flying objects/materials. The eye protection should fit securely on the face so the objects/materials will not enter from any side of the protection (goggles that seal to the face using an elastic headband are recommended). Eye protection will comply with ANSI/ISEA Z87.1-2015 Standards.

8.5 Hearing Protection

All workers and individuals within the work areas will use appropriate hearing protection if operations produce noise levels that exceed levels given in the permissible noise exposure table provided in Section 7.1. Exposure to impulsive or impact noise should not exceed 140 dBA peak sound pressure level. Hearing protection will be recommended if either continuous or impact noise levels exceed 90 dBA (slow response) for an 8-hour work shift. If unable to carry out conversation at an arm length or at three (3) feet distance, hearing protection such as ear plugs or muffs will be used. Hearing protection selected must control employee exposures to comply with OSHA permissible noise standards if noise levels exceed OSHA permissible noise levels. Where disposable earplugs are selected, sufficient supplies will be maintained on-site to allow for multiple changeovers per day, per worker. A non-“roll-down” type earplug, such as the E-A-R Pod Plug, should be considered to reduce the potential for ear canal contamination.

8.6 Respiratory Protection

All personnel and individuals in the work areas will wear respiratory protective equipment when needed, to help prevent exposure to any fumes, vapors, dust, and other respiratory hazards that may be encountered during on-site activities. The respirators (if needed) will be properly fitted and employees who wear or may wear respiratory protection will undergo fit-testing. Respiratory protection will comply with applicable National Institute for Occupational Safety and Health (NIOSH) and American Society for Testing and Materials (ASTM) International Standards depending on the type of PPE to be worn.

During work activities including, but not limited to, saw-cutting of concrete and the operation of power tools such as jackhammers, grinders or drills on concrete or cement (none presently anticipated for the work covered under this HASP), personnel will wear protective equipment to prevent the inhalation of dust and silica particles.

8.7 PPE Program

PPE will be required when work activities generate and/or involve known or suspected atmospheric vapors, gases, liquids, or particulates at or above satisfactory health and safety levels or regulatory action limits. Protective equipment shall be ANSI/ISEA/NIOSH-approved.

For the work covered under this HASP, PPE should typically comprise Level D protection. Should air monitoring indicate that Level D fails to meet protection requirements, work shall be stopped and PPE shall be upgraded to Level C. Level D PPE consists of:

- Standard work uniform with coveralls or tyvek, as needed;
- Steel-toe and steel shank work boots;
- Hard hat;
- Gloves, as needed;
- Safety glasses; and
- Hearing protection, as needed.

Level C PPE consists of:

- Full face respirator fitted with appropriate organic vapor cartridge and Level D PPE.

8.7.1 Inspections

Before use of protective clothing, all personnel shall determine that the clothing material is correct for the specified task at hand. The clothing is to be visually inspected for imperfect seams, non-uniform coatings, tears and malfunctioning closures.

Before using gloves, they are to be checked for pinhole leaks. It is imperative that any equipment found to be defective be replaced immediately.

8.7.2 Donning/Doffing of Personal Protective Equipment

The following information is to provide on-site personnel with helpful hints that, when applied, make donning and doffing of PPE a more safe and manageable task:

- Have a “buddy” check your ensemble to ensure proper donning before entering controlled work areas. Without mirrors, the most obvious discrepancies can go unnoticed and may result in a potential exposure situation;
- Never perform personal decontamination with a pressure washer;
- Decontamination of equipment with water and a detergent shall be performed while PPE is still worn; and

- PPE will be removed and personnel will thoroughly wash their hands prior to leaving the Facility.

All PPE is to be bagged and contained in the proper receptacle prior to proper off-site disposal.

9.0 RECORD OF HASP ACKNOWLEDGEMENT

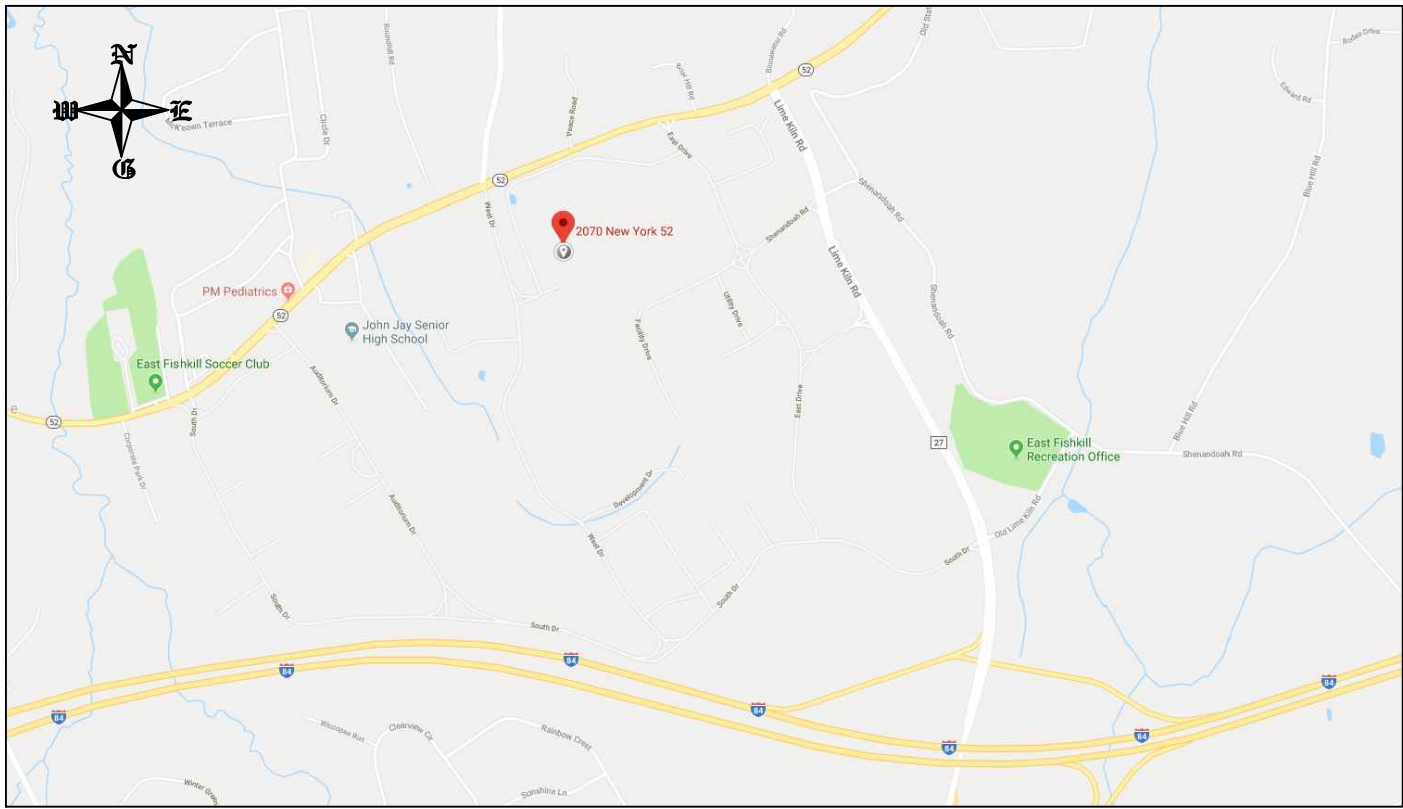
I certify that I have thoroughly read and fully understand the information in this HASP for intrusive activities performed at the iPark 84 Facility. I understand the associated potential health and safety hazards and issues.

