

REMEDIAL WORK PLAN

FOR

**TRANSFORMER ROOMS NOS. 1 & 2 – BLDG. 1
BRONX PSYCHIATRIC CENTER
1500 WATERS PLACE, BRONX, NY 10461
DASNY Project Number 3816609999**

Prepared For:



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January 2026



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Bronx Psychiatric Center
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CERTIFICATION

I, Anthony Sigona, PE certify that I am currently a registered professional engineer licensed by the State of New York and that this Remedial Work Plan 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 Green Remediation (DER-31).

Anthony Sigona, PE
Name

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Anthony J. Sigona
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January 15, 2026
Date

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1.0 INTRODUCTION AND PROJECT OBJECTIVES

This Remedial Work Plan (RWP) has been prepared by TRC Engineers, Inc. (TRC) on behalf of Dormitory Authority of the State of New York (DASNY) and the New York Office of Mental Health (OMH) for Transformer Room No. 1 and Transformer Room No. 2 located inside Building No. 1 (Medical Surgical Building 101 (Thomson Building), located at the Bronx Psychiatric Center located at 1500 Waters Place in Bronx County of New York City, tax block 4226, lot 30.

This RWP outlines the scope of work for the implementation of the remedy selected which is specified in the Administrative Record of Decision (ROD) governing the cleanup of Hazardous Waste at this Site according to New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375.

In order to ensure proper performance of all key objectives of this work plan, TRC Engineers, Inc. (TRC) will review this RWP with New York Office of Mental Health (OMH) and its Environmental Contractor before scheduling this work. The RWP is divided into sequential steps as follows: Transformer Room Sampling, Sampling Room Methodologies, Transformer Room Investigation Report, Project Specifications, Transformer Room Remediation, Soil Excavation and Sampling, Backfilling, and Installation of Concrete Pads (Cover), Solid Waste Management, Transportation and Disposal, and Final Report. The Project Schedule is presented in Section 10.0 of this RWP.

All TRC work will be performed in accordance with the Site-Specific Health and Safety Plan (HASP) presented in Appendix 4 that defines the potential hazards expected to be encountered during the implementation of the scope of work presented in this RWP, the Community Air Monitoring Plan (CAMP) presented in Appendix 5 to monitor for particulates will be implemented, as well as the appropriate exposure controls including engineering, administrative, and personal protective equipment required for each task. In addition, the contractor assigned to perform RWP tasks in this plan will be required to prepare a separate HASP.

2.0 BACKGROUND

The Transformer Rooms Nos. 1 & 2 are located at Building No. 1 Medical Surgical Building 101 (Thomson Building) on a 0.1-acre portion of the 5-acre Bronx Psychiatric Center campus, which is considered an urban area (the “Site”).

Current Site Usage

The Site has been used as transformer rooms for the psychiatric center for over 50 years and is no longer used for electric power supply to the building. The transformers containing PCB oils were reportedly replaced in 1993 with non-PCB transformers. In 1995, the entire floor in Room No. 1 was epoxy sealed, and a limited portion of the floor near the transformer in Room No. 2 was epoxy sealed. Openings between ventilation fan and exterior walls and the space between the floors and electrical equipment were sealed, and annual surface wipe sampling and maintenance of the epoxy coating was conducted. The non-PCB transformers and associated electrical equipment in the rooms were vandalized in 2023 for copper wiring and related equipment resulting in significant damage, the release of transformer oils, and the presence of both built-up debris and general inaccessibility. The Site is currently unoccupied.

Site History

The Thomson Building Site at the Bronx Psychiatric Center, a State Superfund Project in Bronx County recorded as Site No. 203005, was originally classified as a Class 2 inactive hazardous waste disposal site and reclassified as a Class 3 inactive hazardous waste disposal site on August 9, 2006. From 2015 through 2019, the Department developed the Feasibility Study Work Plan and completed several rounds of review and comment, culminating in a public meeting in March 2019 and issuance of the Record of Decision (ROD). A ROD Modification Memorandum dated February 11, 2020, subsequently corrected several inconsistencies in the original documents, including clarifying that the Site is classified as a Class 3 site rather than Class 2. This decision is based on the Administrative Record of the New York State Department of Environmental Conservation (the DEC) for the Bronx Psychiatric Center Site and the public’s input to the remedy presented by the Department. The DEC and NYS OMH also entered a Consent Order on February 23, 2012, Index # R2-0668-06-11; the Order obligates the responsible party to implement this RWP.

The Administrative Record of the New York State Department of Environmental Conservation (the NYSDEC) is based on the following:

1. *Proposed Remedial Action Plan for the Bronx Psychiatric Center site*, dated February 2019, prepared by the NYSDEC
2. *Order on Consent, Index No. R2-0668-06-11, between the NYSDEC and New York State Office of Mental Health, executed on February 23, 2012*
3. *Preliminary Site Assessment Report*, dated December 2000, prepared by Dvirka and Bartilucci Consulting Engineers.
4. *Citizen Participation Plan*, dated March 2013 (revised June 2013), prepared by URS Corporation (URS)
5. *Remedial Investigation Work Plan*, dated October 2013, prepared by URS
6. *Remedial Investigation Report*, dated November 2016, prepared by URS
7. *Feasibility Study Report*, dated February 2019, prepared URS

The transformer rooms at the psychiatric center were operated for over 50 years for electric power supply to the building. There are transformers and associated electrical equipment in the transformer rooms. The prior transformers used at the facility contained PCB dielectric fluid, which leaked historically within the

transformer rooms, impacting the concrete floors beneath and near the transformers and the soils below the building floor. The former PCB transformers were replaced, and the current transformers reportedly contain non-PCB oil.

Transformer Rooms No. 1 and No. 2 are in the east side of the basement of Building No. 1 Medical Surgical Building 101 (Thomson Building). Access to the transformer rooms is limited to maintenance personnel. Transformer Rooms No. 1 and No. 2 currently contain inactive transformers that previously supplied electricity to Building No 1.

In 1995, the concrete floors were encapsulated (sealed) with a two-layer epoxy system in both transformer Rooms No. 1 and 2. The entire floor in Room No. 1 was epoxy sealed, and a limited portion of the floor near the transformer in Room No. 2 was epoxy sealed. Openings between ventilation fan and exterior walls and the space between the floors and electrical equipment were sealed, and surface wipe sampling and maintenance of the epoxy coating were being conducted until October 2023, when access to the Transformer Rooms was compromised due to vandalism. The transformer room floors are currently accessible, however there are areas of the floor that are partially covered with damaged equipment and debris.

Currently, Transformer Room No. 1 contains a 13,800-480-volt double-ended unit substation, consisting of primary switches, transformers, and switch gear. Transformer Room No. 2 contains a 13,800-480-volt double-ended unit substation, consisting of primary switches, transformers, and secondary switchgear, as well as switchgear that is served from Room No. 1. The power is disconnected, and building is unoccupied, and the transformers and equipment and miscellaneous debris will be removed to implement the selected remedy specified in the ROD issued by NYSDEC.

3.0 PRE REMEDIAL TRANSFORMER ROOM SAMPLING

The transformers for Building No. 1 Medical Surgical Building 101 (Thomson Building) will be surveyed for suspect asbestos-containing materials (ACM), Lead Paint, RCRA metals, PCBs, and universal and hazardous wastes prior to any proposed remedial work. The transformers and associated equipment must be sampled and properly characterized prior to removal. The actual number of samples collected for each type of material will depend on the quantity and types of suspect ACM, RCRA metals, and PCB containing material identified.

The proposed survey and sampling will not include an assessment of concrete, soil or groundwater impacts beneath the transformers which was previously performed prior to the ROD. The additional sampling in the Transformer Rooms will be used for waste characterization of the transformers, vandalized equipment and building materials to be removed during remedial activities.

3.1 Asbestos Sampling

The asbestos survey will involve the inspection of all building materials present within the two (2) transformer rooms, including but not limited, to the transformers and associated equipment, vandalized components, debris, and any fire-rated doors. The asbestos survey will involve sampling of all suspect building materials impacted by the work. Homogeneous materials will be classified according to color, appearance and texture and evidence of being installed at the same general time. The suspect homogeneous asbestos containing materials (ACM) will be categorized into one of the three following groups:

- Surfacing Materials - sprayed or trowelled onto structural members (such as beams, columns, decking) for fire protection; on ceilings and walls for fireproofing; or for acoustical or decorative purposes.
- Thermal System Insulation (TSI) - applied to hot and cold-water systems and HVAC systems to prevent heat transfer and water condensation. This includes insulation on piping, pipe joints, and ducts.
- Miscellaneous Materials - all other suspect ACM including, but not limited to, gaskets, pumps, valves, roofing materials, caulk, tar, mastics and transite insulations.

The asbestos sampling will be performed by New York State Department of Labor (NYSDOL) and New York City Department of Environmental Protection (NYCDEP) certified asbestos inspectors/investigators.

The asbestos samples will be transported to a New York State Environmental Laboratory Approved Program (NYS ELAP) laboratory, following proper chain-of-custody procedures for analysis by New York State Polarized Light Microscopy (PLM) Method 198.1, non-friable organically bound (NOB) Method 198.6 or transmission electron microscopy (TEM) Method 198.4, as applicable.

3.2 Lead Paint Survey

A visual inspection of the Transformer Rooms will be performed for suspect Lead Paint.

- Preparation of a Lead Paint summary of field notes, location diagrams, observations and estimated quantities of suspect lead paint will be submitted with the supplemental environmental survey report for the property.

- TRC will conduct lead-based coating inspection of painted building materials using USEPA trained lead inspectors. The method used for the inspection will utilize an X-Ray Fluorescence (XRF) spectrum analyzer.

3.3 RCRA Metal Sampling

Disposal of porous floor debris may contain lead-based paint, as well as other regulated heavy metals typically associated with electrical equipment and is subject to the requirements under both the NYSDEC Solid and Hazardous Waste Management regulations (6 NYCRR 360 and 6 NYCRR 371) and the USEPA RCRA Hazardous Waste Management regulations (40 CFR Parts 260 through 268).

TRC will collect up to two (2) samples, one (1) bulk sample of representative porous floor debris and non-metallic (non-recyclable) materials being removed from each Transformer Room. The samples will be placed in a container and delivered to a New State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory following proper chain-of-custody procedures. The sample will be analyzed following the Toxicity Characteristic Leaching Procedure (TCLP) for leachable RCRA (8) metals (arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury).

The TCLP analysis will provide a preliminary characterization of the projected waste stream for the non-recyclable debris materials as either hazardous or non-hazardous waste. The preliminary hazardous waste sampling can be used as final if TRC visually verifies that the waste stream is the same as what was originally sampled. TRC shall perform final waste characterization to obtain disposal facility acceptance prior to disposal by the contractor if required.

3.4 PCB Sampling

3.4.1 PCB Liquid and Bulk Sampling

The accumulation of any liquid and sediment in the Transformer Rooms may be contaminated. This may include the potential release of di-electric or silicone oils, and potential PCB contamination. Bulk samples of residual liquid and sediment from the surface of concrete and/or drainage low points will be collected. PCB samplers will wear phthalate-free gloves such as neoprene, butyl, or Viton gloves (> 8 hour breakthrough for PCBs) when handling PCB samples.

Sediment Sampling

A total of six (6) discrete liquid and/or sediment samples will be collected using a dedicated disposable Teflon scoop for each liquid and/or sediment sample. Additional bulk samples of manufactured building materials with suspect PCBs will be collected if suspect caulking, textured paint or fireproofing is observed. Additional bulk samples of suspect asbestos porous materials will be sampled for PCBs if present. The samples will be containerized in appropriately labeled and sealed laboratory-supplied glassware.

Liquid and Aqueous Sampling

Collecting aqueous and liquid samples involves a standardized process to ensure accurate analysis. This includes proper sample collection, preservation, and transportation to a lab for analysis. A general approach involves using sterile, rinsed collection bottles, filling them to a specific level, and placing them in coolers with ice for transport according to laboratory for analysis for USEPA SW846 Method 8082A.

Manufactured Building Materials

Bulk Samples will be collected at no more than 1/2-inch depth intervals using a metal chisel or sharp cutting knife. Thus, the initial surface sample should be collected from 0 - 0.5 inches. For porous surfaces, such as caulking and rubber, a representative sample can be collected using a metal chisel or sharp cutting knife. A minimum sample size of the bulk materials will be weighed in the field to achieve at least 10 grams for analysis.

Liquid/sediment samples will be submitted for laboratory analysis acceptable to both New York State Department of Environmental Conservation (NYSDEC) and United States Environmental Protection Agency (USEPA).

3.4.2 PCB Wipe Sampling

Wipe Samples: A total of twelve (12) discreet PCB wipe samples will be collected from non-porous surfaces identified within Transformer Rooms 1 and 2 which include vandalized equipment and materials which will be removed for off-site recycling and/or disposal. Samplers will wear phthalate-free gloves such as neoprene, butyl, or Viton gloves (> 8 hour breakthrough for PCBs) when handling PCB samples.

Each wipe sample will be collected using hexane-rinsed cotton gauze wipe which will be placed in a separate, pre-cleaned glass jar with a Teflon-lined cap for submission to the laboratory under standard chain-of-custody procedures for submission to an independent laboratory certified to perform PCB analysis according to New York State Department of Health (NYSDOH) ELAP program.

Wipe samples will be analyzed using gas chromatography (GC) in accordance with USEPA SW846 Method 8082A following Soxhlet Extraction (SW846 Method 3540C) or approved alternative method.

Laboratory reporting limits for each Aroclor in each sampling media are:

- *Surface Wipe Samples* – reporting limit of 0.1 µg/100 cm².
- Surface wipe samples will be compared to EPA's high occupancy wipe sample criteria of 10 µg/100 cm² 40 CFR 761.61(a)(4)(ii) and NYSDEC 6 NYCRR 371.4(e).

3.4.3 Transformer PCB Oil Sampling

TRC will collect samples of di-electric or silicone-based oil inside the transformers for laboratory analysis. Oil samples will be submitted to the laboratory for PCB analysis. Although the site records indicate they are non-PCB transformers, the sampling of these transformers is recommended by the NYSDEC for legal disposal.

The sampling technician will locate the sampling valve or port, usually at the bottom of the transformer, and prepare all necessary sampling equipment, including clean containers, sampling pumps or syringes, tubing, and safety goggles. Sampling shall be performed including proper sample collection, preservation, and transportation to a laboratory for analysis. A general approach will be followed which involves filling cleaned containers to a specific level and placing them in coolers with ice for transport to laboratory for analysis via USEPA SW846 Method 8082A.

3.5 Sampling Methodologies

All work shall be completed in accordance with this RWP, referenced sampling/analytical methods, the HASP, DER-10/Technical Guidance for Site Investigation and Remediation dated May 2010, and the QAPP included in this Work Plan. No deviations from this RWP or the HASP shall be made without prior receipt of alternate technical direction issued by TRC Project Manager and/or OMH.

3.6 Training & Medical/Fit Tests

All management and field personnel conducting sampling activities in this RWP have experience in the implementation of hazardous waste remediation and related field sampling programs. All TRC staff working on-site will comply with the HASP in effect at the time and will have completed Hazard Communication training specific to the project.

3.7 General Field Requirements

- All Electrical Equipment shall be fully de-energized and inspected by a licensed electrician to ensure the safety of all employees and contractors working in the Transformer Building for the duration of this sampling and remedial work under this project. OSHA Lock out / tag out regulations (29 CFR 1910.147) for the control of hazardous energy for the electric shut down of the Transformer Rooms shall be satisfied.
- During sampling, high powered flashlights or equivalent temporary lighting will be used to supplement poor lighting.
- The “Buddy System” will be strictly enforced for work in building. At no time will personnel be present in the building alone.
- All personnel performing the work will have appropriate training and be familiar with the content of the HASP and safety protocols for the Site (refer to Appendix 4).
- Proper protective clothing such as Tyvek® Suits and half-face purifying respirators will be utilized, as necessary. The respirator filters/cartridges shall provide oil resistant P100 and organic vapor protection.
- A Community Air Monitoring Plan (CAMP) to monitor particulates will be implemented during slab removal, excavation, material handling, and off-site transport, (refer to Appendix 5).
- To prevent cross-contamination, neoprene, butyl, or Viton gloves (> 8-hour breakthrough for PCBs) shall be used when handling PCB samples.
- TRC will provide all sampling equipment and sampling supplies and consumables necessary to perform the sampling, including sample containers, labels, disposable gloves, and templates.

3.8 TRC Mobile Data Solutions

TRC has developed, under our TRC Mobile Data Solutions program, a customizable data collection and reporting process for our project teams to utilize to efficiently collect and report field data.

- Real Time Information - TRC’s real time retrieval allows project staff to coordinate efficiently to provide real-time data on the project.
- The TRC Mobile Data Solutions tool has undergone rigorous internal testing
- TRC-designed mobile applications are customized for asbestos, lead-based paint & hazardous materials surveys, abatement & air monitoring projects, building water intrusion assessments, industrial hygiene evaluations, due-diligence, SPCC inspections, groundwater monitoring, etc.

3.9 Sampling and Analytical Procedures

Analytical methods to be utilized in the analysis of samples collected during this sampling event shall comply with federal, state, and local requirements. TRC will utilize a chain-of-custody, which will accompany all samples to the laboratories. TRC personnel will complete Field Records on TRC Mobile Data Solutions. The site-specific sampling techniques and analytical methods to be used in implementing the remedial action are presented in the Quality Assurance Project Plan (QAPP) in Appendix 1.

3.10 Sampling Media and Materials

All samples shall be collected in laboratory-supplied pre-cleaned glass jars for PCBs and RCRA metal samples. Asbestos samples will be collected into new unused resealable plastic bags.

3.10.1 Containers

All glass sample containers will meet the QA/QC specifications in EPA's Office of Solid Waste and Emergency Response (OSWER) Directive 9240.0-05A, "Specifications and Guidance for Contaminant Free Sample Containers".

3.10.2 Sample Labels

Sample labels will clearly identify the sample, and should include the following:

- Laboratory
- Sample identification number
- Sample collection date and time
- Sample preservative
- Analytical Method

3.11 Community Air Monitoring Plan (CAMP)

The requirements of the CAMP presented in Appendix 5 will be implemented during slab removal, soil excavation, and material loading and off-site transport. The CAMP requires real-time monitoring for particulates (i.e., dust) at the downwind perimeter of the Site. 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 remediation work activities) from potential airborne contaminant releases as a direct result of remedial work activities. The action levels specified in the CAMP require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP documents that work activities did not spread contamination off-Site through the air.

Transformer Rooms 1 and 2 are located in the basement of an unoccupied building and are secluded from the public. Each Transformer Room has an egress on the basement level with dedicated exterior stairs from the basement level directly to the ground level, which is the primary pathway for remedial work and waste removal for basement Transformer Rooms 1 and 2 (refer to the attached photos). During the intrusive remedial activities and slab removal the front primary pathway entrance to the basement can be isolated (e.g. poly vinyl plastic sheeting (curtain wall) to prevent dust from leaving the work area). Polyvinyl plastic sheeting (curtain wall) will be installed at each exterior doorway during intrusive work. Soil and concrete

will be transported to roll-off containers on the ground level via the exterior stairwells, and bins utilized to transport soil and concrete will be covered during transport to the roll-off.

There is a potential for dust emissions to impact the community during transport of soil and concrete into roll off containers, or during off-site transport. Therefore, as a precautionary measure, an exterior dust monitor will be positioned at a downwind location at the exterior doorway nearest to the work, during transport of material outside of the building.

4.0 TRANSFORMER ROOM SUPPLEMENTAL INVESTIGATION REPORT

TRC will prepare a supplemental environmental survey report for the property. This report will include the following:

- Executive Summary.
- Background - detailing facility information, inspector's name(s), certifications and date of survey, and general sampling and analysis procedures employed.
- Inspection Results Summary - identifying materials (with associated locations) confirmed or suspected to be ACM, Lead Paint, RCRA metals, PCBs, universal and hazardous waste.
- Inspection Assessment Results - detailing homogeneous materials, material condition, number of samples collected per group and results.
- Quantity Schedule identifying quantities of ACM, Lead Paint, RCRA metals, PCBs, universal & hazardous waste.
- Areas Not Accessible - identifying all areas where suspect ACM may be present but was not able to be accessed; and
- Report Appendices - including all report documentation, such as analytical results, chain of custody forms, calculation sheets, etc.

In the event that the result of the additional investigation shows contamination not anticipated, these findings would be reviewed with DEC before implementing Remedial Action and before submittal of a remedial plan to the USEPA.

