ADDITIONAL PRE-DESIGN
SUBSURFACE INVESTIGATION
WORK PLAN - REVISED

AT

FORMER IMPERIAL CLEANERS SITE
218 LAKEVILLE ROAD
LAKE SUCCESS, NEW YORK 11042
NYSDEC BCP SITE #C130225

JULY 2020

PREPARED FOR:

MR. JOSEPH JONES
PROJECT MANAGER
NYS DEPARTMENT OF ENVIRONMENTAL CONSERVATION
REMEDIAL BUREAU A, 11TH FLOOR
625 BROADWAY
ALBANY, NEW YORK 12233
Mr. Joseph Jones  
New York State Department of Environmental Conservation  
Division of Environmental Remediation  
625 Broadway, 12th Floor  
Albany, New York 12233-7015

Re: Additional Pre-Design Subsurface Investigation Work Plan - Revised  
Former Imperial Cleaners Site (BCP #C130225)  
218 Lakeville Road, Lake Success, NY

Dear Mr. Jones:

Walden Environmental Engineering, PLLC (Walden) is submitting this Additional Pre-Design Subsurface Investigation Work Plan (Work Plan) to outline proposed soil investigation activities at the above-referenced BCP Site. The site location map is presented as Figure 1. The scope of work presented herein is based on the results of the May 2019 pre-design subsurface investigation performed at the Site by Walden, documented in the Pre-Design Subsurface Investigation Summary Report (Walden, October 2019), and is intended to supplement the findings of that investigation. **This work plan has been revised in accordance with the NYSDEC comment letter dated July 10, 2020. The revised text is presented in bold type to facilitate the State’s review.**

As presented in the February 2019 Remedial Work Plan (RWP) for the Site, prepared by Walden and approved by the New York State Department of Environmental Conservation (NYSDEC), the selected remedial strategy for chlorinated volatile organic compound (VOC) impacts at the Site entails the development and installation of a soil vapor extraction (SVE) system to reduce the residual VOC contaminant mass and to prevent off-site vapor migration by removing contaminated vapors in the subsurface. Additionally, residual source material (soil/sediment) is to be excavated as appropriate. The purpose of the May 2019 pre-design subsurface investigation was to obtain chemical and geological data to support the development of these remedial strategies.
Summary of May 2019 Pre-Design Subsurface Investigation

The May 2019 pre-design subsurface investigation at the Site included the advancement of fourteen (14) soil borings (GB-1 through GB-14), conversion of seven (7) borings into temporary monitoring wells (TMW-1 through TMW-7), and the collection of twenty-eight (28) soil and seven (7) perched groundwater samples. The soil boring/temporary monitoring well locations are depicted on Figure 2. As discussed above, the investigation was performed to evaluate the nature and extent of residual VOC contamination and to characterize geological conditions at the Site to support the design and implementation of an SVE remediation system and identify residual VOC source material to be targeted for excavation.

On-site soils consist mainly of medium brown, fine to medium sand with trace amounts of silt and gravel. The depth to perched groundwater was observed during the investigation to vary from approximately 27 to 33 feet below grade (bg). The approximate groundwater flow direction is west to west-northwest, as determined from water level measurements recorded historically at the Site.

Twenty-eight (28) soil samples, two from each boring location, were collected and analyzed for VOCs via U.S. Environmental Protection Agency (USEPA) Method 5035. None of the reported VOC detections exceeded applicable NYSDEC Soil Cleanup Objectives (SCOs) for Commercial Use or Protection of Groundwater with the exception of tetrachloroethylene (PCE) in the sample collected from boring GB-6, located immediately downgradient of stormwater drywell DW-1 at a depth of 14.5-15.5 feet below grade (the suspected invert of this drainage structure). The reported PCE concentration in this sample exceeded the SCO for Protection of Groundwater, suggesting that contaminant source material is present in and around the DW-1 structure in the southwestern corner of the Site. The PCE and TCE concentrations detected at each location are included on Figure 2.

Perched groundwater samples collected from the seven (7) temporary monitoring wells were analyzed for VOCs and emerging contaminants (1,4-dioxane, and per- and polyfluorinated alkyl substances [PFAS]). VOC impacts were identified in the perched groundwater samples collected at the Site, as discussed in the October 2019 Pre-Design Subsurface Investigation Summary Report; however, the scope of work presented herein for additional subsurface investigation pertains only to further evaluation of on-site soils in suspected source areas. Groundwater impacts will be mitigated by the planned source removal action and SVE remediation system.

Additional Pre-Design Subsurface Investigation

Walden proposes the following scope of work for additional pre-design Site investigation. Proposed soil boring and sampling locations are depicted on Figure 3. Proposed off-site groundwater sampling locations are depicted on Figure 4. The HASP, QAPP and CAMP
that will be implemented during this additional investigation work are presented in Appendix A, B and C, respectively. The CAMP will be implemented during all ground intrusive work and activities involving soil disturbance.

**Delineation of Drywell DW-1 Area**

Based on the presence of an elevated PCE concentration in soil immediately downgradient of drywell DW-1 in the southwestern corner of the Site, removal of this structure and remedial excavation of impacted soils in this area is recommended. In order focus the scope of source removal, the advancement of at least two (2) additional soil borings (GB-15 and GB-16) via direct-push drilling in the vicinity of DW-1 is proposed. Borings shall be advanced from the approximate minimum invert of the DW-1 structure (10 feet bg) to a depth of approximately 27 feet bg (just above the perched groundwater interface) to delineate the lateral and vertical extent of soil impacts. Soils will be continuously sampled, logged and field screened for lithology and evidence of contamination (including screening for the presence of organic vapors with the use of a calibrated photoionization detector, or PID), and will be selectively retained for laboratory analysis based on field screening results.

Delineation activities will continue laterally and vertically until visual observations and field screening results indicate that clean soil has been encountered. These data will be utilized to constrain the limits of remedial excavation in this portion of the Site. It should be noted that delineation immediately downgradient (west-northwest) of DW-1 will not be feasible due to the proximity of the western Site boundary; delineation efforts will therefore be focused primarily on the eastern and northeastern sides of DW-1 as access allows.

**Sub-Slab Soil Investigation, Former Imperial Cleaners Space**

As discussed in the October 2019 Pre-Design Subsurface Investigation Summary Report, soil vapor intrusion (SVI) investigations performed at the Site in February 2016 and April 2019 detected the presence of elevated concentrations of chlorinated VOC vapors beneath the building slab. During the May 2019 subsurface investigation, no VOCs were detected above laboratory reporting limits in soil samples collected from boring GB-7, situated just west of the former Imperial Cleaners tenant space. Furthermore, the soil impacts detected in the DW-1 area on the southwestern portion of the Site may not be the source of the elevated sub-slab VOC vapor concentrations. Therefore, it is possible that an additional source of contaminated vapors may be present beneath the building. Further investigation is proposed beneath the concrete slab floor of the former Imperial Cleaners basement where historical discharges of dry-cleaning solvents have been suspected.

Floor drain FD-2 in this basement space was previously identified as a source of on-site PCE contamination. In 1996, FD-2 was excavated of contaminated sediments and converted into an
SVE remediation well with a screened interval of 4-10 feet below grade. The advancement of up to four (4) sub-slab soil borings (GB-17 through GB-20) in the vicinity of floor drain FD-2 is proposed to evaluate the potential presence of residual source material in this area. These sub-slab soil borings shall be advanced to a depth of ten (10) feet below the bottom of the slab to remain consistent with the terminus of the FD-2 SVE well screen. Soils will be continuously sampled, logged, field screened for lithology and evidence of contamination, and selectively retained for laboratory analysis.

In all proposed soil borings, soils exhibiting the strongest field evidence of contamination (e.g. odors, staining, PID screening results) will be retained for analysis. All soil samples shall be collected in laboratory-supplied glassware and submitted to a New York State Department of Health (NYSDOH)-certified laboratory under chain-of-custody procedures for analysis of VOCs via U.S. Environmental Protection Agency (EPA) Method 5035. Soil sample results will be compared with NYSDEC Part 375/CP-51 SCOs for Commercial Use and Protection of Groundwater.