I certify that I have been trained in the use, care, and limitations of the PPE that could be used.

My signature below is official record that I comply with provisions of the HASP and federal, state, and local health and safety regulations and guidelines.

[illegible]

ATTACHMENT A
iPARK 84 FACILITY SITE MAP



SITE LOCATION

NOT TO SCALE
SOURCE: GOOGLEMAPS.COM

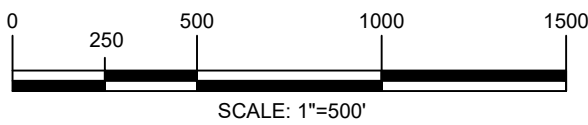


LEGEND

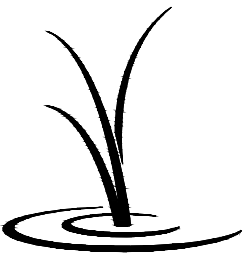
PROPERTY LINE

SITE PLAN

1" = 500'-0"



SITE BASEMAP: CHAZAN ENGINEERING, LAND SURVEYING & LANDSCAPE ARCHITECTURE CO. D.P.C. Poughkeepsie, NY (XBASE-SVY_51421-00.DWG 8/10/15); PARCELS: XSUBD_51539-00.DWG.



WALDEN ENVIRONMENTAL ENGINEERING, PLLC

iPARK 84 CAMPUS, 200 NORTH DRIVE, SUITE #108

HOPEWELL JUNCTION, NEW YORK 12533

P: (845) 745-0888; (516) 624-7200

F: (516) 624-3219

WWW.WALDENENVIRONMENTALENGINEERING.COM

REVISION		
NO.	DATE	COMMENTS
0	1/22/19	BUILDING 330C HASP

LOCATION:

IPARK CAMPUS
2070 ROUTE 52
HOPEWELL JUNCTION, NEW YORK

FOR:

HEALTH AND SAFETY PLAN
BUILDING 330C
IPARK CAMPUS

DRAWING TITLE:

SITE PLAN

DRAWING NO:

1

ISSUED

REVISION NO:

0

DESIGNED BY: LL	DRAWN BY: LTG	JOB NO: iPARK0118.23	DATE: January 22, 2019	SHEET NO: 1 OF 1	24" x 36"
APPROVED BY: JMH	SCALE: AS NOTED	CAD FILE NAME: Z:\iPark0118\iPark0118.23 - HASP for slab cutting - Country Produce 330C\HASP\Site Plan.dwg			

ATTACHMENT B
EMERGENCY ROOM DIRECTIONS

Google Maps

2070 NY-52, Hopewell Junction, NY 12533 to St Luke's Cornwall Hospital

Drive 15.4 miles, 22 min

Map data ©2018 Google 2 mi

2070 NY-52

Hopewell Junction, NY 12533

- Get on I-84 from NY-52 E and Lime Kiln Rd
- ↑

1. Head southeast toward North Dr

⚠ Restricted usage road

5 min (2.4 mi)

↙

2. Slight left onto North Dr

⚠ Restricted usage road

443 ft

↘

3. Turn right onto West Dr

⚠ Restricted usage road

52 ft

↘

4. Turn right onto NY-52 E

0.2 mi

↘

5. Turn right onto Lime Kiln Rd

0.5 mi

⤴



6. Use the right 2 lanes to take the I-84 W ramp

1.1 mi








0.5 mi

Follow I-84 to NY-32 S/N Plank Rd in Balmville. Take exit 10S from I-84

11 min (11.3 mi)

-  7. Merge onto I-84 11.1 mi
-
-  8. Take exit 10S for NY-32 toward US-9W S/Newburgh 0.2 mi
-

Take Robinson Ave and Dubois St to your destination in Newburgh

-  9. Turn right onto NY-32 S/N Plank Rd (signs for Route 9w S) 6 min (1.7 mi)
-
-  10. Use the right 2 lanes to turn right onto Robinson Ave 0.2 mi
-
-  11. Turn left onto South St 0.9 mi
-
-  12. Turn right onto Dubois St 0.3 mi
-
-  13. Turn left 0.3 mi
-
-  14. Turn left 246 ft
-  Destination will be on the left
-
- 125 ft

St Luke's Cornwall Hospital

70 Dubois St, Newburgh, NY 12550

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

ATTACHMENT C
SAFETY DATA SHEETS

SAFETY DATA SHEET

Creation Date 22-Sep-2009

Revision Date 23-Jan-2018

Revision Number 3

1. Identification

Product Name cis-1,2-Dichloroethylene

Cat No. : AC113380000; AC113380025; AC113380100; AC113380500

Synonyms cis-Acetylene dichloride.

Recommended Use Laboratory chemicals.

Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company

Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number

For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11

Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99

CHEMTREC Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Acute oral toxicity	Category 4
Acute Inhalation Toxicity - Vapors	Category 4
Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Respiratory system.	

Label Elements

Signal Word

Danger

Hazard Statements

Highly flammable liquid and vapor
Harmful if swallowed
Harmful if inhaled
Causes serious eye irritation
Causes skin irritation
May cause respiratory irritation

**Precautionary Statements****Prevention**

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

Use only outdoors or in a well-ventilated area

Avoid breathing dust/fume/gas/mist/vapors/spray

Keep away from heat/sparks/open flames/hot surfaces. - No smoking

Keep container tightly closed

Ground/bond container and receiving equipment

Take precautionary measures against static discharge

Do not eat, drink or smoke when using this product

Response

Call a POISON CENTER or doctor/physician if you feel unwell

Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

Call a POISON CENTER or doctor/physician if you feel unwell

Skin

IF ON SKIN: Wash with plenty of soap and water

Take off contaminated clothing and wash before reuse

If skin irritation occurs: Get medical advice/attention

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing

If eye irritation persists: Get medical advice/attention

Ingestion

Rinse mouth

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell

Fire

Explosion risk in case of fire

Fight fire with normal precautions from a reasonable distance

Evacuate area

Storage

Store in a well-ventilated place. Keep cool

Store in a closed container

Store locked up

Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

None identified

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
cis-1,2-Dichloroethylene	156-59-2	97

4. First-aid measures

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact

Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Inhalation	Move to fresh air. Obtain medical attention. If not breathing, give artificial respiration.
Ingestion	Do not induce vomiting. Obtain medical attention.
Most important symptoms and effects	Breathing difficulties. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media	Water spray. Carbon dioxide (CO ₂). Dry chemical. Use water spray to cool unopened containers. Chemical foam. Cool closed containers exposed to fire with water spray.
Unsuitable Extinguishing Media	No information available
Flash Point	6 °C / 42.8 °F
Method -	No information available
Autoignition Temperature	440 °C / 824 °F
Explosion Limits	
Upper	12.80%
Lower	9.70%
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical

Flammable. Vapors may travel to source of ignition and flash back. Containers may explode when heated. Vapors may form explosive mixtures with air.