5.0 STRUCTURAL ENGINEERING

TRC's structural engineer has reviewed the structural drawings provided by New York State Office of Mental Health (OMH) Medical Surgical Building 101 (Thomson Building), Dated December 4, 1958, along with URS's "Review of Structural Analysis" for Building 1, Transformer Rooms 1 & 2, dated October 25, 2017. This included a review of the original 2017 design loading versus the proposed loading condition during the excavation. Prior to the excavation work, the structure will be vacant without any additional interior demolition and unoccupied during the proposed remediation work. Figures 7 and 8 identify the boundaries for the removal of the concrete slab and soil to achieve the restricted-residential soil cleanup objectives (SCOs) for PCBs based on the investigations that were previously completed. Concrete removal outside of the grade beams will be required to remove surface concrete and soil identified with PCB concentrations above 1 ppm.

Per TRC's Structural Engineer's review, the removal of the concrete slab outside of the grade beams will require some additional measures to protect the grade beams and foundations of the Building. Structural Engineering design plans for the removal of the concrete slab and soil will be provided to the remediation contractor with the bid documents.

The Record of Decision (ROD) Alternative 3 identifies soil excavation to a maximum depth of 10 feet below the existing slab elevation as the initially required depth. If the 10 ppm cleanup threshold for contaminants is achieved within this depth, the remediation can proceed as planned under this alternative.

A technical or structural limitation would arise if achieving the 10 ppm cleanup goal requires excavation beyond the 10-foot depth, and that additional depth exceeds what the existing foundations can support without structural reinforcement. If the 10 ppm cleanup objective for subsurface soil is technically impracticable because of these structural limitations, the project objectives would be reviewed with NYSDEC and a risk-based approval from USEPA would be sought.

Additional discussion on the structural issues are described in Section 7.4.

6.0 PROJECT SPECIFICATIONS

Based on the findings of the Transformer Investigation Report in Section 4.0, applicable DASNY Project Specifications will be selected:

- Removal of asbestos-containing materials present in the Transformer Rooms shall be performed by a New York State Department of Labor licensed asbestos abatement contractor, and should be handled, stored, and disposed of according to all local, state, and federal regulations.
- Asbestos Removal - Section 02 82 00
- Lead Containing Paint/Lead Based Paint Disturbances Using OSHA Lead Safe Work Practices – Section 02 83 10
- Non-Liquid PCB Material Removal - Section 02 84 00
- Identification and Disposal of Hazardous Waste – Section 02 86 00
- Removal and Disposal of Universal Waste - Section 02 87 00
- Removal Transport and Disposal of Contaminated Soil – Section 02 61 00

Project Specifications are presented in Appendix 3.

7.0 REMEDIATION WORK

The scope of work for the implementation of this remedy has been selected as specified in the Administrative Record of Decision (ROD) governing the cleanup of Hazardous Waste at this Site according to New York State Environmental Conservation Law and Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) Part 375. All applicable Training & Medical/Fit Testing and General Field Requirements from Sampling Section 3.0 will be enforced during remediation work. Key project personnel and contact information along with resumes of key TRC project personnel are in Appendix 2.

7.1 General Field Requirements

- Community air monitoring will be conducted in accordance with the Community Air Monitoring Plan (CAMP) provided in Appendix 5 during ground-intrusive remediation activities, including slab removal, excavation, material handling, and off-site transport, to protect downwind receptors and prevent off-site migration of contaminants.
- All Electrical Equipment shall be fully de-energized and inspected by a licensed electrician to ensure the safety of all employees and contractors working on this project. OSHA Lock out / tag out regulations (29 CFR 1910.147) for the control of hazardous energy for the electric shut down of the Transformer Rooms shall be satisfied. Sufficient high-powered flashlights or temporary lighting will be used to supplement poor lighting.
- The “Buddy System” will be strictly enforced for work in building. At no time will personnel be present in the building alone.
- All personnel performing the work will have appropriate training and be familiar with the content of the approved Contractor Site HASP and safety protocols for the Site.
- Proper protective clothing such as Tyvek® Suits and half-face purifying respirators will be utilized, as necessary. The respirator filters/cartridges shall provide oil resistant P100 and organic vapor protection.
- To prevent cross-contamination, neoprene, butyl, or Viton gloves (> 8 hour breakthrough for PCBs) shall be used when handling PCB samples.
- OSHA Confined-Space Entry health and safety equipment and training procedures.

7.2 Daily Activities

- All field personnel shall attend a daily kick-off meeting prior to work commencement. The daily meetings will include a safety talk, and remediation work planned for the day.
- An entry/exit log shall be utilized for all workers in each transformer room for safety and emergency purposes.
- The Contractor will provide a daily log of activities and planned next day’s work to TRC’s project manager via email.
- The Project Manager will review all data generated daily.

7.2.1 Daily Reports

Daily reports will be submitted to NYSDEC Project Managers by noon of each day following the field activities and will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric map for Site activities;
- A summary of any and all complaints with relevant details (names, phone numbers);
- Photographs of site activities; and
- An explanation of notable Site conditions.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the RWP or other sensitive or time critical information. However, such conditions must also be included in the daily reports. Emergency conditions and changes to the RWP will be addressed directly to NYSDEC Project Manager via personal communication.

7.3 Transformer Room Remediation

The remediation of the Transformer Rooms aside from asbestos abatement (based on asbestos sampling) shall consist of the removal and clearing of all contents (transformers and equipment) from transformer rooms to prepare removal of the concrete pads. The following are sequential order for this activity.

1. Remove overgrown vegetation to create access to remove transformer and waste materials from the building.
2. Establish Egress to the Transformer Rooms. Temporary removal of Fire Rated Doors and Louvres within the existing limits of the Basement exterior foundation wall. These entry doors and Louvre panels shall be assessed for suspect materials (i.e., asbestos, lead paint) such as insulation.
3. Clean and remove non-porous scrap metal; Additional PCB-wipe sampling may be necessary to confirm the materials have been thoroughly cleaned for recycling.
4. Remove the other porous materials and debris as Toxic Substances and Control Act (TSCA) Regulated PCB Remediation Waste and/or Potentially Hazardous Waste depending on the results of waste characterization sampling activities as described in Section 3.0.
5. The four (4) transformers along with all associated equipment will be de-energized, drained if necessary, and removed from Transformer Rooms 1 & 2, as non-porous scrap metal for recycling depending on waste characterization.

7.3.1 Procedures for Removal of Equipment and Debris on Concrete Slab

- a) Prior to mobilization the contractor shall assure that its employees have received safety equipment training for applicable equipment for this project, i.e., ladders, forklift, crane, and scaffolds training, along with Hazard Communication training as required to perform the work described by this protocol.
- b) The contractor shall submit to TRC all Safety Data Sheets (SDS) for all chemical products proposed to be used in the cleaning process.
- c) Hazardous Material Technicians will remove debris on the floor in each of the rooms.
- d) Equipment and Debris will be segregated as non-porous scrap metal vs porous debris, and based on the results of the supplemental investigation.
- e) All generated waste will be placed in lined containers.
- f) All used cleaning materials, personnel protective equipment (PPE) containing cleaning agents /water, epoxy paint chips and all other waste will be placed into 55-gallon drum(s).
- g) The 55-gallon drum(s) will be moved to a designated onsite temporary storage area.

- h) Optional: If PCB concentrations are greater than $10 \mu\text{g}/100 \text{ cm}^2$, the Scrap metal may be cleaned and re-tested via wipe sampling. The Scrap metal may be recycled (i.e. non-PCB transformer equipment, and other scrap metal) if the surface wipe concentrations meet EPA's high occupancy surface wipe sample criteria of $\leq 10 \mu\text{g}/100 \text{ cm}^2$ (40 CFR 761.61(a)(4)(ii)) and NYSDEC 6 NYCRR 371.4(e).

7.4 Concrete Pad Demolition and Removal

The maximum feasible removal of concrete slabs from Transformer Room 1 and 2 will be based upon the recommendations of the Structural Engineer. The outline of the concrete slab areas to be removed in both Transformer Rooms are based on the building drawings prepared by Urbahn, Brayton & Burrows, Hart & Jerman Associated Architects, dated December 4, 1958. The feasible area for removal of the concrete slab is generally within the foundation lines. Additional protective measures will be required to permit removal of the concrete slab and soil areas located outside of the grade beams where the concrete and soil exceed restricted-residential soil cleanup objectives (SCOs) for PCBs. The bottom elevation of the concrete slab is expected to be above groundwater based on historical data. The maximum concrete slab area to be removed is estimated to be 850 square feet in Transformer Room 1 and approximately 875 square feet in Transformer Room 2. The total volume of concrete to be removed may vary depending on the thickness of the concrete slab which is estimated as 6.5-inches to 18-inches thick. The estimated volume of concrete removal is 65 cubic yards with an assumed weight of 130 tons if the slab is steel-reinforced.

The entirety of the removed concrete slabs will be managed as a ≥ 50 ppm TSCA PCB remediation waste in a TSCA permitted or RCRA Hazardous Waste Landfill. In New York State Hazardous Waste Code B007 is designated for other PCB wastes, including contaminated PCB concrete material. Alternatively, prior to the demolition of the concrete slab, OMH may consider additional in situ sampling to support the segregation of waste for off-site disposal.

7.5 Post Remedial Concrete Sampling

Concrete samples will be collected from remaining concrete to confirm PCB concentrations are less than 1 ppm. Samples will be collected utilizing approximately 1-inch diameter carbide drill bit with an impact hammer drill. Drill bits will be decontaminated between sampling locations. For easy identification, sample locations will be pre-marked using a marker or paint.

Samples will be collected at 1/2-inch depth intervals. Thus, the initial surface sample will be collected from 0 - 0.5 inches. Multiple holes located closely adjacent to each other, may be needed to generate sufficient sample volumes (10 grams (20 mL) of powder) for a PCB determination. Samples will be placed directly into pre-cleaned and labeled containers for transport and delivery to laboratory for PCB analysis using gas chromatography (GC) in accordance with USEPA SW846 Method 8082A. The post remedial concrete sample locations for Transformer Rooms 1 and 2 are shown in Figures 9 and 11, respectively.

7.6 Soil Excavation

To achieve re-classification of the site from a Class 3 to a Class 4 Inactive Hazardous Waste Disposal Site, the post-excavation PCB soil concentrations in the Transformer Rooms must demonstrate to NYSDEC that the PCB concentrations in subsurface soil greater than 2 feet below building slab depth meet the cleanup criteria of 10 ppm.

The soils underneath the transformers will be excavated and end point samples will be collected. All on-site soils which exceed restricted-residential soil cleanup objectives (SCOs) for PCBs (1 ppm) shallow soil (0-2 feet) and 10 ppm in subsurface soil, as set forth in NYSDEC's CP-51 and Part 375-6.8, will be excavated and transported off-site for disposal.

The removal of the soil below the concrete slabs from Transformer Rooms 1 and 2 is depicted on Figures 7 and 8, which outline the excavation mostly within the existing grade beams and pile caps to protect and maintain building integrity. However, there will be some limited areas where the removal of the concrete slab will be performed outside of the grade beams to achieve the SCOs, previously described in Section 5. The area outlined to depict the removal of soil below the concrete slabs in Transformer Rooms 1 and 2 is based on the building drawings prepared by Urbahn, Brayton & Burrows, Hart & Jerman Associated Architects, dated December 4, 1958. The feasible area for removal of the soil below the concrete slabs is drawn within the grade beams and foundation lines. The elevation of the soil at the required depth of the excavation below the concrete slab is expected to be below the groundwater.

The soil area to be removed is estimated to be less than 250 square feet in Transformer Room 1, and less than 250 square feet in Transformer Room 2. The total volume of soil to be removed will vary depending on the depth of groundwater and corresponding de-watering activity required, soil type(s), types of shoring and shielding required and the PCB concentrations in the soil. The soil excavation is required to remove and safely access PCB contaminated soil greater than 10 ppm, based on remedial investigations and the ROD selected for this site.

The entirety of the removed soil will be managed as a ≥ 50 ppm TSCA PCB remediation waste in a TSCA permitted or RCRA Hazardous Waste Landfill. In New York State Hazardous Waste Code B007 is designated for other PCB wastes, including contaminated PCB soil material. Alternatively, prior to the excavation of soil, OMH may consider additional in situ sampling to support the segregation of waste for off-site disposal.

7.6.1 Engineering Shoring Plan

A temporary shoring plan will be prepared by a NYS licensed Professional Engineer working for the remedial contractor for the excavation and backfilling of soil beneath the existing concrete pads located in the transformer rooms. The shoring plan will require an investigation of the underlying soil and groundwater along with review of the existing foundation pile caps and grade beams within the work area. Excavation will be performed around the piles and potentially below the pile caps, and grade beams in the Transformer Rooms. The removal of PCB contaminated soils exhibiting PCB concentrations greater than 10 ppm at depths greater than 2 feet below the concrete slab may require additional shielding to protect workers, and foundation pile caps and grade beams. Shielding may include trench boxes or other types of supports to prevent soil cave-ins. Protection of building foundation and maintaining overall soil stability is essential.

7.6.1.1 Soil Classification

The Occupational Safety and Health Act (OSHA) provides federal regulations under 29 CFR Subpart P of Part 1926 for excavation of soil in relation to soil types. This involves determination of the maximum allowable or permitted slopes of the sidewalls of excavations. The slope can be expressed in terms of the tangent or degrees of the angle that the walls form with the horizontal.

Imminent danger and slope failure is anticipated if the actual slope of the walls exceeds the allowed maximum without additional shielding to protect workers.

Soils that are Type C must not be sloped to greater than $>34^\circ$, and Type B soils must not be sloped to greater than $>45^\circ$. Type A soils must not be sloped greater than $>63^\circ$; if the wall is greater than >12 ft. high, it must not be sloped greater than $>53^\circ$. Type C represents the lowest strength soil, and it requires a flatter slope than Type A and Type B soil to attain the same stability.

Both the USCS and the U.S. Dept. Of Agriculture (USDA) Textural Soil Classification System are complementary methods used to analyze and classify soils. The USDA system is emphasized in the federal OSHA regulations, but the USCS is more consistent with the definitions and engineering terms of the regulatory codes. The Unified Soil Classification System (USCS) is a soil classification system used in engineering and geology to describe the texture and grain size of a soil.

7.6.1.2 Requirements for Protective Systems

Additional shielding is specified by OSHA in 29 CFR Subpart P of Part 1926 to protect workers and permit access for soil sampling at the maximum depths required for soil excavation during the remedial activities. The shielding requirements for protecting employees working in excavations from cave-ins may require additional protective systems to be performed in accordance with the requirements set forth in 1926.652.

Shielding systems include trench boxes, steel plates, and/or combination of protective systems. Shielding does not protect against soil failures. Shielding systems do not support the face of excavations, rather they protect the workers inside of them. For that reason, shielding systems do not allow anyone to work outside the protection of the system being used. These systems must be used in accordance with manufacturer recommendations.

- The requirements for excavations when using shielding (lower portion) in combination with sloping in Type A soil less than or equal to 20 feet deep (20' deep maximum). The maximum allowable slope for Type A soil is 1 to 0.75 (1' rise to 0.75' run).
- The requirements for excavations when using shielding (lower portion) in combination with sloping in Type B soil less than or equal to 20 feet deep (20' deep maximum). The maximum allowable slope for Type B soil is 1 to 1 (1' rise to 1' run).
- The requirements for excavations when using shielding (lower portion) in combination with sloping in Type C soil less than or equal to 20 feet deep (20' deep maximum). The maximum allowable slope for Type C soil is 1 to 1.5 (1' rise to 1.5' run).

7.6.2 Groundwater Dewatering and Treatment Plan

Based on estimated depth of groundwater expected at or near the bottom of the concrete slab, dewatering will be required for this project to stabilize work area and permit removal of PCB contaminated soil. Excavation within the groundwater interfacing elevations requires dewatering activities to control water intrusion and maintain slope stability. Based on applicable regulations the dewatering plan must be prepared by a NYS licensed professional engineer familiar with hydrology. The location for nearest New York City Department of Environmental Protection (NYCDEP) combined sanitary stormwater sewer must be identified and required sampling and effluent treatment must be performed during all dewatering activities.

Discharging to combined sanitary stormwater sewer requires a Discharge Permit obtained from NYCDEP and approval from NYSDEC for impacting stormwater sewer. Self-Certification Form will be submitted to the Bureau of Customer Service based on an estimated discharge of (less than) <10,000 gallons per day.

- Contractor will be responsible for all components of the groundwater de-watering program:
 - Secure NYCDEP de-watering permit and required approval from NYSDEC pursuant to the existing Order on Consent
 - Identify proposed ELAP certified lab(s) to be used for analysis of samples required for dewatering permits.
 - Develop a site map showing proposed piezometers and/or groundwater monitoring wells used for groundwater monitoring and sample locations as needed for permitting processes.
 - Install piezometer(s) and/or groundwater monitoring wells required to adequately measure depth of groundwater, estimate rate of recharge and sample for discharge parameters by field and laboratory analysis.
 - Perform any required well installation, record boring logs, develop, and properly dispose of waste according to NYSDEC requirements.
 - Determine background and upgradient groundwater quality by groundwater monitoring and sampling activities according to federal, state, and local discharge requirements.
 - Conduct limited groundwater sampling applicable to DER-10 technical guidance and - Quality Assurance Project Plan (QAPP) Guidelines to satisfy discharge permitting.
 - TRC will review the de-watering work plan prepared by the remediation contractor and update the QAPP for the project objectives and compliance.

7.6.3 Transformer Room Soil Sampling

Most of the contamination identified by prior investigations are limited to the areas around the drains in the transformer rooms. The removal of the soil to the proposed maximum depth of 10 feet below bottom of concrete pad(s) is expected to be sufficient to meet the cleanup criteria of 10 ppm PCBs.

The objective is to remove the contaminated soil exceeding the PCB cleanup standards after the accessible portions of the concrete pad have been removed without compromising the building foundation and safety of the personnel involved. The concrete pad will be replaced with a clean concrete slab, as specified in the Record of Decision (ROD) dated March 30, 2019. Based on this decision, the NYSDEC will accept the Soil Cleanup Objective (SCO) of 1 part per million (ppm) for surface soil to be met from 0-2 feet below the slab surface, and less than 10 ppm for soil to be met greater than 2 feet below the slab surface. Therefore, below the new concrete pad, the subsurface soil must meet the NYSDEC's Commissioner's Policy 51 (CP-51) guidance value of 10 ppm.

7.6.3.1 Soil Sampling Procedures

Soil sampling will be conducted following excavation below the concrete pad as shown in Figures 10 and 12.

The purpose of this post remediation soil investigation is to:

- assess the concentration of any PCBs remaining in the soil at the depth of 0 to 2 feet below the depth measured from the bottom of the existing floor slab to meet the restricted residential SCOs for PCBs; and,

- assess the concentration of any PCBs remaining in the soil at depths greater than 2' below the bottom of the existing floor slab will be at PCBs concentrations of ≤ 10 ppm.

Sampling locations will be biased toward locations expected to have the greatest degree of contamination at the source areas, i.e., drainage points. However, the post-remedial sampling is intended to also provide sufficient coverage of the entire excavation to allow decisions relative to classification of the site. The results of the sampling for PCB soils inside the building room excavations will also determine whether there is any potential for any remaining PCBs to migrate to and impact the environment outside of the building.

- An Environmental Professional along with HAZ MAT team using confined-space entry permit procedures will conduct PCB soil sampling and will collect end-point excavation samples to be used to determine post-remedial site conditions.
- Soil samples shall be collected along the sidewalls and bottom of the excavation of each transformer room. Soil samples shall be collected from 0 - 2 inches below the surface of the sidewalls and bottom.
- Soil samples will be collected using dedicated disposable plastic trowels and placed in laboratory-supplied 8-ounce glass jars with Teflon lids. Dedicated sampling equipment will be used to prevent cross-contamination between sampling locations. All soil sampling equipment will be properly disposed of with other wastes that are generated during the soil investigation.
- All samples to be submitted for laboratory analysis will be collected, properly cooled, and packaged to prevent breakage. Soil samples will be transported under Chain-Of-Custody to a DOH Environmental Laboratory Approval Program (ELAP)-certified analytical laboratory and analyzed for PCB Arochlors in accordance with EPA Method 8082A.
- All the results of PCB soil sampling will be compared with NYSDEC's Commissioner's Policy 51 (CP-51) to determine whether additional soil excavation and sampling is required.
- All soils 0-2 feet below the building slab surface elevation in Transformer Rooms No. 1 and 2 which exceed the restricted residential SCOs for PCBs will be excavated and transported off-site for disposal. The volume of contaminated soil removed from the site will be determined after implementation of the ROD and subsequent results of the PCB soil sampling and laboratory results.
- The results of soil sampling will not impact the requirements for an environmental easement with a restriction of groundwater use at the site, a cover system, and site management to protect human health.

