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INTERIM REMEDIAL MEASURE SCOPE OF WORK – GROWING UP GREEN ELEMENTARY SCHOOL SUB-SLAB DEPRESSURIZATION SYSTEM

27-09 40th Avenue Off-site
Growing Up Green Elementary School
39-27 28th Street
Long Island City, New York 11101
NYSDEC Site # C241241A

Prepared For:

Contract# D009808, Work Assignment No. 33
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
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39-27 28th Street
Long Island City, NY 11101
27-09 40th Avenue Off-site
(#C241241A)

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Report Date: 7/9/24

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PE Certification:

I, Glenn Netuschil, certify that I am currently a NYS registered professional engineer and that this IRM Scope of Work was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Glenn Netuschil, P.E. – NYS Professional Engineer #074741

1.0 INTRODUCTION

HRP Associates, Inc. (HRP) was tasked by the New York State Department of Environmental Conservation (NYSDEC) under Work Assignment No. D009808-33 to plan and oversee an Interim Remedial Measure (IRM) at the Growing Up Green Elementary School located at 39-27 28th Street, Long Island City, New York 11101 (the "Subject Property"). A Subject Property location map is depicted in **Figure 1**.

The IRM will consist of the installation of a sub-slab depressurization system (SSDS) at the Subject Property to mitigate soil vapor intrusion (SVI). The IRM is being implemented based on the results of SVI structure sampling conducted in February 2024 at the Subject Property which indicated the chlorinated volatile organic compound (CVOC) tetrachloroethene (PCE) is present in sub-slab vapor at concentrations at which the New York State Department of Health (NYSDOH) recommends mitigation. The SVI structure sampling was performed by HRP as part of the 27-09 40th Avenue Off-Site Site Characterization (#C241241A).

This document provides a scope of work (SOW), drawings and specifications, and health and safety requirements associated with the IRM, as well as estimated costs for installation, pilot testing, start-up testing, and two rounds of performance monitoring indoor air sampling.

1.1 Subject Property Description and Background Information

The Subject Property is identified on New York City tax maps as Queens block 398, lot 1. The Subject Property lot is 47,200 square-feet (sq ft) with three buildings which cover approximately 42,500 sq ft. The Growing Up Green Elementary School is the largest of the three buildings at approximately 12,000 sq ft. The remaining two buildings located on lot 1 include a church and an annex building and are not addressed by this IRM. Growing Up Green Elementary School is a three-story building with a split-level slab on grade. The majority of the building slab is at grade, while portions of the slab sit approximately 2-3 feet below grade (ft bg). The ground floor includes a cafeteria, gymnasium (slab 2-3 ft bg), mechanical room (slab 2-3 ft bg), classroom space, offices, storage space, restrooms, and a kitchen. The second and third floors consist of various classroom spaces, restrooms, and office spaces. The building can be accessed from all four sides of the building. A plan view drawing of the ground floor is included in **Appendix A.**

Prior to the design of the SSDS, representatives from the Subject Property, NYSDEC, HRP, and Environmental Assessment and Remediations (EAR), the on-call contractor, met at 39-27 28th Street on April 22, 2024, to determine the proposed SSDS layout and piping route for the discharge stack. Photographs of the Subject Property building are included in **Appendix B**.

Water and sewer services are provided to the Subject Property by New York City. The Subject Property is currently owned by St. Patrick Roman Catholic Church & School. The Subject Property is zoned for manufacturing and residential use. The area surrounding the Subject Property consists of a mix of industrial, commercial, and residential properties. The Subject Property is located across 28th Street and to the northeast of 27-09 40th Avenue (Site #C241241A). Property use surrounding the Subject Property is depicted in **Figure 2.**

1.2 Previous Investigations

On January 27, 2021 EAR completed an SVI investigation at 39-27 28th Street on behalf of the NYSDEC, as part of the Off-Site Site Characterization associated with the 27-09 40th Avenue Site. The results of this investigation indicated that PCE was present in sub-slab vapor and indoor air at concentrations resulting in the recommendation for monitoring based on the May 2017 NYSDOH Soil Vapor/Indoor Air Decision Matrices.

The SVI structure sampling was conducted in general accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York,* October 2006 (including all subsequent revisions and updates), and included the installation of two temporary sub-slab vapor points in the ground floor of the building, the collection of sub-slab vapor, indoor air, and outdoor air samples, and completion of a NYSDOH building questionnaire and chemical product inventory.

A total of five samples were collected from the Subject Property:

- Two sub-slab vapor samples were collected from the ground floor.
- Two indoor air samples were collected from the ground floor.
- One outdoor air sample was collected in front of the building near the southwest corner (28th Street side of building).

On February 21, 2024, HRP conducted SVI structure sampling at the Subject Property as part of the 27-09 40th Avenue Off-Site Site Characterization. The investigation was conducted to identify potential SVI impacts at the Subject Property related to CVOC contamination identified at the 27-09 40th Avenue site and to monitor impacts observed during the 2021 SVI investigation.

The SVI structure sampling was conducted in general accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006* (including all subsequent revisions and updates), and included the installation of two temporary sub-slab vapor points on the ground floor of the building, the collection of sub-slab vapor, indoor air, and outdoor air samples, and completion of a NYSDOH building questionnaire and chemical product inventory.

A total of five samples were collected from the Subject Property:

- Two sub-slab vapor samples were collected from the ground floor.
- Two indoor air samples were collected from the ground floor.
- One outdoor air sample was behind the building near the northeast corner.

All sub-slab vapor and air samples were collected using 6-liter summa canisters outfitted with 8-hour regulators. Each sample was submitted under chain of custody to an Environmental Laboratory Approval Program (ELAP)-certified laboratory to be analyzed for volatile organic compounds (VOCs) by EPA Method TO-15.

Results from the SVI sampling indicated PCE was present in sub-slab vapor and first floor indoor air at concentrations resulting in the recommendation for mitigation based on the May 2017 NYSDOH Soil

Vapor/Indoor Air Decision Matrices. Laboratory analytical results from the SVI structure sampling are presented in **Appendix C**.

1.3 Standards Criteria and Guidance (SCGs)

Specific standards, criteria, and guidance values (SCGs) potentially relevant to the design and implementation of the NYSDEC-selected remedy were considered during the development of this SOW, and include the following:

- NYSDEC *DER-10, Technical Guidance for Site Investigation and Remediation (May 2010)*.
- NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York (October 2006)* and subsequent updates which include:
    - Soil Vapor/Indoor Air Decision Matrices A, B, and C, dated May 2017. The Decision Matrices provide recommended actions based on the concertation of 8 CVOCs in the indoor air in conjunction with the concentrations found in the sub slab samples. The 8 CVOCs included in the Decision Matrices are tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethene (1,1-DCE), carbon tetrachloride, methylene chloride, and vinyl chloride. Recommended actions include "No Further Action", "Identify Source(s) and Resample or Mitigate", "Monitor", and "Mitigate".
    - Soil Vapor/Indoor Air Decision Matrices D, E, and F, dated February 2024. The Decision Matrices provide recommended actions based on the concertation of 13 VOCs in the indoor air in conjunction with the concentrations found in the sub slab samples. The 13 petroleum-related VOCs included in the Decision Matrices are benzene, ethylbenzene, naphthalene, cyclohexane, isooctane (2,2,4-trimethylpentane), 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, o-xylene, m-xylene, p-xylene, heptane, hexane, and toluene. Recommended actions include "No Further Action", "Identify Source(s) and Resample or Mitigate", "Monitor", and "Mitigate".
    - Air Guideline Values (AGVs) presented in Table 3.1 of the guidance, including updated values and Immediate Action Levels for PCE (2013) and TCE (2015).
- NYSDEC Division of Air Resources (DAR) Policy *DAR-1: Guidelines for the Evaluation and Control of Ambient Air Contaminants under 6 NYCRR Part 212, February 2021.*
- American Society for Testing and Materials (ASTM) International *Standard Practice for Installing Radon Mitigation Systems in Existing Low-rise Residential Buildings (ASTM E-2121-21, October 2021).*
- New York City Construction Code (2022) and all applicable local laws and rules.

2.0 INTERIM REMEDIAL MEASURE DESIGN

The following sections describe the IRM and tasks associated with its design and implementation including:

- Concrete Slab Repair, as needed
- GPR Survey
- SSDS Design
- Pilot Testing
- Disposal of Soil and Concrete
- Permitting
- Operation and Maintenance (O&M)
- Green and Sustainable Best Management Practices (BMPs)
- Health and Safety Plan (HASP)
- Construction Completion Report (CCR)
- Roles and Responsibilities

2.1 Concrete Slab Repair

During installation of the SSDS components the concrete slab will be inspected to ensure the slab is in good condition. If any damage to the concrete slab is observed which has potential to serve as an SVI pathway or result in short circuiting during SSDS operation, the concrete slab shall be repaired with hydraulic cement. Furthermore, if any features within the concrete slab such as sumps or floor drains are observed to possess gaps which may interfere with SSDS testing and operation, these features should be sealed around with hydraulic cement.

2.2 GPR Survey

In accordance with New York State law, the Site will be marked out for public utilities by Dig Safe New York. In addition, a ground penetrating radar (GPR) survey of the entire ground floor of the Subject Property building will be performed prior to performing any ground intrusive activities. If the GPR survey indicates likelihood of encountering utilities or other obstructions at a proposed suction point or vapor monitoring point (VMP) location, said suction point/VMP will be shifted to a more suitable location at the discretion of HRP.

2.3 Sub-Slab Depressurization System (SSDS) Design

An active SSDS will be installed in the ground floor of the Subject Property as an IRM. The purpose of the SSDS will be to maintain a negative pressure beneath the building slabs (shallow slab at grade and deep slab 2-3 ft bg) to mitigate SVI and maintain CVOC concentrations in indoor air below NYSDOH AGVs. The SSDS parameters and setup will be determined by the results of a pilot test. The proposed system will initially consist of a minimum of two vertical suction points installed in the cafeteria and gymnasium. Based on the results of pilot testing following the installation of the two suction points in the cafeteria and gymnasium, up to three additional suction points may be installed if the influence achieved with two points is not adequate to maintain negative pressure under a significant portion of the shallow and deep slabs. 21 permanent VMPs are proposed for installation throughout the ground floor

of the building. The VMPs will be installed in the slab to confirm negative pressure across the slab during system pilot testing, start-up, and operation.

The system will be designed and installed in accordance with the SCGs identified in **Section 1.3** above and all applicable local, state, and federal laws, rules, and regulations. The SSDS will be installed as a permanent engineering control. Drawings showing the proposed SSDS layout, design details, and specifications are included in **Appendix A**.

Suction Point Construction for Pilot Testing

The vertical suction points will be installed against the existing floor to ceiling columns or walls in the Subject Property building to avoid potential subsurface utilities, minimize obstructions to building use, minimize trenching and penetrations of the slab, and so that the suction point risers may be bracketed against the columns/walls upon full-scale system implementation.

It is expected that the floor to ceiling columns/walls in the ground floor of the building are supported by footers beneath the concrete slab. The dimensions of the footers are unknown but will need to be investigated for purposes of installing the SSDS suction points. The concrete slab on one side of each column/wall identified to support a suction point will be sawcut such that the horizontal extent of the footer may be determined. Proposed suction point locations are identified in **Appendix A**. Upon identifying the extent of the footers, the vertical suction points will be installed below the concrete slab, adjacent to the footer.

Each suction point will consist of 4-inch slotted polyvinyl chloride (PVC) screen, 12-inches in length, installed beneath the base of the concrete slab (thickness unknown). The bottom of the screens should be fitted with 4-inch PVC caps. The top of each 12-inch slotted screen will be fitted with 4-inch to 4-inch 90° elbow connections as shown in **Appendix A** to bring the effluent end of the suction point piping close enough to the columns that the riser can be supported against the columns (pipe supports to be installed during full-scale SSDS implementation activities). Each of the 90° elbows oriented toward ground surface will be fitted with acrylonitrile butadiene styrene (ABS) risers extending approximately 1 foot above grade. All above ground piping shall consist of ABS. All fittings should be made airtight. The annular space around the PVC screen will be backfilled with No. 1 filter sand and sealed with non-shrink grout. The concrete slab will be fully restored to grade. Restoration of the slab should include installation of a 15-millimeter (mm) vapor barrier over the existing sub-base/native soil and SSDS piping. Concrete with a minimum compressive strength of 4,000 pounds per square inch (PSI) should be poured to match the existing concrete thickness. Suction point construction is depicted in **Appendix A**. While not in use for pilot testing, the suction points will be sealed with a 4-inch diameter Torquer Locking Well Plug to prevent SVI.

Vacuum Monitoring Point Construction

The VMPs will be Vapor Pin® or constructed of an approved alternative. The VMPs will be installed with a silicone sleeve, covered with a protective cap, and will possess a secure cover flush to grade with the concrete slab. The VMPs will be installed prior to pilot testing.

Full-Scale SSDS Construction

Upon construction of the full-scale SSDS, the suction points installed for pilot testing will be fitted with above grade piping. All above-grade riser piping shall consist of 4-inch diameter ABS pipe. The vertical component of each suction point riser should be fitted with a gate valve (as depicted in **Appendix A**) to channel vacuum influence as based on pilot test and start-up test results (discussed in **Section 2.4**). The riser piping will extend up existing columns/walls and/or be suspended from the ceiling using appropriate pipe supports as depicted in **Appendix A** prior to exiting through the windows on the eastern side of the Subject Property building and connecting to a regenerative blower assembly. The regenerative blower assembly will consist of a moisture separator installed prior to the regenerative blower. The regenerative blower will generate the vacuum which will maintain negative pressure beneath the slab. Depending on the analytical results associated with the pilot test, vapor phase granular activated carbon (VPGAC) may or may not be required following the regenerative blower and prior to discharge to the environment. The discharge riser from either the regenerative blower or the VPGAC treatment will extend above the roofline, as depicted in **Appendix A,** and shall be fitted with a rain cap extending five feet above the roofline so that the discharge stack is:

- A minimum of 10 feet from building air intakes or air intakes of neighboring buildings.
- A minimum of 10 feet away from any opening (i.e., window) that is less than 2 feet below the discharge stack exhaust point.

Following assembly, all above-grade pipe fittings and joints will be leak tested using ultrasonic methods. The leak testing will be performed by HRP.

An approximate four by eight-foot lean-to equipment storage shed shall be installed on the eastern exterior of the Subject Property building to house the regenerative blower assembly described above. The proposed staging location and details pertaining to the equipment shed are presented in **Appendix A**.

The specifications for the regenerative blower will be determined following review of the pilot test results (see **Section 2.3**). The regenerative blower will be hardwired to a circuit breaker located in the ground floor of the Subject Property. The blower will be hardwired to a dedicated circuit to be labeled "Environmental Exhaust Fan". The connection should be performed by a licensed electrician in accordance with all state and local laws, codes, and regulations.

To verify the system remains operational, in-line vacuum gauges with a range of 0-30-inches of water column (IWC) and vacuum alarms (RadonAway Checkpoint IIA Mitigation System Alarm or approved equal) will be installed on the riser piping at each suction point as displayed in **Appendix A**. The vacuum alarm will be equipped with an LED light and audible alarm which will activate if vacuum in the riser drops below 0.25 IWC. Additionally, a vacuum gauge with a range of 0-30 IWC will be installed after the "T" fitting which combines the effluent from all of the suction points and prior to the moisture separator. As noted in **Appendix A**, the vacuum gauge location may be adjusted while meeting these criteria such that it remains accessible.

Labels will be placed on above-grade piping which will identify the piping as being part of a SSDS and will advise occupants and workers not to alter the system. Labels will read: "SUB-SLAB

DEPRESSURIZATION SYSTEM DO NOT ALTER". Labels with arrows showing the direction of air flow will be placed on each section of pipe and at each piping intersection.

In case system maintenance is required, contact information will be included on a label placed in a visible spot on the suction point riser. The label will read:

> For SSDS maintenance please contact:
>
> Sydney Sobol
> Project Manager, NYSDEC
> 518-402-4799
> sydney.sobol@dec.ny.gov

2.4 SSDS Pilot Test and Start-Up Test

Following installation of one suction point in the cafeteria (SP-1) and one suction point in the gymnasium (SP-2) as specified in the details presented in **Appendix A**, a pilot test will be performed to measure the vacuum achieved beneath the slab. The data from this pilot test will be used to determine if additional suction points are required, determine flow rate through the system, and to collect effluent samples for modeling and (if deemed necessary) treatment design. Vacuum and flow measurements will be recorded during pilot testing and start-up testing (following final installation). System effluent sampling will be performed during pilot testing and may be performed during start-up based on pilot testing results.

Initial Pilot Test Set-Up

The initial pilot test will be run with SP-1 and SP-2 manifolded together such that their combined influence can be measured.

A portable 1.5 horsepower (HP) regenerative blower, capable of achieving 60 IWC of vacuum, will be temporarily connected to the suction points undergoing testing. A solid 4-inch PVC riser pipe will be fitted to each suction point. A gate valve will be installed in each riser such that the blower influence to each suction point can be adjusted during pilot testing. The risers shall be fitted with adapters to reduce the piping down to flexible hose. The flexible hosing from each suction point will be manifolded together with a "T" fitting. The effluent end of the "T" fitting will be connected to a PVC pipe. A sample port shall be installed in the PVC pipe to allow for collection of air samples and flow measurements. The sample port should be a drilled hole of appropriate size to accommodate equipment for pilot test readings and air sampling. The sample port shall be sealed at all times, except during collection of readings or samples. The sample port shall be installed no less than 8.5 pipe diameters from the "T" fitting. A minimum of 8.5 pipe diameters following the sample port, the PVC piping shall be fitted with a dilution valve which can be implemented during pilot testing to adjust blower influence. Following the dilution valve, flexible hosing or PVC piping may be implemented to connect the assembly to the blower. It is not anticipated that a moisture separator will be required for the pilot test, but a moisture separator shall be provided and installed in the assembly described above a minimum of 8.5 pipe diameters from the sample port and prior to the blower if signs of water intrusion into the suction point and piping are observed. Following the regenerative blower, effluent will be exhausted through piping/hosing to the nearest building exit (or most feasible exit as based on conditions at the time of pilot testing). Based on the results of the

preliminary AERSCREEN described under Effluent Sampling below, VPGAC treatment of the pilot test effluent will not be required prior to discharge to the environment. However, discharge from the pilot test should extend approximately 8 feet above ground surface.

Pilot Testing Methodology

Prior to the initial pilot test, a series of baseline measurements will be collected, which will include the following activities (prior to applying vacuum):

- Collect vacuum readings in inches of water column (IWC) using a magnehelic gauge or digital manometer at the sample port and each VMP;
- Collect VOC readings in parts per million (ppm) using a calibrated photoionization detector (PID) at the suction point sample port and each VMP;
- Collect ambient air temperature (in ˚C) at the suction point sample port; and
- Collect ambient air pressure.

The sample port will be sealed around sampling equipment to reduce potential leaking influences.

Following collection of baseline parameters, the initial SSDS test will be performed by applying full vacuum (no dilution). The SSDS will be allowed to run for thirty minutes. Following thirty minutes and while the SSDS is still running, the following parameters will be monitored at the sample port a minimum of one time:

- Applied vacuum (IWC) using a magnehelic gauge;
- Air velocity (ft/minute) using a calibrated digital anemometer and/or differential pressure (IWC) using a pitot tube;
- Air temperature (˚C);
- VOC reading (ppm) using a PID;

The following parameters will be monitored at each VMP:

- Induced vacuum readings (IWC) using a magnehelic gauge.

If each of the VMPs exhibits a minimum of 0.004 IWC, the dilution valve may be gradually adjusted to target three percentages of blower capacity (steps) to determine the minimum blower capacity required to achieve 0.004 IWC in all VMPs. The steps which will be targeted are approximately 30%, 60% and 90% of the blower capacity. At each step the SSDS will be allowed to run for thirty minutes. Following thirty minutes and while the SSDS is still running, applied vacuum, air velocity, air temperature, and VOCs readings will be taken a minimum of one time per step at the sample port and one round of induced vacuum readings will be taken from each VMP during each step. Additionally, if preferential flow is observed such that one suction point is achieving influence much greater than 0.004 IWC from its associated VMPs and the other suction point is at or only slightly exceeding 0.004 IWC, the suction point gate valves may be adjusted such that the vacuum influence is more evenly distributed.

Additional Suction Points and Pilot Testing

If each of the VMPs does not exhibit a minimum of 0.004 IWC with the blower running at full capacity, additional suction points will be installed at the discretion of HRP. Depending on the vacuum influence observed during the initial pilot test, one suction point may be installed at a time until sufficient influence is achieved for up to three additional suction points, beyond SP-1 and SP-2 (up to five suction points total). If HRP deems significant additional influence is required, all three additional suction points may be installed at once. Following the addition of one or more suction points an additional pilot test will be performed. For example, if two additional suction points are installed per HRPs direction, a second pilot test will be performed with SP-1, SP-2, and the two newly installed suction points. If it is then determined that one additional suction point is required, a third pilot test will be performed with SP-1, SP-2, the two additional suction points installed prior to the second pilot test, and the newly installed suction point.