Hazardous Combustion Products

Hydrogen chloride gas Carbon monoxide (CO) Carbon dioxide (CO₂)

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
2	3	0	N/A

6. Accidental release measures

Personal Precautions	Ensure adequate ventilation. Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges. Avoid contact with skin, eyes and clothing.
Environmental Precautions	See Section 12 for additional ecological information. Do not flush into surface water or sanitary sewer system.
Methods for Containment and Clean Up	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

7. Handling and storage

Handling	Ensure adequate ventilation. Wear personal protective equipment. Use explosion-proof equipment. Use only non-sparking tools. Avoid contact with skin, eyes and clothing. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.
-----------------	--

Storage

Keep in a dry, cool and well-ventilated place. Keep container tightly closed. Keep away from heat and sources of ignition. Flammables area. Keep container tightly closed in a dry and well-ventilated place.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
cis-1,2-Dichloroethylene	TWA: 200 ppm			

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

Engineering Measures

Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment**Eye/face Protection**

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection

Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection

No protective equipment is needed under normal use conditions.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	aromatic
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-80 °C / -112 °F
Boiling Point/Range	60 °C / 140 °F @ 760 mmHg
Flash Point	6 °C / 42.8 °F
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	12.80%
Lower	9.70%
Vapor Pressure	201 mmHg @ 25 °C
Vapor Density	3.34 (Air = 1.0)
Specific Gravity	1.280
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	440 °C / 824 °F
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	C ₂ H ₂ Cl ₂
Molecular Weight	96.94

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions.
Conditions to Avoid	Keep away from open flames, hot surfaces and sources of ignition. Exposure to air. Exposure to light. Incompatible products. Exposure to moist air or water.
Incompatible Materials	Bases
Hazardous Decomposition Products	Hydrogen chloride gas, Carbon monoxide (CO), Carbon dioxide (CO ₂)
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation	Irritating to eyes, respiratory system and skin
Sensitization	No information available
Carcinogenicity	The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
cis-1,2-Dichloroethylene	156-59-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Respiratory system

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects, both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. Do not flush into surface water or sanitary sewer system. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
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cis-1,2-Dichloroethylene	Not listed	Not listed	EC50 = 721 mg/L 5 min EC50 = 905 mg/L 30 min	Not listed
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Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

UN-No UN1150
 Proper Shipping Name 1,2-DICHLOROETHYLENE
 Hazard Class 3
 Packing Group II

TDG

UN-No UN1150
 Proper Shipping Name 1,2-DICHLOROETHYLENE
 Hazard Class 3
 Packing Group II

IATA

UN-No 1150
 Proper Shipping Name 1,2-DICHLOROETHYLENE
 Hazard Class 3
 Packing Group II

IMDG/IMO

UN-No 1150
 Proper Shipping Name 1,2-DICHLOROETHYLENE
 Hazard Class 3
 Packing Group II

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
cis-1,2-Dichloroethylene	X	-	X	205-859-7	-		-	X	X	X	X

Legend:

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
cis-1,2-Dichloroethylene	X	-	X	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 22-Sep-2009

Revision Date 23-Jan-2018

Print Date 23-Jan-2018

Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

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

End of SDS

SAFETY DATA SHEET

Revision Date 17-Jan-2018

Revision Number 3

1. Identification

Product Name 1,1,2-Trichloro-1,2,2-trifluoroethane

Cat No. : T178-1; T178-4

Synonyms Fluorocarbon 113; Freon 113; 1,1,2-Trichlorotrifluoroethane

Recommended Use Laboratory chemicals.

Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company

Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number

CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification

Classification under 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Based on available data, the classification criteria are not met

Label Elements

None required

Hazards not otherwise classified (HNOC)

None identified

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	99

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Skin Contact Wash off immediately with plenty of water for at least 15 minutes.

Inhalation	Move to fresh air.
Ingestion	Do not induce vomiting.
Most important symptoms and effects	No information available.
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Unsuitable Extinguishing Media	No information available
Flash Point	No information available
Method -	No information available
Autoignition Temperature	770 °C
Explosion Limits	
Upper	No data available
Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical

Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products

No information available

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health	Flammability	Instability	Physical hazards
1	0	0	N/A

6. Accidental release measures

Personal Precautions	Ensure adequate ventilation. Use personal protective equipment.
Environmental Precautions	See Section 12 for additional ecological information.

Methods for Containment and Clean Up No information available.

7. Handling and storage

Handling	Ensure adequate ventilation.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls / personal protection

<u>Exposure Guidelines</u>	This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.
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Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
1,1,2-Trichloro-1,2,2-trifluoroethane	TWA: 1000 ppm STEL: 1250 ppm	(Vacated) TWA: 1000 ppm (Vacated) TWA: 7600 mg/m ³ (Vacated) STEL: 1250 ppm (Vacated) STEL: 9500 mg/m ³ TWA: 1000 ppm TWA: 7600 mg/m ³	IDLH: 2000 ppm TWA: 1000 ppm TWA: 7600 mg/m ³ STEL: 1250 ppm STEL: 9500 mg/m ³	TWA: 1000 ppm TWA: 1600 mg/m ³ STEL: 1250 ppm STEL: 9500 mg/m ³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Clear
Odor	aromatic
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-36 °C
Boiling Point/Range	48 °C
Flash Point	No information available
Evaporation Rate	> 1.0 (Ether = 1.0)
Flammability (solid,gas)	No information available
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	363 hPa @ 20 °C
Vapor Density	6.5 (Air = 1.0)
Specific Gravity	1.47 @ 21°C
Solubility	Insoluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	770 °C
Decomposition Temperature	No information available
Viscosity	No information available
Molecular Formula	C ₂ Cl ₃ F ₃
Molecular Weight	187.38

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability	Stable under normal conditions.
Conditions to Avoid	Incompatible products.
Incompatible Materials	Strong acids, Powdered metals
Hazardous Decomposition Products	No information available
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
1,1,2-Trichloro-1,2,2-trifluoroethane	LD50 = 43 g/kg (Rat)	Not listed	LC50 = 38000 ppm (Rat) 4 h LC50 = 38500 mg/kg (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation No information available

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure None known

STOT - repeated exposure None known

Aspiration hazard No information available

Symptoms / effects, both acute and delayed No information available

Endocrine Disruptor Information No information available

Other Adverse Effects The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains. Chlorotrifluoromethane (CFC-13) is a Class I ozone-depleting chlorofluorocarbon. It is stable in the atmosphere. The half-life for degradation by reaction with photochemically-produced hydroxyl radicals is about 62 years. Following gradual diffusion into the stratosphere above the ozone layer, it slowly degrades (est. half-life of 180-450 years) due to direct photolysis and contributes to the catalytic removal of atmosphere ozone.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
1,1,2-Trichloro-1,2,2-trifluoroethane	Not listed	LC50: 7 - 14 mg/L, 96h static (Brachydanio rerio) LC50: = 1250 mg/L, 96h (Pimephales promelas) LC50: = 6240 mg/L, 96h (Oryzias latipes)	Not listed	EC50: = 71 mg/L, 48h (Daphnia magna)

Persistence and Degradability No information available

Bioaccumulation/ Accumulation No information available.