**Off-site Groundwater Sampling**

As discussed in the October 2019 *Pre-Design Subsurface Investigation Summary Report*, PCE was detected in perched groundwater at concentrations exceeding the NYSDEC Class GA Ambient Water Quality Standard of 5 µg/L in all temporary monitoring wells with the exception of TMW-7. The additional investigation will include off-site groundwater sampling downgradient of the Site to evaluate off-site perched groundwater impacts.

The four (4) proposed off-site groundwater monitoring locations (PW-1 through PW-4) will be located along the east side of University Place as shown on Figure 4. The final locations will be established based on the locations of underground utilities, overhead utility lines, parked cars and any other conditions encountered in the field. At each location, temporary wells will be installed to collect groundwater samples from the perched water zone. The temporary wells will be screened from approximately two (2) feet above the water table down to approximately two (2) feet above the top of the clay layer underlying the area downgradient of the Site.

The four (4) soil borings will be advanced utilizing a direct-push drill rig (e.g. Geoprobe). At each location, the Geoprobe will direct push to 20 ft below grade and then utilize split spoons to characterize the subsurface materials at two (2)-foot intervals in order to determine when the top of the clay layer underlying the area downgradient of the Site is reached. At each location, the temporary well will be constructed after identifying the top of clay elevation. The bottom of the four (4) temporary wells will be set approximately two (2) feet above the top of the clay at each location. The temporary wells will be constructed
of one (1)-inch diameter polyvinylchloride (PVC) 0.020-inch screen extending from the bottom of the well to approximately two (2) feet above the water table and solid one (1)-inch diameter PVC riser pipe to grade. Each temporary well will be finished with a J-plug within a five (5)-inch diameter road box with a bolt-down manhole cover.

The temporary wells installed in the perched water zone will remain undisturbed for approximately one (1) week after being installed to reach equilibrium, then groundwater samples will be collected from each of the four (4) off-site locations. At each location, two (2) samples will be collected:

- one (1) from the top of the water column (approximately 1 to 2 feet below the top of the water table), and
- one (1) from the bottom of the water column (approximately 3 to 4 feet above the top of the clay layer).

The depth to water and depth to the bottom of each on-site piezometer will be measured to the nearest 0.01 foot using an electronic water level indicator and recorded. In addition, the elevations of the May 2019 on-site temporary wells and the proposed off-site temporary wells will be surveyed to determine the perched water table elevations and flow direction.

The perched water samples will be collected using dedicated high-density polyethylene (HDPE) tubing. The perched groundwater samples will be submitted for laboratory analysis of VOCs via USEPA Method 8260. The collected groundwater samples will be placed into single-use sampling glassware provided by the laboratory. The sample containers will be labeled with the site name, the Walden job number, sample location and identification, date, time, sampler’s initials, and the parameter(s) for analysis. All samples will be packed on ice in coolers maintained at 4°C prior to transport to the analytical laboratory. Samples will be shipped to the laboratory in such a manner as to avoid container breakage during transportation and to minimize the possibility of cross-contamination. The samples will be picked up by the analytical laboratory or delivered via an overnight courier under the appropriate Chain-of-Custody protocol.

The perched groundwater analytical results reported by the laboratory will be compared to the NYSDEC Class GA groundwater quality standards. If groundwater concentrations exceed the applicable standards, appropriate future actions will be evaluated.

**Reporting**
Following completion of the above scope of work, a report documenting the additional pre-design subsurface investigation activities shall be prepared by Walden for submission to the
NYSDEC. The report will include a discussion of soil boring activities, soil screening and sampling procedures and results, **off-site perched groundwater sampling results**, and supporting documentation including soil boring logs, data tables, Site figures and photographs. The results of the investigation, combined with the results of the February 2016/April 2019 SVI investigations and the May 2019 pre-design subsurface investigation, will be utilized to support the design and implementation of an SVE remediation system at the Site and to focus excavation of residual VOC source material. **Based on the VOC results for the off-site perched groundwater samples (PW-1 through PW-4), appropriate actions to address identified impacts to groundwater, if any, will be evaluated.**

**Schedule**
The Site owner (218 Lakeville Acquisition, LLC) is ready to move forward with the additional investigation work immediately upon receiving the State’s approval of this revised Work Plan. The work will be conducted as quickly as possible, recognizing the following schedule requirements noted in NYSDEC’s July 10th comment letter:

- Commence field work: no later than September 30, 2020
- Complete field work: no later than December 30, 2020
- Submit summary report to State: no later than March 31, 2021

Please call Walden if you have any questions or require any additional information.

Very truly yours,
Walden Environmental Engineering, PLLC

_Nora Brew, P.E.  Jessica Bluth, P.G._
Senior Project Manager  Project Manager

_FIELD_ 
R. Corcoran, NYSDEC  A. Tamuno, Esq., NYSDEC  C. Bethoney, NYSDOH  A. Martin, NYSDOH  G. Bowitch, Esq., Bowitch & Coffey  N. Weisfeld, 218 Lakeville Acquisition LLC
Attachments:
Figure 1 – Site Location Map
Figure 2 – 2019 Pre-Design Investigation Soil and Groundwater Sampling Locations and Results
Figure 3 – Additional Pre-Design Investigation Proposed Soil Boring Locations
Figure 4 – Proposed Off-site Perched Groundwater Sampling Locations

Appendix A – Health and Safety Plan
Appendix B – Quality Assurance Project Plan
Appendix C – Community Air Monitoring Program
Figure 1

Site Location Map
FIGURE 1

SITE LOCATION MAP

(USGS QUAD Sea Cliff, New York) (Scale 1:24000)
Figure 2

2019 Pre-Design Investigation Soil and Groundwater Sampling Locations and Results
Figure 3

Proposed Additional Pre-Design Investigation Soil Boring Locations
SOIL/ GROUNDWATER SAMPLE LOCATIONS (APPROXIMATE)

- GB-1 to GB-19

NOTES

1. Site base map was derived from a property survey prepared by Welsh Engineering & Land Surveying, P.C., 343 Manville Road, Pleasantville, NY 10570, revised on 7/14/00.

2. The Welsh Engineering north area was corrected based on 1999 Nassau County GIS basemap.

3. Plcemeters were installed at each of the 7 groundwater sampling locations (GB-1, GB-2, GB-3, GB-4, GB-9 and GB-12) to allow for groundwater collection and water level measurements.

4. Groundwater samples collected from each of the 7 plcemeters were analyzed for VOCs by EPA Method #8260.

5. Groundwater samples collected from GB-1, GB-2, GB-3 and GB-12 were also analyzed for emerging contaminants (PFCAS and 1,4-

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Figure 4

Proposed Off-site Perched Groundwater Sampling Locations
Appendix A

Health and Safety Plan
HEALTH AND SAFETY PLAN

FOR

FORMER IMPERIAL CLEANERS SITE
218 LAKEVILLE ROAD
LAKE SUCCESS, NEW YORK 11020

SITE #C130225

JULY 2020
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1.0 **Statement of Commitment to Worker Health and Safety**

Walden Environmental Engineering, PLLC (Walden) employees may be exposed to risks from site-related hazardous conditions while performing field activities related to the Former Imperial Cleaners Site located at 218 Lakeville Road, Lake Success, NY. 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 site-specific Health and Safety Plan (HASP) applies to all Walden personnel, owners’ representatives, subcontractors, and the New York State Department of Environmental Conservation (NYSDEC) personnel and/or its representatives on the job site where operations involve actual or potential physical and chemical hazards that have been identified by Walden or others. This HASP is also intended to inform and guide all personnel (Walden employees and/or owner representatives and/or NYSDEC representatives and/or subcontractors) entering the exclusion zone, ensuring that each person sign and acknowledge the site hazards on the acknowledgement form provided in Appendix I. 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 on-site personnel take certain precautions in accordance with this HASP, and Walden may request that others protect their personnel in a manner that they deem necessary or sufficient.
2.0 **General**