7.7 Transportation and Disposal of Waste

Transportation and Disposal of Waste to Authorized transportation, storage, and disposal facilities (TSDF) according to 6 NYCRR Part 360 and/or 373 depending on laboratory results. All PCB waste containers must be marked per 761.40 and .45.

Community air monitoring shall be conducted in accordance with the Community Air Monitoring Plan (CAMP) provided in Appendix 5 during slab removal, excavation, material handling, and off-site transport. Real-time particulate monitoring will be implemented at a location downwind of soil/concrete loading activities for off-Site transport, as applicable. Exceedances of action levels will require, corrective measures, and/or work shutdown to prevent off-site migration of contaminants.

- 1) As the work progresses, remove waste containers from the work area and place in a secured and lockable trailer, dumpster, or other shipping container meeting DOT requirements for transport of PCB-containing waste. The hard top or tarp covered waste container shall be lined with two layers of fire-retardant plastic. PCB-containing waste shall remain under the positive control of the Contractor and must never be left unattended in an area or on a vehicle where unauthorized persons could gain access.
- 2) All waste and debris shall be placed in covered or sealed containers to ensure that dust is not dispersed during transport. Separate PCB containing material debris and collected HEPA dust/debris from other waste (e.g., poly) to minimize the amount of hazardous waste.
- 3) All wastewaters not being managed by the applicable on-site de-watering permit(s) shall be collected in appropriate containers and characterized. If the testing shows levels of PCBs greater than 0.5 ppb PCBs, it will be managed according to TSCA requirements for PCB Remediation Waste.
- 4) Wastewater treatment (media) solid wastes shall also be placed in appropriate hazardous waste containers. If the testing shows levels of ≥ 1 ppm PCBs, it will be managed according to TSCA requirements for PCB Remediation Waste.
- 5) All excavated soil and concrete waste shall be disposed of in accordance with all applicable local, State and Federal regulations. Specifically, waste shall be treated as TSCA regulated PCB Remediation Waste greater than 50 ppm unless an alternative is determined based on additional in situ sampling. In addition, waste characterization may be needed to comply with other federal, state and local requirements.
- 6) All hazardous and TSCA Regulated waste shall be disposed of using USEPA Generator ID# (To Be determined) assigned to this site.
- 7) Disposal Certificates: Contractor shall submit a letter from a permitted TSCA and/or Hazardous Waste Facility, stating that the facility has agreed to accept the waste generated by the work; is authorized to accept the waste under the laws of the State of residence; has the required capacity to treat and dispose of the material; and shall provide or ensure the ultimate disposal method indicated on Uniform Hazardous Waste Manifest.

7.7.1 Procedures for Waste Disposal

- i). Contractor shall submit a Part 364 Waste Transporter Permit, confirming the requirements of NYSDEC Division of Materials Management, to haul to the selected Waste Disposal Facility.
- ii). Contractor shall submit a letter with a statement from the selected Waste Disposal Facility that the waste and waste containers are acceptable for disposal at the facility.
- iii). Contractor shall submit a copy of the Hazardous waste manifest signed by the transporter and the Treatment, Storage and Disposal (TSD) facility accepting the waste.
- iv). Contractor shall submit evidence to the authority that those preparing/signing manifests have received DOT Hazardous Materials Shipping Training (initial and refresher every 3 years).
- v). The waste shall be temporarily stored and managed at a pre-designated location to be determined with consultation with OMH and DEC.
- vi). Prior to removal of any PCB-containing impacted materials the Contractor shall notify Environmental Consultant and request a pre-removal inspection. Posting of warning signs, plasticizing of work area, and all other preparatory steps shall be taken prior to notification of the Environmental Consultant.

- vii). After completion of the removal and cleaning of the work area of equipment and staged materials, a visual inspection for general housekeeping shall be performed by the Contractor. If the removal and cleaning of work area is approved by the Contractor's Supervisor, the Contractor shall then request a visual inspection in writing from the Environmental Consultant.

8.0 BACKFILLING AND INSTALLATION OF CONCRETE PAD (COVER)

Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and establish the design grades at each of the basement transformer room. Notification of Clean Fill form will need to be completed and submitted to NYS DEC if > 10 cubic yards of fill is required. The basement transformer rooms will be re-graded to accommodate installation of a concrete cover system to match the existing conditions.

A new steel reinforced concrete pad cover of sufficient thickness and compressive strength (i.e., greater than 4,000 psi) for building equipment and structural requirements will be installed in the two (2) Transformer Rooms. An independent 3rd party concrete testing and inspection firm will be retained to confirm the construction is completed as intended.

9.0 REMEDIAL WORK REPORTING

Based on the implementation of this RWP, a Remedial Report shall be prepared. This report shall include field data, sample collection data, analytical results, and associated data validation results. A critical component of the Remedial Work Reporting shall be the evaluation and interpretation of the results of the Implementation of the Remedial Work, including waste classifications, estimates of waste quantities and waste disposal and/or recycling alternatives. The Report shall include:

- A general description of the subject properties with a focus on the Transformer Rooms,
- A detailed description of the inventory and sampling program,
- A detailed description of the inventory and waste materials porous and non-porous (including estimated quantities disposed/recycled and representative photographs) from all remedial work,
- Site plans or sketches denoting referenced locations, including bulk and wipe sample locations,
- Table(s) summarizing the findings by material, estimated quantity, location and analytical parameters, and material classification for management/disposal purposes.
- Analytical data for all samples pre and post remedial (included in an appendix).
- Chain of custody forms and lab reports included an appendix.
- Data usability summary reports included as an appendix.
- All waste manifests, bill of ladings, certificates of disposal, certificates of recycling, etc.
- Contractor daily reports (included in an appendix).
- Findings and recommendations.
- General description of final site conditions of Transformer Rooms and Concrete Covers.
- Professional Engineer's certification of final condition of Transformer Room and Concrete Surfaces.
- Institutional controls in the form of an environmental easement and a Site Management Plan will be required.

10.0 PROJECT SCHEDULE

The following identifies projected time frames for each task described in this RWP are provided in calendar days. The time frames assume authorization for all tasks and concurrent implementation of many sub-tasks; however, many sub-tasks have critical path predecessor requirements. In addition, subtask efforts can be prioritized to provide interim reports for the most time critical issues.

Task 1 - Haz Mat Survey of Transformers Rooms 1 & 2

Waste Characterization Sampling of Transformers, Asbestos, PCB and Lead Paint Sampling PCB Wipe Sampling of Non-Porous Surfaces, PCB and RCRA Metal Sampling of Residual Liquids and Sediment

21 Days of Approval of RWP

HAZ MAT Survey & Sampling Report

39 Days of Approval of RWP

Task 2 – Preparation of Self-Implementing Plan for USEPA

39 Days of Approval of RWP

EPA Review and Approval of Self-Implementing Plan (30 Days)

68 Days of Approval of RWP

Task 3 - Prepare Bid Documents with Plans & Performance Based Specification

99 Days of Approval of RWP

Task 4 – Contractor Bid and Selection Process with OHM/DASNY

Submit RFP to Bidders and Selection of Contractor

161 Days of Approval of RWP

Task 5 - Contractor Award and RWP Project Implementation with OHM/DASNY

Project Award and Review/Approval of Contractor Submittals

186 Days of Approval of RWP

Project Completion

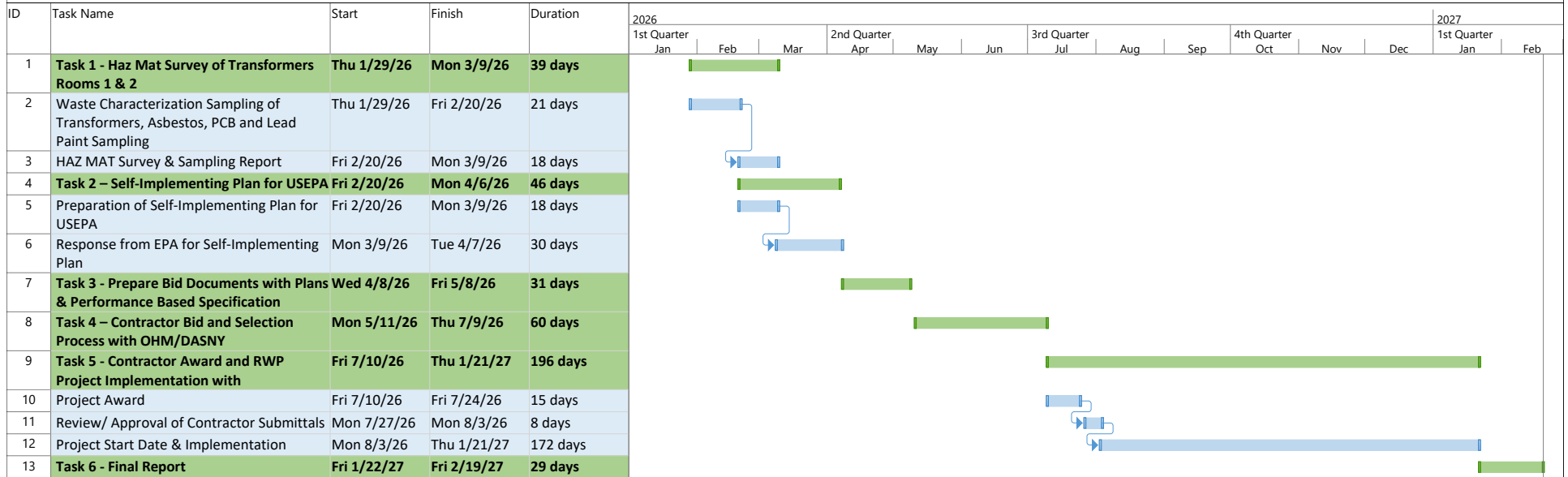
357 Days of Approval of RWP

Submit Final Report to DEC

386 Days of Approval of RWP

GANTT CHART

Project Schedule
Dormitory Authority of the State of New York and the New York State Office of Mental Health
Transformer Room No. 1 and Transformer Room No. 2 - Building 1
Bronx Psychiatric Center
1500 Waters Place, Bronx, New York 10461



FIGURES



SITE LOCUS

IMAGE SOURCE: geology.com

Source: Figures 1-6, Prepared by URS Corporation, February 2018, included in the Record of Decision for Bronx Psychiatric Center State Superfund Project Site No. 203005, dated March 2019, prepared by Division of Remediation New York State Department of Environmental Conservation (NYSDEC).



APPROXIMATE
GRAPHIC SCALE IN FEET

IMAGE SOURCE: DISCOVER GIS DATA NY

615 Broadway, Albany, NY 12242-2544
201 Albany Street, 20th Floor, NY, NY 10005
212 761-1000
www.trcny.com

TRC ENGINEERS, INC. is a member of the TRC Group, a national environmental consulting firm. TRC ENGINEERS, INC. is a member of the TRC Group, a national environmental consulting firm. TRC ENGINEERS, INC. is a member of the TRC Group, a national environmental consulting firm.

BUILDING OWNER:
DOMINION AUTHORITY STATE OF NEW YORK
ENVIRONMENTAL CONSULTANT:
TRC ENGINEERS, INC.

Revised	Description	Date

Client: NYS OFFICE OF MENTAL HEALTH
75 NEW SCOTLAND AVENUE
ALBANY, NY 12208

Project Title:
BRONX PSYCHIATRIC CENTER BUILDING 101
TRANSFER ROOMS NO. 1 & 2
100 WATER PLACE
BRONX, NY

SITE LOCATION MAP

Phase: SUBMISSION
Drawn By: FS
Checked By: AS
Date: 5/5/2025
Scale: 1" = 100'

Seal & Signature: [Signature]

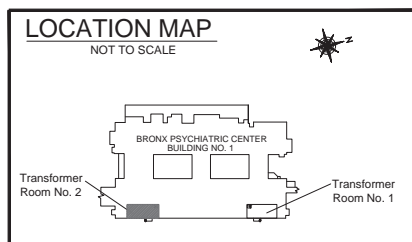
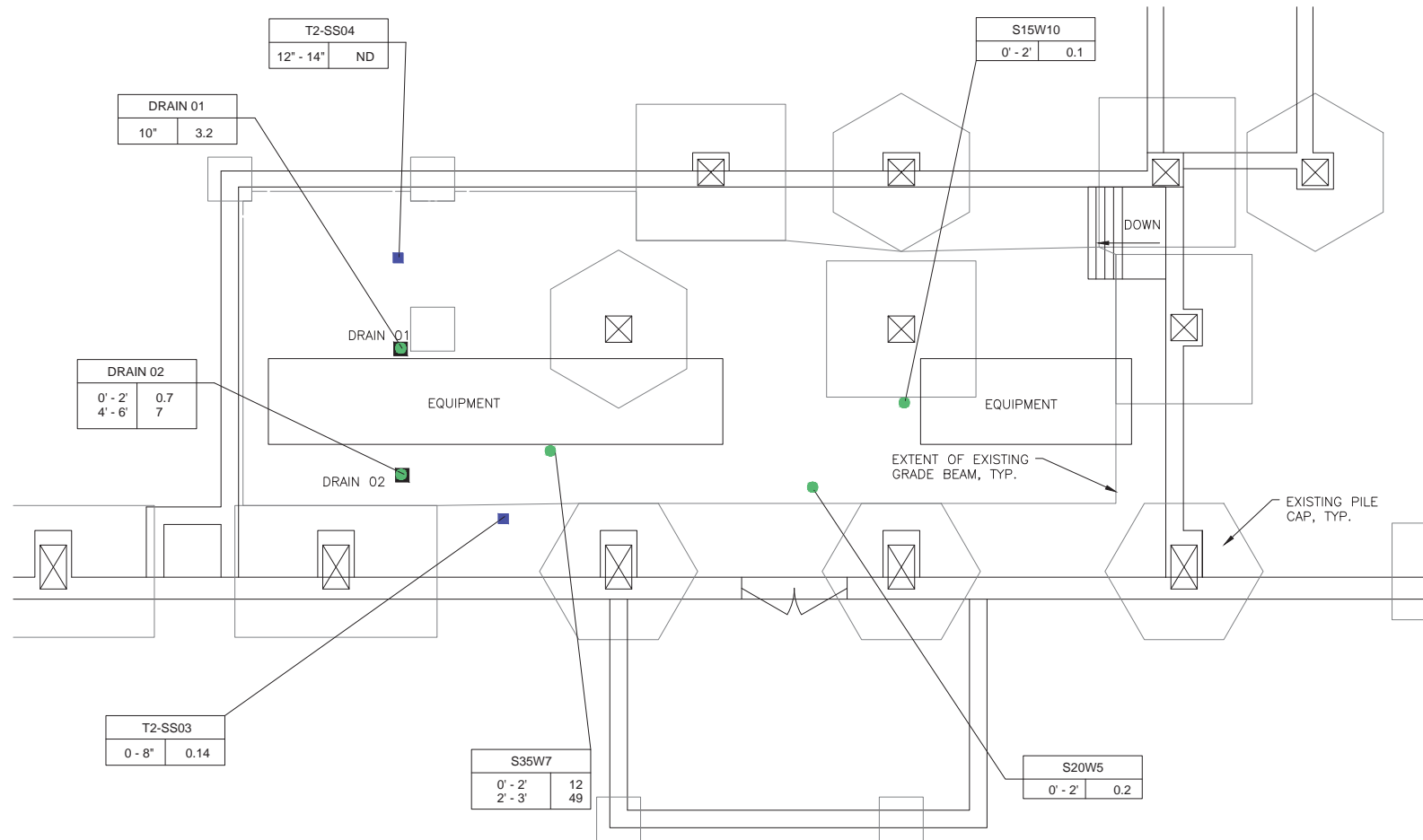
FIGURE 1

100% SUBMISSION
NOT FOR CONSTRUCTION

115 Broadway, Albany, NY 12242-2544
25 Henry Street, 25th Floor, NY, NY 10003
235 Broadway, New York, NY 10007-1007
www.trceng.com

THE CONSULTANT HAS CONDUCTED VISUAL INSPECTIONS OF THE PROJECT SITE AND HAS OBSERVED THE PROJECT SITE. THE CONSULTANT HAS NOT CONDUCTED ANY OTHER INVESTIGATIONS OR ANALYSES. THE CONSULTANT HAS NOT CONDUCTED ANY OTHER INVESTIGATIONS OR ANALYSES. THE CONSULTANT HAS NOT CONDUCTED ANY OTHER INVESTIGATIONS OR ANALYSES.

BUILDING OWNER:
DOMINION AUTHORITY STATE OF NEW YORK
ENVIRONMENTAL CONSULTANT:
TRC ENGINEERS, INC.
115 Broadway, Albany, NY 12242-2544



BASE MAP SOURCE:
Urbahn, Brayton & Durrows, Hart & Jerman Associated
Architects, December 1958



LEGEND

- Structural Column
- Soil Sample Location - 2000
- Soil Sample Location - 2013
- Former Drain
- ND - Not Detected
- NA - Not Analyzed

NOTES:
All locations are approximate.
Concentrations are in mg/kg.

Source: Figures 1-6, Prepared by URS Corporation, February 2018, included in the Record of Decision for Bronx Psychiatric Center State Superfund Project Site No. 203005, dated March 2019, prepared by Division of Remediation New York State Department of Environmental Conservation (NYSDEC).

100% SUBMISSION
NOT FOR CONSTRUCTION

Revisions	Description	Date

Client: NYS OFFICE OF MENTAL HEALTH
PROJECT: BRONX PSYCHIATRIC CENTER
75 NEW SCOTLAND AVENUE
ALBANY, NY 12242

PCB CONCENTRATIONS
IN SOIL SAMPLES
TRANSFORMER ROOM 2

Phase: SUBMISSION
Drawn By: FS
Checked By: AS
Date: 5/5/2025
Seal & Signature: 20201 Project No. 3330409999

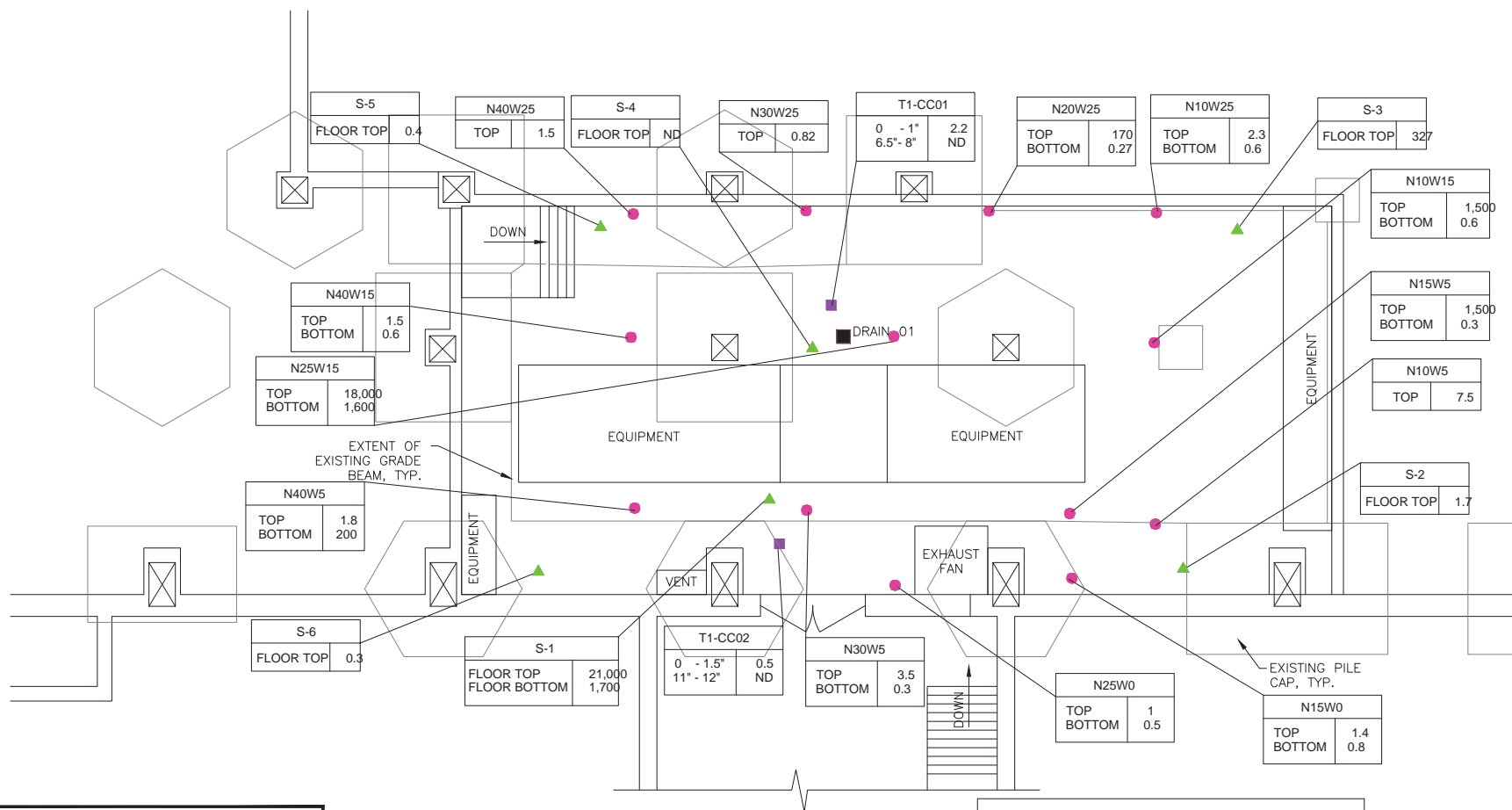
FIGURE 4

4 of 8

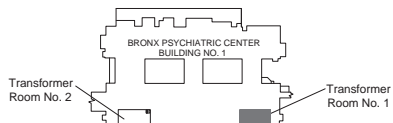
615 Broadway, Albany, NY 12242-2544
25 Henry Street, 20th Floor, NY, NY 10003
535 Franklin Street, Buffalo, NY 14203-1109
www.trec.com

THE CONSULTANT HAS CONDUCTED VISUAL INSPECTIONS OF THE SITE AND HAS OBSERVED THE EXISTING CONDITIONS. THE CONSULTANT HAS NOT CONDUCTED ANY OTHER INVESTIGATIONS OR ANALYSES. THE CONSULTANT HAS NOT CONDUCTED ANY OTHER INVESTIGATIONS OR ANALYSES. THE CONSULTANT HAS NOT CONDUCTED ANY OTHER INVESTIGATIONS OR ANALYSES.