Mobility No information available.

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT Not regulated
TDG Not regulated
IATA Not regulated
IMDG/IMO Not regulated

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
1,1,2-Trichloro-1,2,2-trifluoroethane	X	X	-	200-936-1	-		X	X	X	X	X

Legend:

X - Listed

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N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	99	1.0

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
1,1,2-Trichloro-1,2,2-trifluoroethane	-	X	-

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA Not applicable

Component	Hazardous Substances RQs	CERCLA EHS RQs
1,1,2-Trichloro-1,2,2-trifluoroethane	5000 lb	-

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations
Not applicable

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
1,1,2-Trichloro-1,2,2-trifluoroethane	X	X	X	-	X

U.S. Department of Transportation

Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Revision Date 17-Jan-2018**Print Date** 17-Jan-2018

Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

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End of SDS

SAFETY DATA SHEET

Creation Date 10-Dec-2009

Revision Date 23-Jan-2018

Revision Number 5

1. Identification

Product Name Tetrachloroethylene

Cat No. : AC445690000; ACR445690010; AC445690025; AC445691000

CAS-No 127-18-4
Synonyms Perchloroethylene

Recommended Use Laboratory chemicals.
Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet**Company**

Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone NumberFor information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99**CHEMTREC** Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887**2. Hazard(s) identification****Classification**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Skin Sensitization	Category 1
Carcinogenicity	Category 1B
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, Blood.	

Label Elements**Signal Word**

Danger

Hazard Statements

Causes skin irritation

Causes serious eye irritation

May cause an allergic skin reaction

May cause drowsiness or dizziness

May cause cancer

May cause damage to organs through prolonged or repeated exposure

**Precautionary Statements****Prevention**

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Contaminated work clothing should not be allowed out of the workplace
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection

Response

IF exposed or concerned: Get medical attention/advice

Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

Skin

IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention

Storage

Store locked up
Store in a well-ventilated place. Keep container tightly closed

Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Toxic to aquatic life with long lasting effects

WARNING. Cancer - <https://www.p65warnings.ca.gov/>.

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
Tetrachloroethylene	127-18-4	>95

4. First-aid measures

General Advice

If symptoms persist, call a physician.

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact

Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Inhalation

Move to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Ingestion

Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects

None reasonably foreseeable. May cause allergic skin reaction. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Notes to Physician

Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media No information available

Flash Point No information available

Method - No information available

Autoignition Temperature No information available

Explosion Limits

Upper No data available

Lower No data available

Sensitivity to Mechanical Impact No information available

Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating gases and vapors. Containers may explode when heated.

Hazardous Combustion Products

Chlorine Hydrogen chloride gas Phosgene

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health
2

Flammability
0

Instability
0

Physical hazards
N/A

6. Accidental release measures

Personal Precautions Use personal protective equipment. Ensure adequate ventilation.

Environmental Precautions Do not flush into surface water or sanitary sewer system.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Ensure adequate ventilation. Avoid ingestion and inhalation.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from sunlight.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Tetrachloroethylene	TWA: 25 ppm STEL: 100 ppm	(Vacated) TWA: 25 ppm (Vacated) TWA: 170 mg/m ³ Ceiling: 200 ppm TWA: 100 ppm	IDLH: 150 ppm	TWA: 100 ppm TWA: 670 mg/m ³ TWA: 200 ppm TWA: 1250 mg/m ³ STEL: 200 ppm STEL: 1340 mg/m ³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures

Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment**Eye/face Protection**

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection

Long sleeved clothing.

Respiratory Protection

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Characteristic, sweet
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-22 °C / -7.6 °F
Boiling Point/Range	120 - 122 °C / 248 - 251.6 °F @ 760 mmHg
Flash Point	No information available
Evaporation Rate	6.0 (Ether = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	18 mbar @ 20 °C
Vapor Density	No information available
Density	1.619
Specific Gravity	1.625
Solubility	0.15 g/L water (20°C)
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	> 150°C
Viscosity	0.89 mPa s at 20 °C
Molecular Formula	C ₂ Cl ₄
Molecular Weight	165.83

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Stable under normal conditions.
Conditions to Avoid	Incompatible products. Excess heat. Exposure to moist air or water.
Incompatible Materials	Strong acids, Strong oxidizing agents, Strong bases, Metals, Zinc, Amines, Aluminium
Hazardous Decomposition Products	Chlorine, Hydrogen chloride gas, Phosgene
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Tetrachloroethylene	LD50 = 2629 mg/kg (Rat)	LD50 > 10000 mg/kg (Rat)	LC50 = 27.8 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation Irritating to eyes and skin

Sensitization No information available

Carcinogenicity The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Tetrachloroethylene	127-18-4	Group 2A	Reasonably Anticipated	A3	X	A3

IARC: (International Agency for Research on Cancer)

NTP: (National Toxicity Program)

ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens

IARC: (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2A - Probably Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program)

Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

A1 - Known Human Carcinogen

A2 - Suspected Human Carcinogen

A3 - Animal Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

Mexico - Occupational Exposure Limits - Carcinogens

A1 - Confirmed Human Carcinogen

A2 - Suspected Human Carcinogen

A3 - Confirmed Animal Carcinogen

A4 - Not Classifiable as a Human Carcinogen

A5 - Not Suspected as a Human Carcinogen

Mutagenic Effects No information available

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure Central nervous system (CNS)

STOT - repeated exposure Kidney Liver Blood

Aspiration hazard No information available

Symptoms / effects, both acute and delayed Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Endocrine Disruptor Information

Component	EU - Endocrine Disruptors Candidate List	EU - Endocrine Disruptors - Evaluated Substances	Japan - Endocrine Disruptor Information
Tetrachloroethylene	Group II Chemical	Not applicable	Not applicable

Other Adverse Effects Tumorigenic effects have been reported in experimental animals.

12. Ecological information

Ecotoxicity

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Tetrachloroethylene	EC50: > 500 mg/L, 96h (Pseudokirchneriella subcapitata)	LC50: 4.73 - 5.27 mg/L, 96h flow-through (Oncorhynchus mykiss) LC50: 11.0 - 15.0 mg/L, 96h static (Lepomis macrochirus) LC50: 8.6 - 13.5 mg/L, 96h static (Pimephales promelas) LC50: 12.4 - 14.4 mg/L, 96h flow-through (Pimephales promelas)	EC50 = 100 mg/L 24 h EC50 = 112 mg/L 24 h EC50 = 120.0 mg/L 30 min	EC50: 6.1 - 9.0 mg/L, 48h Static (Daphnia magna)

Persistence and Degradability Insoluble in water Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility . Is not likely mobile in the environment due its low water solubility. Will likely be mobile in the environment due to its volatility.