2.1 **Site Information**
- Owner Name: 218 Lakeville Acquisition LLC
- Location: 218 Lakeville Road, Lake Success, New York
- Walden Job #: IMPL0115

2.2 **Project Personnel**
- Primary Consultant: Walden Environmental Engineering, PLLC
  - 16 Spring Street, Oyster Bay, New York
  - (516) 624-7200 (phone)
  - (516) 624-3219 (fax)
- On-Site Safety Coordinator: Jessica Bluth
- On-Site Health and Safety Officer: Jessica Bluth

2.3 **Project Description**
The Former Imperial Cleaners site is located at 218 Lakeville Road, immediately south of Northern Boulevard (New York State Route 25A) and west of Lakeville Road in Lake Success, New York (RWP Figure 1). The one-story commercial building on-site has one active tenant (Tobacco Plaza) and three vacant tenant spaces. A release of tetrachloroethylene (PCE) at the 218 Lakeville Road Site was first noted in 1995. A site investigation followed to identify source areas and determine the extent of contaminated soil and groundwater at the Site (note that there is a perched water table underlying the site at approximately 30 feet below grade). Contaminated sediments were removed from the source areas (dry wells and leaching pools) to the extent possible without undermining the structures. Post-excavation soil sampling results indicated that volatile organic compounds (VOCs) remained in the subsurface following the source area removal actions. A soil vapor extraction (SVE) system was installed to remove VOC vapors remaining in the soil and improve soil and groundwater quality. A soil, soil gas, groundwater and indoor air monitoring program was implemented to track the reductions in VOC concentrations achieved by operation of the SVE system. The SVE system was shut down several years ago when on-site soil sampling results indicated that the SVE system had successfully reduced soil contaminant concentrations to below the NYSDEC TAGM 4046 Recommended Cleanup Objectives. All of this site investigation and remediation work was conducted by the previous owners of the Site as required by NYSDEC and NYSDOH under the Voluntary Cleanup Program (VCP).
Sub-slab vapor sampling and indoor/outdoor air sampling was performed under the VCP. Walden was retained by 218 Lakeville Acquisition LLC to perform this work in accordance with NYSDEC and NYSDOH requirements.

Further additional soil and groundwater sampling for VOC sampling and geological characterization shall be performed by Walden in accordance with NYSDEC and NYSDOH requirements. In addition, a SVE pilot test will be conducted, and an SVE remedial system will be installed and operated on-site.

2.4 Training
All site-related workers entering the exclusion zone must be trained in accordance with 29 CFR 1910.120 E3 and E4, and all others must have at least 29 CFR 1910.120 E3.

Documentation of Walden personnel training is maintained on files and each Walden employee will have copies of his/her applicable 40-Hour OSHA Training, 8-Hour Refresher and Supervision Training Certificates on-site (maintained by the job health and safety officer or designee).

Each subcontractor working on the job must provide the site safety officer with training documentation for its personnel.

2.5 Affidavit
All Walden personnel and subcontractors who enter site-related exclusion zones must sign the attached Safety Plan Acknowledgment form (Appendix I). Walden personnel and site-related subcontractors must also read and comply with Walden’s generic HASP.

2.6 Alternative Work Practices
Underground utilities must be identified before commencing any subsurface work. Blowers may be employed to reduce and disperse any releases of toxic gases. If items proposed within the work plan are modified based on changes in field conditions, they would be evaluated and an addendum would be prepared to cover these alternative work practices.
3.0 **Hazardous Substances**

Hazardous substances are defined as the suspected or known hazardous substances stored, within any media (contaminated), etc.

The Volatile Organic Compounds (VOCs) Tetrachloroethylene (PCE), Trichloroethylene (TCE) and cis-1,2 Dichloroethylene have been identified in soil, groundwater and sub-slab soil vapor at the Site.

3.1 **Hazard Assessment**

Defined as toxic effects, including Threshold Limit Values (TLVs), Immediately Dangerous to Life or Health’s (IDLHs), reactivity, stability, flammability and operational hazards with sampling, decontaminating, etc.

The major route of exposure to potential contaminants will be respiratory; however, dermal exposure may also be 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. PCE is the compound of highest concern. The program will use engineering controls and Personal Protective Equipment (PPE) to reduce the amount of potential exposure. Continuous air monitoring and personal protection devices will serve to prevent exposure to chemicals.

All field personnel, except for the equipment operator, must remain away from the equipment while work is taking place. All field personnel, including the operator, must wear steel-toe boots. All persons unrelated to the project must remain outside the exclusion zone while work is taking place. If persons other than Walden personnel or associated contractors have business in the exclusion area, they must remain at a safe distance away from Walden personnel during slab drilling activities and as determined by the site health and safety officer.

During typical work activities, surfaces can be expected to become uneven and slippery, causing unsure footing and requiring additional care by personnel engaged in operations. Additional site hazards are presented by the possibility of airborne and waterborne transport of hazardous materials and the presence of contaminated materials and equipment. Other site hazards include those that exist on all sites where construction type
operations take place, e.g., dangers from falling equipment, cuts, abrasions, and contusions.

4.0 Site Work Zones

Site work zones are defined as the designated exclusion zone, contaminant reduction zone and support zone. These work zones will be determined 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.

4.1 Support Zone
The support zone will be located outside of the exclusion zone. Personnel allowed in this area include all site personnel, visitors and representatives of regulatory agencies and observers. No particular training or PPE equipment are needed in the support zone/clean area.

4.2 Contaminant Reduction Zone
The contaminant reduction zone will be located between the support zone and the designated exclusion zone. In this area authorized personnel will don protective equipment, as needed in the exclusion zone. When exiting the contaminant reduction zone, personnel will remove contaminated PPE.

4.3 Exclusion Zone
The exclusion zone is in the immediate work area and that adjacent area as defined by the safety coordinator. Attempts will be made so that equipment and site activities taking place in the exclusion zone are situated so that personnel are upwind of sources. Fans or blowers will be used, if necessary, to disperse gases released during site-related activities.

4.4 Task Specific Level of Protection
See Table 1 for levels of personal protective equipment (PPE) requirements.

4.5 Communications
In the event that Level C respiratory protection is used, hand signals will be developed for communication. At this point, all proposed site-related work would be conducted in Level D PPE.
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>LEVEL OF PROTECTION/TASKS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support Zone</td>
<td>D</td>
<td>Steel toe boots and work clothes</td>
</tr>
<tr>
<td>Exclusion Zone and Contamination Reduction Zone</td>
<td>To be determined by the site safety officer based on contamination present</td>
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<tr>
<td></td>
<td>D (modified)</td>
<td>Steel toe boots, nitrile or latex gloves, hard hat, safety glasses</td>
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<tr>
<td></td>
<td>C</td>
<td>Full face respirator fitted with organic vapor cartridge and Level D</td>
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</table>
5.0 Site Access

In the event of an emergency, the project personnel and subcontractors should assemble at the predetermined assembly area, designated by the site safety officer.

The predetermined assembly area for this site or task is the southwestern corner of the parking lot behind 218 Lakeville Road. The project manager or on-site health and safety officer may relocate this area, if necessary.
6.0 Monitoring Procedures

Monitoring will be conducted at the Site to identify contaminants and contaminant concentrations in all media as follows:

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.

A Photo Ionization Detector (PID), which will be 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 soil vapor and air sampling activities are performed.

6.1 Task Specific Air Monitoring Action Levels

See Table 2 for air monitoring action levels.