The pilot testing assembly will remain consistent for each additional pilot test beyond the initial pilot test in that all suction points installed at the time of each test will be connected to a portable 1.5 horsepower (HP) regenerative blower, capable of achieving 60 IWC of vacuum. A solid 4-inch PVC riser pipe will be fitted to each suction point. A gate valve will be installed in each riser such that the blower influence to each suction point can be adjusted during pilot testing. The risers shall be fitted with adapters to reduce the piping down to flexible hose. The flexible hosing from each suction point will be manifolded together with a fitting capable of manifolding three to five suction points. The effluent end of the manifold fitting will be connected to a PVC pipe with a sample port consistent with the pilot test assembly described above. The remainder of the assembly will be consistent with the pilot test assembly described above.

The pilot test methodology described above will remain consistent for each pilot test run. Baseline readings (same parameters as described for initial pilot test) will be taken following the installation of all suction points to be included in the pilot test but prior to applying vacuum. Following collection of baseline parameters, the test will be performed by applying full vacuum (no dilution). Readings will again be collected from the sample port and VMPs as described for the initial pilot test. If each of the VMPs exhibits a minimum of 0.004 IWC, the dilution valve may be gradually adjusted to target three percentages of blower capacity (steps) to determine the minimum blower capacity required to achieve 0.004 IWC in all VMPs. The same steps will be targeted as described for the initial pilot test and the same monitoring procedure will apply. Additionally, if preferential flow is observed such that one suction point is achieving influence much greater than 0.004 IWC from its associated VMPs and the other suction points are at or only slightly exceeding 0.004 IWC (or vice versa), the ball valves may be adjusted such that the vacuum influence is more evenly distributed.

Start-Up Testing

Start-up testing will be similar to pilot testing. Following installation of the SSDS components as described above, a start-up test will be performed to confirm vacuum beneath the slab, balance flow and vacuum through the system using suction point gate valves, determine flow rate through the system, and to collect supplemental effluent samples for modeling to determine if VPGAC treatment is necessary. Vacuum and flow measurements will be recorded and system effluent sampling will be

performed, as deemed necessary based on pilot testing results (samples only to be collected at time of start-up if pilot test results indicate VPGAC is required).

During start-up testing, vacuum readings will be recorded from the vacuum gauges installed at each suction, the vacuum gauge installed prior to the regenerative blower assembly, and at the permanent VMPs as described for pilot testing. The system shall achieve a vacuum of no less than 0.004 IWC at each of the monitoring points. If the target vacuum rate is not reached at the monitoring points, the system design will be re-evaluated. Flow rates will be recorded at the sample port (location displayed in **Appendix A**). Flow rates will be collected as described for pilot testing. If VPGAC is installed, one sample will be collected at the sample port while the system is running to serve as the pre-treatment sample. One sample will also be collected following the VPGAC to serve as the post-treatment sample. A temporary sample port (consistent with the construction described for the pilot test sample port) will be installed in the effluent piping and sealed to be airtight once sampling is complete. Sampling methodology is described below.

Effluent Sampling and AERSCREEN Modeling

Effluent samples will be collected during pilot testing and (if deemed necessary) during start-up testing. A grab air sample will be collected from the sample port installed in the system piping during one pilot test. Once a sufficient amount of suction points are installed to achieve a minimum of 0.004 IWC in each VMP, as confirmed through testing, the sample will be collected from the combined effluent of these suction points. Pilot test and start-up test samples (as needed) will be grab samples. The samples will be collected using 3-liter summa cannisters fitted with 15-minute regulators. The samples will be submitted under chain of custody to an ELAP-certified laboratory to be analyzed for VOCs by EPA Method TO-15. Prior to sampling, effluent will be screened using a calibrated photoionization detector (PID).

The effluent air samples will be evaluated for toxicity and impacts on the receptors downwind using the NYSDEC DAR Guidelines for the Control of Toxic Ambient Air Contaminants, AERSCREEN dispersion model (AERSCREEN). AERSCREEN is a screening model based on the USEPA AERMOD air quality dispersion model to predict ambient air concentrations attributed to a single source. The input parameters include total VOC concentrations, effluent loading rates, stack height, flow rates, velocity, and the distance to any receptors. The modeling will be completed for the VOCs using the NYSDEC's AERSCREEN dispersion model. The results will be compared to the NYSDEC's Annual Guidance Concentration (AGCs) and Short-Term Guidance Concentrations (SGCs) included in *DAR Policy DAR-1: Guidelines for the Evaluation and Control of Ambient Air Contaminants under 6 NYCRR Part 212*, *February 2021*. The AERSCREEN results will be used to determine if the levels are acceptable for discharge to the atmosphere without any vapor phase treatment during the full-scale SSDS operation.

A preliminary AERSCREEN has been run implementing sub-slab soil vapor data collected during the SVI investigation conducted in February 2024 and using an assumed system flow rate of 150 actual cubic feet per minute (acfm). The results of the AERSCREEN modeling showed that the emissions of VOCs would result in impacts below all applicable SCGs and ACGs. Preliminary AERSCREEN results are presented in **Appendix D**. Given the results of the AERSCREEN, sub-slab soil vapor generated at this Site is preliminarily acceptable for discharge to the atmosphere without vapor phase treatment units during the SSDS pilot testing activities and full-scale SSDS operation. However, an additional AERSCREEN analysis will be performed following pilot testing based on the analytical data associated

with the sample collected during the pilot test. If start-up testing is deemed necessary (pilot test data indicates VPGAC is required), another AERSCREEN analysis will also be performed with the start-up data.

2.5 Performance Monitoring Indoor Air Sampling

To ensure that the SSDS has effectively reduced concentrations of CVOCs in indoor air to background levels, a minimum of two rounds of indoor air samples will be collected after system start-up. The first round of samples will be collected a minimum of 30 days after system start-up. As it is anticipated systems start-up will occur during summer months, a second round of indoor air samples will be collected during the heating season, as defined by the NYSDOH (November 15 – March 31). Each post-mitigation air sampling event will include the collection of two ground floor indoor air samples (one sample to be collected from the cafeteria and one sample to be collected from the gymnasium) and one outdoor air sample. Samples will be collected using 6-liter summa cannisters outfitted with 8-hr regulators. All samples will be analyzed for VOCs via EPA Method TO-15 by an ELAP-certified laboratory.

Sampling should include the completion of a building questionnaire and chemical product inventory in accordance with the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York,* October 2006 (including all subsequent revisions and updates).

2.6 Disposal of Subject Property Concrete and Soils

Waste concrete and soil generated during the installation of suction points and VVMPs should be properly containerized, characterized, and disposed of in accordance with DER-10 and applicable local, state, and federal guidelines. It is anticipated concrete will be disposed of as construction and demolition (C&D) waste. Generation of waste soil is not anticipated as part of the SSDS installation.

2.7 Permitting

The remedial contractor will be required to obtain a permit from the New York City Department of Buildings (NYCDOB). The contractor will submit signed and stamped SSDS drawings to the NYCDOB as part of the permit application prior to SSDS installation. If the system design is modified following the pilot test, updated drawings should be submitted to the NYCDOB and, if necessary, a permit modification should be requested. It is anticipated that the NYCDOB will require an inspection of the completed system prior to start-up which will be coordinated with the remedial contractor and HRP.

2.8 Operation and Maintenance (O&M)

Periodic O&M inspections of the SSDS will be performed by the NYSDEC call-out contractor to ensure the system is operating effectively. Final O&M procedures (including minimum vacuum rates at the suction point riser and VMPs) and frequency of O&M inspections will be determined following installation and start-up of the system. The inspections will include:

- A visual inspection of the regenerative blower, above-grade piping, carbon treatment (if applicable), wall/ceiling supports, labels, vacuum gauges, and alarms to ensure the system is operational and in good condition.

- A reading of the vacuum gauges installed on the suction point risers and blower influent and effluent piping to ensure minimum vacuum levels are being met (to be established following system start-up).
- A visual inspection of the circuit breaker to ensure the circuit labeled "Environmental Exhaust Fan" is on and is properly labeled.
- Collection of vacuum readings from each of the VMPs using a magnehelic gauge or micromanometer to ensure minimum vacuum levels are being met (to be established following system start-up).
- A visual inspection of the ground floor slab to ensure no new cracks or penetrations are present (including penetrations installed by the property owner for drainage, utilities, etc.).
- A visual inspection of the effluent piping and effluent discharge stack to ensure it is properly affixed to the building, the rain cap remains in-tact, and no new air intakes are visible within 10 feet. As access to the rooftop is available, the inspector will also verify that no new equipment has been installed on the building rooftop.
- Inspection of indoor piping and fittings for leaks using ultrasonic methods or an approved alternative.
- Changeout of the carbon treatment system substrate, as needed, if applicable.

Although completion of routine O&M inspections are the responsibility of the NYSDEC call-out contractor, the Subject Property owner and Growing Up Green Elementary School maintenance staff will be provided with an O&M checklist which includes system operating criteria and conditions which can be easily evaluated by the owner, occupant, or tenant (e.g., piping condition, vacuum alarm statuses, vacuum gauges). A laminated copy of the O&M checklist will remain at the Subject Property in a readily accessible and visible location so it may be used by the Subject Property owner and occupants. If it is determined by the owner/occupant that the system is not operating as designed, the inspection checklist will instruct the owner/occupant to contact NYSDEC to request system maintenance. Contact information for the NYSDEC Project Manager, Ms. Sydney Sobol, will be included in the O&M checklist and on a label located on the suction point riser as described in **Section 2.4** above.

2.9 Green and Sustainable Best Management Practices (BMPs)

Green and sustainable remediation best management practices (BMPs) identified for implementation during this project are detailed below.

- The regenerative blower will be sized based on results of the pilot test in order to provide the minimum sub-slab vacuum necessary to prevent SVI (0.004 IWC) while minimizing electricity usage, thereby minimizing emission of carbon dioxide (CO_2) and other greenhouse gases (GHGs) associated with electricity generation during system operation.
- The regenerative blower used during pilot testing will operate on single-phase electricity from a wall outlet in the Subject Property building, thereby eliminating CO_2 emissions associated with a gasoline powered generator.
- Leak testing of system piping will be performed using ultrasonic methods in lieu of a positive pressure test in order to eliminate CO_2 emissions associated with operation of a gasoline powered air compressor.

- Gate valves will be installed in the riser piping of each suction point such that the vacuum and flow through the system can be adjusted to optimize blower efficiency.

2.10 Engineer's Cost Estimate

HRP has prepared an engineer's cost estimate for implementation of the IRM. The cost estimate includes engineer (HRP), contractor, and laboratory costs associated with SSDS installation, pilot testing, and start-up testing. The cost estimate does not include system O&M costs. The engineer's cost estimate is included in **Appendix E**.

2.11 Health and Safety Plan (HASP)

HRP has prepared a site-specific HASP to provide health and safety guidance for HRP personnel during the implementation of activities described in this SOW, included in **Appendix F**. The contractor will be responsible for preparing a HASP to be submitted to HRP and the NYSDEC for approval. The contractor shall take necessary precautions for the health and safety of all on-site, per 29 CFR 1910 and 29 CFR 1926 and applicable provisions of federal, state, and local health and safety laws. The contractor shall designate a responsible representative at the Subject Property to act as the Subject Property's Health and Safety officer whose duties include executing and ensuring compliance with the approved HASP.

2.12 Community Air Monitoring Plan (CAMP)

To ensure the protection of occupants of the Subject Property, HRP has developed and will implement a Community Air Monitoring Program (CAMP), which requires real time monitoring of volatile organics and dust during implementation of the IRM. The CAMP, included as **Appendix G**, will be implemented during all intrusive activities including the installation of vertical suction points and VMPs as described in **Section 2.2** of this Work Plan. Special requirements for indoor work with co-located residences or facilities will be adhered to when intrusive activities are performed indoors as described in **Appendix G**.

2.13 Construction Completion Report (CCR)

HRP will complete a Construction Completion Report (CCR) for the IRM in accordance with Section 5.8 of DER-10. A description of the activities completed in accordance with this SOW will be provided in the CCR. The CCR will include as-built drawings of the SSDS, a photographic log of SSDS installation and other on-site activities, results of pilot testing and start-up testing, effluent sampling analytical data and modeling results, system O&M criteria including an inspection checklist, and any changes or deviations in the system design or any other part of this SOW.

2.14 Roles and Responsibilities

<u>New York State Department of Environmental Conservation (NYSDEC)</u>

The NYSDEC is responsible for the administration of the IRM and coordination with HRP. They will receive and review daily reports from HRP's on-site construction inspector, coordinate review and changes to the design/SOW with all parties, and coordinate access to the Subject Property. Following

system start-up, NYSDEC will coordinate O&M inspections and any maintenance required for the SSDS with the Subject Property owner and tenants/occupants, and a NYSDEC on-call contractor.

HRP Associates, Inc. (HRP)

HRP will provide dedicated full-time engineering oversight during the IRM, reporting to NYSDEC IRM Project Manager, Ms. Sydney Sobol. HRP will be responsible for identifying areas of the concrete slab in need of repair/sealing and inspecting repair/sealing following restoration. HRP will be responsible for collecting data during pilot and start-up testing including vacuum, flow measurements, and system effluent sampling. HRP will provide the necessary monitoring devices (magnehelic gauges, pitot tube, PID) and lab equipment (summa cannisters). Following the collection of pilot test data HRP will make any necessary revisions to the SSDS design plans which will be discussed with the NYSDEC and the contractor. The final SSDS plans will be signed and stamped by HRP's licensed professional engineer (PE). During system installation HRP will provide oversight to ensure the system is installed according to specifications and document installation work for the preparation of as-built drawings and the CCR. During installation and data collection, HRP will provide daily reports to the NYSDEC. Following assembly of above-grade piping HRP will perform ultrasonic leak testing of all above-grade connections and joints. Work will not begin until approval has been granted by the NYSDEC.

NYSDEC On-Call Contractor

IRM implementation will be completed by the contractor. The SOW for the contractor will include:

- Development of a HASP which takes all necessary precautions for the health and safety of all on-site contractor employees with all federal, state, and local health/safety laws; and Site-specific provisions.
- Designate a Health and Safety officer to ensure compliance with the approved Health and Safety Plan.
- Permitting (**Section 2.7** provides detail regarding permitting).
- Procurement of materials required for concrete slab repair/sealing and SSDS pilot testing/installation including but not limited to concrete, subbase, vapor barrier, suction point materials, Vapor Pins®, the regenerative blower, piping, sample port hardware, permanent vacuum gauges, vacuum alarms, brackets, and labels.
- Procuring services of a utility locator to perform a GPR survey of the entire ground floor of the Subject Property building prior to performing any ground intrusive activities.
- Providing labor, tools, and equipment necessary to complete potential concrete slab repair/sealing and SSDS pilot testing/installation work.
- Disposal of waste soil and concrete generated.
- Selection of NYS-approved disposal facilities for all materials removed from the Subject Property and notifying the NYSDEC of selection.
- Obtaining manifests and other disposal documentation to be submitted to HRP and the NYSDEC.
- Performing routine O&M inspections and routine and non-routine maintenance work if required.

Subject Property Owner

The Subject Property owner will be responsible for providing access to the Subject Property and removing stored items from the ground floor and Subject Property building exterior as necessary to complete the SOW.

As discussed in **Section 2.8** above, the Subject Property owner will be provided with an O&M checklist so that the owner as well as tenants/occupants are aware of proper system operating conditions (e.g., piping condition, vacuum alarm statuses, vacuum gauges) and know to contact NYSDEC if a system malfunction occurs.

3.0 PROJECT SCHEDULE

A preliminary schedule of tasks outlined in this SOW is included in the table below. Schedule timeframes will vary based on NYCDOB permit review time and availability of materials. Schedule assumes minimal revisions to the SSDS design will be required following pilot testing.

Task	Duration (days)	Est. Start Date	Est. Completion Date
Subject Property Scoping Visit	1	4/22/2024	4/22/2024
SSDS Design (Includes NYSDEC review)	76	4/22/2024	7/8/2024
Obtain NYCDOB Permit	28	6/10/2024	7/8/2024
Concrete Slab Inspection, Repair (if applicable); Suction Point and VMP Installation and Pilot Test	3	7/15/2024	7/17/2024
Additional Suction Point Installation and Pilot Testing (as needed based on Pilot Test)	2	7/18/2024	7/19/2024
Review Pilot Test Data, Specify Full-Scale SSDS Equipment, EAR Obtain Equipment/Supplies for Full-Scale Implementation (Blower to be installed at later date if lead time exceeds 14 days).	14	7/22/2024	8/05/2024
SSDS Installation	5	8/05/2024	8/09/2024
NYCDOB Inspection & SSDS Start-Up (Date subject to change based on blower lead time, inspection and startup to directly follow blower installation if blower lead time exceeds the 14 days specified above).	1	8/12/2024	8/12/2024
Performance Monitoring Indoor Air Sampling – 1st Round (Date subject to change based on blower lead time, sampling to be performed 30 days after SSDS startup).	1	9/12/2024	9/12/2024
Submission of Final CCR (Includes NYSDEC review) (Date subject to change based on blower lead time, report to be submitted 30 days after 1st Round of Performance Monitoring is completed).	30	9/12/2024	10/12/2024
Performance Monitoring Indoor Air Sampling – 2nd Round (Heating Season)	1	11/15/2024	11/15/2024

4.0 PROJECT CONTACTS

The personnel identified in the table below will fulfill project requirements, roles, and responsibilities to complete this SOW.

Name	Project Role	Company	Phone	Email
Marnie DeLuke	DEC Project Manager	NYSDEC Central Office (Albany)	518-402-3262	marnie.deluke@dec.ny.gov
Sydney Sobol	DEC Project Manager	NYSDEC Central Office (Albany)	518-402-4799	sydney.sobol@dec.ny.gov
Dan Tucholski	Environmental and Exposure Evaluation	New York State Department of Health	518-486-7016	daniel.tucholski@health.ny.gov
Jamie Allen	IRM Construction Manager	Environmental Assessment & Remediations	631-447-6400 Ext. 153	allen@enviro-asmnt.com
Patrick Montuori, PG	HRP Project Manager	HRP Associates, Inc.	518-877-7101 Ext. 1411	patrick.montuori@hrpassociates.com
Glenn Netuschil, PE	HRP Professional Engineer	HRP Associates, Inc.	518-877-7101 Ext. 1409	glenn.netuschil@hrpassociates.com
Liam Whalen	HRP Associate Consultant/On-Site Construction Oversight	HRP Associates, Inc.	518-877-7101 Ext. 1413	liam.whalen@hrpassociates.com
Rev. Robert M. Powers	Subject Property Owner	St. Patrick Roman Catholic Church & School	Rectory Phone number: (718)729-6060	father.rob.powers@gmail.com

FIGURES

Figure 1
Site Location - 39-27 28th Street
Long Island City, Queens, New York
27-09 40th Avenue Off-Site
Site # C241241A
HRP # DEC1033.P2
Scale 1" = 2,000'