Component	log Pow
Tetrachloroethylene	2.53 - 2.88

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Tetrachloroethylene - 127-18-4	U210	-

14. Transport information

DOT

UN-No UN1897
 Proper Shipping Name TETRACHLOROETHYLENE
 Hazard Class 6.1
 Packing Group III

TDG

UN-No UN1897

Proper Shipping Name TETRACHLOROETHYLENE
 Hazard Class 6.1
 Packing Group III

IATA

UN-No UN1897
 Proper Shipping Name TETRACHLOROETHYLENE
 Hazard Class 6.1
 Packing Group III

IMDG/IMO

UN-No UN1897
 Proper Shipping Name TETRACHLOROETHYLENE
 Hazard Class 6.1
 Subsidiary Hazard Class P
 Packing Group III

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Tetrachloroethylene	X	X	-	204-825-9	-		X	X	X	X	X

Legend:

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Tetrachloroethylene	127-18-4	>95	0.1

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Tetrachloroethylene	-	-	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Tetrachloroethylene	X		-

OSHA Occupational Safety and Health Administration
 Not applicable

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Tetrachloroethylene	100 lb 1 lb	-

California Proposition 65 This product contains the following proposition 65 chemicals

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Tetrachloroethylene	127-18-4	Carcinogen	14 µg/day	Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Tetrachloroethylene	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant Y
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 10-Dec-2009

Revision Date 23-Jan-2018

Print Date 23-Jan-2018

Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

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

End of SDS

SAFETY DATA SHEET

Creation Date 03-Feb-2010

Revision Date 14-Jul-2016

Revision Number 2

1. Identification

Product Name Trichloroethylene

Cat No. : T340-4; T341-4; T341-20; T341-500; T403-4

Synonyms Trichloroethene (Stabilized/Technical/Electronic/Certified ACS)

Recommended Use Laboratory chemicals.

Uses advised against

Details of the supplier of the safety data sheet

Company

Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number

CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Skin Corrosion/irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 2
Skin Sensitization	Category 1
Germ Cell Mutagenicity	Category 2
Carcinogenicity	Category 1A
Specific target organ toxicity (single exposure)	Category 3
Target Organs - Central nervous system (CNS).	
Specific target organ toxicity - (repeated exposure)	Category 2
Target Organs - Kidney, Liver, Heart, spleen, Blood.	

Label Elements**Signal Word**

Danger

Hazard Statements

Causes skin irritation
Causes serious eye irritation
May cause an allergic skin reaction
May cause drowsiness or dizziness
Suspected of causing genetic defects
May cause cancer
May cause damage to organs through prolonged or repeated exposure

**Precautionary Statements****Prevention**

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Contaminated work clothing should not be allowed out of the workplace
Do not breathe dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection

Response

IF exposed or concerned: Get medical attention/advice

Inhalation

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

Skin

IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention

Storage

Store locked up
Store in a well-ventilated place. Keep container tightly closed

Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Harmful to aquatic life with long lasting effects
WARNING! This product contains a chemical known in the State of California to cause cancer, birth defects or other reproductive harm.

3. Composition / information on ingredients

Component	CAS-No	Weight %
Trichloroethylene	79-01-6	100

4. First-aid measures

General Advice

Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

Eye Contact

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Skin Contact

Wash off immediately with plenty of water for at least 15 minutes. Immediate medical attention is required.

Inhalation

Move to fresh air. If not breathing, give artificial respiration. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a

pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required.

Ingestion Do not induce vomiting. Call a physician or Poison Control Center immediately.

Most important symptoms/effects None reasonably foreseeable. May cause allergic skin reaction. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Notes to Physician Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media No information available

Flash Point No information available
Method - No information available

Autoignition Temperature 410 °C / 770 °F

Explosion Limits

Upper 10.5 vol %

Lower 8 vol %

Oxidizing Properties Not oxidising

Sensitivity to Mechanical Impact No information available

Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical

Thermal decomposition can lead to release of irritating gases and vapors. Containers may explode when heated. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products

Hydrogen chloride gas Chlorine Phosgene Carbon monoxide (CO) Carbon dioxide (CO₂)

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA

Health
2

Flammability
1

Instability
0

Physical hazards
N/A

6. Accidental release measures

Personal Precautions Ensure adequate ventilation. Use personal protective equipment. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas.

Environmental Precautions Should not be released into the environment. Do not flush into surface water or sanitary sewer system.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Use only under a chemical fume hood. Do not breathe vapors or spray mist. Do not ingest.

Storage Keep containers tightly closed in a dry, cool and well-ventilated place. Protect from light. Do not store in aluminum containers.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
Trichloroethylene	TWA: 10 ppm STEL: 25 ppm	(Vacated) TWA: 50 ppm (Vacated) TWA: 270 mg/m ³ Ceiling: 200 ppm (Vacated) STEL: 200 ppm (Vacated) STEL: 1080 mg/m ³ TWA: 100 ppm	IDLH: 1000 ppm	TWA: 100 ppm TWA: 535 mg/m ³ STEL: 200 ppm STEL: 1080 mg/m ³

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH IDLH: The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Engineering Measures

Use only under a chemical fume hood. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal Protective Equipment

Eye/face Protection

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection

Long sleeved clothing.

Respiratory Protection

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures

Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Liquid
Appearance	Colorless
Odor	Characteristic
Odor Threshold	No information available
pH	No information available
Melting Point/Range	-85 °C / -121 °F
Boiling Point/Range	87 °C / 188.6 °F
Flash Point	No information available
Evaporation Rate	0.69 (Carbon Tetrachloride = 1.0)
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	10.5 vol %
Lower	8 vol %
Vapor Pressure	77.3 mbar @ 20 °C
Vapor Density	4.5 (Air = 1.0)
Specific Gravity	1.460
Solubility	Slightly soluble in water
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	410 °C / 770 °F
Decomposition Temperature	> 120°C
Viscosity	0.55 mPa.s (25°C)

Molecular Formula
Molecular Weight

C₂ H Cl₃
131.39

10. Stability and reactivity

Reactive Hazard	None known, based on information available
Stability	Light sensitive.
Conditions to Avoid	Incompatible products. Excess heat. Exposure to light. Exposure to moist air or water.
Incompatible Materials	Strong oxidizing agents, Strong bases, Amines, Alkali metals, Metals,
Hazardous Decomposition Products	Hydrogen chloride gas, Chlorine, Phosgene, Carbon monoxide (CO), Carbon dioxide (CO ₂)
Hazardous Polymerization	Hazardous polymerization does not occur.
Hazardous Reactions	None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Trichloroethylene	LD50 = 4290 mg/kg (Rat) LD50 = 4920 mg/kg (Rat)	LD50 > 20 g/kg (Rabbit) LD50 = 29000 mg/kg (Rabbit)	LC50 = 26 mg/L (Rat) 4 h

Toxicologically Synergistic Products No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation	Irritating to eyes and skin
Sensitization	No information available
Carcinogenicity	The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
Trichloroethylene	79-01-6	Group 1	Reasonably Anticipated	A2	X	Not listed

IARC: (International Agency for Research on Cancer)

NTP: (National Toxicity Program)

ACGIH: (American Conference of Governmental Industrial Hygienists)

IARC: (International Agency for Research on Cancer)

Group 1 - Carcinogenic to Humans

Group 2A - Probably Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

NTP: (National Toxicity Program)

Known - Known Carcinogen

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

A1 - Known Human Carcinogen

A2 - Suspected Human Carcinogen

A3 - Animal Carcinogen

ACGIH: (American Conference of Governmental Industrial Hygienists)

Mutagenic Effects Mutagenic effects have occurred in humans.