**TABLE 2**

**AIR MONITORING ACTION LEVELS**

<table>
<thead>
<tr>
<th>INSTRUMENT</th>
<th>HAZARD MONITORED</th>
<th>INSTRUMENT READING</th>
<th>ACTION REQUIRED</th>
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<tbody>
<tr>
<td>PID</td>
<td>Organic Vapors</td>
<td>5 ppm or greater above background in the breathing zone for 1 minute and the source of the reading is unknown.</td>
<td>PPE will be upgraded to Level C.</td>
</tr>
</tbody>
</table>
7.0 Decontamination and Disposal

Decontamination procedures apply to all contaminated personnel, surfaces, materials, instruments, equipment, etc. PPE will be removed prior to removing any respiratory protection. All personnel will thoroughly wash their hands and face before leaving the site. Subsurface tools will be steam-cleaned or washed with Alconox detergent and water, then followed by a deionized water rinse and/or air-drying.

Disposal procedures also apply to all contaminated equipment, supplies, disposable items and wash water. Any PPE will be bagged and contained in a drum designated for PPE disposal. All decontamination water and materials will also be drummed and disposed of off-site.
8.0 **Emergency Procedures**

Free and clear egress from the work areas shall be provided. Preparatory meetings will be held to ensure that procedures for reporting and responding to emergency incidents are compatible with emergency response of local, state, and federal agencies. The emergency response plan will be rehearsed prior to start-up of site activities.

8.1 **Personnel Exposure**

In event of personnel exposure (skin contact, inhalation, ingestion, specific procedures for specific chemicals):

- **Skin Contact**: Wash with soap and water.
- **Inhalation**: Remove to fresh air, monitor for ABCs (Airway, Breathing and Circulation).
- **Ingestion**: Call Poison Control Center and monitor ABCs.
- **Eye Exposure**: Repeated eye flush, monitor ABCs and transport to hospital.

8.2 **Personnel Injury**

In the event of personnel injury:

Check ABCs (Airway, Breathing and Circulation). Perform first aid, if required. Contact local ambulance if professional help is needed.

8.3 **Potential or Actual Fire or Explosion**

In event of potential or actual fire or explosion:

If a fire or explosion occurs leave the site and contact the appropriate emergency team (i.e. fire or police).

8.4 **Environmental Accident**

In event of environmental accident (spread of contamination outside site):

Stop spread of chemical as best as possible and notify Walden, NYSDEC, associated contractors and Nassau County Health Department at first opportunity.

8.5 **Emergency Services**

**Emergency Medical Facility:** North Shore University Hospital

**Location:**

300 Community Drive

Manhasset, NY 11030

**Telephone:** (516) 562-0100
Directions to hospital from site (Refer to Appendix V): Make left onto Lakeville Road and head north to Northern Boulevard (Route 25A). Make right onto Northern Boulevard heading east. Take Northern Boulevard 0.7 miles and turn right onto Community Drive heading south. Continue 0.3 miles on Community Drive and arrive at North Shore University Hospital (300 Community Drive, Manhasset, NY).

Ambulance Service: 911
Fire Department: 911
Police Department: 911

North Shore University Hospital (Non-emergency): (516) 562-0100
National Response Center: (800) 424-8802
Poison Control Center: (800) 222-1222
NYSDEC Spill Hotline: (800) 457-7362
APPENDICES
# Appendix I: Site Safety Plan Acknowledgement Form

I have read and understand the procedures set forth in this Health and Safety Plan for the Former Imperial Cleaners Site, 218 Lakeville Road, Lake Success, NY.

<table>
<thead>
<tr>
<th>Printed Name</th>
<th>Signature</th>
<th>Representing</th>
<th>Date</th>
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</table>
Appendix II: Heat Stress

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 measured 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.

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 overchill 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;
d) Immerse the victim in a tub of cold water, while closely monitoring the victim's level of consciousness.

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 should also make sure that sufficient personnel are 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.
Workers may experience 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 decon 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 removing the protective clothing, the worker should wash and dry his skin thoroughly.

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 ½ pound of water loss, 8 ounces of water should be ingested. Water should be replaced by drinking 2 to 4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink diluted 50/50 with water.

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 habits, body weight, as well as predisposing physical conditions such as high blood pressure, heart conditions, diabetes, or one's medication, that may influence an individual's ability to tolerate excessive heat.

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 diluted 50/50 with water.
Salted water or solution should mitigate the cramps. Manual pressure should not be applied to the cramped muscles.

Required Frequency of Heat Stress Monitoring for workers in Impermeable Clothing

<table>
<thead>
<tr>
<th>Adjusted Temperature (°F)</th>
<th>Work Time Allowed Before Monitoring Break (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 or above</td>
<td>15</td>
</tr>
<tr>
<td>87.5-90</td>
<td>30</td>
</tr>
<tr>
<td>82.5-87.5</td>
<td>60</td>
</tr>
<tr>
<td>77.5-82.5</td>
<td>90</td>
</tr>
<tr>
<td>72.5-77.5</td>
<td>120</td>
</tr>
</tbody>
</table>


(2) Calculate the adjusted air temperature (Ta adj) by using this equation:

\[ Ta_{adj} \, ^\circ F = Ta \, ^\circ F + (13 \times \% \text{ sunshine}) \]

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).

Heat Stress Signs and Symptoms

<table>
<thead>
<tr>
<th>Heat Stress Indicator</th>
<th>When to Measure</th>
<th>If Exceeds . . .</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart rate (pulse)</td>
<td>Beginning of rest period</td>
<td>110 beats per minute</td>
<td>Shorten next work period by 33%</td>
</tr>
<tr>
<td>Oral temperature</td>
<td>Beginning of rest period</td>
<td>99°F (after thermometer is under tongue for 3 minutes) or 100.6°F or greater</td>
<td>Shorten next work period by 33% Prohibit work in impermeable clothing and shorten next work period by 33%</td>
</tr>
<tr>
<td>Body weight</td>
<td>1. Before workday begins (a.m.)</td>
<td>Decreases more than 5%</td>
<td>Increase fluid intake</td>
</tr>
<tr>
<td></td>
<td>2. After workday ends (p.m.)</td>
<td></td>
<td></td>
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</tbody>
</table>
Appendix III: 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 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 sweat to evaporate.
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 attached, 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 exposed 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;
- Frostbite (see below).

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

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

<table>
<thead>
<tr>
<th>Wind Speed (mph)</th>
<th>Equivalent Temperature (°F)</th>
<th>Actual thermometer Reading (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>50</td>
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<tr>
<td>calm</td>
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<td>50</td>
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<tr>
<td>5</td>
<td></td>
<td>48</td>
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<td>20</td>
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<td>27</td>
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<tr>
<td>40</td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>40 (Little added effect)</td>
<td>Little Danger (for properly clothed person)</td>
<td>Increasing Danger (Danger from freezing of exposed flesh)</td>
</tr>
</tbody>
</table>
Appendix IV: Chemical Hazards

TETRACHLOROETHENE or PERCHLOROETHENE (PCE)

Introduction
Tetrachloroethylene is a man-made substance widely used for dry cleaning fabrics and textiles and for metal-degreasing operations. It is also used as a starting material (building block) for the production of other man-made chemicals. Other names that may be used for tetrachloroethylene include perchloroethylene, perc, PCE, perclene, and perchlor. Although tetrachloroethylene is a liquid at room temperature, some of the liquid can be expected to evaporate into the air producing an ether-like odor; evaporation increases as temperature increases.

Exposure Pathways
Humans can be exposed to tetrachloroethylene from environmental, consumer product, and occupational sources. Common environmental levels of tetrachloroethylene (often called background levels) are usually several thousand times lower than levels found in some workplaces. Background levels found in the air we breathe and in the food and water we consume probably result from evaporation from industrial or dry-cleaning operations or from releases from areas where chemical wastes are stored. Tetrachloroethylene has been found in at least 330 of the 1117 National Priorities List (NPL) hazardous waste sites.

In general, tetrachloroethylene levels in air are higher in urban and industrialized areas than in more rural or remote areas. Higher-than-background concentrations of tetrachloroethylene have occasionally been measured in air close to chemical waste sites and in water taken from nearby wells.