BUILDING OWNER:
DORMITORY AUTHORITY STATE OF NEW YORK
ENVIRONMENTAL CONSULTANT:
TREC ENGINEERS, INC.



LOCATION MAP NOT TO SCALE



BASE MAP SOURCE:
Urbahn, Brayton & Durrows, Hart & Jerman Associated
Architects, December 1958



LEGEND

- Structural Column
- Concrete Sample Location - 1993
- Concrete Sample Location - 2000
- Concrete Sample Location - 2013
- Former Drain

NOTES:

All locations are approximate. ND - Not Detected
Concentrations are in mg/kg. NA - Not Analyzed
Source: Figures 1-6, Prepared by URS Corporation,
February 2018, included in the Record of Decision
for Bronx Psychiatric Center State Superfund Project
Site No. 203005, dated March 2019, prepared by
Division of Remediation New York State Department
of Environmental Conservation (NYSDEC).

100% SUBMISSION
NOT FOR CONSTRUCTION

Rev.	Description	Date

Client: NYS OFFICE OF MENTAL HEALTH
PROJECT: BRONX PSYCHIATRIC CENTER
75 NEW SCOTLAND AVENUE
ALBANY, NY 12242

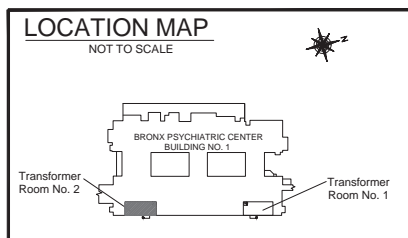
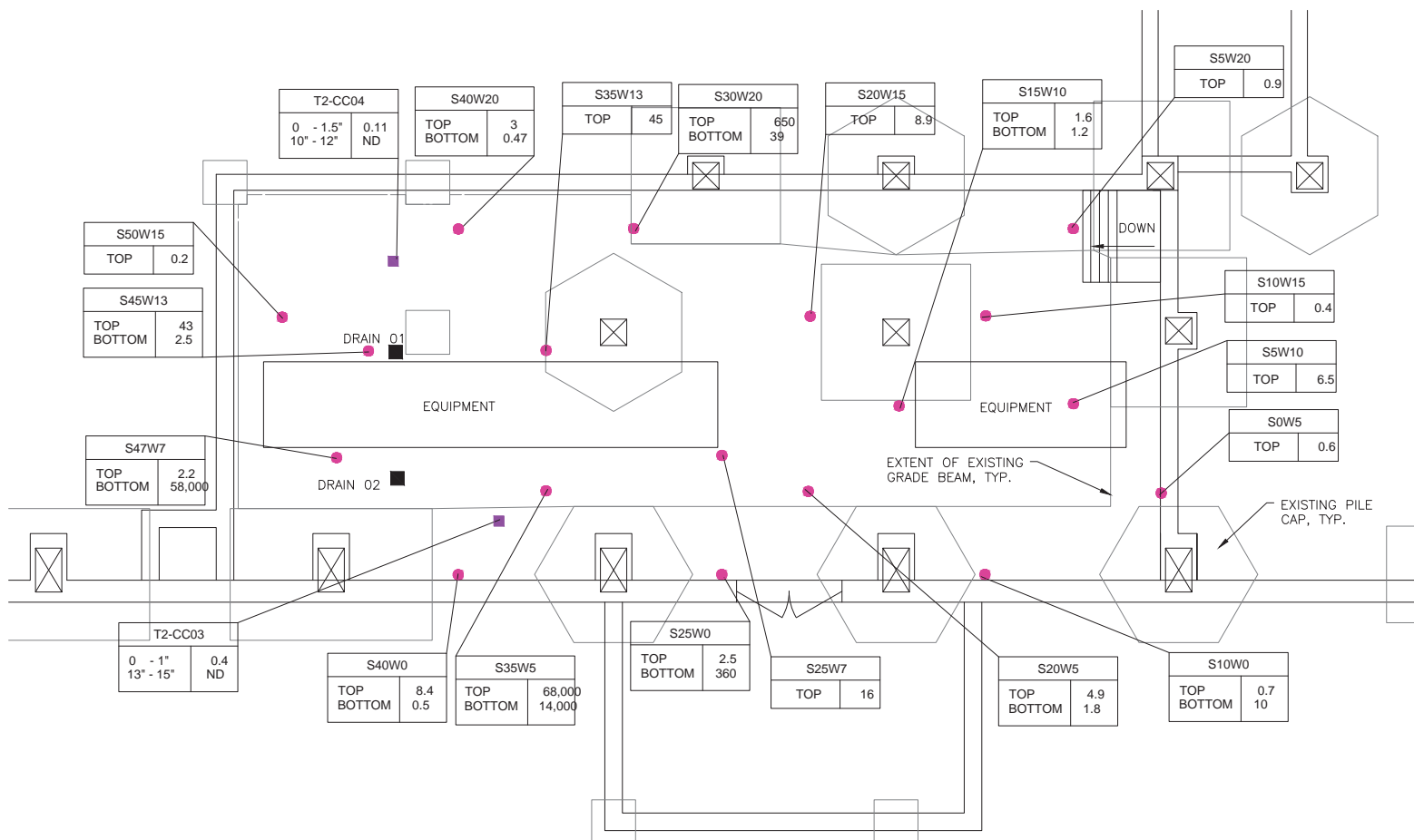
Project Title:
BRONX PSYCHIATRIC CENTER
TRANSFORMER ROOMS NO. 1 & 2
100 WATER PLACE
BRONX, NY

PCB CONCENTRATIONS
IN CONCRETE
TRANSFORMER ROOM 1

Phase: SUBMISSION
Drawn By: FS
Checked By: AS
Date: 5/5/2025
Scale & Signature: 2020 Project No. 3330409999

FIGURE 5

Sheet 1 of 8



BASE MAP SOURCE:
Urbahn, Brayton & Durrows, Hart & Jerman Associated
Architects, December 1958

LEGEND

- Structural Column
- Concrete Sample Location - 2000
- Concrete Sample Location - 2013
- Former Drain

NOTES:
All locations are approximate. ND - Not Detected
Concentrations are in mg/kg. NA - Not Analyzed
Source: Figures 1-6, Prepared by URS Corporation,
February 2018, included in the Record of Decision
for Bronx Psychiatric Center State Superfund Project
Site No. 203005, dated March 2019, prepared by
Division of Remediation New York State Department
of Environmental Conservation (NYSDEC).

100% SUBMISSION
NOT FOR CONSTRUCTION

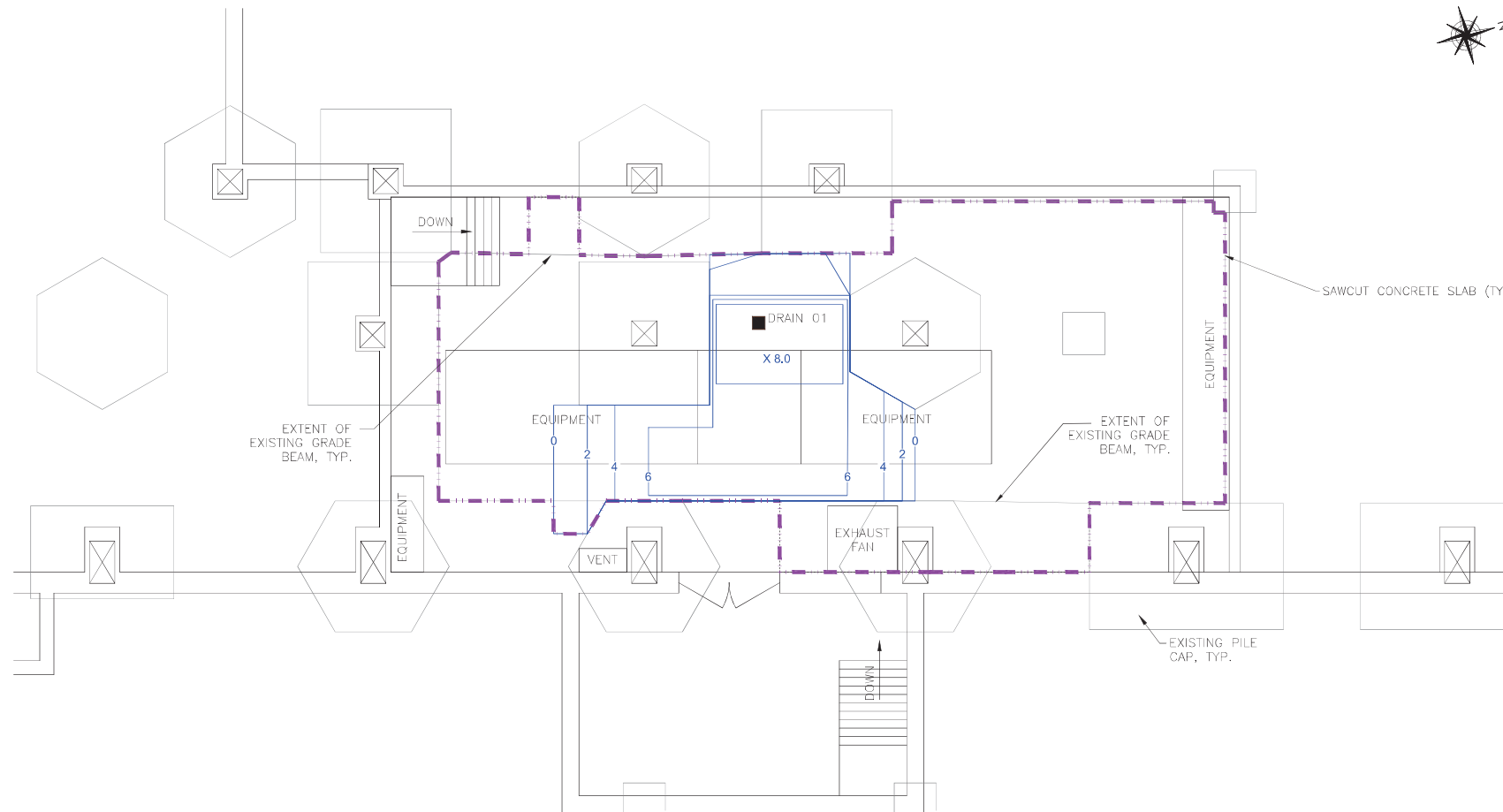
Rev.	Description	Date

Client: NYS OFFICE OF MENTAL HEALTH
PROJECT: BRONX PSYCHIATRIC CENTER SUPERFUND PROJECT
75 NEW SCOTLAND AVENUE
ALBANY, NY 12242

PCB CONCENTRATIONS
IN CONCRETE
TRANSFORMER ROOM 2

Phase: SUBMISSION
Drawn By: FS
Checked By: AS
Date: 5/5/2025
Seal & Signature: 25001 Project No. 3330409999

FIGURE 6
Drawing: 1 of 8



LOCATION MAP

NOT TO SCALE



BASE MAP SOURCE:
Urbahn, Brayton & Durrows, Hart & Jerman Associated
Architects, December 1958



LEGEND

- Structural Column
- Former Drain
- Floor Slab Removal (Estimated)
- Impacted Soil Excavation Depth Contours (Estimated)

NOTE:
All locations are approximate.
Source: Figures 1-6, Prepared by URS Corporation,
February 2018, included in the Record of Decision
for Bronx Psychiatric Center State Superfund Project
Site No. 203005, dated March 2019, prepared by
Division of Remediation New York State Department
of Environmental Conservation (NYSDEC).

Revisions	Description	Date

Client: NYS OFFICE OF MENTAL HEALTH
PROJECT: BRONX PSYCHIATRIC CENTER
75 NEW SCOTLAND AVENUE
ALBANY, NY 12208

Project Title: BRONX PSYCHIATRIC BUILDING 101
TRANSFORMER ROOMS NO. 1 & 2
100 WATER PLACE
BRONX, NY

TRANSFORMER
ROOM 1 - SLAB AND
SOIL REMOVAL
PLAN

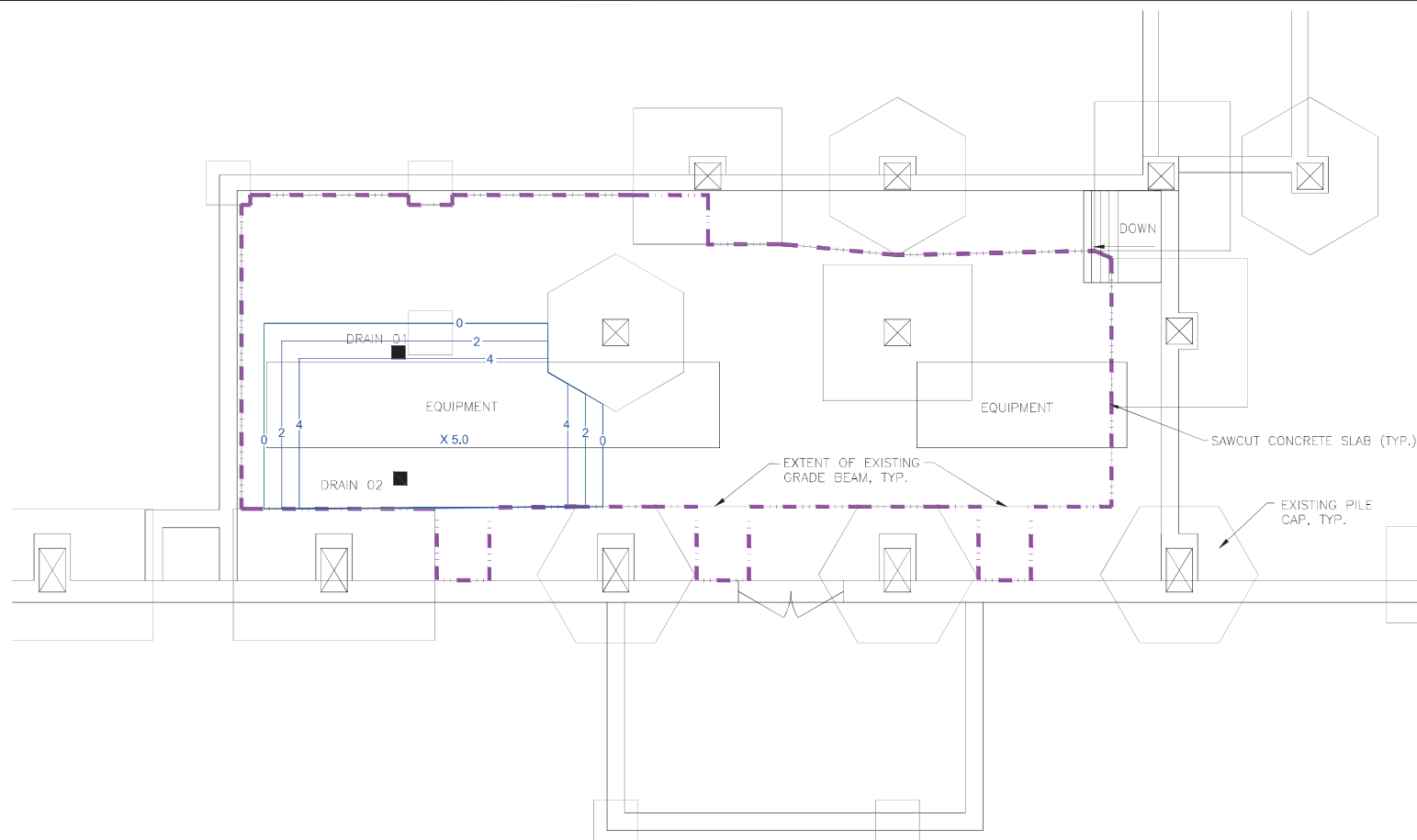
Phase: 100% SUBMISSION
Drawn By: FS
Checked By: AS
Date: 5/5/2025

Seal & Signature: [Signature]

FIGURE - 7

Drawing: 1 of 8

100% SUBMISSION
NOT FOR CONSTRUCTION



LOCATION MAP NOT TO SCALE



BASE MAP SOURCE:
Urbahn, Brayton & Durrows, Hart & Jerman Associated
Architects, December 1958



LEGEND

- Structural Column
- Floor Slab Removal (Estimated)
- Impacted Soil Excavation Depth Contours (Estimated)
- Former Drain

NOTE:

All locations are approximate.
Source: Figures 1-6, Prepared by URS Corporation,
February 2018, included in the Record of Decision
for Bronx Psychiatric Center State Superfund Project
Site No. 203005, dated March 2019, prepared by
Division of Remediation New York State Department
of Environmental Conservation (NYSDEC).