Reproductive Effects No information available.

Developmental Effects No information available.

Teratogenicity No information available.

STOT - single exposure	Central nervous system (CNS)
STOT - repeated exposure	Kidney Liver Heart spleen Blood
Aspiration hazard	No information available
Symptoms / effects, both acute and delayed	Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing
Endocrine Disruptor Information	No information available
Other Adverse Effects	The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do not empty into drains. The product contains following substances which are hazardous for the environment. Contains a substance which is: Harmful to aquatic organisms. Toxic to aquatic organisms.

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
Trichloroethylene	EC50: = 175 mg/L, 96h (Pseudokirchneriella subcapitata) EC50: = 450 mg/L, 96h (Desmodesmus subspicatus)	LC50: 39 - 54 mg/L, 96h static (Lepomis macrochirus) LC50: 31.4 - 71.8 mg/L, 96h flow-through (Pimephales promelas)	EC50 = 0.81 mg/L 24 h EC50 = 115 mg/L 10 min EC50 = 190 mg/L 15 min EC50 = 235 mg/L 24 h EC50 = 410 mg/L 24 h EC50 = 975 mg/L 5 min	EC50: = 2.2 mg/L, 48h (Daphnia magna)

Persistence and Degradability Persistence is unlikely based on information available.

Bioaccumulation/ Accumulation No information available.

Mobility Will likely be mobile in the environment due to its volatility.

Component	log Pow
Trichloroethylene	2.4

13. Disposal considerations

Waste Disposal Methods Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
Trichloroethylene - 79-01-6	U228	-

14. Transport information

DOT

UN-No	UN1710
Proper Shipping Name	TRICHLOROETHYLENE
Hazard Class	6.1
Packing Group	III

TDG

UN-No	UN1710
Proper Shipping Name	TRICHLOROETHYLENE
Hazard Class	6.1
Packing Group	III

IATA

UN-No	UN1710
Proper Shipping Name	TRICHLOROETHYLENE

Hazard Class	6.1
Packing Group	III
IMDG/IMO	
UN-No	UN1710
Proper Shipping Name	TRICHLOROETHYLENE
Hazard Class	6.1
Packing Group	III

15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
Trichloroethylene	X	X	-	201-167-4	-		X	X	X	X	X

Legend:

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

Component	TSCA 12(b)
Trichloroethylene	Section 5

SARA 313

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
Trichloroethylene	79-01-6	100	0.1

SARA 311/312 Hazard Categories

Acute Health Hazard	Yes
Chronic Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

Component	CWA - Hazardous Substances	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants
Trichloroethylene	X	100 lb	X	X

Clean Air Act

Component	HAPS Data	Class 1 Ozone Depletors	Class 2 Ozone Depletors
Trichloroethylene	X		-

OSHA Occupational Safety and Health Administration

Not applicable

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
Trichloroethylene	100 lb 1 lb	-

California Proposition 65 This product contains the following proposition 65 chemicals

Component	CAS-No	California Prop. 65	Prop 65 NSRL	Category
Trichloroethylene	79-01-6	Carcinogen Developmental Male Reproductive	14 µg/day 50 µg/day	Developmental Carcinogen

U.S. State Right-to-Know Regulations

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
Trichloroethylene	X	X	X	X	X

U.S. Department of Transportation

Reportable Quantity (RQ): Y
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information

Prepared By Regulatory Affairs
Thermo Fisher Scientific
Email: EMSDS.RA@thermofisher.com

Creation Date 03-Feb-2010
Revision Date 14-Jul-2016
Print Date 14-Jul-2016
Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

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

End of SDS

SAFETY DATA SHEET

Revision Date 19-Jan-2018

Revision Number 3

1. Identification

Product Name Poly(vinyl chloride), high molecular weight

Cat No. : AC183320000; AC183320010; AC183325000

Synonyms Chlorethene homopolymer; Ethylene, chloro-, polymer; PVC

Recommended Use Laboratory chemicals.

Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company

Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

Emergency Telephone Number

For information **US** call: 001-800-ACROS-01 / **Europe** call: +32 14 57 52 11
Emergency Number **US**:001-201-796-7100 / **Europe**: +32 14 57 52 99
CHEMTREC Tel. No.**US**:001-800-424-9300 / **Europe**:001-703-527-3887

2. Hazard(s) identification

Classification

Classification under 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Based on available data, the classification criteria are not met

Label Elements

None required

Hazards not otherwise classified (HNOC)

None identified

3. Composition/Information on Ingredients

Component	CAS-No	Weight %
PVC (Chloroethylene, polymer)	9002-86-2	100

4. First-aid measures

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Skin Contact	Wash off immediately with plenty of water for at least 15 minutes.
Inhalation	Move to fresh air.
Ingestion	Do not induce vomiting.
Most important symptoms and effects	No information available.
Notes to Physician	Treat symptomatically

5. Fire-fighting measures

Unsuitable Extinguishing Media	No information available
Flash Point	
Method -	No information available
Autoignition Temperature	435 °C
Explosion Limits	
Upper	No data available
Lower	No data available
Sensitivity to Mechanical Impact	No information available
Sensitivity to Static Discharge	No information available

Specific Hazards Arising from the Chemical

Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products

None known

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health
1

Flammability
1

Instability
0

Physical hazards
N/A

6. Accidental release measures

Personal Precautions	Ensure adequate ventilation. Use personal protective equipment.
Environmental Precautions	See Section 12 for additional ecological information.

Methods for Containment and Clean Up No information available.

7. Handling and storage

Handling	Ensure adequate ventilation.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls / personal protection

Exposure Guidelines

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH	Mexico OEL (TWA)
PVC (Chloroethylene, polymer)	TWA: 1 mg/m ³			

Legend

ACGIH - American Conference of Governmental Industrial Hygienists

Engineering Measures Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment

Eye/face Protection Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin and body protection Wear appropriate protective gloves and clothing to prevent skin exposure.

Respiratory Protection Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Hygiene Measures Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Physical State	Powder Solid
Appearance	Off-white
Odor	Odorless
Odor Threshold	No information available
pH	
Melting Point/Range	No data available
Boiling Point/Range	
Flash Point	
Evaporation Rate	No information available
Flammability (solid,gas)	No information available
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	No information available
Specific Gravity	1.4000
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	435 °C
Decomposition Temperature	No information available
Viscosity	No information available

10. Stability and reactivity

Reactive Hazard None known, based on information available

Stability Stable under normal conditions.

Conditions to Avoid Incompatible products.

Incompatible Materials Strong oxidizing agents

Hazardous Decomposition Products None under normal use conditions

Hazardous Polymerization Hazardous polymerization does not occur.

Hazardous Reactions None under normal processing.