Exposure to tetrachloroethylene may also occur from some consumer products. Products that may contain tetrachloroethylene include auto brake noise-reducers and cleaners, suede protectors, water repellents, silicone lubricants, belt lubricants and dressings, specialized aerosol cleaners, ignition wire driers, fabric finishers, spot removers, adhesives and wood cleaners. Although uncommon, small amounts of tetrachloroethylene have been found in food.

The levels of tetrachloroethylene in air in dry-cleaning shops, textile and chemical processing operations and degreasing operations can result in exposures that are much higher than those found in the outside environment. Levels of tetrachloroethylene in the workplace are usually measured in parts of tetrachloroethylene per million parts of air (ppm), while common environmental levels are usually measured in parts per billion (ppb) or parts per trillion (ppt).

Metabolism
Because tetrachloroethylene evaporates quickly, the most common exposure to tetrachloroethylene comes from breathing air containing it. This is certainly true for individuals who work with the chemical, but it is probably also true for those who live in industrial and commercial areas where large amounts of the compound are used or disposed of. Tetrachloroethylene may also enter the body through drinking contaminated water or eating contaminated food. Because tetrachloroethylene does not pass through the skin to any
significant extent, entry into the body by this path is of minimal concern, although skin irritation may result from repeated or prolonged contact with the undiluted liquid. Scientific reports indicate that tetrachloroethylene is present (and may in fact be concentrated) in the breast milk of mothers who have been exposed to the chemical.

**Health Effects**

In high concentrations in air, particularly in closed, poorly ventilated areas, single exposures to tetrachloroethylene can cause central nervous system (CNS) effects leading to dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking and possibly unconsciousness and death. As might be expected, these symptoms occur almost entirely in work (or hobby) environments. The potential long-term health effects that might occur in humans from breathing lower levels of tetrachloroethylene than those that produce CNS effects or from ingesting very low levels of the chemical found in some water supplies have not been identified. The effects of exposing infants to tetrachloroethylene through breast milk are unknown.

Animal studies, conducted with amounts much higher than typical environmental levels, have shown that tetrachloroethylene can cause liver and kidney damage, liver and kidney cancers and leukemia. Developmental effects in fetuses have been observed but only at tetrachloroethylene exposure levels that also produce toxicity in the maternal animal.

The U.S. Department of Health and Human Services has determined that tetrachloroethylene may reasonably be anticipated to be a carcinogen. Based on evidence from animal studies, tetrachloroethylene is thought to be capable of causing cancer in humans. It should be emphasized, however, that currently available information is not sufficient to determine whether tetrachloroethylene causes cancer in humans.

Short-term exposures to air containing more than 100 ppm of tetrachloroethylene have produced harmful effects in both humans and animals and more prolonged exposures to approximately 9 ppm caused harmful liver effects in mice. It should be pointed out that some of the highest environmental levels of tetrachloroethylene ever recorded (at waste disposal sites, for example) were still 150 times smaller than the concentrations shown to produce symptoms of toxicity in animals after repeated exposure. Drinking (or eating) the equivalent of approximately 60 to 80 mg (less than a spoonful) of undiluted tetrachloroethylene per kg; of body weight (1 kg = 2.2 pounds) has produced effects similar to drinking alcohol. Tetrachloroethylene was used in the past as a medicine to eliminate worms in humans, but safer and more effective drugs are now available. More prolonged exposures in animals have produced harm to the liver at doses of approximately 100 mg/kg/day. These levels of exposure are more than 1,000 times higher than would be expected even if humans ingested the most contaminated drinking water ever reported.

Cancer: From data in animals, EPA has estimated that if people breathe air containing 1 ppm tetrachloroethylene all day every day for 70 years, there would be an added risk of 66 additional cases of cancer in a population of 10,000 people (or 65,500 additional cases in a population of 10,000,000) over the number of cases that would be observed in a population not exposed to tetrachloroethylene. If people consume 1.0 mg tetrachloroethylene/kg/day in food and water every day for 70 years, there would be at the most a risk of 510 additional cases of cancer in a
population of 10,000, or 5 10,000 additional cases in a population of 10,000,000. It should be noted that these risk values are plausible upper-limit estimates. Actual risk levels are unlikely to be higher and may be lower.

**Regulations**
The government has made recommendations to limit the exposure of the general public to tetrachloroethylene in drinking water and the exposure of workers to tetrachloroethylene in the workplace.

The Environmental Protection Agency (EPA) has developed the following health advisories to describe concentrations of tetrachloroethylene in drinking water at which no adverse effects are anticipated to occur: 2.0 milligrams per liter of water (mg/L) for short-term exposure of children, 1.4 mg/L for longer term exposure of children, and 5.0 mg/L for long-term exposure of adults. In addition, a drinking water equivalent level (DWEL) of 0.5 mg/L has been established.

The Occupational Safety and Health Administration (OSHA) has a legally enforceable exposure limit of 25 ppm tetrachloroethylene in air for an 8-hour workday, 40-hour workweek based on non-cancer health considerations. The National Institute for Occupational Safety and Health (NIOSH) has classified tetrachloroethylene as a potential occupational carcinogen and recommends that workplace exposure be limited to the lowest possible level.


Properties:
Colorless liquid, ether-like odor, extremely stable, resists hydrolysis, d 1.625 (20/20C), bp 121°C, fp -22°C, bulk d 13.46 lb/gal (26°C), refr index 1.5029 (25°C), flash p none. Miscible with alcohol, ether, and oils; insoluble in water.
Non-flammable.

Derivation:
(1) By chlorination of hydrocarbons and pyrolysis of the carbon tetrachloride also formed,
(2) from acetylene and chlorine via trichloroethylene.

Method of purification: Distillation.
Grade: Purified, technical, USP, as tetrachloroethylene, spectrophotometric.
Hazard: Irritant to eyes and skin. TLV: 50 ppm in air.
Use: Dry-cleaning solvent, vapor -degreasing solvent, drying agent for metals and certain other solids, vermifuge, heat transfer medium, manufacture of fluorocarbons.
APPENDIX V
HOSPITAL ROUTE
AND EMERGENCY NUMBERS

Emergency Telephone Numbers

Nassau County Police Department  911
Nassau County Fire Department  911
Emergency Medical System  911
North Shore University Hospital  (516) 562-0100
National Response Center  (800) 424-8802
Poison Control Center  (800) 222-1222
NYSDEC Spill Hotline  (800) 457-7362

Hospital Information
North Shore University Hospital is able to treat chemical exposures and has an emergency room.
The address is: 300 Community Drive, Manhasset, New York.

HOSPITAL ROUTE – TAKE LAKEVILLE ROAD NORTH TO NORTHERN BOULEVARD. TURN RIGHT TO TAKE NORTHERN BOULEVARD 0.7 MILES EAST TO COMMUNITY DRIVE. TURN RIGHT – HOSPITAL IS 0.3 MILES SOUTH ON LEFT OF COMMUNITY DRIVE.
Appendix B

Quality Assurance Project Plan
Quality Assurance Project PLAN

FOR

Former Imperial Cleaners Site
218 Lakeville Road
Lake Success, New York 11020

Site #C130225

July 2020
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1.0 Project Organization and Responsibilities

Walden Environmental Engineering, PLLC (Walden) maintains company policies and procedures to ensure that all sample collection and analyses meet a high degree of quality. These policies and procedures provide confidence that the resulting data provide an accurate representation of the matrix being sampled. Quality Assurance/Quality Control (QA/QC) starts with the design of the sampling program and ends with the summarized analytical data submitted in the final report. This Quality Assurance Project Plan (QAPP) describes these QA/QC policies and procedures.

The project Quality Assurance Officer (QAO) is responsible for ongoing surveillance of project activities, for ensuring conformance to this QAPP, and for evaluating the effectiveness of its requirements. The QAO has access to any personnel or subcontractors, as necessary, to resolve technical problems and take corrective action as appropriate and has the authority to recommend that work be stopped when there are factors present that may jeopardize quality. The QAO will be available to respond to immediate QA/QC problems.