Revisions	Description	Date

Client: NYS OFFICE OF MENTAL HEALTH
75 NEW SCOTLAND AVENUE
ALBANY, NY 12242

Project Title: BRONX PSYCHIATRIC CENTER BUILDING NO. 1 & 2
TRANSFORMER ROOMS NO. 1 & 2
1000 WATER PLACE
BRONX, NY

TRANSFORMER
ROOM 2 - SLAB AND
SOIL REMOVAL
PLAN

Phase: 100% SUBMISSION
Drawn By: FS
Checked By: AS
Date: 5/5/2025
Seal & Signature: [Signature]

FIGURE 8

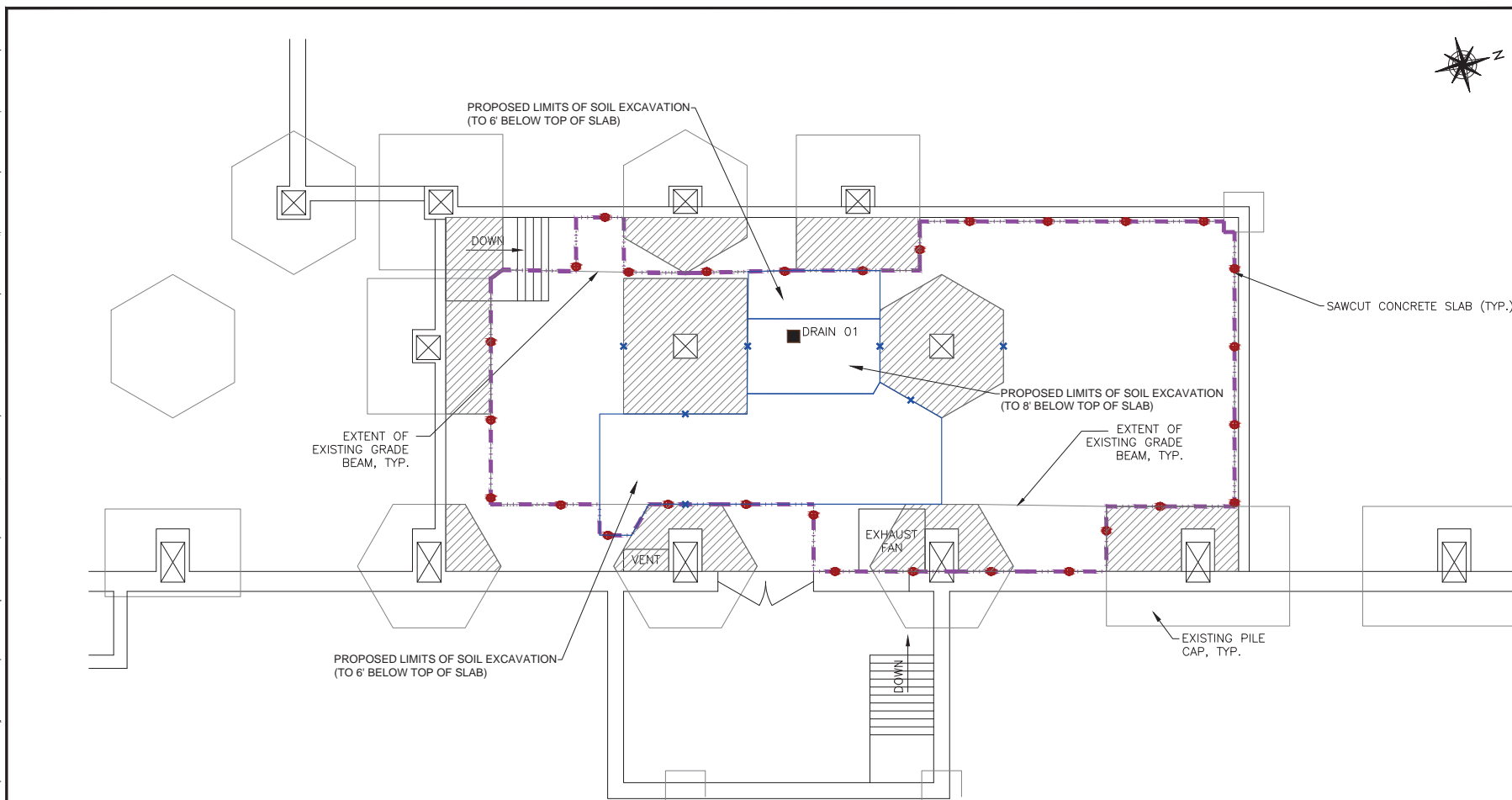
Drawing: 2 of 8

100% SUBMISSION
NOT FOR CONSTRUCTION

515 Broadway, Albany, NY 12242-2568
25 Liberty Street, 25th Floor, NY, NY 10006
539 Franklin Street, Buffalo, NY 14203-1109
WWW.GSENY.COM

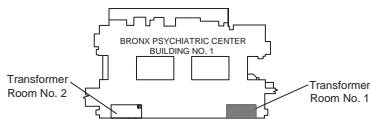
PROJECT: BRONX PSYCHIATRIC CENTER BUILDING NO. 1
PROJECT NO.: 203005
DATE: 9/22/2025

BUILDING OWNER:
DOMINION AUTHORITY STATE OF NEW YORK
ENVIRONMENTAL CONSULTANT:
TRC ENGINEERS, INC.



LOCATION MAP

NOT TO SCALE



BASE MAP SOURCE:
Urbahn, Brayton & Durrows, Hart & Jerman Associated
Architects, December 1958



LEGEND

- Structural Column
- Former Drain
- Post Remediation Concrete (Floor Slab) Sample Location
- Post Remediation Concrete (Concrete Footing) Sample Location
- Areas hatched in grey indicate subsurface concrete footing is present immediately beneath the slab

NOTES:

- All locations are approximate.
- Concrete Samples will be collected at 1/2-inch depth intervals. Multiple holes located closely adjacent to each other, may be needed to generate sufficient sample volumes (10 grams (20 mL) of powder) for a PCB determination. Concrete sampling will be conducted following removal of the concrete slab as shown in Figure 7.
- Source: Figures 1-6, Prepared by URS Corporation, February 2018, included in the Record of Decision for Bronx Psychiatric Center State Superfund Project Site No. 203005, dated March 2019, prepared by Division of Remediation New York State Department of Environmental Conservation (NYSDEC).

Revision	Description	Date

Client: NYS OFFICE OF MENTAL HEALTH
PROJECT: BRONX PSYCHIATRIC CENTER BUILDING NO. 1
PROJECT NO.: 203005
DATE: 9/22/2025

TRANSFORMER ROOM 1 -
POST REMEDIATION
CONCRETE SAMPLE
LOCATIONS

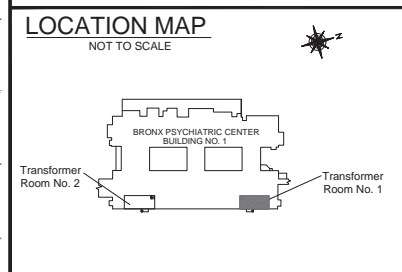
100% SUBMISSION
Drawn By: FS/HD/AS
Checked By: [Signature]
Date: 9/22/2025
Seal & Signature: [Signature]

FIGURE 9









9 of 12

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Proposed Soil Excavation Contours (Estimated)



LEGEND

-  Structural Column
-  Former Drain
-  Historic Soil Sample Location
-  Floor Slab Removal (Estimated)
-  Post Excavation Sample Location and Identification Number
-  B - Bottom, S - Sidewall
-  Soil Sample Location and Identification Number (to be collected beneath concrete slab following removal)
-  Areas Hatched in grey indicate subsurface concrete footing is present immediately beneath the slab

- NOTES:
1. All locations are approximate. All soil sample identifications will contain the prefix ("RM-1") for sample collection (I.E., RM-1-PX-B-1).
 2. Soil sampling will be conducted following excavation. Soil sampling will be conducted following the excavation of soil shown in figure 7. Please note that only historic soil sample locations outside of the limits of soil excavation are shown.
 3. Two distinct sidewall soil samples will be collected at each sidewall location (at grade and 5' below the top of slab).
 4. Source: Figures 1-6. Prepared by URS Corporation, February 2018, included in the Record of Decision for Bronx Psychiatric Center State Superfund Project Site No. 203005, dated March 2019, prepared by Division of Remediation New York State Department of Environmental Conservation (NYSDCE).

100% SUBMISSION
NOT FOR CONSTRUCTION

[illegible]

Client
on NY'S OFFICE OF MENTAL HEALTH
ENVIRONMENTAL OPERATIONS AND MAINTENANCE
ADMINISTRATIVE SUPPORT SERVICES GROUP
75 NEW SCOTLAND AVENUE
ALBANY, NY 12208

Project Title
BRONX PC MEDICAL SURGICAL BUILDING 101
TRANSFORMER ROOMS NO. 1 & 2
1500 WATER PLACE
BRONX, NY

TRANSFORMER
ROOM 1 - POST
REMEDIATION SOIL
SAMPLE LOCATIONS

Phase 100% SUBMISSION		
Drawn By: FS/HD	Checked By: AS	Date: 9/22/2025
Seal & Signature		DASNY Project No: 3393409999

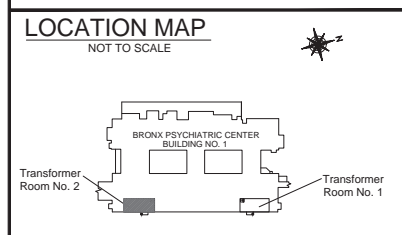
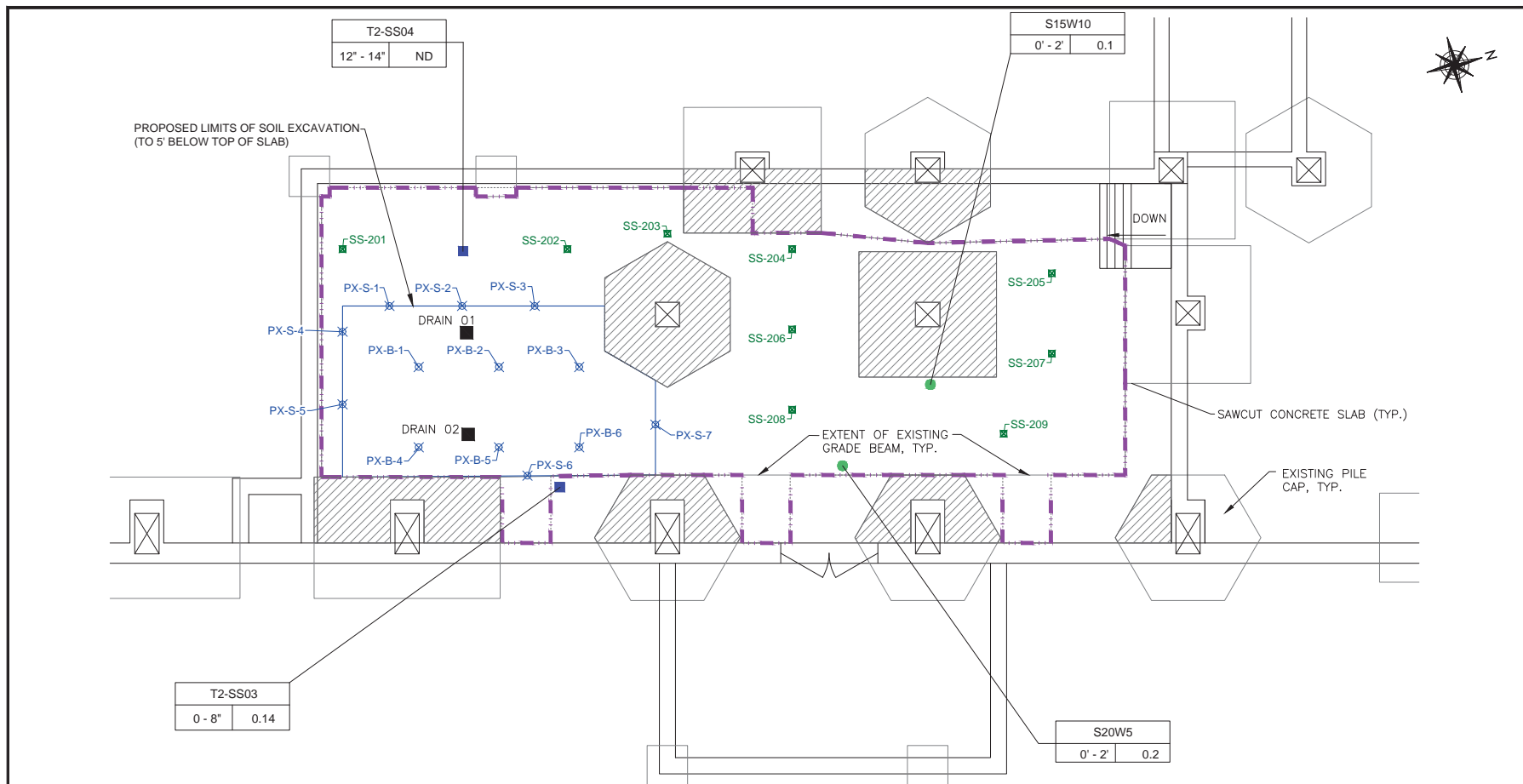
FIGURE 10



1. All locations are approximate.
2. Concrete Samples will be collected at 1/2-inch depth intervals. Multiple holes located closely adjacent to each other, may be needed to generate sufficient sample volumes (10 grams (20 mL) of powder) for a PCB determination. Concrete sampling will be conducted following removal of the concrete slab as shown in Figure 8.
3. Source: Figures 1-6, Prepared by URS Corporation, February 2018, included in the Record of Decision for Bronx Psychiatric Center State Superfund Project Site No. 203005, dated March 2019, prepared by Division of Remediation New York State Department of Environmental Conservation (NYSDCE).

FIGURE 11

P:\60425929 Bronx Bldg 1 Transformer Rooms T-S\900-CAD-GIS\2018 CAD\1-IGURE 3-11 14-15.dwg User:meistek Mar 14, 2018 - 11:56am



BASE MAP SOURCE:
Urbahn, Brayton & Durrows, Hart & Jernan Associated
Architects, December 1958



LEGEND

- Structural Column
- Historic Soil Sample Location
- Floor Slab Removal (Estimated)
- Post Excavation Sample Location and Identification Number
 - B - Bottom, S - Sidewall
- Soil Sample Location and Identification Number (to be collected beneath concrete slab following removal)
- Areas hatched in grey indicate subsurface concrete footing is present immediately beneath the slab

NOTES:

- All locations are approximate. All soil sample identifications will contain the prefix ("RM-2") for sample collection (I.E., RM-2-PX-B-1).
- Soil sampling will be conducted following excavation below the concrete pad. Soil sampling will be conducted following the excavation of soil shown in Figure 8. Please note that only historic soil sample locations outside of the limits of soil excavation are shown.
- Two distinct sidewall soil samples (I.E. PX-S-#(1) and PX-S-#(5)) will be collected at each sidewall location (at approximate 1 foot below top of slab and 5' below the top of slab).
- Source: Figures 1-6, Prepared by URS Corporation, February 2018, included in the Record of Decision for Bronx Psychiatric Center State Superfund Project Site No. 203005, dated March 2019, prepared by Division of Remediation New York State Department of Environmental Conservation (NYSDEC).

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NOT FOR CONSTRUCTION

315 Broadway, Albany, NY 12242-2944
38 State Street, 6th Floor, St. NY 10038
239 Florida Street, Suite 401, NY 10038-1109
NEW YORK, NY 10038

PROJECT: BRONX PSYCHIATRIC CENTER BUILDING NO. 1 & 2
TRANSFORMER ROOMS NO. 1 & 2
1540 WATER PLANT
BRONX, NY

CLIENT: NYS OFFICE OF MENTAL HEALTH
DIVISION OF MENTAL HEALTH
100 NASSAU ST., 10TH FLOOR
NEW YORK, NY 10038-4202

PROJECT TITLE: BRONX PSYCHIATRIC CENTER BUILDING NO. 1 & 2
TRANSFORMER ROOMS NO. 1 & 2
1540 WATER PLANT
BRONX, NY

100% SUBMISSION
Drawn By: FS/HD/AS
Checked By: [Signature]
Date: 9/22/2025
Scale: 1/2" = 1'-0"

FIGURE 12
Drawing 12 of 12

APPENDIX 1

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN

This Quality Assurance Project Plan (QAPP) presents the organization, objectives, planned activities, and specific quality assurance/quality control (QA/QC) procedures associated with the field activities described in the Remedial Work Plan (RWP). The QAPP also describes specific protocols for field sampling, sample handling and storage, and laboratory analysis. The data generated from the analysis of samples will be used to document the waste characterization of materials to be removed during remedial activities.

Project Organization and Responsibility

A qualified person will coordinate and manage the sampling and analysis program, data reduction, QA/QC, data validation, analysis, and reporting. TRC will direct the sampling activities and coordinate laboratory and remedial investigation activities. The TRC Project Quality Assurance (QA) Officer will be Elizabeth Denly and will report directly to the Project Manager, Anthony Sigona.

A qualified person will ensure that the QAPP is implemented and will oversee data validation. A qualified person will provide oversight and technical support for the sampling and analytical procedures followed in this project. This individual has the broad authority to approve or disapprove project plans, specific analyses, and final reports. The Project QA Officer is independent from the data generation activities. In general, the QA officer will be responsible for reviewing and advising on all QA/QC aspects of this program.

Data validation will be performed for the waste characterization building material, sediment, and liquid sample analytical data. The results of the data validation will be summarized in Data Usability Summary Reports (DUSRs). Nancy Weaver of Environmental Data Services, Inc. is the proposed data validator for this project. Resumes of key personnel, including the Project QA Officer, Project Manager, and Data Validator are provided in *Appendix 2* of the RWP.

Laboratories used will be New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP)-certified laboratories. The proposed laboratories for this project are Pace Analytical Services, LLC in Westborough, Massachusetts (ELAP Certification No. 11148), EMSL Laboratory and Atlas Environmental Lab Corporation in New York, New York (ELAP Certification No. 11999). Atlas Laboratory will be the primary laboratory for asbestos and lead paint analyses. QA/QC samples for asbestos will be submitted to EMSL. The laboratories will communicate directly with the Project Manager regarding the analytical results and reporting and will be responsible for providing all labels, sample containers, temperature blanks, shipping coolers, and laboratory documentation.

QA Objectives for Data Management

New York State Analytical Services Protocol (ASP) Category B laboratory packages will be provided by the laboratory.

All analytical measurements will be made so that the results are representative of the media sampled and the conditions measured. Data will be reported in consistent dry weight units for solid samples (i.e., $\mu\text{g/kg}$ and/or mg/kg). Table 1A presents the proposed samples, sampling and analytical parameters, analytical methods, sample preservation requirements, containers, and QA/QC samples.

Quantitation Limits (QLs) are laboratory-specific and reflect those values achievable by the laboratory performing the analyses.

Data Quality Levels (DQLs) are those reporting limits required to meet the objectives of the program (i.e., program action levels, cleanup standards, etc.).

Data Quality Objectives (DQOs) define the quality of data and documentation required to support decisions made in the various phases of the data collection activities. The DQOs are dependent on the end uses of the data to be collected and are also expressed in terms of objectives for precision, accuracy, representativeness, completeness, and comparability.

The analytical methods to be used at this site provide the highest level of data quality and can be used for purposes of risk assessment, evaluation of remedial alternatives and verification that cleanup standards have been met. However, in order to ensure that the analytical methodologies are capable of achieving the DQOs, measurement performance criteria have been set for the analytical measurements in terms of accuracy and precision.

The overall QA objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting which will provide results that are scientifically valid, and the levels of which are sufficient to meet DQOs.

All on-site soils which exceed restricted-residential soil cleanup objectives (SCOs) for PCBs (1 ppm) in shallow soil (0-2 feet) and 10 ppm in subsurface soil (greater than 2 feet), as set forth in NYSDEC's CP-51 and Part 375-6.8, will be excavated and transported off-site for disposal.

The QA objectives are defined as follows:

- **Accuracy** is the closeness of agreement between an observed value and an accepted reference value. The difference between the observed value and the reference value includes components of both systematic error (bias) and random error.

Accuracy in the field is assessed through the adherence to all field instrument calibration procedures, sample handling, preservation, and holding time requirements.

The laboratory will assess the overall accuracy of their instruments and analytical methods (independent of sample or matrix effects) through the measurement of "standards," materials of accepted reference value. Accuracy will vary from analysis to analysis because of individual sample and matrix effects. In an individual analysis, accuracy will be measured in terms of blank results, the percent recovery (%R) of surrogate compounds in organic analyses and/or laboratory control samples (LCSs). This gives an indication of expected recovery for analytes tending to behave chemically like the spiked or surrogate compounds.

- **Precision** is the agreement among a set of replicate measurements without consideration of the "true" or accurate value: i.e., variability between measurements of the same material for the same analyte. Precision is measured in a variety of ways including statistically, such as calculating variance or standard deviation.

Precision will be measured through the calculation of relative percent differences (RPDs). The resulting information will be used to assess sampling and analytical variability. These criteria apply only if the sample and/or duplicate results are $>5\times$ the quantitation limit; if both results are $<5\times$ the quantitation limit, the criterion will be doubled.

Precision in the laboratory is assessed through the calculation of RPD for duplicate samples. For organic soil and groundwater analyses, laboratory precision will be assessed through the analysis of field duplicates.

- **Completeness** is a measure of the number of valid data obtained from a measurement system compared to the amount that was expected to be obtained under normal conditions. “Normal conditions” are defined as the conditions expected if the sampling plan was implemented as planned.

Field completeness is a measure of the number of (1) valid measurements obtained from all the measurements taken in the project and (2) valid samples collected. The field completeness objective is greater than 90 percent.

Laboratory completeness is a measure of the number of valid measurements obtained from all valid samples submitted to the laboratory. The laboratory completeness objective is greater than 95 percent.

- **Representativeness** is a qualitative parameter that expresses the degree to which data accurately and precisely represents either a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition within a defined spatial and/or temporal boundary. To ensure representativeness, the sampling locations have been selected to provide coverage over a wide area and to highlight potential trends in the data. In addition, field duplicate samples will provide an additional measure of representativeness at a given location.

Representativeness is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Remedial Work Plan is followed, and that proper sampling, sample handling, and sample preservation techniques are used.

Representativeness in the laboratory is ensured by using the proper analytical procedures, appropriate methods, and meeting sample holding times.

- **Comparability** expresses the confidence with which one data set can be compared to another. Comparability is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the Work Plan are followed and that proper sampling techniques are used. Maximization of comparability with previous data sets is expected because the sampling design and field protocols are consistent with those previously used.

Comparability is dependent on the use of recognized United States Environmental Protection Agency (USEPA) or equivalent analytical methods and the reporting of data in standardized units. Laboratory procedures are consistent with those used for previous sampling efforts.