11. Toxicological information

Acute Toxicity

Component Information**Toxicologically Synergistic Products**

No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure**Irritation**

No information available

Sensitization

No information available

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Component	CAS-No	IARC	NTP	ACGIH	OSHA	Mexico
PVC (Chloroethylene, polymer)	9002-86-2	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects

No information available

Reproductive Effects

No information available.

Developmental Effects

No information available.

Teratogenicity

No information available.

STOT - single exposure

None known

STOT - repeated exposure

None known

Aspiration hazard

No information available

Symptoms / effects, both acute and delayed

No information available

Endocrine Disruptor Information

No information available

Other Adverse Effects

The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains.

Persistence and Degradability

No information available

Bioaccumulation/ Accumulation

No information available.

Mobility

No information available.

13. Disposal considerations

Waste Disposal Methods

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. Transport information

DOT

Not regulated

TDG

Not regulated

IATA

Not regulated

IMDG/IMO

Not regulated

15. Regulatory information

International Inventories

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	IECSC	KECL
PVC (Chloroethylene, polymer)	X	X	-	-	420-490-3		X	X	X	X	X

Legend:

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations

TSCA 12(b) Not applicable

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA Occupational Safety and Health Administration
Not applicable

CERCLA Not applicable

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations Not applicable

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
PVC (Chloroethylene, polymer)	-	X	-	-	-

U.S. Department of Transportation

Reportable Quantity (RQ): N

DOT Marine Pollutant N

DOT Severe Marine Pollutant N

U.S. Department of Homeland Security

This product does not contain any DHS chemicals.

Other International Regulations

Mexico - Grade No information available

16. Other information**Prepared By**Regulatory Affairs
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Revision Summary This document has been updated to comply with the US OSHA HazCom 2012 Standard replacing the current legislation under 29 CFR 1910.1200 to align with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Disclaimer

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

End of SDS

ATTACHMENT D
HEAT STRESS

HEAT STRESS

1. Heart rate (HR) should be monitored by the radial pulse for 30 seconds as soon as possible in the resting period.

If at the beginning of the rest period a worker's radial pulse is measure and his heart rate exceeds 100 beats per minute, the worker's next work period should be reduced by 33%. Therefore, if the original work period was one hour, the following work cycle should be reduced to 40 minutes.

2. Heat Stroke is a true medical emergency. First aid should be directed toward immediate measures to cool the body quickly, as well as seeing that the victim receives medical attention as soon as possible.

Prior to medical treatment, remove as much clothing as possible and proceed to cool the victim's body, taking care not to over chill the victim once his temperature falls below 102°F. One of the following cooling measures should be taken: (a) sponge the bare skin with cool water; (b) apply cold packs continuously; (c) wrap the victim in a sheet soaked with water; or (d) immerse the victim in a tub of cold water, while closely monitoring the victim's level of consciousness.

3. Prior to site activity, the Site Safety Officer may make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature and body water loss) during actual site work if conditions warrant these measures. In addition, the Site Safety Officer would want to ensure that the team members have been acclimatized to the particular environmental conditions and that personnel are aware of the signs and symptoms of heat sickness and have been adequately trained in first aid procedures. As Site Safety Officer, one could also make sure there is sufficient personnel on-site, so as to rotate work assignments, schedule work during hours of reduced temperatures and ensure personnel do not consume alcoholic or caffeinated beverages but rather drink moderate levels of an electrolyte solution and eat well prior to commencing site work.
4. The worker could be experiencing a condition of heat rash. Allow workers to rest and relieve the itching associated with heat rash rather than return to work too soon. Itching

workers may not follow stringent decontamination procedures or scratch where it itches on-site and risk cross contamination.

Keeping the skin clean and dry will reduce the incidence of heat rash. This can be accomplished by wearing cotton garments (or other materials that absorb perspiration) underneath protective clothing. Upon removal of the protective clothing, the worker should wash and dry his skin thoroughly.

5. The sense of thirst is not an adequate regulator of water replacement during heat exposure. Therefore, as a general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. For every 1/2 pound of water loss, 8 ounces of water should be ingested. Water should be replaced by drinking 2-4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink split 50/50 with water.
6. Although there is no specific test given during a baseline physical that would identify a person's intolerance to heat, there are physical factors and personal habits which may indicate possible intolerance to heat, such as, whether or not an individual smokes, one's dietary habit, body weight, as well as predisposed physical conditions such as high blood pressure, heavier conditions, diabetes or one's medication, that may influence an individual's ability to tolerate excessive heat.
7. Heat cramps are caused by profuse perspiration with inadequate fluid intake and salt replacement. Heat cramps most often afflict people in good physical condition who overwork in conditions of high temperature and humidity. Heat cramps usually come on suddenly during vigorous activity. Untreated, heat cramps may progress directly to heat exhaustion or heat stroke. First aid treatment: remove victim to a cool place and give sips of salted water (1 teaspoon of salt to 1 quart of water) - 4 ounces every 15 minutes over a period of one hour. A commercial preparation, e.g., Gatorade, may be used if split 50/50 with water.

The salted water or solution should mitigate the cramps. Manual pressure should not be applied to the cramped muscles.

TABLE C-1

REQUIRED FREQUENCY OF HEAT STRESS MONITORING
FOR WORKERS IN IMPERMEABLE CLOTHING

Adjusted ⁽²⁾ Temperature (°F)	Work Time Allowed Before Monitoring Break (min.)
90 or above	15
87.5-90	30
82.5-87.5	60
77.5-82.5	90
72.5-77.5	120

- (1) Adapted from Eastern Research Group and National Institute for Occupational Safety and Health, Occupational Safety and Health Guidance Manual for Super Activities. September 26, 1984, pp. 8-75.
- (2) Calculate the adjusted air temperature (Ta adj) by using this equation:

$$Ta \text{ adj } ^\circ F = Ta \text{ } ^\circ F + (13 \times \% \text{ sunshine})$$

Measure air temperature (Ta) with a standard thermometer, with the bulb shielded from radiant heat. Then estimate percent sunshine (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows).

TABLE C-2

HEAT STRESS SIGNS AND SYMPTOMS

Heat Stress Indicator	When to Measure	If Exceeds	Action
heart rate (pulse)	beginning of rest period	110 beats per minute	shorten next work period by 33%
oral temperature	beginning of rest period	99 °F (after thermometer is under tongue for 3 minutes) 100.6 °F or greater	shorten next work period by 33% prohibit work in impermeable clothing and shorten next work period by 33%
body weight	1. before workday begins (a.m.) 2. after workday ends (p.m.)	Decreases more than 5%	increase fluid intake

ATTACHMENT E
COLD STRESS

COLD STRESS (Hypothermia)

Cold stress is a function of cold, wetness and wind. A worker's susceptibility to cold stress can vary according to his/her physical fitness, degree of acclimatization to cold weather, age and diet.