The primary responsibilities of the QAO are as follows:

- Monitor the correction of QC problems and alert task leaders to where similar problems might occur.
- Develop and maintain project QA files for sampling, monitoring, and field QA records.
- Participate in QA audits.
- Recommend changes to the project manager to improve the effectiveness of the project in reaching its QA objectives for field sampling and monitoring activities.
- Review proposed additions and changes to this QAPP.

The project QA will be maintained under the direction of Ms. Jessica Bluth (see attached resume), who will be assigned as the project’s QAO, in accordance with this QAPP. QC for specific tasks will be the responsibility of Walden and its subcontractors, which shall be selected at the time the work is required under the direction of Ms. Bluth.
2.0 Quality Assurance Project Plan Objectives

2.1 Overview
Overall project goals are defined through the development of Data Quality Objectives (DQOs), which are qualitative and quantitative statements that specify the quality of the data required to support decisions. Data quality is measured by how well the data meet the QA/QC goals of the project. In this plan, "Quality Assurance" and "Quality Control" are defined as follows:

- Quality Assurance - The total integrated program for assuring reliability of monitoring and measurement data.
- Quality Control - The routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process.

As stated in the Guidance for Data Quality Objectives Process (EPA QA/G-4), DQOs are derived from the outputs of each step of the DQO process that:

- Classify the study objective;
- Define the most appropriate type of data to collect;
- Determine the most appropriate conditions from which to collect the data; and
- Specify acceptable levels of decision errors that will be used as the basis for establishing the quantity and quality of data needed to support the decision (USEPA, 1994).

A non-probabilistic (judgmental) sampling approach will be used to select the specific sampling locations for the areas of concern. A judgmental sampling design consists of directed samples at specific sampling locations to confirm the existence of contamination at these chosen locations based on visual or historical information (i.e., discoloration, staining, and deterioration).

Total study error is the combination of sampling and measurement error. Total study error is directly related to decision error. These decision errors can be controlled through the use of hypothesis testing. For this sampling, the null hypothesis (baseline condition) is that the parameter of interest exceeds the cleanup levels. This decision has the smallest degree of decision error. In addition, measurement error is reduced by analyzing individual samples using more precise laboratory and sampling methods. The soil and groundwater sampling will be performed with dedicated equipment and following the appropriate standard operating procedures for sample handling.
2.2 QA/QC Requirements
QA elements to be evaluated include accuracy, precision, sensitivity, representativeness and completeness. Reporting of the data must be clear, concise and comprehensive. The data generated by the analytical laboratory for this project is required to be sensitive enough to achieve detection levels low enough to meet Contract Required Quantitation Limits (CRQLs) as specified in NYSDEC Analytical Services Protocol (NYSDEC ASP) for Superfund CLP and EPA SW-846 methods performed in accordance with NYSDEC ASP protocol. The analytical results meeting the CRQLs will provide data sensitive enough to meet the objectives of the work described in the Additional Pre-Design Subsurface Investigation Work Plan (Walden, July 2020). The QC elements that are important to this project are blank contamination, instrument calibration, completeness of field data, sample-holding times, sample preservation and sample chain of custody.

2.3 Initial Instrument Calibration
Calibration curves will be developed for each of the compounds to be analyzed. Standard concentrations and a blank will be used to produce the initial curves. The development of calibration curves and initial calibration response factors must be consistent with method requirements presented in the most recent version of SW-846 and the NYSDEC’s Analytical Services Protocol (ASP).

2.4 Continuing Instrument Calibration
The initial calibration curve will be verified every 12 hours by analyzing one calibration standard. The standard concentration will be the midpoint concentration of the initial calibration curve. The calibration check compound must come within 25% relative percent difference (RPD) of the average response factor obtained during initial calibration. If the RPD is greater than 25%, then corrective action must be taken as provided in the specific methodology.

2.5 Method Blanks, Field Blanks and Trip Blanks
Method blank or preparation blank is prepared from an analyze-free matrix, which includes the same reagents, internal standards and surrogate standards as the related samples. It is carried through the entire sample preparation and analytical procedure. A method blank analysis will be performed once for each 12-hour period during the analysis of samples for Volatile Organic Compounds (VOCs). The method blank will be used to demonstrate the level of laboratory background and reagent contamination that might result from the analytical process itself.

Field blanks and trip blanks will also be collected to ensure no contamination arises from sampling equipment or the transportation and handling methods.
2.6 **Duplicates**
Duplicate samples are two or more samples considered representative sub-samples of the same source. The samples are identically processed throughout the measurement system. For the additional soil investigation, one (1) duplicate sample will be collected per day of sampling. For the off-site groundwater sampling, one (1) duplicate sample will be collected per day of sampling. Duplicate samples will be analyzed as per appropriate methodology. Duplicate analyses for Target Compound List (TCL) compounds will be associated with matrix spike and matrix spike duplicate analyses. The results of the duplicate analyses will be used to assess the precision of the measurement systems.

2.7 **Surrogate Spike Analysis**
Surrogate standard determinations will be performed on all samples and blanks analyzed by the analytical laboratory. All samples and blanks will be spiked with the appropriate surrogate compounds (as indicated by the methodology) before purging or extraction in order to monitor preparation and analyses of samples. Surrogate spike recoveries shall fall within the advisory limits in accordance with the SW-846 protocols for samples falling within the quantitation limits without dilution.

2.8 **Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank Analysis**
Matrix Spike (MS) and Matrix Spike Duplicate (MSD) analyses will be performed to evaluate the matrix effect of the sample upon the analytical methodology along with the precision of the instrument by measuring recoveries. The MS/MSD samples will be analyzed for each group of samples of a similar matrix, at a rate of one for every batch of field samples. The Relative Percent Difference (RPD) will be calculated from the difference between the MS and MSD. Matrix spike blank (MSB) analysis will be performed to indicate the appropriateness of the spiking solution(s) used for the MS/MSD.

2.9 **Accuracy**
Accuracy is defined as the nearness of a result or the mean (x) of a set of results to the true value. Accuracy is assessed by means of reference samples and percent recoveries. Accuracy includes both precision and recovery, and is expressed as Percent Recovery (% REC). The MS sample is used to determine the percent recovery. The matrix spike % REC is calculated by the following equation:

\[
\%REC = \frac{SSR - SR}{SA} 
\]

where:
- SSR = measurement from spiked sample
- SR = measurement from un-spiked sample
- SA = actual data of spike added
2.10 **Precision**

Precision is defined as the measurement of agreement of a set of replicate results among themselves without assumption of any prior information as to the true result. Precision is assessed by means of duplicate/replicate sample analyses. Analytical precision is expressed in terms of Relative Percent Difference (RPD) which is calculated using the following equation:

\[
\text{RPD} = \frac{D_1 - D_2}{(D_1 + D_2)/2}
\]

where:

- \(\text{RPD}\) = Relative Percent Difference
- \(D_1\) = larger sample value
- \(D_2\) = smaller sample value

2.11 **Sensitivity**

The sensitivity objectives for this plan require that data generated by the analytical laboratory achieve detection levels low enough to meet the CRQLs as specified by SW-846 methods. The Method Detection Limits (MDL) for target compounds and target analyses will be established by the analytical laboratory to be well below the remedial objectives and submit appropriate documentation to Walden as required by the QAO.

2.12 **Representativeness**

Representativeness is a measure of the relationship of an individual sample taken from a particular site to the remainder of the site and the relationship of a small aliquot of the sample (i.e., the one used in the actual analysis) to the sample remaining on-site. A blind duplicate is used to accomplish this task, as well as assessing the precision of the data. The RPD between the two samples should be less than 50%. The use of standardized techniques and statistical sampling methods influences the representativeness of an aliquot of sample to the sample at the site. The representativeness of samples is assured by adherence to sampling procedures presented in this document, therefore no specific representativeness samples are to be collected.