Table 1A Analytical Parameters, Methods, Preservation, Holding Time, and Container Requirements for Building Materials and Transformer Samples								
Sample Matrix	Analytical Parameter	Sample Type	Estimated No. of Samples ¹	No. of QA/QC Samples	EPA Analytical Method	Sample Preservation	Holding Time ²	Sample Container
Surfacing Materials	Asbestos	Grab	6-12	3	NYS PLM Method 198.1/198.8	NA	NA	Laboratory provided bags
Thermal System Insulation (TSI)	Asbestos	Grab	6-12	3	New York State PLM Method 198.1	NA	NA	Laboratory provided bags
Miscellaneous Materials	Asbestos	Grab	25-75	3-12	New York State PLM Method 198.1, NOB Method 198.4 or TEM Method 198.6, as applicable.	NA	NA	Laboratory provided bags
Non-Porous Surfaces	Polychlorinated Biphenyls (PCBs)	Wipe	12	2 (Blanks)	SW846 Method 3540C and SW846 Method 8082A	1:4 Acetone-Hexane	365 days	Glass 120ml/4oz w/ 1:4 Acetone: Hexane
Transformer Oil	PCBs	Grab	8-12	4	SW846 Method 3580A and SW846 Method 8082A	None	365 days	Glass 60mL/2oz unpreserved
Paint (e.g., floor epoxy and other paint)	Lead	Grab	10-20	0	NIOSH 7082	None	365 days	Glass 60mL/2oz unpreserved
Porous Floor Debris & Non-Metallic (Non-Recyclable) Materials	TCLP RCRA 8 Metals	Composite	2	0	6010D/7470	None	180 days except mercury which is 28 days	Glass 250mL/8oz unpreserved
Concrete	PCBs	Grab	50-100	0	SW846 Method 3540C and SW846 Method 8082A	None	365 days	Glass 250mL/8oz unpreserved
Manufactured Materials	PCBs	Grab	10-15	0	SW846 Method 3540C and SW846 Method 8082A	None	365 days	Glass 250mL/8oz unpreserved
¹ Actual number of samples may vary depending on field conditions, sample material availability, and field observations. ² From date and time of sample collection PLM - Polarized Light Microscopy; NOB - Non-friable organically bound; TEM - Transmission electron microscopy; TCLP - Toxicity Characteristic Leaching Procedure; RCRA - Resource Conservation and Recovery Act. Samples submitted to the laboratory for RCRA Metals & PCB analysis will be transported to the laboratory in a cooler with ice.								

Table 1B Analytical Parameters, Methods, Preservation, Holding Time, and Container Requirements for Liquid and Sediment Samples								
Sample Matrix	Analytical Parameter	Sample Type	No. of Samples ¹	No. of QA/QC Samples	EPA Analytical Method	Sample Preservation	Holding Time ²	Sample Container
Sediment	PCBs	Grab	2-6	1	SW846 Method 3540C and SW846 Method 8082A	None	365 days	Glass 250ml/8oz unpreserved
Aqueous Liquid	PCBs	Grab	2-6	1	SW846 Method 3510C and SW846 Method 8082A	None	365 days	2-Amber 1-L glass unpreserved
Non-Aqueous Liquid	PCBs	Grab	2-6	1	SW846 Method 3580A and SW846 Method 8082A	None	365 days	Glass 60mL/2oz unpreserved

¹ Actual number of samples may vary depending on field conditions, sample material availability, and field observations.
² From date and time of sample collection

Table 1C Analytical Parameters, Methods, Preservation, Holding Time, and Container Requirements for Soil Samples								
Sample Matrix	Analytical Parameter	Sample Type	No. of Samples ¹	No. of QA/QC Samples	EPA Analytical Method	Sample Preservation	Holding Time ²	Sample Container
Soil	PCBs	Grab	60-128	1 per 20 samples submitted to the laboratory	SW846 Method 3540C and SW846 Method 8082A	None	365 days	Glass 250ml/8oz unpreserved

¹ Actual number of samples may vary depending on field conditions, sample material availability, and field observations.
² From date and time of sample collection

Project Goals

The principal objectives of the Remedial Work Plan (RWP) sampling program are to provide a limited waste characterization analysis of the vandalized transformer room materials and building materials to be removed during remedial activities, analysis of the concrete and subsurface soils beneath the concrete slabs to achieve re-classification of the Site from a Class 3 to Class 4 Inactive Hazardous Waste Disposal Site, and analysis of groundwater samples for New York City Department of Environmental Protection (NYCDEP) dewatering permits.

Sampling Plan

Environmental sampling will include building materials, oils, liquids, sediment, and soil as shown in Tables 1A through 1C. All samples will be collected using disposable sampling equipment. Samplers will wear phthalate-free gloves such as neoprene, butyl, or Viton gloves (> 8 hour breakthrough for PCBs) shall be always used when handling PCB samples. Only clean or disposal instruments will be allowed to touch the sample to the extent practicable.

Soil and Sediment Sampling

Soil and sediment samples will be collected as per procedures in RWP in 2-ounce sterile scoops and placed in the sample bottles. Discrete sediment samples will be collected using a dedicated disposable Teflon scoop or other similar device depending on the sample matrix for each liquid and/or sediment sample. Samples will be placed directly into pre-cleaned and labeled containers for transport and delivery to laboratory for PCB analysis using gas chromatography (GC) in accordance with USEPA SW846 Method 8082A.

Liquid and Aqueous Sampling

Collecting aqueous and liquid samples involves a standardized process to ensure accurate analysis. This includes proper sample collection, preservation, and transportation to a lab for analysis. A general approach involves using sterile, rinsed collection bottles, filling them to a specific level, for transport to the laboratory for analysis for USEPA SW846 Method 8082A.

Concrete Sampling

Concrete samples will be collected utilizing approximately 1-inch diameter carbide drill bit with an impact hammer drill. Drill bits will be decontaminated between sampling locations. For easy identification, sample locations will be pre-marked using a marker or paint. Any debris will be removed with a clean brush or cloth prior to drilling.

Samples will be collected at 1/2-inch depth intervals. Thus, the initial surface sample will be collected from 0 - 0.5 inches. Multiple holes located closely adjacent to each other, may be needed to generate sufficient sample volumes (10 grams (20 mL) of powder) for a PCB determination. Samples will be placed directly into pre-cleaned and labeled containers for transport and delivery to laboratory for PCB analysis using gas chromatography (GC) in accordance with USEPA SW846 Method 8082A.

PCB Manufactured Building Materials

Bulk Samples will be collected at no more than 1/2-inch depth intervals using a metal chisel or sharp cutting knife. Thus, the initial surface sample should be collected from 0 - 0.5 inches. For porous surfaces, such as caulking and rubber, a representative sample can be collected using a metal chisel or sharp cutting knife. A minimum sample size of the bulk materials will be weighed in the field to achieve at least 10 grams for analysis. Samples will be placed directly into pre-cleaned and labeled containers for transport and delivery to laboratory for PCB analysis using gas chromatography (GC) in accordance with USEPA SW846 Method 8082A.

PCB Wipe Sampling

Wipe Samples will be collected in accordance with 40 CFR 761.3 and 761.123. PCB-free gauze wipes will be wetted with hexane to collect surface wipe samples. Wipe sampling will be performed using a 10 cm by 10 cm template consistent with American Society for Testing and Materials *Standard Practice for Field Collection of Organic Compounds from Surfaces Using Wipe Sampling*. Each wipe sample will be collected in a 100-cm² area. In cases where the surface area available for wipe sampling is less than 100 cm², the actual area wiped will be recorded.

Transfer of PCBs from the surface will occur through physical wiping of the defined surface area while applying moderate pressure. Wipes will be handled using appropriate chemical resistant gloves followed by storage in a clean glass jar having a Teflon-lined cap. The lid should be labelled with the sample identification described above along with an unsampled wipe labelled blank. A wipe sample will be collected from both sampling stations at each sampling event time.

Samples will be analyzed for PCBs using gas chromatography (GC) in accordance with USEPA SW846 Method 8082A. Sample results will be compared to EPA's High Occupancy surface wipe sample criteria of 10 µg/100 cm² 40 CFR 761.61(a)(4)(ii) and NYSDEC 6 NYCRR 371.4(e).

Lead-Based Paint Sampling

TRC will inspect the Transformer Rooms for lead based paint (LBP), utilizing a USEPA Certified Lead-Based Paint Professional. Paint chip samples will be collected in glass 60mL/2oz unpreserved jars and submitted for lead analysis via NIOSH 7082 to a laboratory accredited by American Industrial Hygiene Association (AIHA), Environmental Lead Laboratory Accreditation Program (ELLAP), and the NYSDOH.

Asbestos-Containing Material Sampling

TRC will conduct a survey of the portions of the Transformer Room anticipated to be affected by the renovation scope. The survey will be performed by licensed NYSDOL asbestos inspectors and New York City Department of Environmental Protection (NYCDEP) investigators. Suspect homogeneous materials are defined as those materials that are visually similar in color, appearance and texture and show evidence of being installed at the same general time.

A minimum of three (3) samples of thermal system insulation (e.g., boiler, pipe, pipefitting, and tank insulation) and two (2) samples of miscellaneous materials (e.g., ceiling tile, floor tile, window caulking, wallboard, and roofing materials) will be collected from each homogeneous material. These samples will be collected from discrete and different locations of the material so that samples are collected in a random

manner from well-distributed locations. If multiple pieces of equipment (e.g., boilers, water tanks, condensate tanks) appear to be insulated with the same material (under any protective coverings), the material may have been considered a homogeneous material. If it is apparent that repairs have been made using a different material, samples would have been collected of each material.

For surfacing materials (e.g., spray-applied insulation) a minimum of three (3) bulk samples will be collected from each homogeneous area that measures 1,000 square feet or less, five (5) bulk samples from each homogeneous area that measures greater than 1,000 square feet but less than 5,000 square feet, and seven (7) bulk samples from each homogeneous area that measures greater than 5,000 square feet.

Following the identification of suspect homogeneous materials, representative samples will be collected. Multiple bulk samples will be collected from each suspect homogeneous material in accordance with the Asbestos Hazard Emergency Response Act (AHERA) requirements. A unique sample identification number was assigned incrementally for each sample. These samples will be placed in containers and delivered to the laboratory following proper chain-of-custody procedures. The samples will be submitted to ELAP certified Labs.

Measurement Quality Objectives

The measurement quality objectives associated with the field investigation are presented below.

Accuracy

Field Accuracy Objectives

Accuracy in the field is assessed through the adherence to all field instrument calibration procedures, sample handling, preservation, and holding time requirements. Accuracy will also be evaluated using field blanks, cooler temperature blanks, media certification checks, breakthrough checks, field surrogates, and field spikes.

Field blanks will be submitted with wipe matrices and will consist of clean sample media that accompany samples to and from the site in the same cooler or shipping container. Field blanks will be used to ensure that there is no contamination as a result of the shipment/transportation/on-site storage activities. Field blanks will be collected at a frequency of one per sampling event for all parameters associated with the wipe samples.

QC Sample Collection

QC samples will include field duplicates for samples. Refer to Table 1A-1B for a summary of QC sample preservation and container requirements.

Field duplicates are an additional aliquot of the same sample submitted for the same parameters as the original sample. Field duplicates will be used to assess the sampling and analytical reproducibility. Field duplicates will be collected by alternately filling sample bottles from the source being sampled. Refer to Table 1A-1B for a summary of QC sample preservation and container requirements.

Sample Preservation and Containerization

The analytical laboratory will supply the containers for analytical samples. These containers will be cleaned by the manufacturer to meet or exceed all analyte specifications established in the latest USEPA's Specifications and Guidance for Contaminant-Free Sample Containers. Certificates of analysis are

provided with each bottle lot and maintained on file to document conformance to USEPA specifications. Soil samples will be placed in chilled coolers immediately after collection.

Equipment Decontamination

Since disposable sampling equipment will be utilized, equipment decontamination procedures are not included in this QAPP.

Field Custody Procedures

Sample chain-of-custody and packaging procedures are summarized below. These procedures are intended to ensure that the samples will arrive at the laboratory with the chain-of-custody intact.

- The field sampler is personally responsible for the care and custody of the samples until they are transferred or dispatched properly. Field procedures have been designed such that as few people as possible will handle the samples.
- All bottles will be identified by the use of sample labels with sample numbers, sampling locations, date/time of sample collection, and type of analysis.
- Sample labels will be completed for each sample using waterproof ink unless prohibited by weather conditions. For example, a logbook notation would explain that a pencil was used to fill out the sample label because the pen would not function in wet weather.
- Samples will be accompanied by a properly completed chain-of-custody form. The sample numbers and locations will be listed on the chain-of-custody form. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. This record documents the transfer of custody of samples from the sampler to another person, to a mobile laboratory, to the permanent laboratory, or to/from a secure storage location.
- All shipments will be accompanied by the chain-of-custody record identifying the contents. The original record will accompany the shipment, and copies will be retained by the sampler and placed in the project files.
- Samples will be properly packaged for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in and secured to the inside top of each sample box or cooler. Shipping containers will be secured with strapping tape and custody seals for shipment to the laboratory. The custody seals will be attached to the front right and back left of the cooler and covered with clear plastic tape after being signed by field personnel. The cooler will be strapped shut with strapping tape in at least two locations.
- If the samples are sent by common carrier, the air bill will be used. Air bills will be retained as part of the permanent documentation. Commercial carriers are not required to sign off on the custody forms since the custody forms will be sealed inside the sample cooler and the custody seals will remain intact.
- Samples remain in the custody of the sampler until transfer of custody is completed. This consists of delivery of samples to the laboratory sample custodian, and signature of the laboratory sample

custodian on chain-of-custody document as receiving the samples and signature of sampler as relinquishing samples.

Data Management and Reporting

ASP Category B Laboratory Packages will undergo data validation. A NYSDEC Data Usability Summary Report (DUSR) will be prepared for each laboratory package.

APPENDIX 2

PROJECT PERSONNEL ORGANIZATION CHART AND RESUMES



TRC Project Team Organizational Chart
Remedial Work Plan Implementation
Bronx Psychiatric Center
State Superfund Project (Site No. 203005)

RESPONSIBLE PARTY

NYS OMH AUTHORIZED REPRESENTATIVE

PRINCIPAL-IN-CHARGE

Edward Gerdts, CIH

PROGRAM MANAGER

Josh Cupriks, CIH, CSP

QUALITY ASSURANCE OFFICER

Elizabeth Denly, ASQ CMQ/OE

HEALTH & SAFETY OFFICER

Daren Bryant

REPORTING MANAGER

Lindsay O'Hara, CHMM

PROJECT MANAGER

Anthony Sigona, PE, QEP

FIELD SAMPLING TEAM

Dmitriy Khimich	Yuiry Klimenko	York Gavilanez
Nancy Guvera	John Antley	Maya Wells

REPORTING TEAM

Kimberly Tisa	Frank Santaly
Henry Delgado	

SUBCONTRACTORS

Laboratory Services
Pace Analytical Services LLC
EMSL Analytical, Inc.
Atlas Environmental Lab Corp.

Waste Mgmt.
Innovative Recycling
Technologies

Data Validation Services
Environmental Data Services

JOHN ANTLEY

EDUCATION

B.S. Environmental Science, Minor in Chemistry, New Jersey Institute of Technology (NJIT), May 2020.

AREAS OF EXPERTISE

John Antley has technical experience in the following general areas:

- Field Instrument Calibration & Operation
- Collection of Soil, Groundwater, and Air Samples
- Resource Recovery/Solid Waste Management
- Overburden Well Installation Oversight
- Field Work Oversight
- Data Usability/Data Analysis
- Report Preparation
- Environmental Compliance

REPRESENTATIVE EXPERIENCE

John Antley possesses over 3 years of experience in the environmental field, with knowledge in areas of site investigation, waste management, soil and ground water sampling, oversight of field crews, and coordinating field events.

New York City Department of Parks and Recreation, Multiple Sites, Environmental Scientist – Multiple Sites, New York

Mr. Antley serves as an Environmental Scientist performing environmental, geotechnical, and permeability investigations at New York City parks as part of investigations for capital projects. Mr. Antley's responsibilities included providing direction to the geophysical and drilling subcontractors and calibrating and utilizing field instrumentation including a PID during subsurface investigation. Mr. Antley documented soil characteristics and permeability parameters, collected soil samples for laboratory analysis, completed chain-of-custody (COC) forms, and followed standard COC procedures.

New York State Department of Environmental Conservation, Vibracore Sediment Sampling, Environmental Scientist – Newtown Creek, Brooklyn, New York

Mr. Antley served as the lead Environmental Scientist performing sediment sampling in Newtown Creek in Brooklyn, NY. Mr. Antley's responsibilities included oversight of contractors, collection of vibracore sediment samples, characterization of sediments, and collection of sediment samples. Mr. Antley was responsible for ensuring all environmental standards and guidelines were followed for this project.

Transmission Developers Inc., Champaign-Hudson Power Express, Community Air Monitoring, Environmental Scientist – Queens, New York

Mr. Antley serves as the lead Environmental Scientist performing air monitoring and construction inspection services at the Champaign-Hudson Power Express in Queens, NY. Mr. Antley's responsibilities include calibration and use of field instrumentation including a photoionization detector (PID) and DuskTrak II Monitors to implement the Community Air Monitoring Plan (CAMP). Mr. Antley prepares daily reports summarizing the community air monitoring data and construction activities. Mr. Antley oversees the maintenance of all equipment and telemetric systems for this project.



PSEG, LLS., Sand Hills Substation, Resource Recovery, Environmental Scientist – Sandhills, New Jersey

Mr. Antley serves as the lead resource recovery personnel at the Sandhills substation in Sandhills, NJ during the construction of a new substation. Mr. Antley was responsible for managing the solid waste manifests for all the soil excavated from the Site. Approximately 25 truckloads of soil were transported off-Site daily. Mr. Antley frequently acted as the liaison between the construction crew advancing the excavations, contracted waste-haulers, and the client. He also conducted environmental compliance inspections daily.

New York City School Construction Authority, Environmental Scientist – Multiple Sites, New York

Mr. Antley serves as an environmental scientist performing site assessments and investigation for new construction and renovation of New York City public schools. Responsibilities include preparation and review of Phase I Environmental Site Assessments (ESAs), Phase II Environmental Site Investigation (ESI) scopes of work, and Phase II ESIs. In preparation of Phase I ESAs, Mr. Antley has reviewed and summarized prior investigation reports of New York State Department of Environmental Conservation (NYSDEC) Brownfield Sites, Restrictive Declarations on facilities with NYC Department of Environmental Protection (NYCDEP) and/or NYC Mayor's Office of Environmental Remediation (NYCOER) oversight, and other pertinent documents.

Parkway Generation, Bergen Generating Station Acid Spill Investigation, Environmental Scientist – New York

Mr. Antley performed continuous soil sampling, logged soil characteristics analyzed soil acidity levels using mobile lab equipment, and selected and submitted soil samples to the laboratory for analysis under standard COC procedures as part of investigation activities following a 200-gallon release of sulfuric acid at the Bergen Generating station. Mr. Antley provided oversight of the subcontractor during remedial activities and organized a field event which included soil sampling, groundwater sampling, and temporary and permanent well installations.

SPECIALIZED TRAINING

- OSHA 10-Hour Construction Industry Training
- OSHA 40-Hour Hazardous Waste Operations (HAZWOPER) Training

AFFILIATIONS

SELECTED PUBLICATIONS AND PRESENTATIONS

Khalizov, A. F., Guzman, F. J., Cooper, M., Mao, N., Antley, J., & Bozzelli, J. (2020). Direct detection of gas-phase mercuric chloride by ion drift - Chemical ionization mass spectrometry. *Atmospheric Environment*, 238, [117687]. <https://doi.org/10.1016/j.atmosenv.2020.117687>



DAREN J. BRYANT **PROGRAM MANAGER – TRC NYC OFFICE SAFETY COORDINATOR**

EDUCATION

B.S., Environmental Science, University at Buffalo, NY, Phi Beta Kappa, magna cum laude, 1997

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

USEPA Lead-Based Paint Risk Assessor

AMPP C-3/C-5 Supervisor/Competent Person for Deleading of Industrial Structures

NYCDEP Asbestos Investigator

NYSDOL Asbestos Inspector, Management Planner, Project Designer, Project Monitor, and Air Sampling Technician, Mold Assessor

AREAS OF EXPERTISE

Mr. Daren J. Bryant has project and quality management experience in the following general areas:

- Asbestos/Lead-Based Paint Survey/Design and Abatement Oversight
- USEPA/NYSDOH Asbestos & Lead-Based Paint Training Accreditation & Certification
- Environmental Health & Safety Management
- OSHA Compliance
- Indoor Air Quality Assessments
- Industrial Hygiene Exposure Assessments

REPRESENTATIVE EXPERIENCE

Mr. Bryant has over 24 years of experience and progressive responsibility in environmental consulting and training. His qualifications include extensive hands-on planning, field investigations and site management, design, permitting, cost estimating, and project management. Mr. Bryant's background includes extensive service to public and private-sector clientele including Metro North Railroad, the New York Power Authority, the New York City School Construction Authority, the New York City Transit Authority, and New York University.