USGS Quadrangle Information
Quad ID: 40073-G8
Name: Central Park, New York

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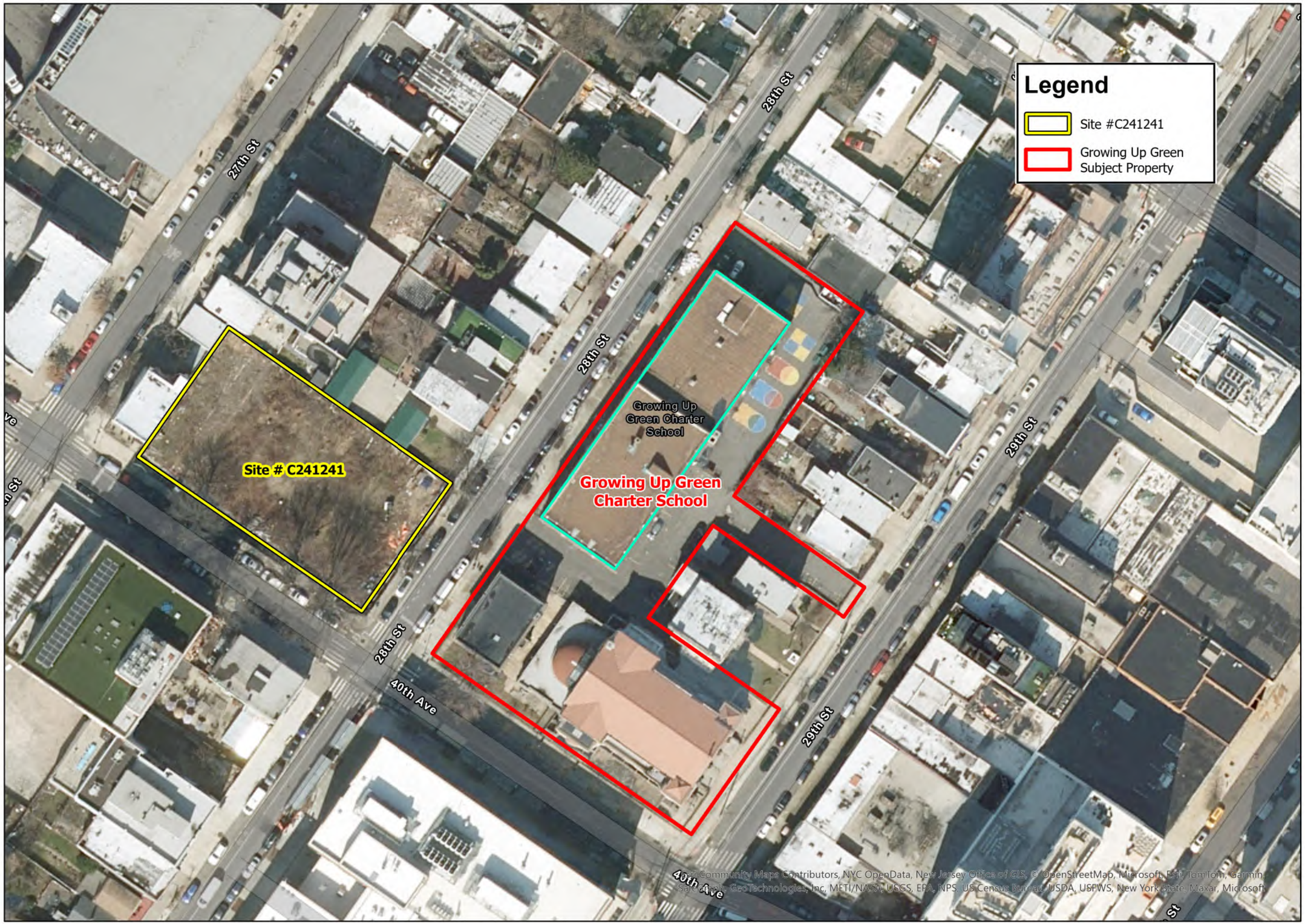
Path: S:\Data\NI\NYDEC - NYSDEC\NEW YORK\MULTIPLE SITES\DEC1033P2\GIS\27-09_40thAve\27-09_40thAve.aprx



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North

0 30 60
Feet

Revisions					
No.	Date				

Designed By: LW
Drawn By: BOB
Reviewed By: PWM

Issue Date: 02/20/2024
Project No: DEC1033.P2
Sheet Size: 11x17

Surrounding Property Use

Growing Up Green
39-27 28th Street
Site #C241241A
27-09 40th Avenue
Long Island City, Queens, NY

Figure No.
2

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APPENDIX A
SUB-SLAB DEPRESSSURIZATION SYSTEM (SSDS) DRAWINGS

BUILDING CHARACTERISTICS

BLOCK: 398
LOT:1
OCCUPANCY CLASS: G:EDUCATION
CONSTRUCTION CLASS:1
MDC: N/A
BUILDING HEIGHT: 30'
BUILDING STORIES: 3

JOB DESCRIPTION

INSTALLATION OF SUB SLAB DEPRESSURIZATION SYSTEM TO MITIGATE SOIL VAPOR INTRUSION.
NO CHANGE IN USE, EGRESS, OR OCCUPANCY.

PROGRESS INSPECTIONS (TR1):
[ ] FINAL INSPECTION 28-116.2.4.2, BC 110.5, AND 1 §RCNY 101-10

PROFESSIONAL STATEMENT

PROPOSED SCOPE IS EXEMPT FROM 2020 NYCECC AS IT DOES NOT ALTER THE EXISTING FAÇADE, ROOF, INSULATION, MECHANICAL OR SERVICE HOT WATER SYSTEMS OR RELATED DUCTWORK, NOR INTERIOR OR EXTERIOR LIGHTING.

PLOT PLAN
NTS

THIS PROPERTY IS NOT LOCATED IN SPECIAL FLOOD HAZARD AREA.

STATE OF NEW YORK
GLENN NETUSCHIL
074747
LICENSED PROFESSIONAL ENGINEER

GENERAL CONSTRUCTION
JOB# Q01065151-I1

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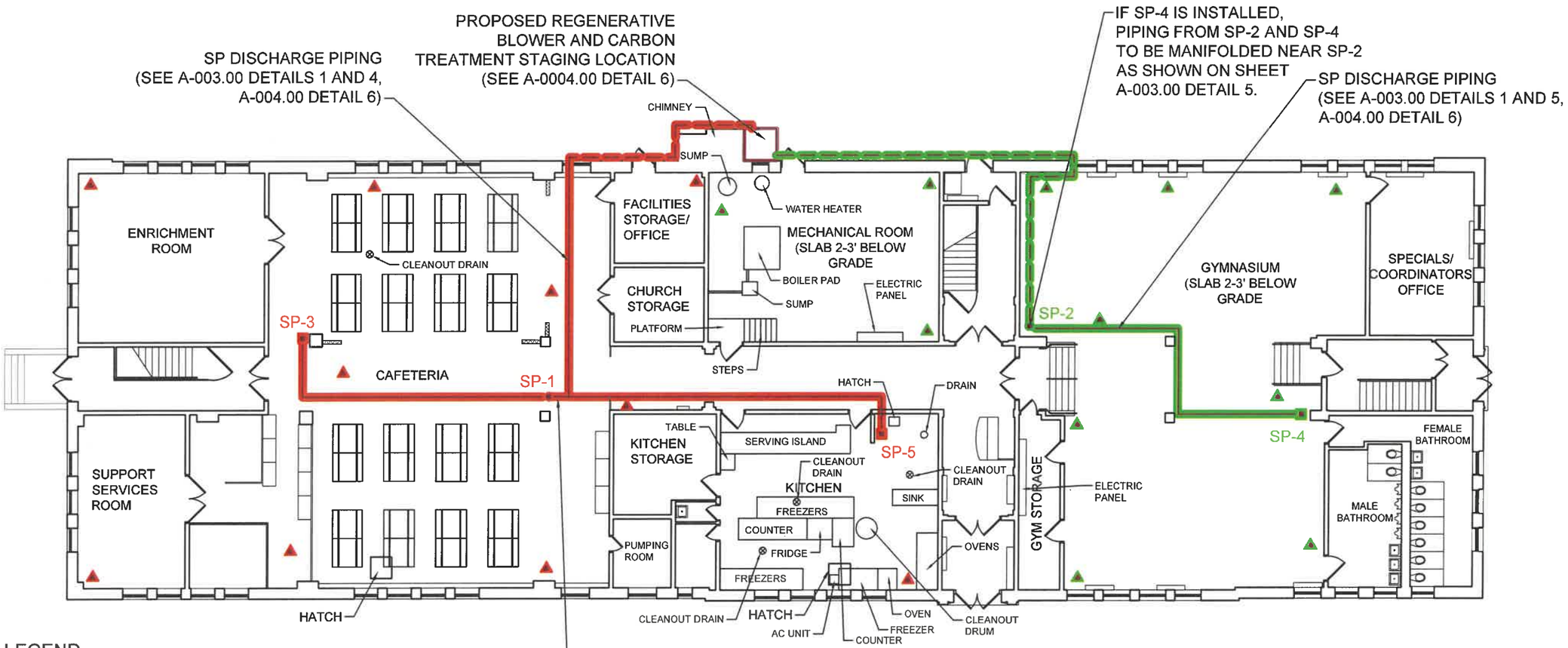
REVISIONS		DESIGNED BY:	REVIEWED BY:	ISSUE DATE:	GROWING UP GREEN ELEMENTARY 39-27 28TH STREET LONG ISLAND CITY, NEW YORK PROPOSED SSDS	SHEET NO.
NO.	DATE	MR	GN	06/06/2024		**T-001.00**
		DRAWN BY:	PROJECT NUMBER:	SHEET SIZE:		SHEET 01 OF 06
		BOB	DEC1033.P2	11"x17"		



LEGEND

- SP -SUCTION POINT (SP) (SEE A-003.00 DETAILS 1 AND 2)
- -VAPOR MONITORING POINT (VMP)
- -VMP ASSOCIATED WITH SP IN CAFETERIA (SEE A-003.00 DETAIL 3)
- -VMP ASSOCIATED WITH SP IN GYMNASIUM (SEE A-003.00 DETAIL 3)
- -SUCTION POINT PIPING SUSPENDED FROM CEILING
- -SUCTION POINT PIPING SECURED TO WALL
- -SUCTION POINT (SP) PROPOSED FOR INSTALLATION AS NEEDED BASED ON RESULTS OF PILOT TEST OF SP-1 AND SP-2. (SEE A-003.00 DETAILS 1 AND 2)

IF SP-3 AND SP-5 ARE INSTALLED, PIPING FROM SP-1, SP-3, AND SP-5 TO BE MANIFOLDED NEAR SP-1 AS SHOWN ON SHEET A-003.00 DETAIL 4.

SCALE 1/16" = 1'-0"

NOTES:
INTERIOR FEATURES ARE APPROXIMATE.
SUCTION POINTS, VMP LOCATIONS, AND PIPING ROUTES ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS.

MAP REFERENCE:
"GROUND FLOOR PLAN, PRELIMINARY SOCIAL DISTANCING CAPACITY STUDY, PROJECT GROWING UP GREEN - ES, 39-27 28TH STREET, LONG ISLAND CITY, NEW YORK 11101"; DWG NO A-100.00; DATE 9 JULY 2020; PROJECT NO. 19261; SHEET 1 OF 3; PREPARED BY CTA ARCHITECTS P.C.

STATE OF NEW YORK ★ GLENN NETUSCHIL ★ LICENSED PROFESSIONAL ENGINEER 074747

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NORTH

0 8' 16'

REVISIONS	
NO.	DATE

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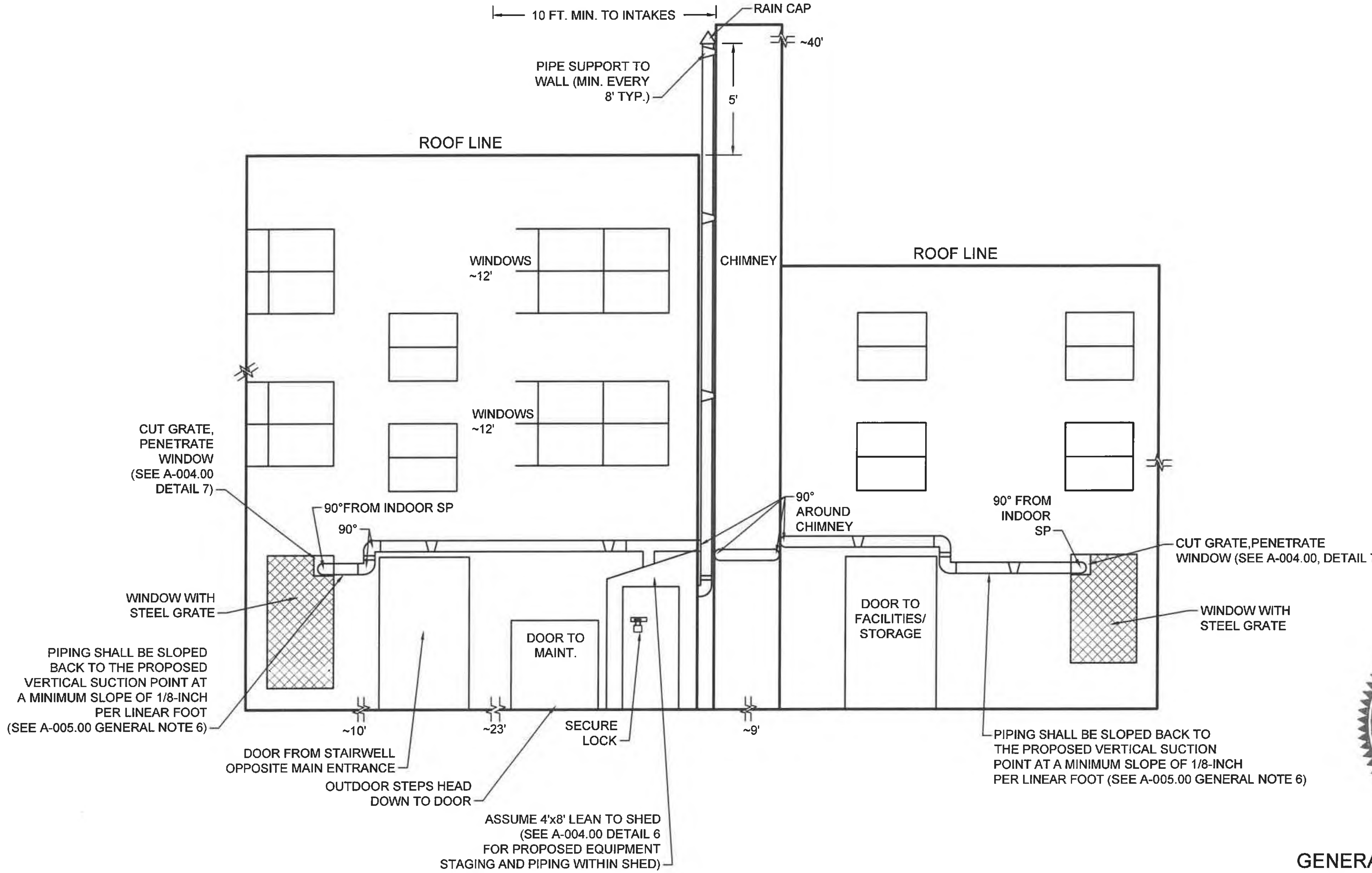
MR	PWM	06/06/2024
DRAWN BY:	PROJECT NUMBER:	SHEET SIZE:
BOB	DEC1033.P2	11"x17"

PROPOSED SSDS
INTERIOR GROUND FLOOR LAYOUT

GROWING UP GREEN ELEMENTARY
39-27 28TH STREET
LONG ISLAND CITY, NEW YORK

SHEET NO.
A-001.00
SHEET 02 OF 06



STATE OF NEW YORK
GLENN NETUSCHIL
074741
LICENSED PROFESSIONAL ENGINEER

NOTE:
ALL DIMENSIONS AND FEATURES ARE APPROXIMATE.

GENERAL CONSTRUCTION
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MR	GN	06/06/2024
DRAWN BY:	PROJECT NUMBER:	SHEET SIZE:
BOB	DEC1033.P2	11"x17"

PROPOSED SSDS
EXTERIOR LAYOUT

GROWING UP GREEN ELEMENTARY
39-27 28TH STREET
LONG ISLAND CITY, NEW YORK

SHEET NO.
A-002.00
SHEET 03 OF 06

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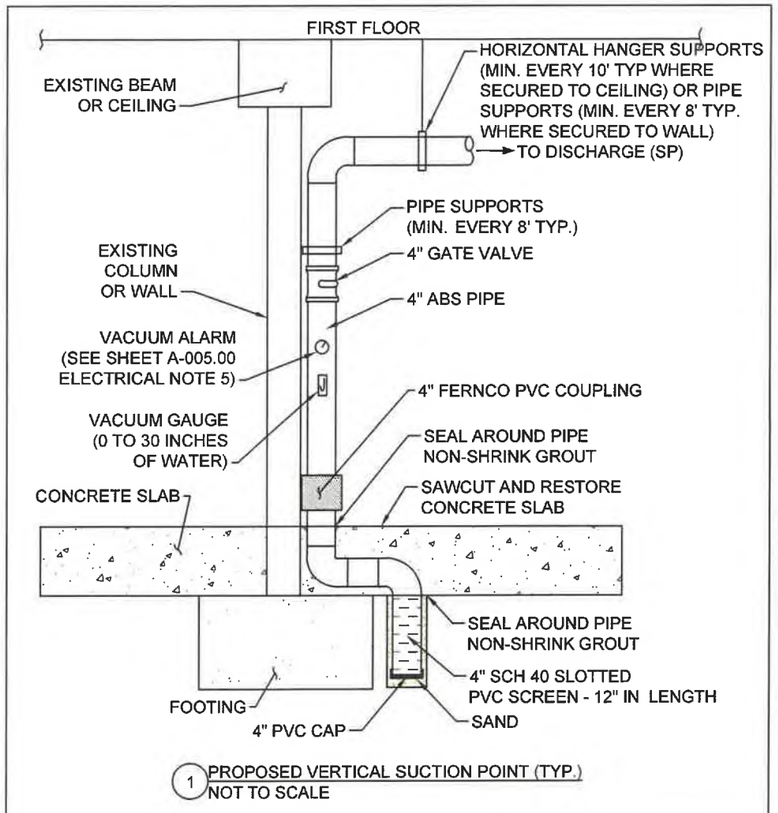
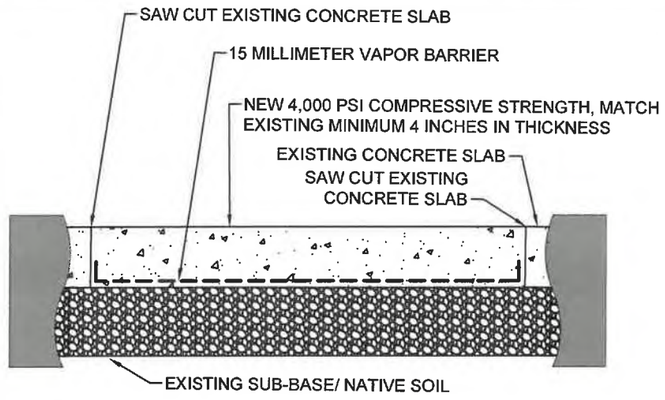
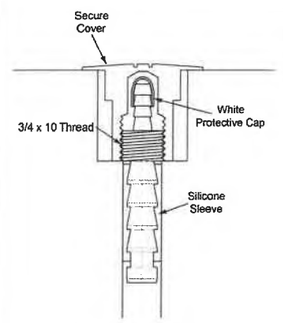


1 PROPOSED VERTICAL SUCTION POINT (TYP.)
NOT TO SCALE

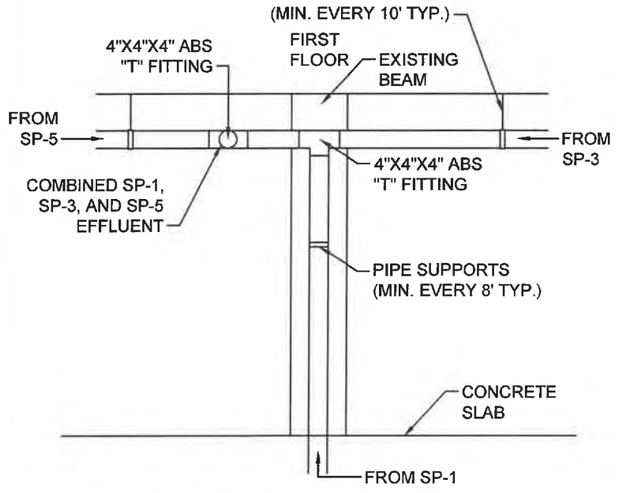


2 TYPICAL CONCRETE SLAB REPAIR DETAIL
NOT TO SCALE

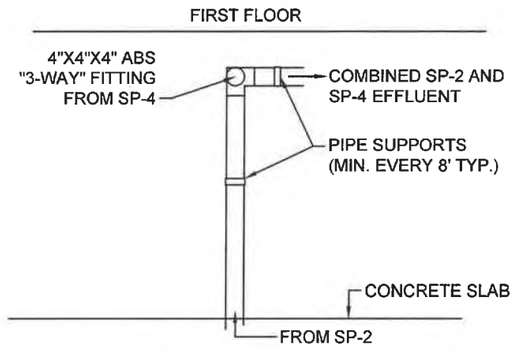


NOTE:
VACUUM MONITORING POINT CONSTRUCTED OF VAPOR PIN® OR APPROVED ALTERNATIVE

3 PROPOSED VACUUM MONITORING POINT
NOT TO SCALE



4 SP-1, SP-3, AND SP-5 MANIFOLD
NOT TO SCALE



5 SP-2 AND SP-4 MANIFOLD
NOT TO SCALE

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MR	GN	06/06/2024
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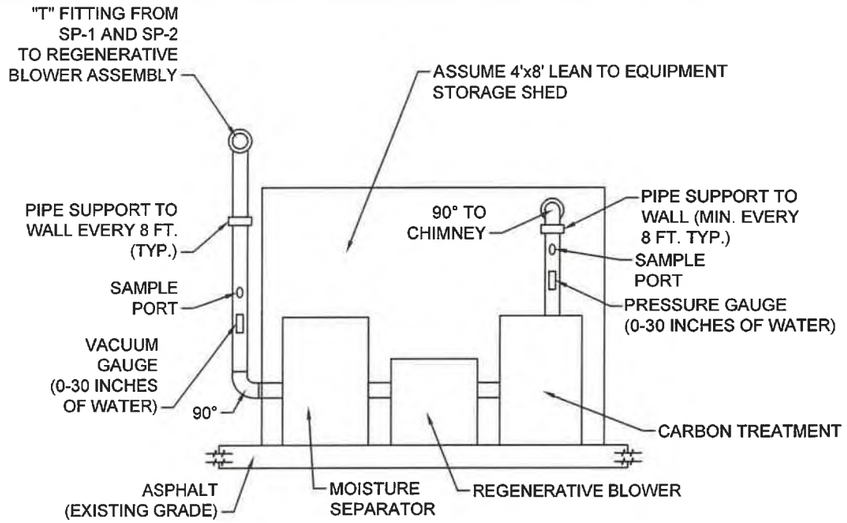
BOB	DEC1033.P2	11"x17"

PROPOSED SSDS
PILOT TEST DETAILS

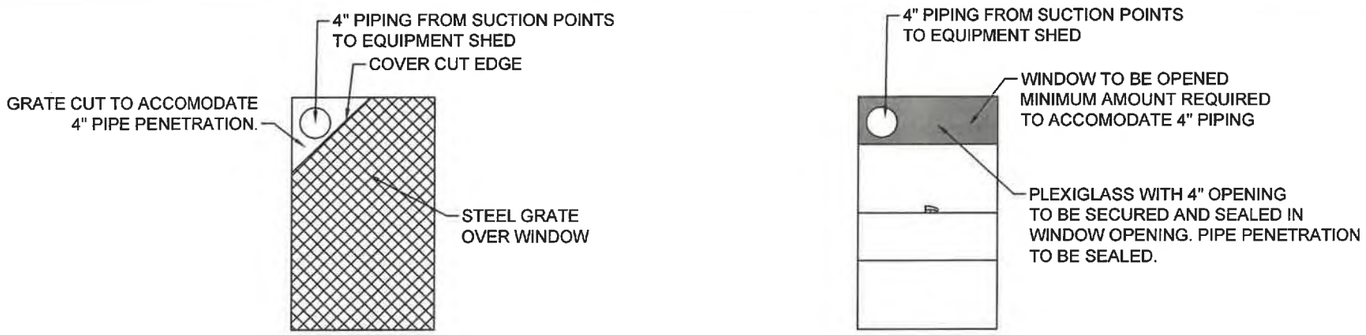
GROWING UP GREEN ELEMENTARY
39-27 28TH STREET
LONG ISLAND CITY, NEW YORK

SHEET NO.
A-003.00
SHEET 04 OF 06



NOTES:
1. CARBON TREATMENT AS NEEDED BASED ON RESULTS OF PILOT TESTING (SEE SHEET A-005.00 CARBON NOTE 1)
2. MOISTURE SEPARATOR, REGENERATIVE BLOWER, AND EQUIPMENT STORAGE SHED TO BE SPECIFIED BASED ON RESULTS OF PILOT TEST (SEE A-005.00 BLOWER NOTE 2)
3. SAMPLE PORT AND VACUUM GAUGE PLACEMENT SHALL BE ADJUSTED AS NECESSARY TO MAINTAIN ACCESSIBILITY. THE SAMPLE PORT AND VACUUM GAUGE SHALL BE PLACED AFTER THE EFFLUENT MANIFOLD AND PRIOR TO THE MOISTURE SEPARATOR, REGENERATIVE BLOWER, AND CARBON TREATMENT ASSEMBLY.