Prevention

Institute the following steps to prevent or overexposure of workers to cold:

1. Maintain body core temperature at 96.8° F or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing. Wool is recommended since it can keep the body warm even when the wool is wet.
2. Avoid frostbite by adequately covering hands, feet and other extremities. Clothing such as insulated gloves or mittens, earmuffs and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20° F) workers should wear anti-contact gloves. Tool handles and control bars should be covered with insulating material.
3. Adjust work schedules if necessary, providing adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.
4. Provide a heated enclosure for workers close to their work area. Workers should remove their outer layer(s) of clothing while in the shelter to allow for sweat evaporation.
5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the build-up of toxic or explosive gases or vapors. Care must be taken to keep any heat source away from flammable substances.
6. Using a wind chill chart such as the one in Table D-1, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT or 20° F. For exposure skin, continuous exposure should not be permitted at or below an ECT of -35° F.
7. Workers who become immersed in water or whose clothing becomes wet (from perspiration, rain, etc) must immediately be provided a change of dry clothing whenever the air temperature is 25.6° F or below.

8. Maintain an optimal level of worker fitness by encouraging regular exercise, proper diet, etc. If possible, acclimatize workers to site conditions for several days before work begins.

Monitoring

Personnel should be aware of the symptoms of cold stress. If the following symptoms of systemic hypothermia are noticed in any worker, he/she should immediately go the warm shelter:

Heavy, uncontrollable shivering;
Excessive fatigue or drowsiness;
Loss of coordination;
Difficulty in speaking; and,
Frostbite (see below).

Frostbite is the generic term for local injury resulting from cold. The stages of frostbite and their symptoms are as follows:

1. Frostbite or incipient frostbite: sudden blanching or whitening of the skin.
2. Superficial frostbite: waxy or white skin, which is firm to the touch (tissue underneath is still resilient).
3. Deep frostbite: tissues are cold, pale and solid.

TABLE D-1

WINDCHILL CHART

Wind Speed (mph)	Actual thermometer Reading (°F)									
	50	40	30	20	10	0	-10	-20	-30	-40
	Equivalent Temperature (°F)									
Calm	50	40	30	20	10	0	-10	-20	-30	-40
5	48	37	27	16	6	-5	-15	-26	-36	-47
10	40	28	16	4	-9	-21	-33	-46	-58	-70
15	36	22	9	-5	-18	-36	-45	-58	-72	-85
20	32	18	4	-10	-25	-39	-53	-67	-82	-96
25	30	16	0	-15	-29	-44	-59	-74	-88	-104
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116
>40 (Little added effect)	Little Danger (For properly clothed person)				Increasing Danger (Danger from freezing of exposed flesh)			Great Danger		

APPENDIX B
COMMUNITY AIR MONITORING PLAN

iPARK 84
(FORMER IBM EAST FISHKILL FACILITY)

BUILDING 220 (FORMERLY BUILDING 310) SOIL CHARACTERIZATION
COMMUNITY AIR MONITORING PLAN (CAMP)

The following Community Air Monitoring Plan (CAMP) is based on the New York State Department of Environmental Conservation's (NYSDEC's) Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10) (May 2010) Appendix 1A: New York State Department of Health Generic Community Air Monitoring Plan, with modifications as appropriate for the scope of work to be performed at the iPark 84 Former IBM East Fishkill facility.

Overview

A 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.

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

Qualified Environmental Monitor Responsibilities

The qualified environmental monitor (QEM) shall be Walden Environmental Engineering, PLLC, whose designated employees will be responsible for implementing the CAMP and performing the on-site air monitoring specified below. The QEM has the authority to stop work and shall be responsible for the air monitoring and daily calibration and maintenance of the equipment in accordance with the manufacturer's specifications. All instrumentation and equipment shall be maintained at all times in proper operating condition. Copies of manufacturers' monitoring equipment specifications shall be maintained on-site at all times during the work and shall be attached to the on-site copy of the CAMP.

The QEM or designated representative shall document in the dedicated CAMP project log book each calibration event, any equipment and instrument malfunctions, unusual conditions, air monitoring station locations, any exceedances of action levels and countermeasures implemented. Dates and times must be well documented.

Ambient air monitoring shall be conducted upwind and downwind of the work area at the property perimeters for fugitive dust emissions and organic vapors during periods of soil boring, excavation, other ground intrusive activities, placement of excavated materials in storage piles, and loading of transporting vehicles. If readings above established threshold levels are detected, the Contractor shall institute measures to control dust and/or organic vapors at no additional cost to the Owner. The measures utilized shall be subject to the approval of the Owner and Owner's designated representatives.

Any exceedance of a CAMP threshold or action level shall be recorded on the project summary report which shall be submitted to NYSDEC and NYSDOH. The summary report shall include the instrument readings at the monitoring stations, location of the monitoring station where any exceedance was recorded, readings at upwind locations, duration of any elevated readings (i.e., number of 15-minute time-weighted exceedances), activities being performed at the time of any exceedances, and descriptions of countermeasures implemented to control the exceedance and prevent future occurrences.

The Contractor shall respond to exceedances of the CAMP action levels immediately.

Odor or dust complaints from any owner of an adjacent or nearby property shall be managed by the Contractor in a manner equivalent to an exceedance of an action level in the CAMP.

Community Air Monitoring Plan

Based upon the nature of known or potential contaminants in the vicinity of Building 220, real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone/work area will be necessary.

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

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil samples. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while overturning soil, 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) shall be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment such as a MiniRAE 2000 photoionization detector (PID) Portable VOC Monitor or other appropriate instrument 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.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds five (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 five (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 five (5) ppm over background but less than 25 ppm, work activities must be halted. The source of vapors must be identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can only 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 five (5) ppm over background for the 15-minute average; and
- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown. Work methods and controls will be re-evaluated.

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

Particulate Monitoring, Response Levels, and Actions

Particulate (dust) 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 (such as a portable particulate monitor EPAM 5000 or equal) capable of measuring particulate matter less than ten (10) micrometers in size (PM-10) and capable of integrating over a period of fifteen (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.

All readings must be recorded and be available for State (NYSDEC and NYSDOH) personnel to review.

Particulate concentrations shall be monitored at the upwind perimeter of an active work zone for background concentrations at the beginning and the end of the work day and at the downwind perimeter of an active work zone on a continuous basis during all ground intrusive activities. At any time, the Contractor will carry out dust and particulate control measures, such as water misting to prevent generation of dust and particulate matter during the work activities.

If the elevated levels of particulate matter are detected during the monitoring, corrective action is determined by the following levels:

- If the downwind PM-10 at a site perimeter location is 100 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) greater than background (upwind perimeter) for the 15-minute period of if airborne dust is observed leaving the perimeter of the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques if the downwind PM-10 particulate level does not exceed $150 \mu\text{g}/\text{m}^3$ above the upwind level and if no visible dust is migrating from the work area; and
- If, after implementing dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \mu\text{g}/\text{m}^3$ above the upwind level, work must be stopped and re-evaluation of work activities initiated. Work can resume if dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \mu\text{g}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

Summary

As noted above, air monitoring activities for the iPark 84 Building 220 proposed loading dock work described in the *Building 220 (Formerly Building 330) Proposed Loading Dock Area Soil Characterization Work Plan* (Walden, August 2019) will be appropriate for the soil sampling activities to be conducted at Building 220. Therefore, the CAMP will encompass VOC and particulate monitoring during the ground intrusive activities. A CAMP report will be submitted to NYSDEC and NYSDOH upon completion of the project.