New York City School Construction Authority, Program Manager, New York, NY (2011 - Present)

Mr. Bryant has served as Project Manager with responsibility for the asbestos/lead-based paint/polychlorinated biphenyl survey and design as well as abatement oversight for various schools across the five boroughs of New York City. Responsibilities included detailed document and construction drawing review, field survey scheduling and sampling, quality control reviews, personnel management, technical report and specification writing, cost estimation, design drawing, and final report submittal.

Asbestos, Lead, and Testing - Metro North Railroad, Program Manager, New York, NY (2018-Current)

Mr. Bryant currently is currently working on asbestos, lead-based paint, and industrial hygiene/indoor air quality consulting projects for the Metro North Railroad Company for various work in Grand Central Terminal as well as for the structures and train lines along the various train lines in New York, New Jersey, and Connecticut. His main responsibilities include technical expertise in all facets of compliance



work for asbestos and lead under the USEPA, NYSDOL, and OSHA. Mr. Bryant also plays a role in the management of all indoor air quality assessments, industrial hygiene exposure monitoring, and personal air sampling under the direction of a Certified Industrial Hygienist (CIH).

New York Power Authority, Safety Officer/Senior Project Manager, New York, NY (2013-2015)

Mr. Bryant served as Site Safety Officer and Senior Project Manager with responsibility for the on-site asbestos abatement at the deconstruction of the Charles Poletti Power Plant in Astoria, NY. As Safety Officer, Mr. Bryant reviewed and prepared Job Safety Briefings, Job Hazard Analyses, and work plans during the demolition of the power plant. Responsibilities also included site-specific compliance with NYSDOL asbestos abatement requirements, adherence to the 02081 asbestos specifications, review and interpretation of all sample results, field personnel management, and daily documentation and coordination with the general contractor, abatement contractors, and construction management team.

Lead-Based Paint Inspection Services Contract / Healthy Homes - New York City Housing Authority (NYCHA), Project QA/QC Task Manager (2019-current)

Project QA/QC Task Manager for residential unit lead inspection services task order contract to NYCHA, the largest public housing authority in the U.S. with over 140,000 apartment units. Mr. Bryant provides overall QA/QC of team conducting HUD based lead paint assessments throughout client's properties in the five boroughs of New York City. Contract includes coordinated residential unit access to fulfill lead-based paint inspection and reporting requirements on a unit-by-unit basis. Inspections include XRF evaluations and paint chip as one of seven contracts awarded by the public agency to support their goal of testing over 135,000 residential apartments, starting in April, 2019. Mr. Bryant was part of the team managing field and office teams utilizing TRC's Mobile Data Solutions platform to automate an efficient reporting structure with high quality assurance. Residential lead-based paint inspections were conducted in over 3,000 apartment units in the first one year of contract services. Currently over 23,000 apartments have been successfully inspected and reported.

Asbestos, Lead-Based Paint and Environmental Consulting Services - New York City Build-it-Back, Senior Project Manager, Queens, NY (2016-2019)

Mr. Bryant was responsible for providing environmental support services to the New York City Mayor's Office of Housing Recovery Operations (NYCHRO) and the Build it Back Program administered by the New York City Department of Design & Construction (NYCDDC). As prime consultant for Tishman Construction Corp. of New York (Tishman), Mr. Bryant has been responsible for all environmental and hazardous material testing for homes within the borough of Queens, NY, which sustained a large volume of homes damaged by Hurricane Sandy due to its large residential coastline. Mr. Bryant, along with representatives from Tishman, their parent company AECOM, and NYCDDC, provided initial inspection and design services for properties accepted into the program, with TRC's role primarily as construction and renovation phases. Mr. Bryant also provided support services for inspection work for Tishman for additional hazardous materials identified, such as damage from water intrusion and/or microbial growth, underground storage tank inspection and removal, groundwater and soil testing for potentially hazardous waste characterization and disposal, and the installation of monitoring wells for the New York City Department of Environmental Protection and/or the New York State Department of Environmental Conservation in areas where wetlands permits are in place.

New York University, Project Manager, 370 Jay Street, Brooklyn, NY (2014-Current)

Mr. Bryant is currently responsible for the environmental oversight of the abatement and gut renovation of the former Metropolitan Transit Authority (MTA) headquarters which is currently in the process of



becoming New York University's Center for Urban Studies and Planning. Mr. Bryant has been responsible for leading an experienced field team to perform a detailed site assessment using previous survey documents as well as extensive sampling for various environmental contaminants. Mr. Bryant also served as Project Designer for this large-scale abatement and is currently managing the abatement oversight and monitoring, taking this project from start to finish for New York University. Mr. Bryant also managed and submitted all polychlorinated biphenyl (PCB) testing, remediation, and document submittals to the United States Environmental Protection Agency Region 2.

New York City Transit Authority, Project Manager, New York, NY (2012- 2013)

Mr. Bryant served as Project Manager with responsibility for the asbestos abatement and deleading of industrial structures for various facilities across the five boroughs of New York City. Responsibilities included detailed document and construction drawing review, field survey scheduling and sampling, quality control reviews, personnel management, technical report writing, project initiation, and compliance with the Office of System Safety and NYSDOL system-wide variances.

Various Clients, Training Manager, New York, NY (2008-2011)

Mr. Bryant served as Training Manager with responsibility for the accreditation of NYSDOH-approved asbestos safety training courses as well as USEPA-approved lead-based paint training courses. His main duties were the development, implementation, scheduling, instruction, and NYSDOH and USEPA document submittal for various public and private students seeking certification training for various asbestos and lead-based paint disciplines.

City of Phoenix, Project Manager, Phoenix, AZ (2001-2006)

Mr. Bryant served as Project Manager with responsibility for the management of all field inspections and technical report and specification writing for the City of Phoenix Lead Hazard Control Program. His main duties included the scheduling of all properties requiring lead-based paint inspections and risk assessments, interpretation of all sample data, and compliance with USEPA and HUD requirements.

SPECIALIZED TRAINING

- 40-Hour OSHA Hazardous Waste Operations And Emergency Response Training
- 30-Hour OSHA Construction Safety
- 10-Hour OSHA Outreach Training
- X-Ray Fluorescence Analyzer Training
- General Safety For Aerial Lifts Training
- Advanced Fungal Workshop Training
- TRC Excellence In Project Management Training
- MTA Track Training
- Metro North Safety Training
- CSX Railway Training

JOSHUA CUPRIKS, CIH, CSP

EDUCATION

M.S. Environmental Studies/Industrial Hygiene (1998); The University of Rochester School of Medicine & Dentistry

B.S. (Magna Cum Laude) Organismal Biology (1994): SUNY New Paltz

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Certified Industrial Hygienist (CIH) – American Board of Industrial Hygiene

Certified Safety Professional (CSP) – Board of Certified Safety Professionals

NYSDOL Mold Assessor

AREAS OF EXPERTISE

Mr. Joshua Cupriks CIH, CSP has program management and technical experience in the following general areas:

- Extensive classical Industrial Hygiene, Safety and Compliance experience and problem-solving skills;
- National and international experience (Hawaii to Dubai);
- Strong familiarity with and proven success on high profile and mission critical projects;
- Strong Team building and interpersonal skills;
- Strong quality control and client-building/Team marketing skills;
- History using the above to grow EHS divisions and grow the bottom line
- Working knowledge of the transportation, repair/manufacturing, property management, construction, medical, academic and energy sectors

REPRESENTATIVE EXPERIENCE

Mr. Cupriks has 30 years of experience and progressive responsibility in Consulting and Management Services. Regional EHS Manager/Practice Director with proven safety compliance, problem-solving client service management, quality control, business/technical development and National Safety Team/group working experience.

Long Island Railroad (LIRR), Long Island, New York

Project Manager/CIH of record for three consecutive Industrial Hygiene Contracts from 1998 – 2012 and for the current contract. Responsible for efficiently managing and performing a variety of industrial hygiene sampling, safety and environmental assessment surveys in both office, station/track facilities, management office/operational facility space. Work tasks have involved System/Corporate Safety program updates with regards to FRA Standard changes, System/Corporate Safety program reviews and updates, NYS PESH Bureau interpretive support, comprehensive ventilation and Indoor Air Quality (IAQ) surveys, emergency/proactive air quality surveys and exposure assessments (diesel exhaust, chemical, metal [including mercury], silica, man-made vitreous fiber, community/personal noise and EMF). Additionally managed numerous projects related to oil/water separation systems, tank management systems, environmental groundwater and soil investigations, Health & Safety training, scientific (e.g., efficacy of novel chlorine dioxide delivery systems in a train car setting) experimentation and independent



oversight, unknown contaminant testing, toxic metals abatement and historical Industrial Hygiene data management.

Port Authority of New York/New Jersey (PANYNJ) and Port Authority Trans Hudson (PATH) Commuter Facilities, New York, New York

Over the past fifteen years, Mr. Cupriks has served as a defense CIH for PATH/PANYNJ through the law firm of Siegel, McCambridge, Singer & Mahoney (SMSM). In this capacity he has provided key research, report and expert witness services for casework typically involving asbestos, diesel exhaust exposure and rail safety. Work has required a working knowledge of System Safety Program spanning sixty years, including but not limited to training procedures/records, occupational sampling data and interpretation and established employee/union work practices.

Amtrak/New Jersey Portal Bridge Replacement Project

Safety Manager and Inspector for a 3rd Party Team of inspection safety professionals working to identify and address environmental, health & safety concerns for this mission critical \$1.6 billion hazardous (COPR-impacted) waste impacted site owned by Glenn Springs Holdings, Inc.

Mr. Cupriks' Team interfaced with the larger project safety on this sixteen-acre site to meet site safety goals, State of New Jersey and Federal/Amtrak safety, procedural requirements.

Metropolitan Transportation Authority (MTA), New York, New York

Mr. Cupriks served in a variety of capacities between approximately 1998 and 2021 for a number of MTA contracts involved with Environmental, Health & Safety including but not limited to:

- More recently, Industrial Hygiene support/management services for on-going station upgrades. In this capacity, Mr. Cupriks worked with the Contractor of Record and MTA System safety to ensure compliance issues were identified and addressed in dynamic working environments.
- Extensive track walking with MTA System Safety Management to identify asbestos materials (i.e., signal caps, insulation, etc.) and other Environmental Conditions of Concern prior to scheduled track work. Project.
- Project Manager for the MTA Bus Industrial Hygiene Contract.
- Industrial Hygiene/Technical Advisor for the 7-line extension Team.
- Separate, on-call hazard summaries/Safety Data Sheet (SDS) reviews for chemical products prior to and during use as needed.
- Extensive asbestos/air sampling/project monitoring work between 1998 and 2002.

New Jersey Transit (NJT) Light Rail Transit System, Jersey City, NJ and Surrounding Area (1998 – 2002)

Mr. Cupriks served as the lead Project Industrial Hygienist/Environmental Scientist/Safety Specialist assessing and addressing conditions of concerns associated with the Project Management of demolition/decommissioning of structures, construction, storm water management/waterway protection along the full length of the NJT light rail transit corridor. Multiple concurrent goals included protection of workers, the environment and the public within surrounding communities.



Union County, New Jersey

Mr. Cupriks worked closely with County officials to complete this nearly year-long project serving as the Industrial Hygiene Project Manager for the completion of mission critical project Covid-19 prevention programs pertaining to a wide variety of active/mission critical public spaces such as zoos, public parks, prisons, animal/medical support facilities and office buildings. This project took on special urgency due to the designation of Union County as the most-impacted region in the United States at the start of the Covid-19 pandemic. This work involved a dedicated team of industrial hygienists, architects and engineers working together to create comprehensive occupancy/recovery plans and perform county staff/contractor training on a triage basis.

Triborough Bridge and Tunnel Authority (TBTA), New York, New York

Mr. Cupriks served as Project Manager for asbestos air sampling and asbestos bulk sampling services for multiple contracts. The air sampling contract involved the rehabilitation of the Brooklyn Battery Parking Garage. Routine operations included coordination of field staff, laboratory resources, daily contact with client staff and engineers, reporting/interpretation of laboratory data and attending necessary project meetings to meet scope and schedule requirements.

Fire Department of New York (FDNY), New York, New York

Industrial Hygiene/Project Manager for Industrial Hygiene Contract (# 05720060025097). Responsible for working closely with the FDNY OSHA Compliance Unit Management and Project Manager(s) to ensure a high level of technical integrity for a variety of air and potable water quality investigations. This work often involved sampling for potential disease-causing organisms (e.g., parasites and bacteria) in potable water and/or assessing OSHA compliance with regards to potential employee exposure to combustion products (i.e., engine equipment repair activities) associated with well-defined firefighting training activities.

New York City School Construction Authority (NYCSCA), New York

Lead Industrial Hygiene Project Manager/technical lead for a number of community noise and indoor air quality projects related primarily to chemical storage/disposal, indoor air quality, water damage surveys and assessment of toxic mold/microbial growth over several contract periods. These projects were typically conducted on an emergency response basis and involved a variety of microbiological sampling protocols and subsequent interpretation. This data, along with additional types of specialized IAQ sampling, was then used to assess the extent of damage in building materials and harm posed to staff and students. This information was used to address high profile hazard/safety assessment (re-occupancy) and construction/renovation issues for School properties. Based on these experiences, Mr. Cupriks “ghost wrote” NYCSCA Guidelines on microbial abatement/design at the time. This included additional guideline documentation regarding the best building and building practices for construction management.

General Services Administration (GSA), New York, New York

Project Manager for Industrial Hygiene and related engineering services on an as-needed basis. Worked closely with GSA Project Management in order to provide technical oversight and support services for both cutting edge comprehensive IAQ investigations (e.g., involving probability analysis), potable water system (e.g., lead, legionella sp.) and routine asbestos (e.g., weekly) air/bulk sampling projects. As these projects often involved high public visibility, a strong understanding of the New York City Building Code,



occupational/environmental Standards and Guidelines and current general industry practices and sampling data interpretation was mandatory.

New Jersey Department of Environmental Protection (NJ DEP), Kiddie Kollege Daycare Center (Former Accutherm Site), Franklinville, New Jersey

Mr. Cupriks provided Industrial Hygiene/Project Management services for this former preschool center which had become heavily contaminated with mercury and mercury vapors during historic thermometer manufacturing activities. A detailed site investigation of the facility was performed to assess ambient levels of mercury vapor within each level of the unoccupied structure to determine both the source and recovery/abatement potential. Ambient air quality screening was performed in conjunction with extensive bulk sampling analysis of representative building materials. Real time air and bulk sampling results were summarized to provide a comprehensive three-dimensional (3D) map of mercury contamination by level which aided the New Jersey Department of Health in formulating their risk assessment. Due to the extensive nature of mercury contamination within porous building materials, it was determined that rehabilitation of the building was not possible and that demolition as per Local, Federal and State of New Jersey laws would be required. This project also provided oversight and review of the on-site Health & Safety Plan which covered soil and ground water investigation activities.

Federal Bureau of Prisons (FBOP)/UNICOR E-Waste Recycling Facilities, Nationwide

Represented the Federal Government as the CIH of Record in a Union arbitration lawsuit involving heavy metal exposure. This case involved an extensive review of historical and current Health & safety policy with respect to engineering controls, employee/working inmate PPE and potential for heavy metal exposures associated with e-waste recycling operations.

Federal Prison Industries, Inc. (UNICOR), Nationwide

Project/Industrial Hygiene Project Manager for a wide variety of environmental and industrial hygiene analysis within numerous low to high security prison settings. Notable projects include the research and design of industrial hygiene sampling intended to assess the occupational noise and breathing hazards associated with a novel large scale solar cell assembly plant located FCI Otisville, in addition to traditional metal, noise, solvent and dust exposures associated with electronics reclamation, vehicle upfitting/manufacture, steel, and traditional furniture making operations in various Federal Correctional and Penitentiary Institutes.

Federal Bureau of Prisons (FBOP), Northeast and Mid-Atlantic Territory Project

Industrial Hygiene Manager for a wide variety of environmental and industrial hygiene analysis within numerous low to high security prison settings. Two notable projects include annual re-certification of the ventilation system servicing the Brooklyn Minimum Detention Center Tuberculosis Ward as per Centers for Disease Control (CDC) criteria, and completion of a comprehensive tunnel baseline inspection for industrial hygiene (e.g., worker/inmate health & safety requirements and precautions) and soil/groundwater environmental contamination (e.g., septic water, lead paint, PCBs, PAHs, metals, pesticides, airborne and surface microbial growth). This latter work was performed to determine what safety and material handling and disposal requirements, if any, would be required during the clean up a service tunnel spanning the perimeter of the FCI Danbury facility.



Turner Construction, New York City Metropolitan Area

Industrial Hygiene Project Manager and lead technical resource for a wide range of industrial hygiene, safety and Indoor Air Quality (IAQ) needs associated with new major construction and/or renovation projects. Work has involved assessment of and disposal requirements for hazardous/flammable chemicals, authoring of work procedures during use of potentially hazardous/flammable chemicals, authoring of mitigation plans for microbial growth/water damage, post-flood and fire damage assessments, permit required confined space/confined space support, HASP/Work Plan implementation and construction oversight monitoring. More notable project locations include a three-year renovation of Madison Square Garden, construction of the New York City Police Training Academy in Flushing, NY, renovation of the Museum of Modern Art of East 47th Street in Manhattan and the recently completed Memorial Sloan Kettering flagship hospital located on East 74th Street in Manhattan.

The Address Downtown, Dubai UAE

Principal investigator and Industrial Hygiene Project Manager for a forensic team dedicated to the largest insurance claim (*\$1 billion*) in the world following a New Year's Eve fire event in 2016. This work involved extensive investigations to the structure to define pre-existing damage conditions relative to those caused by the fire event. Competing interests included the King of Dubai and insurance firms of record.

Lower Manhattan Development Corporation (LMDC), New York, New York

Project/Industrial Hygiene Team Manager for the successful implementation of bulk dust sampling for PAHs, PCBs, dioxins, metals, and silica within a high- profile office building impacted by the events of September 11. This project required working with client management to establish an effective sampling strategy and close communication with field staff to ensure proper execution. Performed similar work for exposed concrete (bathtub) surfaces on existing construction adjacent to this Site as part of structural engineering planning requirements. These results were compared to USEPA background criteria for New York City and nationally recognized toxicological references, where appropriate

SPECIALIZED TRAINING

- American Industrial Hygiene Association (National and Metropolitan New York Chapters)
- American Academy of Industrial Hygiene

PROFESSIONAL AFFILIATIONS

Chi Epsilon, Honorary Civil Engineering Society

American Society of Civil Engineers

PATENTS

"Method for Improving Data Transfer Efficiency," U.S. Patent No. 1234567, issued January 1, 2024.

"Improved Method for Filtering Noisy Data," U.S. Patent No. 9876543, issued July 5, 2023. (Lead Inventor)

LANGUAGES

- Fluent French

AWARDS

- Award, Awarding Entity, Date



SELECTED PUBLICATIONS AND PRESENTATIONS

Last, F. M. 2003. "Indoor Air Quality in New York City." Presented at IAQA 2003, International Air Quality Association. August 15, 2003. New York, New York.

EXPERT TESTIMONY

Deposition testimony on behalf of W. R. Grace in a case involving insurance coverage in the matter of Hatco Corp. vs. W. R. Grace et. al. (Civil Action No. 89-1031) United States District Court for the District of New Jersey. June 1996. Case settled September 1996.

LEGISLATIVE TESTIMONY

"Testimony on Oil Spill Prevention Legislation." Presented at Joint Hearing of the New Jersey Senate Energy and Environment Committee and the Assembly Environmental Quality Committee. February 6, 1990.

HENRY DELGADO

YEARS OF ENVIRONMENTAL CONSULTING EXPERIENCE: 17

EDUCATION

A.A.S., Applied Sciences, Bergen Community College, 2006

AREAS OF EXPERTISE

Mr. Henry Delgado has more than 17 years of experience in the following general areas:

- Drafting and design technology
- AutoCAD Civil 3D design
- Implementation of AutoCAD Civil 3D concepts
- Drafting Design Standardization
- Preparation of Site and floor plans, elevations, sections and details
- Environmental consulting drawings and graphic deliverables including contaminant distribution, groundwater flow maps, investigation sampling plans, civil design plans, and remedial design plans

Mr. Delgado, based in TRC's NYC office, has experience and has assumed progressively increasing responsibility as senior computer-aided drafting and design operator within TRC's Engineering, Construction and Remediation (ECR) Practice, where his responsibilities include preparing drawings in support of environmental investigation and design projects and reports and graphic support services for environmental investigation and remediation projects. His qualifications include extensive use of AutoCAD 2006 through 2025, Civil 3D, and as well as Microsoft Office suite of software.