(6) PROPOSED REGENERATIVE BLOWER AND CARBON TREATMENT
NOT TO SCALE



NOTES:
1. GRATE TO BE CUT SUCH THAT THE MINIMUM AMOUNT OF THE GRATE REQUIRED TO ACCOMMODATE THE PIPING IS REMOVED.
2. ANY REMAINING SHARP EDGES ON THE GRATE WHICH POSE A HEALTH AND SAFETY RISK SHALL BE COVERED (MATERIAL TO BE SPECIFIED).
3. PLEXIGLASS AND PIPING PENETRATIONS SHALL BE AIR TIGHT. MATERIALS WITH WHICH TO SECURE AND SEAL PLEXIGLASS TO BE SPECIFIED.
4. SEE GEN, GENERAL NOTE 4

(7) PROPOSED WINDOW PENETRATION
NOT TO SCALE

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REVISIONS		DESIGNED BY:	REVIEWED BY:	ISSUE DATE:	PROPOSED SSDS PILOT TEST DETAILS	SHEET NO.
NO.	DATE	MR	GN	06/06/2024		A-004.00
		DRAWN BY:	PROJECT NUMBER:	SHEET SIZE:	GROWING UP GREEN ELEMENTARY 39-27 28TH STREET LONG ISLAND CITY, NEW YORK	SHEET 05 OF 06
		BOB	DEC1033.P2	11"x17"		

GENERAL NOTES:

1. THE SYSTEM INSTALLATION SHALL BE IN CONFORMANCE WITH THE OCTOBER 2006 FINAL GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK PREPARED BY NEW YORK STATE DEPARTMENT OF HEALTH (NYSDOH) AND ALL APPLICABLE PORTIONS OF THE LOCAL BUILDING CODES.
2. THE CONTRACTOR SHALL OBTAIN ALL THE NECESSARY PERMITS, INSURANCE, AND LICENSES REQUIRED TO COMPLETE ALL THE WORK AND PAY ALL NECESSARY FEES FOR THE PERMITS OBTAINED.
3. THE CONTRACTOR SHALL PERFORM PRIVATE UTILITY MARKOUT PRIOR TO CORING SLAB FOR SSDS INSTALLATION.
4. WINDOWS PROPOSED FOR PIPING PENETRATION SHALL BE OPENED THE MINIMUM AMOUNT REQUIRED TO ACCOMMODATE 4" PIPING. PLEXI-GLASS WITH 4" DIAMETER CIRCULAR OPENING TO BE SECURED AND SEALED IN WINDOW OPENING. PIPING PENETRATION TO BE SEALED. PLEXI-GLASS AND PIPING PENETRATION SHALL BE AIR TIGHT. MATERIALS WITH WHICH TO SECURE AND SEAL THE PLEXI-GLASS TO BE SPECIFIED. WINDOW GRATES PROPOSED FOR PIPING PENETRATION SHALL BE CUT TO ACCOMMODATE 4" PIPING. THE GRATE SHOULD BE CUT SUCH THAT THE MINIMUM AMOUNT OF THE GRATE REQUIRED TO ACCOMMODATE THE PIPING IS REMOVED. ANY SHARP EDGES REMAINING ON THE GRATES WHICH POSE A HEALTH AND SAFETY THREAT SHOULD BE COVERED(MATERIAL TO BE SPECIFIED FOLLOWING PILOT TEST).
5. THE CONTRACTOR SHALL MOBILIZE TO THE SITE AND PROVIDE ANY TEMPORARY FACILITIES TO PERFORM THE WORK AND COORDINATE INSTALLATION ACTIVITIES WITH BUILDING OWNER AND/OR TENANTS TO MINIMIZE DISRUPTIONS TO THEIR OPERATIONS.
6. THE CONTRACTOR SHALL PROVIDE AND INSTALL THE PROPOSED VERTICAL SUCTION POINTS AS SHOWN ON SHEET NO. A-003.00, INCLUDING ALL ASSOCIATED PIPING, FITTINGS, AND CONNECTIONS. THE ABOVEGROUND HORIZONTAL LATERAL PIPING SHALL BE SLOPED BACK TO THE PROPOSED VERTICAL SUCTION POINT AT A MINIMUM SLOPE OF 1/8-INCH PER LINEAR FOOT.
7. THE CONTRACTOR SHALL ARRANGE FOR THE OFFSITE TRANSPORTATION AND DISPOSAL OF ALL WASTE AND DEBRIS GENERATED DURING THE PERFORMANCE OF THE WORK.
8. THE CONTRACTOR SHALL PERFORM SITE RESTORATION ACTIVITIES AND DEMOBILIZE FROM THE SITE.
9. THE VERTICAL DISCHARGE RISER SHALL BE SECURELY ANCHORED WITH ADEQUATE STRUCTURAL SUPPORTS.
10. UNLESS OTHERWISE SPECIFIED, ALL ABOVE GRADE PIPING SHALL BE CONSTRUCTED OF 4-INCH ABS PIPE.
11. ALL CONNECTIONS AT PIPE FITTINGS AND JOINTS SHALL BE LEAK TESTED. THIS SHALL BE DEMONSTRATED BY THE PERFORMANCE OF AN AUDIO LEAK TEST USING ULTRASOUND DETECTOR, ULTRAPROBE 9000 MANUFACTURED BY UE SYSTEMS, INC. FOLLOWING PIPE/FITTINGS ASSEMBLY BY THE CONTRACTOR.
12. INSTALLATION OF THE VERTICAL SUCTION POINT COMPONENTS, PIPING, REGENERATIVE BLOWER AND WALL PENETRATIONS MUST BE COORDINATED WITH THE BUILDING OWNER AND ENGINEER.
13. RISER PIPE TO THE ROOF SHALL BE COORDINATED WITH THE BUILDING OWNER AND ENGINEER. THE RISER PIPE SHALL BE EXTENDED TO THE ROOF WITH MINIMAL CHANGES IN DIRECTION.
14. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL EQUIPMENT, PIPING, AND VACUUM MONITORING POINT LOCATIONS FOR APPROVAL BY THE ENGINEER BEFORE CONSTRUCTION.
15. THE PIPING WHERE VISIBLE AND ACCESSIBLE, SHALL BE LABELED AT 10-FOOT INTERVALS WITH "FLOW ARROW" AND "SUB-SLAB DEPRESSURIZATION SYSTEM - DO NOT ALTER".
16. THE VERTICAL RUNS OF SUCTION POINT PIPING WITHIN THE BUILDING ALONG WITH THE HORIZONTAL PIPING ALONG THE GYMNASIUM WALL SHALL BE FINISHED AND CLOSED OFF WITH AZEK PVC BOARD OR APPROVED ALTERNATIVE.
17. HRP SHALL BE RESPONSIBLE FOR COORDINATING SITE ACCESS.

GRANULAR ACTIVATED CARBON TREATMENT NOTES:

1. THE NEED FOR VAPOR PHASE TREATMENT UNITS DURING FULL-SCALE OPERATION SHALL BE DETERMINED BASED ON THE RESULTS OF PILOT TEST SAMPLING. THE EFFLUENT AIR SAMPLE RESULTS FROM THE PILOT TEST WILL BE ANALYZED USING THE NYSDEC DAR GUIDELINES FOR THE CONTROL OF TOXIC AMBIENT AIR CONTAMINANTS AERSCREEN DISPERSION MODEL (AERSCREEN). IF IT IS DETERMINED THAT CONTAMINANT LEVELS ARE NOT ACCEPTABLE FOR DISCHARGE TO THE ATMOSPHERE WITHOUT VAPOR PHASE TREATMENT DURING THE FULL-SCALE SSDS OPERATION, VAPOR PHASE TREATMENT WILL THEN BE SPECIFIED BASED ON THE DATA COLLECTED DURING PILOT TESTING.

PILOT TEST NOTES:

1. A PILOT TEST WILL BE PERFORMED PRIOR TO INSTALLATION OF THE SSDS. THE CONTRACTOR SHALL INSTALL THE VACUUM MONITORING POINTS AND PROPOSED VERTICAL SUCTION POINTS AS SHOWN ON SHEET NO. A-003.00. THE SUCTION POINTS SHALL BE STUBBED UP A MINIMUM OF 12-INCHES ABOVE THE CONCRETE SLAB. THE CONTRACTOR SHALL PROVIDE A REGENERATIVE BLOWER CAPABLE OF 60 INCHES OF WATER,PIPING, AND FITTINGS TO CONNECT THE BLOWER TO THE VERTICAL SUCTION POINT AND DISCHARGE PIPING TO THE BUILDING EXTERIOR.
2. THE CONTRACTOR SHALL PROVIDE A VAPOR PHASE GRANULAR ACTIVATED CARBON (VPGAC) CAPABLE OF ACCOMODATING THE MAXIMUM FLOW RATE WHICH MAY BE ACHIEVED BY THE REGENERATIVE BLOWER.
3. THE DISCHARGE PIPE FROM THE VPGAC DRUM SHALL EXTEND 8 FEET ABOVE GROUND SURFACE.
4. THE CONTRACTOR SHALL CONNECT THE BLOWER TO THE BUILDING POWER SUPPLY OR PROVIDE A GENERATOR.
5. WHEN NOT IN USE AND UPON COMPLETION OF PILOT TESTING, THE SUCTION POINTS SHALL BE SEALED WITH 4" TORQUER LOCKING WELL PLUGS.

BLOWER NOTES:

1. THE REGENERATIVE BLOWER IS SHOWN TO ILLUSTRATE THE GENERAL LOCATION IN THE PIPING RUN AND SHALL NOT BE CONSIDERED TO BE ACCURATE. THE ACTUAL CONFIGURATION AND DIMENSIONS OF THE REGENERATIVE BLOWER ASSEMBLY WILL VARY BASED ON MANUFACTURING METHODS AND FIELD CONDITIONS. FINAL DESIGN AND REGENERATIVE BLOWER SYSTEM SELECTED ARE SUBJECT TO APPROVAL. CONTRACTOR SHALL PROVIDE ALL REGENERATIVE BLOWER SPECIFICATIONS AND CUT SHEETS FOR APPROVAL PRIOR TO INSTALLATION.
2. THE REGENERATIVE BLOWER (AND ALL ASSOCIATED EQUIPMENT AND HOUSING) TO BE IMPLEMENTED FOR FULL SCALE SSDS OPERATION SHALL BE SPECIFIED BASED ON THE RESULTS OF THE PILOT TEST.
3. THE BLOWER SHALL BE HARDWIRED TO A DEDICATED CIRCUIT TO BE LABELED "ENVIRONMENTAL EXHAUST BLOWER." THE CONNECTION SHOULD BE PERFORMED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH ALL STATE AND LOCAL LAWS, CODES, AND REGULATIONS.
4. THE CONTRACTOR SHALL PROVIDE CONNECTION TO GROUNDING FOR THE REGENERATIVE BLOWER.
5. INSTALLATION, OPERATION, AND MAINTENANCE SHALL BE PERFORMED IN ACCORDANCE WITH THE INFORMATION SPECIFIED HEREIN AND IN ACCORDANCE WITH VENDOR AND MANUFACTURER RECOMMENDATIONS.

ELECTRICAL NOTES:

1. FURNISH AND INSTALL ALL NECESSARY CABLE SUPPORT BOXES, PULL BOXES AND CONDUIT SUPPORTS, AS REQUIRED BY APPLICABLE BUILDING CODES. ALL CONDUITS THAT HAVE RUNS IN EXCESS OF 180 DEGREES SHALL BE PROVIDED WITH PULL BOX.
2. NO ELECTRICAL CONNECTIONS SHALL BE MADE TO, OR WORK PERFORMED ON ENERGIZED EQUIPMENT. LICENSED ELECTRICIANS TO MAKE ALL FINAL CONNECTIONS TO EQUIPMENT.
3. THE CONTRACTOR SHALL VERIFY ELECTRICAL REQUIREMENTS OF THE NEW EQUIPMENT TO BE USED.
4. PREPARE AND FURNISH THE OWNER RECORD PLANS FOR ALL WORK INSTALLED.
5. VACUUM ALARM TO BE COORDINATED BY THE ENGINEER FOR APPROPRIATE PLACEMENT. THE VACUUM ALARM SHALL BE HARDWIRED TO A SEPARATE CIRCUIT THAN THE REGENERATIVE BLOWER.
6. REGENERATIVE BLOWER SHALL BE HARDWIRED TO DEDICATED CIRCUIT LABELED "ENVIRONMENTAL EXHAUST FAN".

CONCRETE NOTES:

1. THE CONCRETE SLAB SHALL BE SAW CUT AT EACH SUCTION POINT LOCATION AND THE EXTENT OF BUILDING FOOTINGS (IF PRESENT) SHALL BE IDENTIFIED PRIOR TO INSTALLING SUCTION POINTS. THE SLAB SHALL BE CUT TO ACCOMMODATE 4" DIAMETER PVC PIPING AS PRESENTED ON SHEET A-003.00.
2. UPON CUTTING THROUGH CONCRETE SLAB, THE CONTRACTOR SHALL COMPLETE INSTALLATION OF THE VERTICAL SUCTION POINT AND MINIMIZE ANY POTENTIAL SOIL VAPORS FROM INFILTRATING THE BUILDING.
3. IF DURING THE VERTICAL SUCTION POINT INSTALLATION GROUNDWATER IS ENCOUNTERED, THE DEPTH OF THE VERTICAL SUCTION POINT WILL BE ADJUSTED BASED ON THE ENGINEER'S APPROVAL.
4. THE CONTRACTOR SHALL CAPTURE ALL WATER AND DUST GENERATED DURING THE PERFORMANCE OF THE WORK.
5. RESTORE CONCRETE WITH 15 MILLIMETER VAPOR BARRIER, A MINIMUM 4-INCH CONCRETE THICKNESS, AND MINIMUM 4,000 PSI CONCRETE STRENGTH.

STATE OF NEW YORK
GLENN NETUSCHIL
074741
LICENSED PROFESSIONAL ENGINEER

GENERAL CONSTRUCTION
JOB# Q01065151-I1

HRP
MOVE YOUR ENVIRONMENT FORWARD
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

NOT TO SCALE

REVISIONS	
NO.	DATE

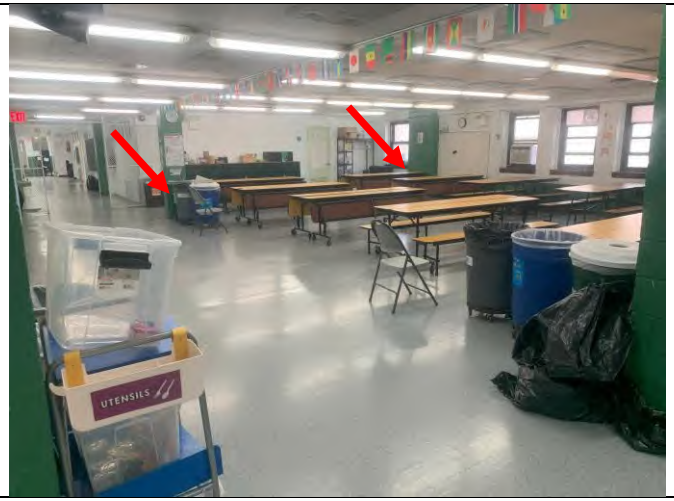
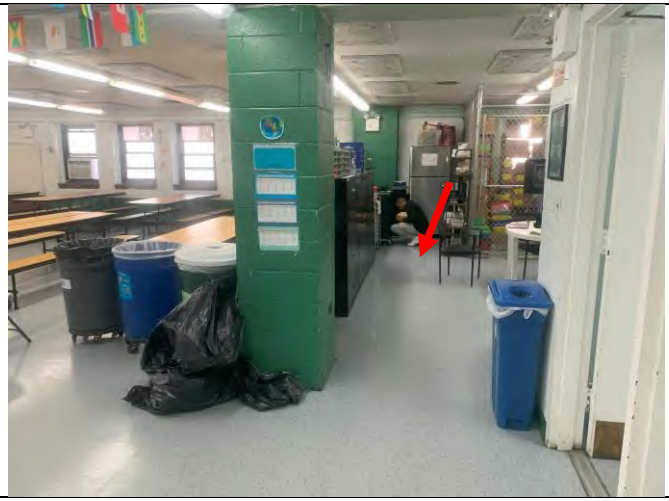
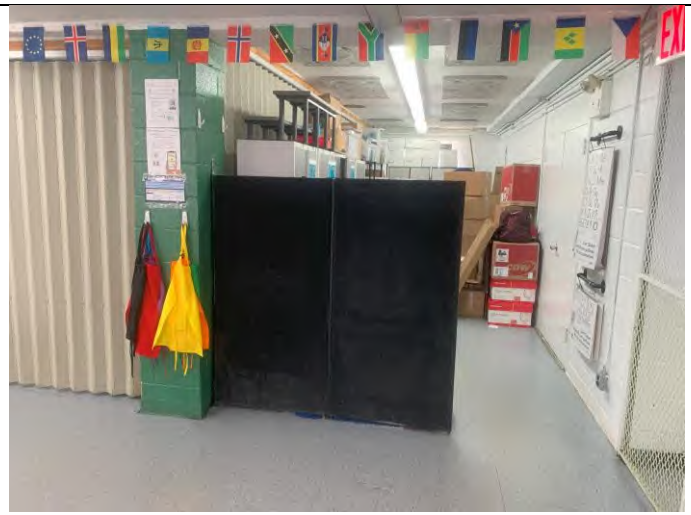
DESIGNED BY:	REVIEWED BY:	ISSUE DATE:
MR	GN	06/06/2024
DRAWN BY:	PROJECT NUMBER:	SHEET SIZE:
BOB	DEC1033.P2	11"x17"