2.13 **Completeness**

Completeness is a measure of the quantity of data obtained from a measurement system as compared to the amount of data expected from the measurement system. Completeness is defined as the percentage of all results that are not affected by failing QC qualifiers and should be between 90% and 100% of all analyses performed. The objective of completeness in laboratory reporting is to provide a thorough data support package. The laboratory data package provides documentation of sample analysis and results in the form of summaries, QC data and raw analytical data. The laboratory will be required to submit
data packages that follow SW-846 reporting format, which, at a minimum, will include the following components:

1. All sample chain-of custody forms.
2. The case narrative(s) presenting a discussion of any problems and/or procedural changes required during analyses. Also presented in the case narrative are sample summary forms.
3. Documentation demonstrating the laboratory's ability to attain the contract specified detection limits for all target analyses in all required matrices.
4. Tabulated target compound results and tentatively identified compounds.
5. Surrogate spike analysis results (organics).
7. QC checks sample and standard recovery results.
9. Internal standard area and RT summary.

2.14 **Comparability**
Comparability is the degree to which analytical data generated from an individual laboratory can be compared with those from another laboratory, in terms of use of standardized industry methods and equivalent instrumentation techniques. No laboratory split samples will be taken for this project.
3.0 **Calibration and Maintenance Procedures of Field Equipment**

Walden follows manufacturer’s recommendations and guidelines with regard to field instrument calibration procedures. The calibration of each instrument will be checked prior to each day’s use. The date and time of the calibration check, serial number, model number and signature of the calibrating technician will be entered into the field logbook. If the instrument readings are incorrect, the instrument will be either recalibrated by the technician or returned to the Walden’s office where it will be further evaluated and/or repaired. If field instruments require major overhauls, the instruments will be returned to the appropriate manufacturer.

Preventive maintenance of field equipment is performed routinely before each sampling event and more extensive maintenance is performed based on hours of use. The Walden equipment coordinator has overall responsibility for the preventive maintenance program. However, certain maintenance programs are overseen by the project manager. Routinely, manually operated sampling equipment is checked to ensure it operates properly and that excessive wear has not occurred. If necessary, equipment is taken out of service for repair or replacement.

Soil and groundwater sampling equipment will be decontaminated with a water and alconox solution before every sample is taken.
4.0 Sample Custody

4.1 Overview
The handling of samples in the field and in the laboratory will conform to the sample custody procedures presented in this section. Field custody procedures involve proper sample identification, chain-of-custody forms, packaging and shipping procedures. Laboratory custody begins with the receipt of samples by the laboratory and continues through sample storage, analysis, data reporting and data archiving. This section provides the procedures that will be followed during the course of the project to ensure proper sample custody.

4.2 Field Custody Procedures for Off-Site Laboratory
The following elements are important for maintaining the field custody of samples:

- Sample identification
- Sample labels
- Custody records
- Shipping records
- Packaging procedures

Sample labels will be attached to all sampling containers before field activities begin. Each label will contain an identifying number and each number will have a suffix that identifies the site and where the sample was collected. Approximate sampling locations will be marked on a map with a description of the sample location. The number, type of sample and sample identification will be entered into the field logbook. A chain-of-custody form will accompany the sampling containers from the laboratory into the field. Upon receipt of the samples and cooler, the sampler will sign and date the first “received” blank space. After each sample is collected and appropriately identified entries will be made on the chain-of-custody form that will include:

- Site name and address
- Samplers’ names and signatures
- Names and signatures of persons involved in chain of possession
- Sample number
- Number of containers
- Sampling station identification
- Date and time of collection
- Type of sample and the analyses requested
- Preservatives used (if any)
- Pertinent field data (if any)
After sampling has been completed, the samplers will return/ship the samples to the laboratory. The sampler will sign and date the next "relinquished" blank space. One copy of the custody form will remain with the field personnel and the remaining copies will accompany the samples to the laboratory. The samples will be shipped to the laboratory within 24 hours of collection. Samples will be received by laboratory personnel, who will assume custody of the samples and sign and date the next "received" blank.

4.3 Laboratory Custody Procedures

Upon receipt by the analytical laboratory, samples will proceed through an orderly processing sequence specifically designed to ensure continuous integrity of both the sample and its documentation.

All samples will be received by the laboratory's sample control group and will be carefully checked for label identification and completed accurate chain-of-custody records. The sample will be tracked from storage through the laboratory system until the analytical process is completed and the sample is returned to the custody of the sample control group for disposal. Generally, access to NYSDOH ELAP certified laboratories is restricted to prevent any unauthorized contact with samples, extracts, or documentation.
5.0 Sample Preparation and Analytical Procedures

Containers, preservation and holding times of environmental samples will be applied as detailed in the NYSDEC ASP. Analyses of environmental samples will be performed by the protocol requirements of the SW-846.

A summary of analyses and related QA/QC samples would be performed on the samples collected are described in the Additional Pre-Design Subsurface Investigation Work Plan (Walden, July 2020). Organic compounds will be analyzed by the following methods:

- Soil
  - TCL VOCs by USEPA Method 5035

- Groundwater
  - TCL VOCs by USEPA Method 8260

If any modifications or additions to the standard procedures are anticipated, and if any nonstandard sample preparation or analytical protocol is to be used, the modifications and the nonstandard protocol will be explicitly defined and documented. Prior approval by Walden’s QAO is necessary for any nonstandard analytical or sample preparation protocol used by the laboratory.
6.0 **Data Reduction, Validation, Review and Reporting**

6.1 **Overview**
The process of data reduction, review, and reporting ensures that assessments or conclusions based on the final data accurately reflect actual site conditions. This plan presents the specific procedures, methods, and format that will be employed for data reduction, review and reporting of each measurement parameter determined in the laboratory and field. Also described in this section is the process by which all data, reports and work plans are proofed and checked for technical and numerical errors prior to final submission.

6.2 **Data Reduction**
Data reduction is the process by which raw analytical data generated from the laboratory instrument systems are converted into usable mass concentrations. The raw data, which may take the form of summation of areas under the curve instrument responses, or observations is processed by the laboratory and converted into concentrations expressed in micrograms per kilogram for soil samples and in micrograms per cubic meter for sub-slab vapor and air samples. The analytical laboratory will be required to follow SW-846 data reduction procedures.

Data reduction also includes the process by which raw field data is summarized into tables and graphs, from which quantitative or qualitative assessments can be derived by filter integration and evaluation. Field data that is anomalous will be thrown out to create a linear interpretation of the data that depicts a more accurate trend.

Field data obtained during sampling is summarized on appropriate field forms. This information will be used to assess field conditions at the time of sampling and is summarized and analyzed along with the chemistry data in the final report. Occasionally, the reduction of actual field data requires correcting measurement data for the measurement system's baseline value. The data will be adjusted only after the raw data has been submitted to Walden’s QAO and prior to preparation of the final report.

6.3 **Walden Data Review**

6.3.1 **Laboratory Data**
The QAO or a designee under the project manager’s supervision, will review each analytical data package for completeness (i.e., have all the analyses requested been performed?) and general protocol compliance, such as holding times, detection limits, spike recoveries and surrogate recoveries. The results of this review will be summarized and submitted to the independent validator with the data package. If information is found
to be missing from the data package the analytical laboratory will be contacted and requested to submit any missing information.

6.3.2 Data Usability Report
Walden’s QAO will evaluate all of the analytical laboratory data according to the NYSDEC Division of Environmental Remediation (DER) Data Usability Summary Report (DUSR) guidelines to determine if the data presented by the laboratory meets the project specific criteria for data quality and use. Taking into account protocols for sampling, transport, analysis, reduction, and reporting, the QAO will use this information and his/her own experience to establish whether the results of each analysis can be used for the purpose intended. Data deficiencies, analytical protocol deviations, and quality control problems are identified and the effect on the data is evaluated. It will be determined whether the final results can be used as reported, qualified to indicate limitations, or rejected outright.

6.4 Data Validation
Data validation is the systematic process by which data quality is determined with respect to data quality criteria that are defined in project and laboratory QC programs and within the referenced analytical methods. The data validation process consists of an assessment of the acceptability or validity of project data with respect to the stated project goals and the requirements for data usability. Ideally, data validation establishes the data quality in terms of project DQOs. Data validation consists of data editing, screening, checking, auditing, certification, review and interpretation.