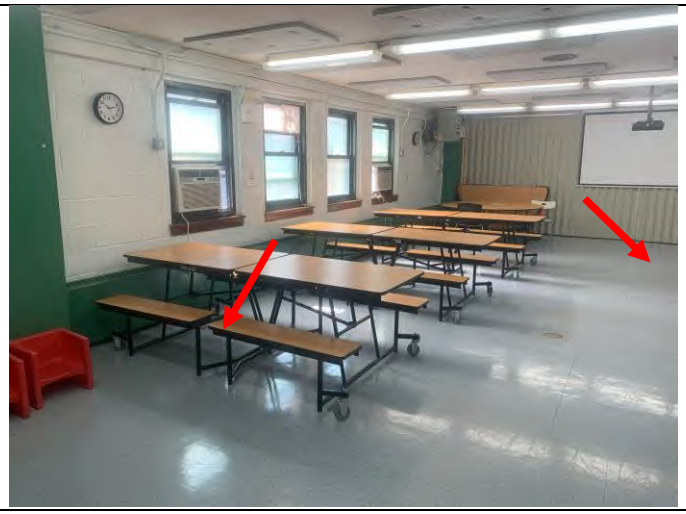
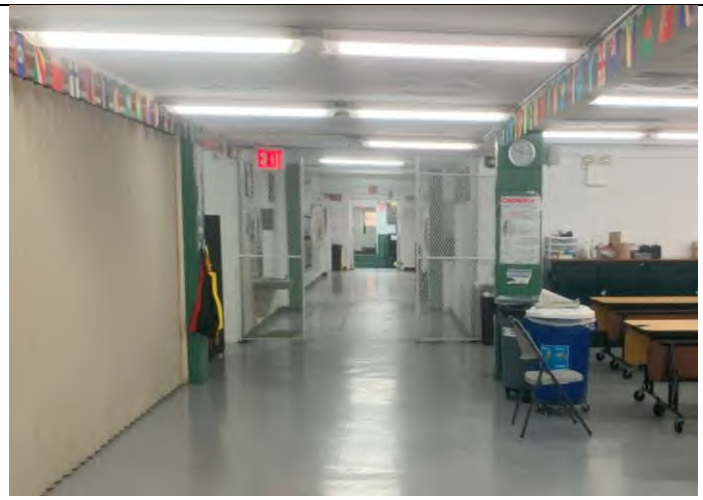
PROPOSED SSDS PILOT
GENERAL NOTES

GROWING UP GREEN ELEMENTARY
39-27 28TH STREET
LONG ISLAND CITY, NEW YORK

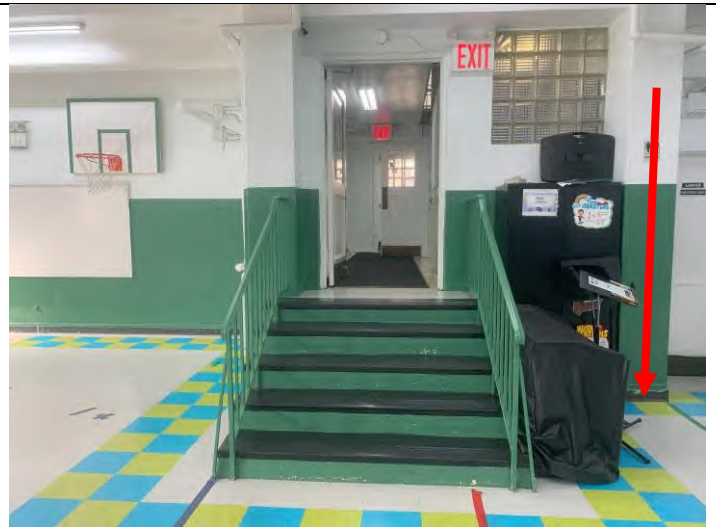
SHEET NO.
A-005.00
SHEET 06 OF 06

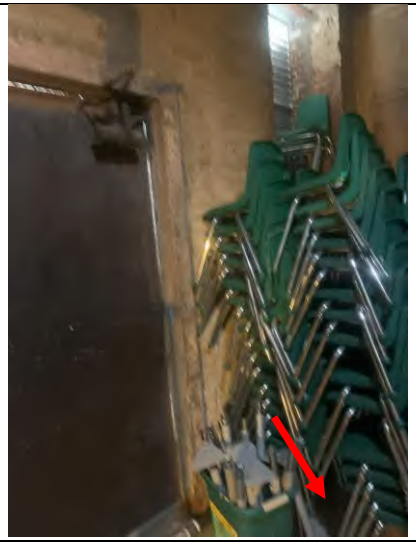
APPENDIX B
SUBJECT PROPERTY PHOTOGRAPHIC LOG

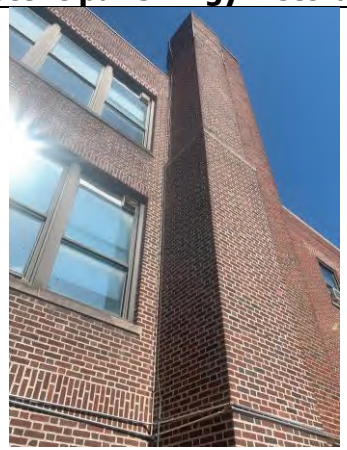
	
Proposed suction point (SP-1) location with one vacuum monitoring point (VMP) beneath the window on the western side of the cafeteria	**Proposed VMP location in northwest corner of the cafeteria**
	
Proposed SP-3 location and pillar for pipe mounting at northern end of the cafeteria	**Proposed piping pathway along ceiling to window penetration on eastern wall for SP-1, SP-3, and SP-5**

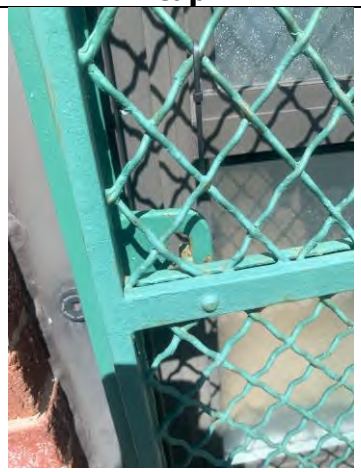
	
Proposed VMP locations in eastern half of the cafeteria	**Proposed VMP location in northeast corner of the "enrichment room"**
	
Proposed VMP location in southeast corner of storage area	**Proposed Pipe pathway from SP-5 to SP-1 and SP-3 connection along ceiling with VMP behind gate**

	
Proposed SP-5 location in southeastern corner of kitchen with hatch and drain visible	**Hatch in southeast corner of kitchen near proposed SP-5**
	
Proposed piping along ceiling in the kitchen	**Proposed VMP location in southwest corner of kitchen**

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Proposed Suction Point (SP-2) location on the northern side of the gymnasium east of the stairs and VMP west of the stairs</td><td>Proposed area of SSDS piping from SP-2 to window penetration with proposed VMP in northeastern corner</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Proposed piping pathway across ceiling from SP-4 to SP-2 and VMPs below window and in front of office door</td><td>Proposed SP-4 with piping mounted to pillar on southern side of gymnasium and VMP around stair</td></tr>
</table>

	
Proposed VMP locations on western wall of gymnasium	**Proposed VMP in maintenance room next to sump in northeastern corner of maintenance room**
	
Proposed VMP under chairs in southeast corner of maintenance room, door to exterior	**Proposed VMP in southwest corner of maintenance room**

	
Electric panel in maintenance room	**Electric panel in gym storage**
	
Proposed location of regenerative blower lean-to shelter on eastern side of building south of existing chimney stack	**Proposed effluent piping pathway following existing chimney stack on south side**

	
Proposed effluent discharge point to terminate in a rain cap	**Window with grate that will be partially removed for SSDS piping pathway**
	
Window grate material to be cut for SSDS piping pathway	**Eastern side of building with proposed SSDS piping layout exterior run from SP-1,3, and 5 window penetration to regenerative blower**

APPENDIX C
SOIL VAPOR INTRUSION (SVI) DATA

Table 2
Off-Site Soil Vapor Instrusion Investigations
Soil Vapor/Air Laboratory Analytical Results (Detections Only)
27-09 40th Avenue
Site #C241241A
27-09 40th Avenue
Long Island City, Queens, NY

Property 2 - 39-42 40th Street (Block 398, Lot 1)									
Sample ID:	**P2A-F1SS**	**P2A-F1IA**	**P2B-F1SS**	**P2B-F1IA**	**P2-OA**	**Air Guidance Values**	**Immediate Action Levels**	**NYSDOH May 2017 & February 2024 Matrix Recommendations**	**Final Action Recommended**
Lab ID:	**24B2567-02**	**24B2567-01**	**24B2567-04**	**24B2567-03**	**24B2567-05**				
Date Collected:	**02/21/2024**	**02/21/2024**	**02/21/2024**	**02/21/2024**	**02/21/2024**				
Sample Locations:	**First-floor Sub-Slab Soil Vapor Concentrations**	**First-floor Indoor Air Concentrations**	**First-floor Sub-Slab Soil Vapor Concentrations**	**First-floor Indoor Air Concentrations**	**Outdoor Air Concentrations**				
Volatile Organic Compounds (µg/m3)									
1,1,1-Trichloroethane	**0.33 J**	< 0.060	**5.4**	< 0.059	< 0.060	NP	NP	No Further Action	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113	**0.55 J**	**0.51 J**	**0.71 J**	**0.51 J**	**0.50 J**	NP	NP	NP	
1,1-Dichloroethane	< 0.20	< 0.069	< 0.20	< 0.069	< 0.069	NP	NP	NP	
1,2,4-Trichlorobenzene	**0.43 J**	< 0.14	< 0.41	< 0.14	< 0.14	NP	NP	NP	
1,2,4-Trimethylbenzene	**1.4**	**0.31**	**1.9**	**0.60**	**0.43**	NP	NP	No Further Action	
1,2-Dichloroethane	**0.29 J**	**0.071 J**	< 0.15	**1.8**	**0.08 J**	NP	NP	NP	
1,3,5-Trimethylbenzene	**0.59**	< 0.13	**0.77**	**0.17 J**	< 0.13	NP	NP	No Further Action	
1,3-Butadiene	< 0.19	< 0.065	< 0.19	**0.12**	< 0.065	NP	NP	NP	
1,4-Dichlorobenzene	< 0.29	< 0.10	< 0.29	**0.10 J**	< 0.10	NP	NP	NP	
2-Butanone (MEK)	< 5.8	**2.5 J**	**5.8 J**	**3.7 J**	**5.6**	NP	NP	NP	
2-Hexanone (MBK)	< 0.18	< 0.062	**1.2**	**0.42**	< 0.062	NP	NP	NP	
4-Ethyltoluene	**0.49**	**0.10 J**	**0.71**	**0.15 J**	**0.093 J**	NP	NP	NP	
4-Methyl-2-pentanone (MIBK)	< 0.22	**0.20**	< 0.22	**0.35**	**0.15**	NP	NP	NP	
Acetone	**110**	**7.7**	**69**	**15**	**15**	NP	NP	NP	
Benzene	**20**	**0.86**	**2.5**	**1.5**	**1.2**	NP	NP	No Further Action	
Carbon Disulfide	**30**	< 0.21	**5.2**	< 0.21	< 0.21	NP	NP	NP	
Carbon Tetrachloride	**1.2**	**0.44**	**3.5**	**0.49**	**0.45**	NP	NP	No Further Action	
Chloroform	**2.5**	**0.096 J**	**8.3**	**3.9**	**0.12 J**	NP	NP	NP	
Chloromethane	**0.41**	**1.2**	< 0.28	**1.2**	**1.2**	NP	NP	NP	
Cyclohexane	**58**	**0.15**	**1.6**	**0.20**	**0.14**	NP	NP	No Further Action	**Mitigate**
Dichlorodifluoromethane (Freon 12)	**2.8**	**0.92**	**3.9**	**0.83**	**0.87**	NP	NP	NP	
Ethanol	**19**	**20**	**47**	**190 E**	**67 E**	NP	NP	NP	
Ethyl Acetate	< 1.4	**3.4**	**6.3**	**3.0**	**39**	NP	NP	NP	
Ethylbenzene	**1.9**	**0.64**	**3.2**	**0.84**	**1.2**	NP	NP	No Further Action	
Heptane	**4.8**	**0.28**	**0.81**	**0.47**	**0.30**	NP	NP	No Further Action	
Hexane	**10 J**	< 2.6	< 7.4	< 2.6	< 2.6	60	NP	No Further Action	
Isopropanol	**59**	**13**	**520 E**	**11**	**230 E**	NP	NP	NP	
m&p-Xylene	**5.5**	**2.5**	**10**	**3.4**	**5.2**	NP	NP	No Further Action	
Methylene Chloride	< 0.93	**1.1 J**	< 0.93	**1.6**	**1.2 J**	60	NP	No Further Action	
Naphthalene	< 0.43	< 0.15	< 0.43	**0.34**	< 0.15	NP	NP	No Further Action	
o-Xylene	**1.5**	**0.58**	**2.6**	**0.81**	**0.98**	NP	NP	No Further Action	
Propene	**8.4**	< 1.3	< 3.8	**1.7 J**	< 1.3	NP	NP	NP	
Styrene	**0.75**	< 0.12	**1.1**	**0.35**	< 0.12	NP	NP	NP	
Tetrachloroethylene	**5.6**	**0.3**	**1300**	**2.0**	**0.26**	30	300	**Mitigate**	
Tetrahydrofuran	< 1.1	< 0.39	**1.2 J**	< 0.39	**1.2**	NP	NP	NP	
Toluene	**15**	**4.4**	**17**	**8.3**	**6.5**	NP	NP	No Further Action	
Trichloroethylene	**2.2**	< 0.14	**10**	< 0.14	< 0.14	2	20	No Further Action	
Trichlorofluoromethane (Freon 11)	**1.5 J**	**1.3**	**5.6**	**1.3**	**1.3**	NP	NP	NP	
Vinyl Acetate	**30**	< 0.51	**5.3 J**	< 0.50	< 0.51	NP	NP	NP	

Legend:

50	Decision Matrices recommend a specific action based on parameter concentrations.
25	Parameter was detected at concentrations exceeding the laboratory reporting limit.
< 10	Parameter was detected at concentrations exceeding the laboratory reporting limit.

Notes:

All concentrations in micrograms per cubic meter (µg/m^3)
Recommendations based on May 2017 and February 2024 NYSDOH Soil Vapor/Indoor Air Matrices (Decision Matrices)
E = Reported result is estimated; value reported over verified calibration range
J = Detected but below the Reporting Limit; therefore, result is an estimated concentration
NP = Standard Not Promulgated

APPENDIX D
PRELIMINARY AERSCREEN RESULTS

Sub-Slab Depressurization System (SSDS) Estimated Emissions Calculations (Pre-Pilot Test)
27-09 40th Avenue Off-Site
Grouwing Up Green Elementary School
39-27 28th Street
Long Island City, New York 11101
NYSDEC Site # C241241A

Blower Specifications						
P_S	P_{act}	T_S	T_{act}	Flow Rate		
(inHg)	(inHg)	(°R)	(°F)	(scfm)*	(acfm)	(m3/hr)
29.92	30	520	70	148	150	255

Note:
1) Flow rate was converted from standard cubic feet per minute to actual cubic feet per minute using the following equation:

$$acfm = scfm \times (P_S/P_{act}) \times ([T_{act} + 459.67]/T_S)$$

where

P_S = Pressure at Standard Conditions (inHg)
P_{act} = Actual Pressure On-Site, Estimated (inHg)
T_S = Temperature at Standard Conditions (°R)
T_{act} = Actual Temperature On-Site, Estimated (°F)
* estimated maximum flow rate associated with proposed system.

Emissions Calculations							
Pollutant	CAS No.	Concentration			Estimated Emissions		Potential Emissions
		P2A-F1SS	P2B-F1SS	Maximum Observed			
		(µg/m³)	(µg/m³)	(µg/m³)	(g/hr)	(lb/hr)	(TPY)
Acetone	67-64-1	110	69	110	0.03	6.19E-05	2.71E-04
Benzene	71-43-2	20	2.5	20	0.01	1.13E-05	4.93E-05
Carbon Disulfide	75-15-0	30	5.2	30	0.01	1.69E-05	7.40E-05
Carbon Tetrachloride	56-23-5	1.2	3.5	3.5	0.00	1.97E-06	8.63E-06
Chloroform	67-66-3	2.5	8.3	8.3	0.00	4.67E-06	2.05E-05
Chloromethane	74-87-3	0.41	--	0.41	0.00	2.31E-07	1.01E-06
Cyclohexane	110-82-7	58	1.6	58	0.01	3.27E-05	1.43E-04
Dichlorodifluoromethane (Freon 12)	75-71-8	2.8	3.9	3.9	0.00	2.20E-06	9.62E-06
1,1-Dichloroethane	75-34-3	0.29	--	0.29	0.00	1.63E-07	7.15E-07
Ethanol	64-17-5	19	47	47	0.01	2.65E-05	1.16E-04
Ethyl Acetate	141-78-6	--	6.3	6.3	0.00	3.55E-06	1.55E-05
Ethylbenzene	100-41-4	1.9	3.2	3.2	0.00	1.80E-06	7.89E-06
4-Ethyltoluene	622-96-8	0.49	0.71	0.71	0.00	4.00E-07	1.75E-06
Heptane	142-82-5	4.8	0.81	4.8	0.00	2.70E-06	1.18E-05
Hexane	110-54-3	10	--	10	0.00	5.63E-06	2.47E-05
2-Hexanone (MBK)	591-78-6	--	1.2	1.2	0.00	6.76E-07	2.96E-06
Isopropanol	67-63-0	59	520	520	0.13	2.93E-04	1.28E-03
Propene	115-07-1	8.4	--	8.4	0.00	4.73E-06	2.07E-05
Styrene	100-42-5	0.75	1.1	1.1	0.00	6.19E-07	2.71E-06
Tetrachloroethylene	127-18-4	5.6	1,300	1,300	0.33	7.32E-04	3.21E-03
Tetrahydrofuran	109-99-9	--	1.2	1.2	0.00	6.76E-07	2.96E-06
Toluene	108-88-3	15	17	17	0.00	9.57E-06	4.19E-05
1,2,4-Trichlorobenzene	120-82-1	0.43	--	0.43	0.00	2.42E-07	1.06E-06
1,1,1-Trichloroethane	71-55-6	0.33	5.4	5.4	0.00	3.04E-06	1.33E-05
Trichloroethylene	79-01-6	2.2	10	10	0.00	5.63E-06	2.47E-05
Trichlorofluoromethane (Freon 11)	75-69-4	1.5	5.6	5.6	0.00	3.15E-06	1.38E-05
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	0.55	0.71	0.71	0.00	4.00E-07	1.75E-06
1,2,4-Trimethylbenzene	95-63-6	1.4	1.9	1.9	0.00	1.07E-06	4.69E-06
1,3,5-Trimethylbenzene	108-67-8	0.59	0.77	0.77	0.00	4.34E-07	1.90E-06
Vinyl Acetate	108-05-4	30	5.3	30	0.01	1.69E-05	7.40E-05
m&p-Xylene	1330-20-7	5.5	10	10	0.00	5.63E-06	2.47E-05
o-Xylene	1330-20-7	1.5	2.6	2.6	0.00	1.46E-06	6.41E-06
Methyl Ethyl Ketone	78-93-3	--	5.8	5.8	0.00	3.27E-06	0.00
Total VOC				**2,229**	**0.57**	**0.00**	**0.01**

Notes:
1) Concentrations are based on laboratory analysis of sub-slab vapor samples P2A-F1SS and P2B-F1SS collected during the soil vapor intrusion (SVI) investigation conducted on February 21, 2024. The maximum observed concentration from the two samples was multiplied by the estimated maximum flow rate for the proposed system to estimate air emissions.
2) Potential Emissions assume operating 8,760 hours per year.
3) CAS No. - Chemical Abstracts Service Number
4) µg/m3 - micrograms per cubic meter
5) lbs/hr - pounds per hour
6) TPY - tons per year
7) -- indicates analyte not detected

Sub-Slab Depressurization System (SSDS) Estimated Emissions Calculations (Pre-Pilot Test)
27-09 40th Avenue Off-Site
Grouwing Up Green Elementary School
39-27 28th Street
Long Island City, New York 11101
NYSDEC Site # C241241A

Stack Parameters									Building Dimensions		
Stack Height		Stack Diameter	Exhaust Flow Rate	Exhaust Temperature	Distance to Property Line	Building Angle to North	Direction of Stack	Distance to Stack from Center	Height	Length	Width
(ft)	(m)	(in)	(acfm)	(°F)	(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)
35	10.6680	4	150	70	35	35	113	32	30	200	65

AERSCREEN Maximum Impacts (1 lb/hr Basis)			
Maximum 1-Hour Concentration	Scaled 8-Hour Concentration	Scaled 24-Hour Concentration	Scaled Annual Concentration
($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
935	841	561	93.49

Guideline Concentration Analysis							
Pollutant	CAS No.	Estimated Emissions		Estimated 1-Hour Maximum Impact	SGC	Estimated Annual Maximum Impact	AGC
		(lb/hr)	(TPY)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
Acetone	67-64-1	6.19E-05	0.0002713321	0.06	180,000	0.01	30,000
Benzene	71-43-2	1.13E-05	0.0000493331	0.01	27	0.00	0.13
Carbon Disulfide	75-15-0	1.69E-05	0.0000739997	0.02	6,200	0.00	700
Carbon Tetrachloride	56-23-5	1.97E-06	0.0000086333	0.00	1,900	0.00	0.17
Chloroform	67-66-3	4.67E-06	0.0000204732	0.00	150	0.00	14.7
Chloromethane	74-87-3	2.31E-07	0.0000010113	0.00	22,000	0.00	90
Cyclohexane	110-82-7	3.27E-05	0.0001430660	0.03	---	0.00	6,000
Dichlorodifluoromethane (Freon 12)	75-71-8	2.20E-06	0.0000096200	0.00	---	0.00	12,000
1,1-Dichloroethane	75-34-3	1.63E-07	0.0000007153	0.00	---	0.00	0.63
Ethanol	64-17-5	2.65E-05	0.0001159328	0.02	---	0.00	45,000
Ethyl Acetate	141-78-6	3.55E-06	0.0000155399	0.00	---	0.00	3,400
Ethylbenzene	100-41-4	1.80E-06	0.0000078933	0.00	---	0.00	1,000
4-Ethyltoluene	622-96-8	4.00E-07	0.0000017513	0.00	---	0.00	---
Heptane	142-82-5	2.70E-06	0.0000118399	0.00	210,000	0.00	3,900
Hexane	110-54-3	5.63E-06	0.0000246666	0.01	---	0.00	700
2-Hexanone (MBK)	591-78-6	6.76E-07	0.0000029600	0.00	4,000	0.00	30
Isopropanol	67-63-0	2.93E-04	0.0012826610	0.27	98,000	0.03	7,000
Propene	115-07-1	4.73E-06	0.0000207199	0.00	---	0.00	3,000
Styrene	100-42-5	6.19E-07	0.0000027133	0.00	17,000	0.00	1,000
Tetrachloroethylene	127-18-4	7.32E-04	0.0032066524	0.68	300	0.07	3.8
Tetrahydrofuran	109-99-9	6.76E-07	0.0000029600	0.00	30,000	0.00	350
Toluene	108-88-3	9.57E-06	0.0000419331	0.01	37,000	0.00	5,000
1,2,4-Trichlorobenzene	120-82-1	2.42E-07	0.0000010607	0.00	3,700	0.00	35
1,1,1-Trichloroethane	71-55-6	3.04E-06	0.0000133199	0.00	9,000	0.00	5,000
Trichloroethylene	79-01-6	5.63E-06	0.0000246666	0.01	20	0.00	0.21
Trichlorofluoromethane (Freon 11)	75-69-4	3.15E-06	0.0000138133	0.00	9,000	0.00	5,000
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	76-13-1	4.00E-07	0.0000017513	0.00	960,000	0.00	180,000
1,2,4-Trimethylbenzene	95-63-6	1.07E-06	0.0000046866	0.00	---	0.00	60
1,3,5-Trimethylbenzene	108-67-8	4.34E-07	0.0000018993	0.00	---	0.00	60
Vinyl Acetate	108-05-4	1.69E-05	0.0000739997	0.02	5,300	0.00	200
m&p-Xylene	1330-20-7	5.63E-06	0.0000246666	0.01	22,000	0.00	100
o-Xylene	1330-20-7	1.46E-06	0.0000064133	0.00	22,000	0.00	100
Methyl Ethyl Ketone	78-93-3	3.27E-06	0.0000143066	0.00	13,000	0.00	5,000

Note:
1) AERSCREEN maximum impacts were modeled on a 1 pound per hour basis. The maximum 1-hour concentration and scaled annual concentration were each scaled by the actual emission rate of each pollutant in order to estimate the maximum short-term (i.e., 1-hour) and annual impacts. These impacts were compared to the Short-Term Guideline Concentration (SGC) and Annual Guideline Concentration (AGC) presented in NYSDEC guidance document DAR-1.
2) --- indicates SGC or AGC not promulgated.


39-27 28th Street, Long Island City, NY
Building Dimensions and Stack Location
27-09 40th Avenue Off-Site
NYSDEC Site # C241241A
Legend
Property Boundary
Proposed Stack Location
Building Center
65 ft
200 ft
32 ft
35 ft
39-27 28th St
28th St
29th St
40th Ave
39-44
39-30
39-32
39-34
39-36
39-14
39-18
3920a
39-24
39-28
39-21
39-42
39-33
3913
N
100 ft
Google Earth
Image Landsat / Copernicus

APPENDIX E
ENGINEER'S COST ESTIMATE

Engineer's Cost Estimate
Sub-Slab Depressurization System Design + Installation
Growing Up Green Elementary School
39-27 28th Street
Long Island City, NY
27-09 40th Avenue Off-Site
NYSDEC Site # C241241A

Engineering/Consulting Costs			
Description	**Estimate**	**Est. w/ 10% Contingency**	**Assumptions**
Design	$ 25,000.00	$ 27,500.00	Includes initial site visit, design drawing and work plan preparation, 1 round of revisions based on NYSDEC/ call-out contractor/permit expeditor comments, PE completion of permitting forms, pilot test data analysis and related revisions.
Pilot Testing	$ 12,000.00	$ 13,200.00	Level II Consultant, 5 days on-site, includes 2 round trips to site, 5 nights per diem, equipment (PID, velocity meter, magnehelic gauges)
SSDS Install Oversight and Start-Up Testing	$ 15,000.00	$ 16,500.00	Level II Consultant, 6 days on-site, includes 2 round trips to site, 6 nights per diem, equipment (PID, ultrasonic leak detector, velocity meter, magnehelic gauges)
Post Mitigation Indoor Air Sampling	$ 5,000.00	$ 5,500.00	Level II Consultant, 2 events 2 days each, includes 1 night per diem per event, equipment (PID, magnehelic gauges)
Construction Completion Report (CCR)	$ 15,000.00	$ 16,500.00	
Total	**$ 72,000.00**	**$ 79,200.00**	

Engineer's Cost Estimate
Sub-Slab Depressurization System Design + Installation
Growing Up Green Elementary School
39-27 28th Street
Long Island City, NY
27-09 40th Avenue Off-Site
NYSDEC Site # C241241A

Contractor Costs			
Description	**Estimate**	**Est. w/ 10% Contingency**	**Assumptions**
Project Management and Permit Preparation	$ 20,000.00	$ 22,000.00	Includes HASP development, review of designs and related meetings, coordination of site visits, obtaining subs and materials, permit expeditor, asbestos inspection, and fire inspection. Project Manager 80 hours, Foreman 40 hours, plus permit expeditor subcontractor costs.
Initial Site Visit	$ 700.00	$ 770.00	Foreman 1 day, 1 round trip to site.
Pilot Test	$ 30,000.00	$ 33,000.00	Foreman 5 days, 3 Laborers 5 days ea., 2 hrs OT per employee per day, includes pilot test materials (5 suction points and gate valves, 21 vapor pins, temporary piping). HRP to supply pilot test blower. Includes soil disposal.
SSDS Install and Start-Up Test	$ 40,000.00	$ 44,000.00	Foreman 6 days, 3 Laborers 6 days ea., 2 hrs OT per employee per day, 7 round trips to site. Includes materials (blower, knockout tank, VPGAC drum, pipe, fittings, anchors, utility chases, guages and alarm). Includes electrician subcontractor.
Total	**$ 90,700.00**	**$ 99,770.00**	

Engineer's Cost Estimate
Sub-Slab Depressurization System Design + Installation
Growing Up Green Elementary School
39-27 28th Street
Long Island City, NY
27-09 40th Avenue Off-Site
NYSDEC Site # C241241A

Laboratory Costs				
Description	**Unit Rate**	**Quantity**	**Estimate**	**Assumptions**
Pilot Test Sampling - TO-15 Samples (Cat B)	$ 203.00	1	$ 203.00	One TO-15 effluent sample to be collected during Pilot Test for treatment determination.
Start-Up Test Sampling - TO-15 Samples (Cat B)	$ 203.00	2	$ 406.00	One TO-15 effluent sample to be collected during Start-Up to evaluate effectiveness of treatment.
Post Mitigation Indoor Air Sampling - TO-15 Samples (Cat B) (2 Rounds)	$ 203.00	6	$ 1,218.00	Three TO-15 samples per round (2 ground floor, 1 outdoor air), two rounds (one conducted 30 days after install and one conducted during heating season).
Total			**$ 1,827.00**	

APPENDIX F
HEALTH AND SAFETY PLAN (HASP)

MOVE YOUR ENVIRONMENT FORWARD

SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP)

27-09 40th Avenue Off-site
Growing Up Green Charter School
Interim Remedial Measure - Sub-Slab Depressurization System
39-27 28th Street
Long Island City, New York 11101
NYSDEC Site # C241241A

Prepared For:

New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233
Contract #D009808-33

Prepared By:

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

HRP #: DEC1033.P2

Issued On: June 7, 2024

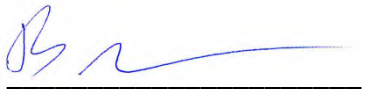
Addendum Number	Date Issued	Reason For Modification

Disclaimer

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

CERTIFICATION

This Addendum to the HRP Generic Health and Safety Plan has been prepared under the supervision of, and has been reviewed by, a Associate Safety Professional (ASP).



Bryan Sherman, ASP
BCSP # 31838

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Figures

Tables

Appendices

1.0 EMERGENCY CONTACTS/PLANNING

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

Emergency Phone Numbers 39-27 28th Street Long Island City, NY	
Emergency Contacts	**Phone Number**
Fire, Ambulance, Police Emergency:	911
NYCPD 114th Precinct (Sector C) Police Department (routine calls):	718-626-9311
FDNY Ladder 116 - Fire Department (routine calls):	718-476-6267
Mount Sinai Queens	718-963-7272
Poison Control Center:	1-800-222-1222
NYDEC Spills hotline:	1-800-457-7362
Poison Control Center:	1-800-222-1222
National Response Center:	800-424-8802
Project Manager: Patrick Montuori	518-978-2380
Site Safety Officer: Patrick Montuori	518-978-2380
NYSDEC Project Manager: Marnie DeLuke	518-402-3262

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

- **Mount Sinai Queens** – Located at 25-10 30th Avenue, Queens, NY (approximately 1.7 miles from the work site)

First Aid, Fire Protection, Emergency Response Equipment Storage Locations	
First Aid Kit:	In Vehicle
Fire Extinguisher:	In Vehicle
Spill Kit	In Vehicle
Hand Sanitizer	In Vehicle
Social distancing Caution Tape, Cones	In Vehicle

A Safety and Logistics Planning call will be held prior to conducting any intrusive activities at the site. Representatives from HRP and each subcontractor will attend the call to discuss logistical

and safety challenges general to the scope of work and specific to the Site. This call is documented on the Safety and Logistics Planning Call Log in **Appendix A.**

2.0 INTRODUCTION

2.1 Purpose and Scope

This Health and Safety Plan (HASP) addresses the health and safety practices that will be employed by HRP Associates, Inc. personnel and our subcontractors participating in the Interim Remedial Measures (IRM) for the Growing Up Green Charter School located at 39-27 28th Street. The IRM implementation consists of the installation and testing of a sub-slab depressurization system (SSDS) designed to mitigate soil vapor intrusion (SVI) at the Subject Property (39-27 28th Street). HRP is responsible for the design of the SSDS, providing full time oversight of the NYSDEC call-out contractor during IRM activities, and collecting data during pilot and start-up testing related to system design.

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

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

The NYSDEC contractor Environmental Assessment and Remediation Inc. (EAR) will be responsible for developing their own HASP which should comply with 29 CFR 1910 and 29 CFR 1926 and applicable provisions of federal, state, and local health and safety laws. The contractor's HASP will be reviewed and approved by HRP and NYSDEC.

2.2 Site Information and Areas of Environmental Concern

2.2.1 Site Information and Description

Site Name: Growing Up Green Charter School

Site Address: 39-27 28th Street, Long Island City, Queens, NY

Site Contact: Marnie DeLuke, NYSDEC

Site Contact Phone Number: 518-402-3262

2.3 Background and Project Description

The Subject Property is identified on New York City tax maps as Long Island City block 398, lot 1. The Subject Property is located across 28th Street and to the northeast of 27-09 40th Avenue (Site #C241241A). A map of the site location is depicted in **Figure 1** – Site Location. The Subject Property lot is 47,200 square-feet (sq ft) with three buildings on it which cover approximately 42,500 sq ft. The Subject Property is the largest of the three buildings at approximately 12,000 sq ft. It is a three-story building with a split-level slab on grade. The slab under the northern portion of the building is at grade, while the slab under the southern portion of the building sits approximately 2-3-feet below grade (ft bg). The Subject Property building is currently used as a charter school. The ground floor includes a cafeteria, gymnasium (slab 2-3 ft bg), mechanical room (slab 2-3 ft bg), classroom space, offices, storage space, restrooms, and a kitchen. The second and third floors consist of various classroom spaces, restrooms, and office spaces. The building can be accessed from all four sides of the building.

Prior to the design of the SSDS, representatives from the Subject Property, NYSDEC, HRP, and EAR, the on-call contractor, met at 39-27 28th Street on April 22, 2024, to determine the proposed SSDS layout and piping route for the discharge stack.

Water and sewer services are provided to the Subject Property by New York City. The Subject Property is currently owned by St. Patrick Roman Catholic Church & School. The Subject Property is zoned for manufacturing and residential use. The area surrounding the Subject Property consists of a mix of industrial, commercial, and residential properties. Property use surrounding the Subject Property is depicted in Figure 2.

2.3.1 Personnel Designations

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

All subcontractors must have received the required level of training and field experience as required under subpart (e) of OSHA 29 CFR 1910.120 and OSHA 29 CFR 1926.65 for Hazardous Waste Operations and Emergency Response (HAZWOPER).

Project Team Member	Responsibilities and Tasks
Liam Whalen (or Qualified Alternate Safety Officer)	**Health & Safety Officer – HRP Associates, Inc.** - Ensuring all site work is being performed in accordance with HRP Associates, Inc. Safety Program, as well as in accordance with local, state and federal regulations. - Directing and implementing HRP's HASP. - Reviewing the Subcontractor's HASP and being aware of the hazards detailed therein. - Conduct a job orientation meeting and routine safety meetings for HRP Associates, Inc. employees and subcontractors, as applicable. - Provide copies of these inspections, recordkeeping/personnel logs to the engineer/contractor as required. - Ensuring all project personnel have been adequately trained in the recognition and avoidance of unsafe conditions. - Authorizing Stop Work Orders that shall be executed upon the determination of an imminent health and safety concern, and will notify the appropriate contacts upon issuance of this order. - Authorizing work to resume, upon approval from the Contractor. - Directing activities, as defined in the HRP's and the Contractor's written HASP, during emergency situations. - Providing personnel monitoring where applicable. - Ensuring that adequate personal protective equipment and first aid supplies are available. - Ensure site security, to the extent practicable. - Ensure accident victims are promptly cared for, and the incident is investigated and properly reported.
Patrick Montuori (Site Supervisor/ Project Manager) **Mark Wright (Alternate Site Supervisor)**	**Site Supervisor/Project Manager – HRP Associates, Inc.** - Monitor and assist the site Health and Safety officer. - Maintain appropriate rules, regulations and codes at the job site. - Provide advance safety planning for all activities through the use of scheduling and administrative controls. - Obtain site-specific health and safety information and communicate that information with the appropriate personnel (i.e. contractors, client, etc.) - Report all injuries, illnesses and other incidents to the Director of Safety[1]. - Ensure all HRP personnel are trained and qualified to perform site work.
Site Workers[2] (Subcontractors)	**Site Workers** - Read and work in accordance with this HASP. - Report all unsafe work practices to the HSO. - Report all incidents, including near-misses to the HSO. - Work in a safe manner. - Provide Designated Competent Person
A complete list of HRP employee and subcontractor responsibilities (as applicable) can be found in the HRP Generic Health and Safety Plan. 1 Supervisor's Investigation Report included as (**Appendix C**) 2 A list of site workers will be maintained in the Personnel Log (**Appendix B**)	

3.0 AREAS OF ENVIRONMENTAL CONCERN

3.1 Scope of Work

The scope of work (SOW) for the Growing Up Green Charter School IRM will include the installation and testing of an SSDS at the Subject Property. Installation work will be completed by EAR, a NYSDEC call-out contractor. HRP will complete engineering oversight and design data collection. HRP will be responsible for the following subtasks:

- Full time oversight during all on-site IRM activities including SSDS installation and pilot testing. The on-site inspector will act as a liaison between the property owner, the contractor, the public, and the NYSDEC PM.
- Preparation of daily reports which will include photographic logs, to be submitted to the NYSDEC PM.
- Recording measurements during pilot and start-up testing, including vacuum, flow, and photoionization detector (PID) readings.
- Collection of performance monitoring indoor air samples.

Roles and responsibilities are detailed in the IRM SOW.

EAR will be responsible for developing their own HASP which should comply with 29 CFR 1910 and 29 CFR 1926 and applicable provisions of federal, state, and local health and safety laws. The contractor's HASP will be reviewed and approved by HRP and NYSDEC.

4.0 HAZARD ANALYSIS

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

4.1 Hazard Analysis Summary/Minimization

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

Confined Spaces

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

Excavations

It is HRP's policy to ensure that for excavation projects the subcontracted environmental contractor will provide a competent person to perform daily and as needed inspections of excavation sites. This policy will be conveyed through the subcontract agreement with the environmental contractor. At a minimum HRP will provide our employees involved with construction projects with awareness level training regarding excavation hazards and notify the subcontracted firm if any obvious excavation safety hazard exists during the course of on-site activities. No excavation work is anticipated during the IRM implementation.

Chemical Hazards

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

Physical Hazards

Physical hazards known or suspected to be onsite are listed in **Table 1b** (follows text). **Table 1b** includes description of potential hazards, methods to identify/minimize them, potential for occurrence and potentially affected tasks.

4.2 Changes in Conditions or Scope

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

4.3 Monitoring Procedures

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

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

Instrument/Procedure	**Sampling Interval**
Photoionization Detector (PID) in the breathing zone	Periodically as deemed by HSO

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

The following *Action Levels* will be used:

Instrument	Action Level	Level of Protection or Action Required
PID	No reading above background	▪ No action required. ▪ Continue PID monitoring. ▪ (Modified) Level D protection.
PID	Up to 5 ppm above background	▪ Evacuate exclusion zone. ▪ Recheck levels after 15 minutes. ▪ If levels are sustained, reassess. ▪ Use engineering controls to lower breathing zone vapors. ▪ Level C protection (at the HSO direction).
PID	>5 ppm above background	▪ Evacuate exclusion zone. ▪ Recheck levels after 15 minutes. ▪ Use engineering controls to lower breathing zone vapors. ▪ If levels are sustained, contact Safety Manager, and re-evaluate HASP.

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

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

Community Air Monitoring (required by DER 10)

To ensure the protection of receptors surrounding the site HRP has developed and will implement a Community Air Monitoring Program (CAMP), which requires real time monitoring of volatile organics and dust during the remedial investigation. The CAMP, included as **Appendix F** in the IRM Work Plan will be implemented during all intrusive activities.

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

If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than the background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that no visible dust is migrating from the work area.

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

5.0 ENGINEERING CONTROL MEASURES/GENERAL SAFETY

5.1 Air Monitoring

In order to determine potential health hazards and to determine the level of personal protection needed during drilling, excavation and sampling activities within the areas of concern, a PID will be periodically operated to monitor air quality for the purpose of ensuring minimal exposure to volatile organic compounds. Please refer to Section 4.3 of this plan for specific air monitoring procedures/action levels.

5.2 Protective Zones

Prior to commencement of work in area of suspected contamination, protective zones specific for each phase of the Plan will be established by the HSO if necessary prior to the start of field work. These zones will be defined during the Daily Job Brief.

The purpose of the protective zones is to prevent potential cross-contamination of adjacent areas as well as to protect project personnel from exposure to contaminated areas.

Protective zones shall be delineated as follows:

- **Exclusion Zone:** This is the contaminated area in which intrusive activities are performed. The "Area of Environmental Concern" (AOEC) is located within this area. A single access point for entrance and exit should be established and maintained, if possible. This zone should be delineated from the Contaminant Reduction Zone via perimeter cones or caution tape, or other applicable method. Work areas are shown on **Figure 2**. The Exclusion Zone delineation and any necessary modifications will be based on site conditions.

- **Contaminant Reduction Zone:** This zone is a transition zone located between the Exclusion Zone and the Support Zone and is utilized to decontaminate personnel and equipment.

- **Support Zone:** This zone will be utilized by equipment and vehicle storage and will be kept free of contaminated material. The HSO will determine the location of this zone. In the event of a site evacuation, the rally point will be the paved playground space on the eastern side of the building.

  The designated rally point may be relocated by the HSO based on project or site conditions. All site workers will be notified of any relocation prior to implementation.

6.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

6.1 Level of Protection

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

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

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

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

If the Daily Job Briefing determines that protection beyond Level C is required, HRP will re-evaluate the HASP as well as the site conditions, and will revise the HASP as required.