The purpose of data validation is to define and document analytical data quality and determine whether the laboratory data quality is sufficient for the intended use(s) of the data. An approved independent data evaluator will not review data prior to its use in reports prepared by Walden unless requested by the NYSDEC. Both the field and laboratory data will be subjected to a level of data validation commensurate with the required data quality level. If required, the data will be validated in accordance with the following document: "Functional Guidelines for Evaluating Inorganic Analyses" and the "Functional Guidelines for Evaluating Organic Analyses" (Technical Directive Document No. HQ-8410-01, USEPA). The validator will evaluate the analytical laboratory's ability to meet the DQOs provided in this QAPP. Noncompliant data will be flagged in accordance with the NYSDEC ASP and corrective action will be undertaken to rectify any problems.
6.5 Reporting

6.5.1 Field Data Reporting
All field real-time measurements and observations will be recorded in project logbooks or field data records. Field measurements may include temperature, wind speed and direction, and PID results, if applicable. All data will be recorded directly and legibly into field logbooks. If entries are changed, the change will not obscure the original entry and the correction will be signed. Field data records will be organized into standard formats whenever possible and retained in permanent files.

6.5.2 Laboratory Data Reporting
All sample data packages submitted by the analytical laboratory will be required to be reported in conformance to the SW-846 deliverable requirements as applicable to the method utilized.

6.6 Data Usage
The soil and groundwater data will be used to evaluate and determine contamination extent on the site based on the regulatory levels and project cleanup objectives.
7.0 **Internal Quality Control**

7.1 **Overview**
QC checks will be performed to ensure the collection of representative and valid data. Internal QC refers to all data compilation and contaminant measurements. QC checks will be used to monitor project activities to determine whether QA objectives are being met. All specific internal QC checks to be used are identified in this section.

7.2 **Laboratory Quality Control**
The analytical laboratory is required to exercise internal control in a manner consistent with the requirements of this QAPP. Control checks and internal QC audits are required by the NYSDEC ASP methods. These include reference material analysis, blank analysis, MS/MSD analysis, cleanups, instrument adjustments and calibrations, standards and internal audits. One qualified professional will proof and check all final reports for transcription and/or calculation errors. Twenty percent of all final reports will be subsequently checked again by a qualified professional. All data tables will be checked to ensure no transcription errors have occurred. Data tables will also be checked to see that any criteria cited for comparison purposes is appropriate and correctly referenced. All calculations will be checked to ensure that they will be properly presented and that resulting values are achievable. If any results cannot be duplicated the calculations will be independently checked for accuracy.
8.0 **Performance and System Audits**

Performance audits, when performed, will be used to monitor project activities to assure compliance with project DQOs. Walden periodically conducts internal audits of field activities. Walden’s on-site project manager will routinely monitor all field activities to ensure that work is done correctly. All sampling and analytical work will be reviewed routinely by the project manager. All data sheets obtained in the field will be initialed and dated by project manager after review and acceptance of the services performed. A field audit will include monitoring and evaluation of sample collection, sample holding times, preservation techniques, field QC and equipment calibration. These audit forms will be kept on file with the Walden project manager for a period of at least one (1) year after completion of the project, then will be transferred to storage and held for an additional five (5) years.
9.0 Analytical Corrective Action

9.1 Laboratory Corrective Action
Corrective actions will be implemented if unsatisfactory performance and/or system audit results indicate that problems exist. Corrective action may also be implemented if the result of a data assessment or internal QC check warrants such action.
### 10.0 Analytical Methods/Quality Assurance Summary Table

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<tr>
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<tr>
<td>Matrix Type</td>
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<td>Number of Trip Blanks</td>
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<td>VOCs</td>
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<tr>
<td>Analytical Methods</td>
<td>USEPA Method 5035</td>
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<tr>
<td>Number and Type of Duplicate Samples to be Collected</td>
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<tr>
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<tr>
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<td>per USEPA Method 5035</td>
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<tr>
<td>Sample Holding Time</td>
<td>per USEPA Method 5035</td>
</tr>
</tbody>
</table>

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</tr>
</tbody>
</table>
QUALITY ASSURANCE OFFICER RESUME
Jessica Bluth, P.G.
Project Manager

Ms. Bluth is one of Walden Associates’ highly knowledgeable project geologists. She specializes in groundwater investigations, landfill post-closure and environmental monitoring, compliance inspections, tank removal, permitting and violation resolution. She has worked with a diverse clientele, including municipal, commercial, industrial and state markets. Ms. Bluth has conducted numerous soil/groundwater quality and sub-surface investigations and has also performed UST-related services for many commercial and industrial petroleum distribution sites throughout New York state.

EDUCATION
M.S. in Geology
University of Pittsburgh, 2004
B.S. Geology
State University of New York at Binghamton, Harpur College of Arts and Sciences, 2001 cum laude

LICENSES/ CERTIFICATIONS
Professional Geologist in New York
American Institute of Professional Geologists (AIPG)
OSHA 40-hour HAZWOPER Health and Safety Training
Current Loss Prevention System (LPS) Training
Long Island Association of Professional Geologists

EXPERIENCE
■ Coordinates and performs field activities including groundwater and soil sampling, soil boring/well installations, well abandonments, subsurface utility mark-outs and waste disposal oversight.
■ Prepares technical hydrogeologic reports (Subsurface Investigation Reports, Site Conceptual Models, Exposure Assessments, Well Abandonment Reports, etc.).
■ Analysis, interpretation and reporting of data (utilizing EQuIS and GAMA for data management purposes).
■ Procurement and review of subcontractor proposals.
■ Performs groundwater, soil/sediment, sub-slab/soil vapor, indoor air sampling activities at developed and undeveloped residential, commercial, industrial and municipal sites in accordance with Phase II and other investigations as well as on-going monitoring programs.
■ Coordinates and directs subcontractors performing excavation and remedial activities, soil boring and well installation activities, utility mark-outs and ground-penetrating radar surveys.
■ Performs and manages monitoring and remedial activities at New York State Brownfield, Inactive Hazardous Waste Disposal (Superfund), Voluntary Cleanup and Solid Waste Management Program sites throughout Long Island and New York City.
■ Develops Spill Response and Prevention Plans including flow diagrams for possible spill outcomes, first response methods, management responsibilities and instructions for spill reporting.
■ Performs tightness tests on petroleum UST in accordance with Nassau County Fire Marshal (NCFM).
■ Conducts UST removals, compliance testing, permitting and violation resolutions for a variety of clients.
Appendix C

Community Air Monitoring Program
APPENDIX D

New York State Department of Health
Generic Community Air Monitoring Plan

The following discussion is taken from NYSDEC’s DER-10 Technical Guidance for Site Investigation and Remediation Appendix 1A (May 2010).

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

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

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

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

**Periodic monitoring** for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. “Periodic” monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

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

If ground intrusive activities will include work inside a building or within 20 feet of a receptor (occupied building, place where people could be, etc.), then the following applies:

**Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures**

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative pressure enclosures, or special ventilation devices
should be considered to prevent exposures related to work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as weekends or evening hours, in non-residential settings.

If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response actions should also be pre-determined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.

Depending on the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

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

**VOC Monitoring, Response Levels, and Actions**

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

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

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

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.
All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

**Particulate Monitoring, Response Levels, and Actions**

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

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

As noted above, air monitoring activities for the Former Imperial Cleaners Site (218 Lakeville Road) site activities described in the *Additional Pre-Design Subsurface Investigation Work Plan* (Walden, July 2020) will be appropriate for the soil sampling, groundwater sampling, SVI sampling, SVE pilot testing, SVE remedial system installation or any other ground intrusive activities (such as drilling, test pits, excavation, soil pile staging, etc.), and periodic sub-slab vapor, indoor and outdoor air sampling to be conducted. Therefore, the CAMP will encompass periodic VOC monitoring using a PID and dust monitoring as appropriate.