The following table provides a summary of the minimum level of PPE required on site:

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

Description	Level of Protection [1]	
	D	C
Plugs or Muffs	R [2]	R [2]
Hands & Arms		
Work Gloves	R	O [2]
Chemical Resistant Gloves (Nitrile)	O	R
Insulated Gloves	O	O
Foot		
Work Boots/Steel Toe Boots	R	R
Chemical Resistant Boots	O	O
Disposable Boot Covers	O	O
Respiratory Protection [3]		
½ Mask Air Purifying Respirator (APR) or Full face APR	NA	R
Dust Protection	O	NA
Powered APR	NA	NA
SCBA/Supplied Air Respirator	NA	NA

R = Required, **O** = Optional, **NA** = Not Applicable

[1] The level of protection identified here does not include the necessary equipment for entering confined spaces. Refer to Moran Environmental Recovery's Safety Manual Confined Space Program for atmospheric sampling protocols and breathing and rescue equipment necessary for those operations.

[2] The use of this PPE may or may not be required depending on site conditions/location and will be addressed at the time of task assignment by the HSO.

[3] Respiratory protection necessary to protect against VOC, dusts/particulates and not oxygen deficient atmospheres.

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

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

Task Description	Invasive (Y/N)	Protection Level
Site Restoration	Y	Level D

7.0 DECONTAMINATION

7.1 Decontamination Procedures

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

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

7.2 Emergency Decontamination

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

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

7.3 Personal Hygiene

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

8.0 EMERGENCY ACTION PLAN/SPILL RESPONSE

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

1. If the emergency originates within the work area covered by this Plan, the HRP HSO shall act as the Emergency Coordinator. The emergency evacuation signal is an air horn or a loud yell. All emergency situations (including worker injuries, no matter how small) will be reported to the HSO, who will determine the appropriate emergency response, up to and including evacuation. Only the HSO may initiate evacuation of the work area. The HSO will be responsible for reporting any emergency situation to the appropriate authorities, using a telephone or other appropriate method.

2. In the case of an evacuation, site workers will exit the site along the safest route(s) and assemble with team members at a safe rally point. Those workers in the Exclusion Zone will follow the emergency decontamination procedures outlined in Section 7.2. Accounting of all site personnel will be conducted by the HSO using the personnel log at a location determined by the HSO.

3. HRP personnel are not permitted to participate in handling the emergency. Fire and medical emergencies will be handled by the local fire department and ambulance service. In the case of a spill of hazardous materials the NYSDEC will be contacted.

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

4. Once initial emergency procedures to protect worker safety and health have been addressed, and control of emergency has been completed, the HSO will complete an Investigation Report and submit this form to the appropriate personnel (HRP and/or client contact).

5. All site workers will be familiarized with the above procedures during the pre-entry briefing to be conducted before site work begins.

9.0 TRAINING/MEDICAL SURVEILLANCE

9.1 Training Requirements

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

9.2 Pre-Entry Briefing

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

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

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

9.3 Morning Safety (Tailgate) Meeting

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

9.4 Medical Surveillance

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

10.0 AUTHORIZATIONS

Personnel authorized to enter the Exclusion Zone include the personnel listed in Section 2.4. Persons not listed in Section 2.4 may enter the Exclusion Zone only if the appropriate training and medical fitness certifications have been supplied to either the HRP Project Manager or Health and Safety Manager and the HSO or his/her designee on site has approved site entry. All personnel entering or leaving the Exclusion Zone must sign in and sign out with the recordkeeper.

11.0 FIELD TEAM REVIEW

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

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

Printed Name	Signature	Date

12.0 APPROVALS

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

Liam Whalen — June 7, 2024
Liam Whalen — Date
On-Site Health and Safety Officer

Patrick Montuori — June 7, 2024
Patrick Montuori, P.G. — Date
Project Manager

Bryan Sherman — June 7, 2024
Bryan Sherman, ASP — Date
Office Health and Safety Manager

Subcontractor:

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

_____ _____
Name — Date

Representing _____

The Designated Competent person representing [subcontractor] at the site will be

_____.

Any alternate Competent Person will be noted in the Daily Job Brief Record (**Appendix D**).

ADDITIONAL APPROVALS (or Re-Approvals)	
Name:	**Date:**

13.0 RECORDKEEPING

By the completion of the Project this Site-Specific HASP Document, and all associated records (completed Safe Work Permit Forms, Daily Briefs Forms, Monitoring data, etc.) must be provided to the Office Administrative Assistant at the Office that implemented the Project. The Administrative Assistant will then electronically store these records into the project folder. It is expected that some scanning will be necessary.

FIGURES

Figure 1: Site Location Map

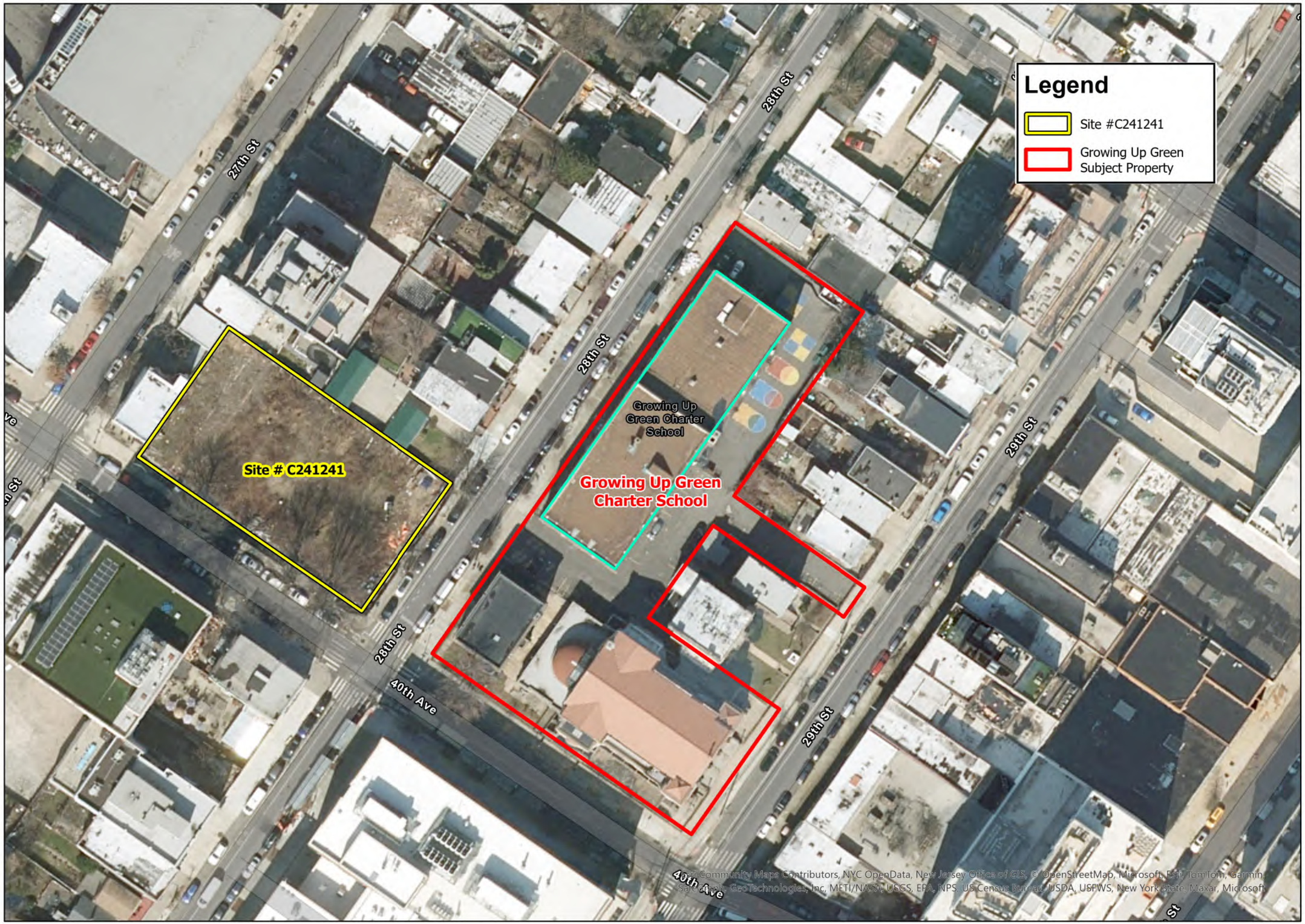
Figure 1
Site Location - 39-27 28th Street
Long Island City, Queens, New York
27-09 40th Avenue Off-Site
Site # C241241A
HRP # DEC1033.P2
Scale 1" = 2,000'

USGS Quadrangle Information
Quad ID: 40073-G8
Name: Central Park, New York

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

Path: S:\Data\NI\NYDEC - NYSDEC\NEW YORK\MULTIPLE SITES\DEC1033P2\GIS\27-09_40thAve\27-09_40thAve.aprx

Figure 2: Site Plan with Areas of Environmental Concern



HRP
MOVE YOUR ENVIRONMENT FORWARD
ONE FAIRCHILD SQUARE
SUITE 110
CLIFTON PARK, NY 12065
(518) 877-7101
HRPASSOCIATES.COM

North

0 30 60
Feet

Revisions					
No.	Date				

Designed By: LW
Drawn By: BOB
Reviewed By: PWM

Issue Date: 02/20/2024
Project No: DEC1033.P2
Sheet Size: 11x17

Surrounding Property Use

Growing Up Green
39-27 28th Street
Site #C241241A
27-09 40th Avenue
Long Island City, Queens, NY

Figure No.
2

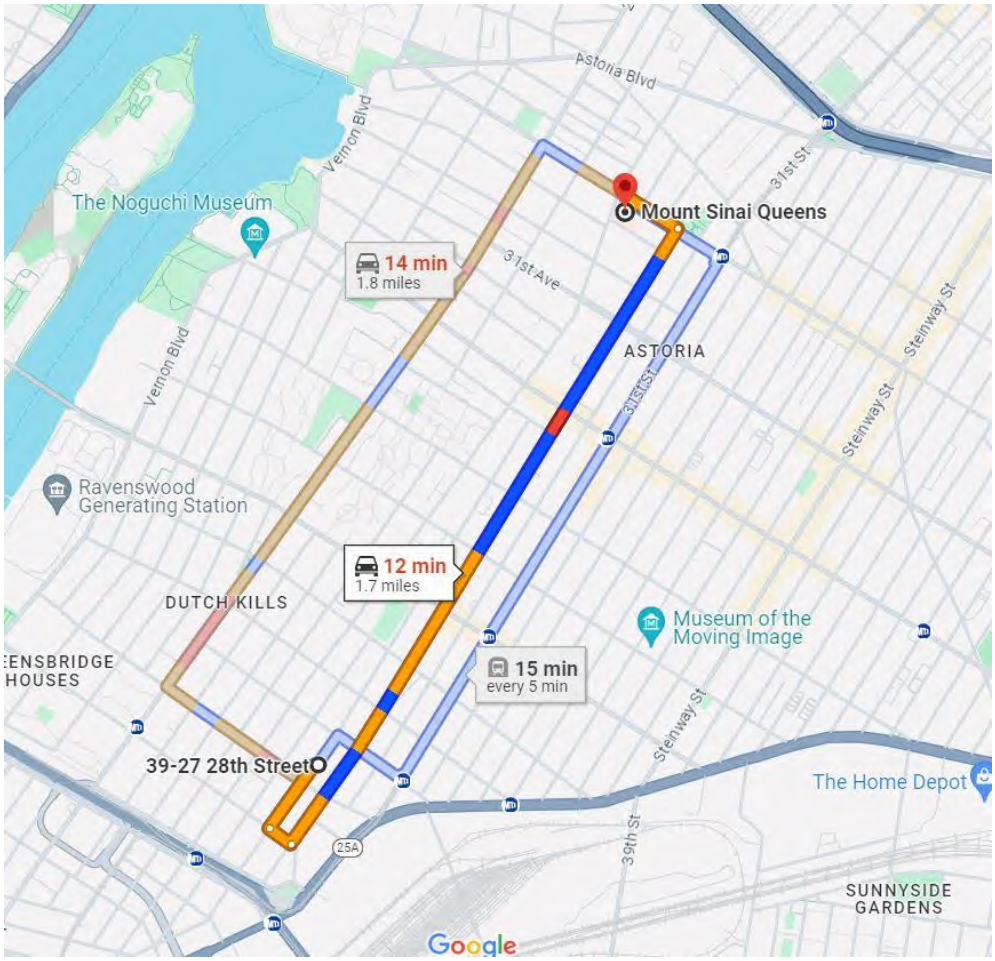
Path: S:\Data\NNYDEC - NYSDEC\NEW YORK\MULTIPLE SITES\DEC1033P2\GIS\27-09_40thAve\27-09_40thAve.aprx

Figure 3: Route and Map to Nearest Hospital

Directions to Mount Sinai Queens Hospital

Total Estimated Time: 12 minutes
Total Estimated Distance: 1.7 miles

Begin at 39-27 28th Street, Long Island City, NY
End at Mount Sinai Queens
25-10 30th Avenue, Queens, NY



TABLES

TABLE 1a: Chemical Hazards Known or Suspected On-Site

TABLE 1a

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Highlight those that apply

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

TABLE 1a

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Highlight those that apply

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
2-Methylphenol (o-cresol) [skin]	1.4 mg/L	5 ppm	5 ppm	---	250 ppm	Inh, Abs, Ing, Con	Confusion, depression, Resp Fail; difficulty breathing, irregular rapid respiration, weak pulse; skin, eye burns; dermatitis
3, 3'-Dichlorobenzidine	---	None	**---**	---	---	Inh, Abs, Ing, Con	Sens, Derm, Head, Dizz, Burns, GI Upset, [Carc]
4-Isopropyltoluene	---	---	---	---	---	Con, Inh, Ing	Defat, Eryt
Acenephthene	0.5048 mg/m^3	---	---	---	---	---	---
Acenaphthylene	---	---	---	---	---	---	---
Acetone	47.5 mg/m^3	1,000 ppm	500 ppm		2,500 ppm	Ing, Inh, Con	Head, Dizz; Irrit Eyes, Nose, Throat; Derm, CNS, Depress, Derm
Acetonitrile	70 mg/m^3	40 ppm	20 ppm	---	500 ppm	Inh, Ing, Abs, Con	Asphy; Nau, Vomit; Chest Pain; Weak, Stupor, Convuls; Eye Irrit
Aldrin	---	0.25 mg/m^3	0.25 mg/m^3	---	25 mg/m^3	Inh, Abs, Ing, Con	Head, Dizz, Nau, Vomit, Mal, Myo, [Carc]
Anthracene (Coal Tar Pitch)	---	0.2 mg/m^3			[80 mg/m^3]	Inh, Con	Derm, bron, [carc]
Antifreeze		50 ppm	100 mg/m^3 (aerosol)	---	ND	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Nau, Vomit, Abdom Pain, Lass, Dizz, Stup, Conv, CNS, Depres, Skin Sen
Arsenic	----	0.010 mg/m^3	0.01 mg/m^3	----	[5 mg/m^3]	Abs, Inh, Con, Ing	Derm; GI; Resp Irrit; ulceration of nasal septum; Resp, Irrit, Hyper Pig of Skin, [Carc]
Barium (elemental)	---	0.5 mg/m^3	0.5 mg/m^3		50 mg/m^3 (barium components)	Inh, Ing, Con	Resp. Irrit, GI, Muscle Spasm, Eye Irrit, Slow Pulse; skin burns
Benzene*	4.7 ppm	1 ppm	0.5 ppm	5 ppm	[500 ppm]	Inh, Ing, Abs, Con	Irrit Eyes, Nose, Throat; Head, Nau, Derm, Ftg, Anor, Lass, [Carc]

TABLE 1a

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Highlight those that apply

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

TABLE 1a

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Highlight those that apply

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Cis-1-2-Dichloroethylene	---	200 ppm	200 ppm	----	1000 ppm	Inh, Con, Ing	Irrit Eyes, Resp, CNS Depress
Copper (dusts and mists) (fumes)		1 mg/m^3 0.1 mg/m^3	1 mg/m^3 0.2 mg/m^3	----	100 mg/m^3	Inh, Ing, Con	Vomit, Derm, CNS, Irrit, Derm, Nau, Taste (metallic)
Cyanide	0.9 mg/m^3	5 mg/m^3	5 mg/m^3 (10 min)	5 mg/m^3	25 mg/m^3	Inh, Ing, Abs, Con	Weak, Head, Nau, Conf, Cyan
Dibenzo(a,h)anthracene						Inh, Ing	
Dichloromethane	540 mg/m^3	25 ppm	50 ppm	125 ppm	[2,300 ppm]	Inh, Abs, Ing, Con	Irrit Eyes, Skin, lass, drow, dizz, Numb, tingl, Nau, [Carc]
Diethylphthalate**	---	None	5 mg/m^3	---	N.D.	Inh, Ing, Con	Irrit Eyes, Skin, Nose, Throat, Head, Dizz, Nau, Lac, Possible Polyneur, Vestibular Dysfunc, Pain, Numb, lass, Spasms in Arms and Legs
Di-n-octylphthalate	---	---	---	---	---	Inh, Ing, Con	---
Dimethylpthalate	---	5 mg/m^3	5 mg/m^3	---	2,000 mg/m^3	Inh, Ing, Con	Irrit, Resp, Abdom
Ethyl Benzene*	8.7 mg/m^3	100 ppm	100 ppm	125 ppm	700 ppm	Inh, Abs, Con	Head. Irrit, Derm, Narc., Irrit Eyes, Skin; Coma
Fluoranthene		0.2 mg/m^3	0.2 mg/m^3			Ing, Inh	[Carc]
Fluorine*	6 mg/m^3	0.1 ppm	1 ppm	2 ppm	25 ppm	Inh, Con	
Fuel Oil/#2	----	----	300 ppm	----		Inh, Abs, Ins, Con	Irrit Eyes, Skin, Derm, Head, Ftg, Blurred Vision, Dizz, Conf
Ideno(1,2,3-cd)pyrene		0.2 mg/m^3				Ing, Inh	
Lead (inorganic forms and dust as Pb)****		0.05 mg/m^3	0.05 mg/m^3		100 mg/m^3	Inh, Ing, Con	Irrit, Cns, Vomit, Narco, Weak, Pall, Insom, Lass, Abdom, Constip

TABLE 1a

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Highlight those that apply

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Mercury (organic alkyl compounds) [skin]		0.01 mg/m^3	0.01 mg/m^3	0.03 mg/m^3	2 mg/m^3	Inh, Abs, Ing, Con	Irrit Eyes, Skin; Cough & Chest Pain, Bron Pneu, Tremor, Insom, Irrty, Indecision, Head, Ftg, Weak, Stomatitis, Salv, GI Dist, Anor, Low-wgt, Ataxia
Mercury (compounds)	----	0.1 mg/m^3	0.025 mg/m^3	0.1 mg/m^3	10 mg/m^3	Inh, Abs, Ing, Con	Irrit Eyes, Skin; Cough & Chest Pain, Bron Pneu, Tremor, Insom, Irrty, Indecision, Head, Ftg, Weak, Stomatitis, Salv, GI Dist, Anor, Low-wgt, Ataxia
Methanol	13.1150 mg/m^3	200 ppm	200 ppm	---	6,000 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Resp, Head, drow, dizz, Nau, Vomit, vis dist, Optic, derm
Methyl Ether	----	----	---	----	---	Inh	Poison
Methyl Ethyl Ketone (2-Butanone)***	0.7375 mg/m^3	200 ppm	200 ppm	300 ppm	3,000 ppm	Inh, Con, Ing	Irrit Eyes, Skin, Nose, Throat, Head, Dizz, Vomit, Derm
Methylene Chloride	540 mg/m^3	25 ppm	50 ppm	125 ppm	[2,300 ppm]	Inh, Ing, Con, Abs	Ftg, Weak, dizz, drow, Numb, Tingle [carc], Irrit Eyes, Skin, Nau
Mineral Spirit	20 ppm	500 ppm	100 ppm	---	20,000 mg/m^3	Inh, Ing, Con	Irrit Eyes, Nose, Throat, Dizz, Derm, Chemical pneu
Methyl tert butyl ether (MTBE)	---	---	50 ppm	---		Inh, Abs	
Naphtha	0.86 ppm	100 ppm	400 ppm	---	1,000 ppm	Inh, Con, Ing	Light Head, Drow, Irrit, Derm, Irrit Eyes, Skin, Nose

TABLE 1a

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Highlight those that apply

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Naphthalene*	0.084 ppm	10 ppm	10 ppm	15 ppm	250 ppm	Inh, Abs, Ing, Con	Eye irritation; headache; confusion, excitement, malaise (vague feeling of ill-being); nausea, vomiting, abdominal pain; irritated bladder; profuse sweating; renal shutdown; dermatitis
Nickel (metal)	---	1 mg/m^3	1.5 mg/m^3	---	[10 mg/m^3]	Inh, Ing, Con	Head, Verti, Nau, Vomit, Pain, Cough, Weak, Convuls, Delirium, Pneu, ,[Carc]
Nitrobenzene	0.0235 mg/m^3	1 ppm	1 ppm	---	200 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Anoxia, Derm, Anem, Methem
n-Butylbenzene	---	---	---	---	---	---	---
n-Propylbenzene	---	---	---	---	---	---	---
PCBs 42% chlorine (Aroclor 1242)	---	1 mg/m^3 (skin)	1 mg/m^3 (skin)	---	[5 mg/m^3]	Inh, Abs, Ing, Con	Irrit Eyes, Chloracne, Liver Damage [carc]
PCBs 54% chlorine (Aroclor 1254)	---	0.5 mg/m^3 (skin)	0.5 mg/m^3 (skin)	---	[5 mg/m^3]	Inh, Abs, Ing, Con	Irrit Eyes; Chloracne, Liver Damage [carc]
Petroleum Distillates	---	500 ppm	100 ppm		[1,100 ppm]	Inh, Ing, Con	Dizz, Drow, Head, Dry Skin, Nau, Irrit Eyes, Nose, Throat, [Carc]
Phenanthrene (Coal Tar Pitch)		0.2 mg/m^3	0.2 mg/m^3		[80 mg/m^3]	Inh, Con	Derm, bron, (carc)
Phenol**	0.1786 mg/m^3	5 ppm	5 ppm	---	250 ppm	Inh, Abs, Ing, Con	Irrit Eyes, Nose, Throat, Anor, Low Wgt, Weak Musc Ache, Pain, Dark Urine, Cyan, Liver, Kidney Damage, Skin, Burns, Derm, Ochronosis, Tremor, Convuls, Twitch
Pyrene		0.2 mg/m^3			[80 mg/m^3]	Inh, Con	[Carc]

TABLE 1a

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Highlight those that apply

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
Sec-Butylbenzene	---	---	---	---	---	---	---
Selenium	N/A	0.2 mg/m^3	0.2 mg/m^3	Unknown	1 mg/m^3	Inh, Ing, Con	Irrit, Head, Fever, Chills, Skin/Eye Burns, Metallic Taste, GI, Dysp, Bron
Silver (metal and soluble compounds as Ag)	----	0.01 mg/m^3	Metal = 0.1 mg/m^3 Soluble 0.01 mg/m^3		10 mg/m^3	Inh, Ing, Con	Blue-gray Eyes, Nasal Septum, Throat, Skin; Irrit, Ulcer, Skin, GI Dist
Tetrachloroethylene (a.k.a. perchloroethylene)***	4.68 ppm	100 ppm	25 ppm	200 ppm	[150 ppm]	Inh, Ing, Con, Abs	Irrit Eyes, Skin, Nose, throat, Resp. Nau, flush face, Neck, dizz, inco, head, drow, eryth, [Carc]
Toluene*	2.14 ppm	200 ppm	50 ppm	300 ppm	500 ppm	Inh, Abs, Ins, Con	Resp, Irrit, Ftg, Conf, Dizz, Head, Derm, Euph, Head, Dilated Pupils, Lac, Ner, Musc FTg, Insom, Pares, Derm, lass
Petroleum Distillates (naphtha)	10 ppm	100 ppm	400 ppm	---	1,000 ppm	Con, Inh, Ing	---
Trans 1,2-Dichloroethylene	0.3357 mg/m^3	200 ppm	200 ppm	---	1,000 ppm	Inh, Con	Irrit, Resp, CNS depress
Trichloroethylene***	21.4 ppm	100 ppm	50 ppm	200 ppm	[1,000 ppm]	Inh, Con, Abs, Ing	Head, Vert, Nau, Vomit, Derm, Vis Dist, Tremors, Som, Nau, Irrit Eyes, Skin, Card Acc., Ftg, [Carc]
Trichlorofluoromethane	28 mg/m^3	1,000 ppm	1,000 ppm		2,000 ppm	Inh, Con, Ing	Inco, trem, derm, card, asph, frost
Trichlorotrifluoroethane	45 ppm	1,000 ppm	1,000 ppm	1,250 ppm	2,000 ppm	Inh, Con, Ing	Irrit Skin, throat, Drow, Derm, CSN, Depress
Vinyl Chloride***	10-20 ppm	1 ppm	1 ppm	5 ppm	ND	Inh, Con	Lass, Abdom, Gi Bleeding; Hepatomegaly; Pallor or Cyan of Extremities; Liq: Frostbite; [Carc]

TABLE 1a

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Highlight those that apply

CONTAMINANT	ODOR THRESHOLD	OSHA PEL[1]	TLV (ACGIH)	OSHA CEILING[2] /STEL	IDLH CONC.	ROUTES OF EXPOSURE	SYMPTOMS OF ACUTE EXPOSURE[3]
VM&P Naphtha (petroleum naphtha)	---	---	300 ppm	---	ND	Con, Ing, Inh	Irrit Eyes, Nose, Throat, Dizz, drow, head, nau, dry skin, chem. Pneumonitis
Xylene*	4.5 mg/m^3	100 ppm	100 ppm	150 ppm	900 ppm	Inh, Ing, Abs, Con	Dizz, Drow, Irrit, Excite, Nau, Vomit, Eyes, Skin, Nose, Throat
Zinc (oxide)	---	5 mg/m^3	2 mg/m^3	---	500 mg/m^3	Inh	Dry Throat, Cough, Chills, Tight Chest, Blurred Vision
4,4′ DDD	---	---	---	---	---	Ing, Inh, Con	---
4,4′ DDE	---	---	---	---	---	Ing, Inh, Con	---
4,4′ DDT	5.0725 mg/m^3	1 mg/m^3	1 mg/m^3	---	[500 mg/m^3]	Inh, Abs, Ing, Con	Irrit Eyes, Skin, Pares, Tongue, Lips, Face, Trem, Anxi, Dizz, Conf, Mal, Head, Lass, Conv, Paresi Hands, Vomit, [Carc]
Aldrin		0.25 mg/m^3	0.25 mg/m^3	---	[25 mg/m^3]	Inh, Abs, Ing, Con	Head, Dizz, Nau, Vomit, Mal, Myo [Carc]
Chlordane [skin]	0.0084 mg/m^3	0.5 mg/m^3	0.5 mg/m^3		[100 mg/m^3]	Inh, Abs, Ing, Con	Blurred vision, confusion, delirium, cough; abdominal pian, nausea, vomiting diarrhea; irritability, tremor, convulsions [Carc]
EDB	76.8 mg/m^3	20 ppm		30 ppm	[100 ppm]	Inh, Abs	Resp. Irr, Eye Irr. [Carc]
Endosulfan I Endosulfan II	---	0.1 mg/m^3	0.1 mg/m^3	---	N.D.	Inh, Abs, Ing, Con	Irrit, Skin, Nau, Conf, Agit, Flush, Dry, Trem, Conv, Head
Endosulfan Sulfate		---	0.1 mg/m^3	---	---	Ing, Con	---
Endrin	1.8 x 10^{-2} ppm	0.1 mg/m^3	0.1 mg/m^{-3}	---	2 mg/m^3	Inh, Abs, Ing, Con	Epil Conv, Stup, Head, Dizz, Abdom, Nau, Vomit, Insom, Agress, Conf, Drow, Lass, Anor
Endrin Aldehyde	1.8 x 10^{-2} ppm	---	---	---	---	Inh, Con	---
Endrin Ketone	---	---	---	---	---	---	---

TABLE 1a

CHEMICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Highlight those that apply

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

NOTES

* = Constituent found in ETPH

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

***=Constituent found in Volatile Organic Compounds

****=Constituent found in Leaching Lead

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

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

[3]Abbreviations are contained on the next page

[ ] = Potential Occupational Carcinogen

ND = Not Been Determined

ABBREVIATIONS

abdom = Abdominal
abs = Absorption
aggress = Aggressiveness
agit = Agitation
anor = Anorexia
anos = Anosmia (loss of the sense of smell)
Anxi = anxiety
anem – Anemia
aspir = Aspiration
asph – asphyxia
bron = Bronchitis
bron pneu = Bronchitis pneumonitis
[carc] = Potential occupational carcinogen
Card = Cardiac arrhythmias
CNS = Central nervous system
conf = Confusion
constip = Constipation
con = Skin and/or eye contact
conv = Convulsions
corn = Corneal
cyan = Cyanosis
defat = Defatting
depres = Depressant/Depression
derm = Dermatitis
diarr = Diarrhea
dist = Disturbance
dizz = Dizziness
drow = Drowsiness
dry = Dry mouth
dysp = Dyspnea (breathing difficulty)
emphy = Emphysema
epil-conv = Epileptiform convulsions
eryth = Erythema
euph = Euphoria
fib = Fibrosis
frost = frostbite
ftg = Fatigue
flush = Flushing
GI = Gastrointestinal
head = Headache
hyperpig = Hyperpigmentation
inco = Incoordination
ing = Ingestion
inh = Inhalation
inj = Injury
insom = Insomnia
irrit = Irritation
irrty = Irritability
lac = Lacrimination (discharge of tears)
lass = Lassitude (weakness, exhaustion)
li-head = Lightheadedness
liq = Liquid
low-wgt = Weight loss
mal = Malaise (vague feeling of discomfort)
malnut = Malnutrition
methem = Methemoglobinemia
myo = Myochonic (jerks of limbs)
mg/m = milligrams/cubic meter
muc memb = Mucous membrane
mus ftg = Muscle fatigue
narco = Narcosis
nau = Nausea
ner = Nervousness
numb = Numbness
optic = Optic nerve damage (blindness)
pall = Facial pallor
parap = Paralysis
ppm = Parts per million
pares = Paresthesia
paresi = Paresis
peri neur = Peripheral neuropathy
pneu = Pneumonitis
prot = Proteinuria
pulm = Pulmonary
peri neur = Peripheral neuropathy
pneu = Pneumonia
prot = Proteinuria
pulm = Pulmonary
repro = Reproductive
resp = Respiratory
skin sen = skin sensitization
salv = Salvation
som = Somnolence (sleepiness unnatural drowsiness)
subs = Substernal (occurring beneath the sternum)
stup = Stupor
sys = System
tingle = tingle limbs
trem – Tremors
verti = Vertigo
vis dist = Visual disturbance
vomit = Vomiting
weak = Weakness

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

TABLE 1b

PHYSICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Description of Hazard	Methods to Identify and Minimize	Potential for Occurrence	Potentially Affected Tasks
1. Operating Heavy Equipment	• Utilizing proper equipment operation methods • Maintain safe clearance distances • Wear appropriate eye/ear protection according to manufacturer's recommendations	Moderate	Observation of Excavation/Sampling
2. Inclement weather	• Determine probable weather conditions prior to arrival at site • Avoid working during hurricanes, blizzards, persistent heavy rain or snow, close thunderstorms	Moderate	Observation of Excavation/Sampling
3. Heat/cold Stress	• Determine probable weather conditions prior to arrival at site • Wear proper clothing • Monitoring of yourself and team mates • Drink plenty of fluids • Utilize work breaks as often as necessary • Avoid working in extreme cold conditions	Moderate	Observation of Excavation/Sampling
4. Slip, trip, and fall hazards caused by irregular and loose rocky topography	• Wear appropriate footwear to increase traction when possible • Be aware of surroundings	Low	Observation of Excavation/Sampling

TABLE 1b

PHYSICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Description of Hazard	Methods to Identify and Minimize	Potential for Occurrence	Potentially Affected Tasks
5. Utilities	• Complete a Call Before You Dig markout prior to the work start date • Obtain buried private lines information from and clear sampling locations with Site Contact • Avoid using heavy equipment or drill rig in close proximity to overhead utilities • Inspect sampling areas for Call Before You Dig markings; inspect catch basins and manholes to determine buried pipeline directions prior to sampling • Avoid sampling within area of pavement cuts that may be indicative of buried lines	Moderate	Observation of Excavation/Sampling
6. Falling into Test Pit or other Fall Hazards	• Wear appropriate footwear to increase traction • Be aware of surroundings • Do not stand too close to the edge of the test pit	Moderate	Observation of Test Pit
7. Cave in of Test Pit	• Be aware of surroundings • Do not enter a Test Pit over three feet deep	Low	Observation of Test Pit
8. Inhalation of Volatiles	• Implement and adhere to action levels stipulated in air monitoring program for volatile organics • Wear appropriate protective equipment • Report potential exposure symptoms immediately • Utilize engineering controls such as fans	Low	Observation of Excavation/Sampling

TABLE 1b

PHYSICAL HAZARDS KNOWN OR SUSPECTED ON-SITE

Description of Hazard	Methods to Identify and Minimize	Potential for Occurrence	Potentially Affected Tasks
9. Skin contact with volatile organic compounds, semi volatile organic compounds, metals, TPHs, PCBs, pesticides, cyanide	• Wear appropriate protective clothing • Follow proper decontamination procedures • Report potential exposure symptoms immediately	Low	Observation of Excavation/Sampling

APPENDIX A

Safety and Logistics Planning Call Log

Safety and Logistics Call Log
DEC009808

Date of Call

Work Assignment Number / Task

DEC Site Name and Number

Names of Attendees (and phone #s):

HRP

- HRP PM
- HRP SSO
- HRP Other
- HRP Other
- HRP Other

DEC

- DEC PM
- DEC Other

Subcontractors

- Driller Contact
- Utility Survey
- Surveyor
- Construction
- Other

Other

Brief Description Scope of Work (Task Specific) Use additional forms for additional tasks

Logistics:

Date of Work:

Time to Meet:

Site Contact (phone)

Notification of Site Contact made by:

Describe any unusual site specific conditions/logistics here (if any):

Notes below as needed:

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

Will there be intrusive work? Y / N

Locations marked in the field? Y / N

NYS Code Rule 753/Dig Safe System: Ticket Number:

Confirmed that mark-out complete? Y / N

Anticipated Subsurface Conditions (Geology, Utilities, etc.):

Anticipated Depth to Groundwater:

Will NAPL/Product be Present: Y / N Describe:

Safety and Logistics Call Log
DEC009808

Will there be any other parties entering the work zones? Describe control measures:

Lab and Equipment:

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

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

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

Bottle Order Received/Checked? Y / N
How will samples be conveyed to lab? _____
Sample TAT? Standard 24 hr TAT 48 hr TAT Other: _____

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

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

Site Setting:

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

Task-Specific Chemicals and Hazards (describe): _____
PPE Level (circle): D C B A Modifications: _____
Glove Types: _____ Face covering needed? Y / N
Other specialty PPE: _____

Safe to Work Alone: Y / N
Other Precautions: Y / N Describe: _____

COVID 19 Protocols to be Observed: Y / N

Waste Containment:
How/where will materials be contained, labelled, stored, or disposed?

Miscellaneous:

APPENDIX B
Personnel Log

PERSONNEL LOG

Name	Representing	Date	Time In	Time Out

APPENDIX C
Supervisor's Investigation Report

INCIDENT REPORT

Section 1.0: Complete By Employee and Project Manager

(provide to Human Resources Manager) Incident Case No. _____

Employee Name: Employee Title/Position:	Age: Sex: ☐ Female ☐ Male	Time employee began work: Date of Incident: Time of Incident:	Weather Conditions: Date of Report: Time Report Completed:
Department: Office Location: Supervisor:			
Employee Address: Street: City/Town: Zip Code: Phone Number:	Location of Incident: Address: City/Town: State:		

Type of Incident:

☐ Motor Vehicle Accident ☐ Other Accident or Injury ☐ Near Miss (no actual accident or injury occurred)

- Did the incident or near miss occur during business hours and/or travel to and from a client location? Yes / No
- If a motor vehicle accident, was it a personal vehicle or company vehicle? Yes / No / Not Applicable
- Did the incident result in first aid treatment (either during or outside of business hours? Yes / No (if yes, add details below)
- Did the incident result in medical treatment beyond first aid? Yes / No (if yes, add details below)
- Did the incident result in lost time or days away from work? Yes/No (lost time begins the day after incident/injury)
  - If yes, provide number of days away from work:_____

Notes/Details:

_____

_____

If injuries occurred, list names and describe nature, degree, and body part injured: Number of injured:_____

1.

2.

Complete Section 3.0

WITNESS STATEMENT: WHAT HAPPENED AND WHAT WAS THE EMPLOYEE DOING BEFORE THE INCIDENT OCCURRED? WHAT WAS THE EMPLOYEE DOING WHEN THE INCIDENT OCCURRED? WHAT WAS THE EMPLOYEE DOING AFTER THE INCIDENT OCCURRED?	Describe what took place? Who was at fault for vehicle accidents, citation? Was power equipment involved, if so, describe?

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

Completed by:	Reviewed by:	Date

Section 2.0: Complete By Supervisor or Human Resources Manager

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

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

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

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

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

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

Section 4.0: Complete By Human Resources Manager

Incident Report Case No. _____

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

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

APPENDIX D
Daily Job Brief Record

DAILY JOB BRIEF RECORD

	Growing Up Green Charter School 39-27 28th Street, Long Island City, NY	DEC1033.P2
Person Conducting	Site Name/Address	HRP Client Name/Job #
Sydney Sobol (DEC) 518-402-4799		Patrick Montuori 845-531-9490
Client Contact/Phone	HRP H&S Rep.	HRP Supervisor
Date/Time	Number Attending	Weather

Designated Competent Person: _____

Description of Work: _____

Attendees (use additional sheets as needed):

Name	Company	Signature

Emergency Telephone Numbers FIRE / POLICE / AMBULANCE: 911

Hospital Name & Location: **Mount Sinai Queens, 25-10 30th Avenue, Queens NY**

NYSDEC Spill Line: 1-518-457-7362 National Response Center: 800-424-8802 CBYD: 800-922-4455

Health & Safety Manager: Bryan Sherman 518-560-2980

HAZARDS

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

PERSONAL SAFETY

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

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

FIRE SAFETY

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

ISOLATE EQUIPMENT

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

ELECTRICAL EQUIPMENT

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

AIR MONITORING Type of Meter: _____ Date last calibrated: _____

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

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

Contaminants of Concern: _____

HEALTH & SAFETY SIGNATURE: _____ Date: _____

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

☐ HAZARD ZONES NOT APPLICABLE, GENERAL WORK AREA

Level D ☐ Modified Level D ☐ Level C ☐

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

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

APPENDIX E
Equipment Calibration Log

EQUIPMENT CALIBRATION LOG		
Instrument	**Calibration Date**	**Calibrated By**

APPENDIX G
COMMUNITY AIR MONITORING PLAN (CAMP)

Community Air Monitoring Plan

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than the background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work will be stopped and a re- evaluation of activities initiated. Work can resume provided that dust suppression measures

and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

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

VOC Monitoring, Response Levels, and Actions

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

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

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

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

- All 15-minute readings will be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

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

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

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

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

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

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

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

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

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

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

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

Community Air Monitoring Plan

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

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

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

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

VOC Monitoring, Response Levels, and Actions

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

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

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

3. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

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

Particulate Monitoring, Response Levels, and Actions

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

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

2. If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

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

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Appendix 1B
Fugitive Dust and Particulate Monitoring

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

1. Reasonable fugitive dust suppression techniques must be employed during all site activities which may generate fugitive dust.

2. Particulate monitoring must be employed during the handling of waste or contaminated soil or when activities on site may generate fugitive dust from exposed waste or contaminated soil. Remedial activities may also include the excavation, grading, or placement of clean fill. These control measures should not be considered necessary for these activities.

3. Particulate monitoring must be performed using real-time particulate monitors and shall monitor particulate matter less than ten microns (PM10) with the following minimum performance standards:

(a) Objects to be measured: Dust, mists or aerosols;
(b) Measurement Ranges: 0.001 to 400 mg/m3 (1 to 400,000 :ug/m3);
(c) Precision (2-sigma) at constant temperature: +/- 10 :g/m3 for one second averaging; and +/- 1.5 g/m3 for sixty second averaging;
(d) Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 :m, g= 2.5, as aerosolized);
(e) Resolution: 0.1% of reading or 1g/m3, whichever is larger;
(f) Particle Size Range of Maximum Response: 0.1-10;
(g) Total Number of Data Points in Memory: 10,000;
(h) Logged Data: Each data point with average concentration, time/date and data point number
(i) Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number;
(j) Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes), alarms required;
(k) Operating Time: 48 hours (fully charged NiCd battery); continuously with charger;
(l) Operating Temperature: -10 to 50^{o} C (14 to 122^{o} F);
(m) Particulate levels will be monitored upwind and immediately downwind at the working site and integrated over a period not to exceed 15 minutes.

4. In order to ensure the validity of the fugitive dust measurements performed, there must be appropriate Quality Assurance/Quality Control (QA/QC). It is the responsibility of the remedial party to adequately supplement QA/QC Plans to include the following critical features: periodic instrument calibration, operator training, daily instrument performance (span) checks, and a record keeping plan.

5. The action level will be established at 150 ug/m3 (15 minutes average). While conservative,

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

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

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

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

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

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