REPRESENTATIVE EXPERIENCE (Descriptions marked with an asterisk (*) undertaken within the past three years)

New York City School Construction Authority, CADD Technician – Multiple Sites, New York City*

Mr. Delgado has been responsible for the preparation of detailed design drawings in AutoCAD for construction of sub-slab depressurization systems (SSDS) and gas vapor barriers for over 30 New York City public schools (e.g., X096, Q315, M868, K511, Q298, Curtis High School, K338, Beacon High School, Q335, Q050, X226, Q125, M323, etc.). Mr. Delgado has been responsible for coordinating the drawing format with the architects who are responsible for the overall project design. The drawing sets prepared by Mr. Delgado have been integrated into the publicly bid contract documents for the new schools. For public schools in remedial programs (Q315, X096, K671, and K710), following construction, Mr. Delgado prepared as-built drawings of engineering control systems (i.e., SSDS, gas vapor barrier, and composite cover system) for submission to NYSDEC. In addition, as part of projects publicly bid by the NYCSCA, Mr. Delgado has been responsible for the preparation of design drawings showing environmental remediation requirements for New York City school sites.

Mr. Delgado has also been responsible for the preparation of figures for due diligence reports, remedial investigation reports, remedial action work plans, final engineering reports and site management plans for over 250 New York City public school sites. Drawings prepared by Mr. Delgado included site location maps, site plans, sample location plans, site plans showing contaminant concentrations, geologic cross-sections, groundwater surface elevation contour maps, and contaminant plume maps.



Furthermore, at the request of IEH Division, Mr. Delgado prepared the HazMap, which contains the locations of all schools within the five boroughs where environmental work has occurred. The HazMap operates as an environmental database and is used as a reference for the IEH Division.

Finally, Mr. Delgado contributed to the creation of posters displaying flow-charts with dynamic visuals to present at the NYCSCA exhibit during career day.

NYSDEC STANDBY ENGINEERING SERVICES CONTRACT – MULTIPLE SITES, NEW YORK*

Mr. Delgado has served as the CAD Designer for a majority of TRC's work assignments (WA) under the Standby Engineering Services Contract for State Superfund Sites, among which include the following sites:

- Bridge Cleaners Offsite (Site No. 241127 OU2) Remedial Investigation (RI) WA
- Monroe Electronics (Site No. 837013) Remedial Investigation (RI)/Feasibility Study (FS) WA
- Fashion Care Cleaning (Site No. 442044) RI/FS WA
- Katzman Recycling (Site No. 558035) Remedial Design (RD) WA
- Solvent Finishers (Site No. 130172) RD WA
- Cross-Country Sanitary/Kessman Landfill (Site No. 340011) RD /Remedial Action (RA) WA
- Pall Corporation (Site No. 130053B) RA/Site Management (SM) WA
- Photocircuits Corporation (Site No. 130009) RA/SM WA

Mr. Delgado prepared the figures for the RI/FS Reports including Site plans, sample location plans, geologic cross sections, groundwater surface elevation contour maps, and three conceptual designs for remedial alternatives, showing horizontal extents of groundwater contamination. Mr. Delgado has provided CAD support in all aspects of the Design Phase Submittals from 30%, 95%, and Final Design stages. Preparation of Remedial Design and details include Excavation Area Plans and Site Restoration Plans. In addition, Mr. Delgado is responsible for preparation of figures included in Site Management Plans (SMP) and Final Engineering Reports (FERs), including site plans, sample location plans, proposed injection and monitoring well locations, groundwater surface elevation contour maps, and chlorinated volatile organic compound (CVOC) iso-concentration maps.

NEW YORK CITY DEPARTMENT OF PARKS AND RECREATION ENVIRONMENTAL SERVICES CONTRACT – MULTIPLE SITES, NEW YORK*

Mr. Delgado prepared drawings and figures associated with the investigation and design plans for the redevelopment of multiple sites in New York City into public parks. Specifically, Mr. Delgado prepared soil sampling plans, site plans showing soil concentrations, and conceptual remedial design plans and details.

THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY, BULK AND SATELLITE FUEL FARMS – JOHN F. KENNEDY INTERNATIONAL AIRPORT, JAMAICA, NEW YORK

Mr. Delgado prepared contract design drawings for environmental, electrical and mechanical disciplines for upgrades to two dual phase extraction remediation systems. Upgrades to the remediation systems included removal of existing remediation equipment and replacement with new remediation equipment, including an oil-water separator, an air stripper, granular activated carbon units, air diaphragm pumps, etc. The contract drawings included details of specific replacement equipment and clearly depict the work (environmental, electrical, and mechanical) to be performed by the contractor. The drawings sets



prepared by Mr. Delgado were integrated into the publicly bid contract documents for the remediation system upgrades. Additionally, the contract drawings were prepared in accordance with The Port Authority of New York and New Jersey (Port Authority) AutoCAD standards. The contract drawings were reviewed by the Port Authority AutoCAD department and passed, therefore, complying with the Port Authority standards.

ELIZABETH A. DENLY, ASQ CMQ/OE PROGRAM DIRECTOR – PFAS GROUP

EDUCATION

B.A., Chemistry, University of New Hampshire

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Certified Manager of Quality/Organizational Excellence, American Society of Quality

PROFESSIONAL THOUGHT/LEADERSHIP:

- Currently serving on the Interstate Technology and Regulatory Council (ITRC) PFAS team. Led the development of the Naming Conventions & Physical/Chemical Properties fact sheet; led the development of the section on PFAS data evaluation for the Technical/Regulatory guidance document; Ms. Denly won the 2017 ITRC Industry Affiliates Program Award for her contributions to the ITRC PFAS team.
- Currently serving on the ITRC 1,4-Dioxane team. Co-leading the Sampling & Analysis sub-team for the development of fact sheet and chapter in the Technical/Regulatory guidance document.
- Leader in TRC's Center of Research and Expertise (CORE) PFAS team. Ms. Denly educates representatives of regulatory agencies, attorneys, and clients about chemistry, data evaluation/interpretation, investigation, fate and transport, and remediation of PFAS. In addition, Ms. Denly leads a team of TRC scientists to stay informed of current PFAS issues and science.

AREAS OF EXPERTISE

Ms. Elizabeth Denly, has experience in the following general areas:

- Data Evaluation/Data Validation
- Emerging Contaminants
- Quality Assurance Project Plans
- Data Usability Assessments
- Quality Assurance Management
- Field and Laboratory Audits
- Procedures for Peer Review of Deliverables
- Consultant for Regulatory Agencies

REPRESENTATIVE EXPERIENCE

Ms. Denly serves as TRC's Quality Assurance (QA) & Chemistry Director. She is also the PFAS Group Program Director. As a chemistry director at TRC, Ms. Denly is responsible for providing QA/quality control (QC) oversight, developing data quality objectives, and data interpretation in support of a variety of environmental investigations, including risk-based soil cleanups, remediation programs, delineation, contaminant ambient air monitoring, and human health and ecological risk assessments. Ms. Denly has provided this oversight under different regulatory programs.

As QA director at TRC, Ms. Denly is responsible for the creation and implementation of the Quality Management Plan and standard operating procedures (SOPs) for field sampling and documentation



protocols. Ms. Denly also leads Quality Coordinator networks, which are responsible for the development and communication of quality initiatives within the organization.

PROJECT QA EXPERIENCE

Ms. Denly routinely performs or provides oversight of data usability assessments or data validation for a variety of analytical parameters, including volatile organic compounds (VOCs); semivolatile organic compounds (SVOCs); pesticides; polychlorinated biphenyl (PCB) Aroclors; metals; wet chemistry; PCB homologues/congeners; dioxins; specialty analyses, including gas chromatography/mass spectrometry/selective ion monitoring (GC/MS/SIM); and various air analyses. Data usability assessments and data validation have been performed under several different regulatory programs including NYSDEC, MassDEP, CTDEEP, NJDEP, TCEQ, and EPA.

Preparation of Project-specific QAPPs

Ms. Denly provides consultation on proper sampling procedures, analytical method selection, and quality control requirements, and has prepared QAPPs for a wide body of regulatory programs, including NYSDEC, New York City Department of Environmental Protection (NYCDEP), and USEPA Regions 1 and 2. This experience includes the more detailed format in the Uniform Federal Policy for QAPPs, currently required by many of the USEPA Regions. In addition, Brownfields QAPPs are routinely prepared using Quality Assurance Guidance for Conducting Brownfields Site Assessments, September 1998, EPA 540-R-98-038 in EPA Regions I, II, and III.

2010-Present: Compendium of Analytical Methods Q&A

Massachusetts Department of Environmental Protection (MassDEP) has generated a compendium of specific quality control and reporting requirements for many of the commonly-used SW-846 methods in order to promote inter-laboratory consistency and to also be able to provide the regulators with a greater degree of certainty regarding the quality of the data. All questions received by MassDEP in reference to this compendium of analytical methods are forwarded to Ms. Denly. Ms. Denly is responsible for generating a response to each question on behalf of MassDEP and for tracking all questions and answers for subsequent posting on the MassDEP web site.

MassDEP Data Audit Project

Ms. Denly was responsible for performing review/evaluation of data packages for 1,4-dioxane, extractable petroleum hydrocarbons (EPH), volatile petroleum hydrocarbons (VPH), air-phase petroleum hydrocarbons (APH), and TO-15 analyses from laboratories selected by MassDEP as part of a Data Audit project to ensure compliance with the methods and MassDEP's Compendium of Analytical Methods. As part of the evaluation, all raw data were reviewed. She developed worksheets that can be used in the future by MassDEP auditors for 1,4-dioxane, EPH, VPH, APH, and TO-15 data. In addition, Ms. Denly provided MassDEP with a detailed final report summarizing critical flaws in laboratory procedures which led to the regeneration of results from the subject laboratories.

Analytical Laboratory Audits

In order to ensure that analytical laboratories are capable of producing data of the quality needed to meet the objectives of most methodologies, Ms. Denly typically performs a very detailed on-site laboratory audit prior to contracting with our laboratories. Ms. Denly has developed internal audit checklists for an extensive list of preparation and analytical methods (including the most commonly used SW-846 methods



and USEPA air methods) as well as general QA laboratory procedures (i.e., sample receiving, glassware washing, bottle preparation, data management, SOPs, and performance evaluation studies).

Selection of Appropriate Analytical Methodologies

In order to ensure the objectives of the project are met, Ms. Denly is responsible for working with the project team and laboratories to ensure the selected methodologies will achieve the desired regulatory standards. Ms. Denly has extensive experience with when it is necessary to request method modifications (i.e., decreasing final extract or digestate volumes) or specialized analyses (i.e., SIM, PCB homologue analyses) that can be performed to increase the sensitivity of various analytes.

2010-Present: VPH by GC/MS

Ms. Denly provided assistance to MassDEP for the development of a protocol for the analysis of VPH by GC/MS. Ms. Denly also assisted MassDEP with the implementation and development of a multi-laboratory round-robin performance evaluation study for the final VPH by GC/MS methodology and the development of a subsequent report for this study. She also assisted MassDEP with training for laboratories interested in implementing this method

GLX Constructors

Ms. Denly serves as the Quality Manager for a large MBTA rail extension program in Massachusetts. She has trained staff on project-specific quality peer review procedures to ensure the proper level of review is occurring on all deliverables. Ms. Denly has participated in project-specific audits performed by the client and successfully shown demonstration of TRC's adherence to project-specific quality policies in engineering, construction, and design associated with this program. She also is responsible for the assessment of analytical data generated under this program to ensure it is defensible and meets the requirements of MassDEP CAM protocols.

Vieques Island, Environmental Cleanup Oversight

Ms. Denly provides technical and regulatory compliance oversight to the Commonwealth of Puerto Rico and the Puerto Rico Department of Natural and Environmental Resources (PRDNER) regarding the investigation, assessment, and remediation of contamination on Vieques Island by the U.S. Navy in support of the property's transfer to the Commonwealth of Puerto Rico. Ms. Denly conducts technical and regulatory reviews pertaining to analytical methods and QA/QC issues of the documents prepared by Navy subcontractors including work plans, field sampling plans, investigation results, technical memoranda, feasibility studies, and remedial designs.

PROFESSIONAL AFFILIATIONS

Licensed Site Professional Association, Massachusetts, Associate Member (LSPA)

American Chemical Society (ACS)

American Society for Quality (ASQ)

SELECTED PUBLICATIONS AND PRESENTATIONS

Technical Presenter for ITRC, History & Use and Sampling & Analysis, 1,4-Dioxane Workshop, AEHS East Coast Conference, Amherst, MA, October, 2019.

Denly, E., Panel member on discussion of PFAS Chemistry and Analytics, PFAS Experts Symposium, Nathan, Remediation Journal, Arlington, VA, May 2019.



Denly, E., PFAS Analysis: What to Expect and How to Evaluate the Data, AEHS Platform Presentation, March 2019.

Denly, E., Occhialini, J., Potential for PFAS Cross-Contamination from Sampling Equipment, Clothing, and Personal Care Products, AEHS East Coast Conference, Amherst, MA, October 2017 and October 2018.

Denly, E., LOQ, LOD, DL, RL, QL, SQL, MDL, PQL: What the “L”? Presented at Thirty-first Annual International Conference on Soils, Sediments, Waters, and Energy, Amherst, MA. 2015.

Denly, E., Laboratory Report Review, MassDEP Petroleum Analytical Methods: VPH, EPH, and APH, AEHS East Coast Conference, Amherst, MA, October 2014 and October 2015

Denly, E., Overview of QC Requirements for Organic and Inorganic CAM Protocols and New CAM Protocols: APH, TO-15, Perchlorate, Massachusetts Licensed Site Professional Association, 2010.

Denly, E. Chapnick, S., “Is Presumptive Certainty Generating Usable Data for Massachusetts Contingency Plan (MCP) Decisions?” Paper presented at Twentieth Annual Conference on Contaminated Soils, Sediments and Waters, Amherst, MA. 2004.

Publications:

Denly E, Occhialini J, Bassignani P, Eberle M, Rabah N. Per- and polyfluoroalkyl substances in environmental sampling products: Fact or fiction? Remediation. 2019; 29:65–76.

Simon JA, Abrams S, Bradburne T, et al. PFAS Experts Symposium: Statements on regulatory policy, chemistry and analytics, toxicology, transport/fate, and remediation for per- and polyfluoroalkyl substances (PFAS) contamination issues. Remediation. 2019; 29:31–48.

Eberle M, Edelman M, Denly E, Rabah N. Evaluation of the effects of PFAS soil adsorption and transformation in the presence of divalent cations under ambient conditions. Remediation. 2019;30:15–25.

NANCY GUEVARA

EDUCATION

B.A. Engineering Sciences, Dartmouth College, 2013

B.E. Environmental Engineering, Thayer School of Engineering at Dartmouth College, 2014

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

OSHA 40 Hour 29 CFR 1910.120

OSHA 30 Hour Construction Industry

NYS DOL Mold Assessor

NYS DOL/USEPA Asbestos Inspector, Project Monitor, Project Designer and Air Sampling Technician

USEPA Lead Paint Inspector and Risk Assessor

OSHA 2264: Permit-Required Confined Space Entry Training

REPRESENTATIVE EXPERIENCE

Ms. Nancy Guevara has seven years of environmental consulting and management experience focusing on Regulatory Compliance and Due Diligence, Industrial Hygiene, Health and Safety, and Material Science Services for public and private sector clients including financial institutions, developers, transportation authorities, telecommunication firms, and commercial and residential management firms.

Ms. Guevara's project experience in due diligence includes Property Condition Assessments (ASTM Standard Practice E2018-15 and Fannie Mae Multifamily), Zoning Reports and Phase I Environmental Site Assessments (ASTM E1527-13 Standard). In addition, she has experience writing and implementing Spill Prevention Control and Countermeasure Plans (SPCCs), Storm Water Pollution Prevention Plans (SWPPPs) and Risk Management Plans.

Ms. Guevara also has six years of experience coordinating project activities for asbestos and lead paint projects, industrial hygiene projects including mold and moisture, indoor air quality assessments, abatement and remediation cost estimates, contractor selection, and oversight.

Property Condition Assessments (PCA) and Phase I Environmental Site Assessments (ESA), Commercial Properties – Massachusetts and Connecticut

Project Manager responsible for on-call basis property condition and environmental assessment services for four corporate commercial office developments including one free-standing parking structure located in three parcels totaling 18.159 acres and over 400,000 square feet of rentable area. Tasks involve site scheduling and surveying, review of associated construction records, municipal records, technical documents, capital expenditure history, maintenance records, term table and report generation.

Property Condition Assessments (PCA) and Phase I Environmental Site Assessments (ESA), Storage Facilities – Smithfield Rhode Island

Project Manager responsible for on-call basis property condition and environmental assessment services for a self-storage facility consisting of one, one-story office building and 10, one-story storage buildings located within two parcels totaling 9.6 acres. Tasks involve site scheduling and surveying, review of associated construction records, municipal records, technical documents, capital expenditure history, maintenance records, term table and report generation.



Due Diligence and Regulatory Compliance Assessments for Multiple Projects

Project Manager responsible for on-call basis Due Diligence and Regulatory Compliance Assessment services of retail/commercial developments including hotels, shopping centers, warehouses, storage facilities, gasoline stations and industrial buildings. Tasks involve site scheduling and surveying, employee training, review of associated technical documents, review of regulatory history and permits, conducting permit renewals, and development of SPCC, SWPPP and RMP reports, as applicable.

Phase I Environmental Site Assessments (7 Years ESA) - Multiple clients - National Level

Site inspector assisting in coordinating all aspects of Phase I ESA portfolios for commercial and retail property lending and financing transactions. Project activities include hazardous material inspections and photographic documentation as part of Phase I ESA, background research including staff interviews, document review, determination of environmental RECs, CRECs and HRECs for the sites and final reporting.

Spill Prevention Control and Countermeasure Plan (SPCC) and Storm Water Pollution Prevention Plan (SWPPP) Preparation - Northeast Region

Northeast Team Leader responsible for coordinating all efforts for SPCC and SWPP Plan preparation for 20 plus sites in the northeast, as required by the United States Environmental Protection Agency (EPA) Oil Pollution Prevention regulation (40 CFR §112). Responsible for preparation of SWPP Plans for sites seeking to obtain Pollutant Discharge Elimination System (NPDES) permit coverage. Tasks involve conducting site inspections of facilities in New York, New Jersey and Puerto Rico, U.S. Virgin Islands, interviewing facility personnel, reviewing site documents to evaluate petroleum storage, conducting storm water sampling to maintain (NPDES) permit coverage, and training facility staff on spill response procedures and best management practices.

EPCRA Tier II, RMP Support - New York

Project Manager responsible for completing and filing Risk Management Plans (RMPs) at multiple commercial facilities, as required by the New York City Department of Environmental Protection Local Law 92 of 1993. Tasks involve site inspection and coordination with facilities, review of EPCRA Tier II reports, associated technical documents, RMP preparation and filing with NYCDEP.

Post-Remediation Oversight - New York

Project Manager responsible for providing continual environmental oversight, support and reporting services to 75 schools and overseeing the implementation of Remedial Action Work Plans and Site Management Plans at each site. Tasks include oversight of contractors, inspection of sub-slab depressurization systems, collaborating with government agencies including the NYSDEC and NYC school authorities to ensure timely and efficient completion of the projects and development of client reports.

Emergency Response, Water Intrusion and Microbial Management Services - Puerto Rico

Project Manager responsible for field operations including sampling protocols, reporting and staffing for the investigation and clean-up of seven shopping plazas, over 300 tenant spaces inspected for mold and moisture. Site activities included inspection, development of remediation work plans, remediation cost estimating, contractor oversight and clearance sampling.



Indoor Air Quality and Microbial Management Services - Multiple Clients - New York

Project Manager responsible for on-call basis industrial hygiene services in the greater NY area.

Responsible for responding to client requests for viral, fungal and bacterial sampling, mold sampling and moisture mapping projects, respirable dust, crystalline silica and metal dust sampling.

Responsible for communicating with clients, preparing proposals, coordinating field operations and staffing, implementing sampling protocols, ordering equipment and sampling media from laboratories, and preparing client reports, remediation work plans and remediation cost estimates.

OSHA Fit Testing and Management Services - New York

Project Manager responsible for coordinating and conducting fit testing services of N95, half-face and full-face respirator in accordance with OSHA's §1910.134 - Respiratory Protection Program.

Asbestos and Lead Management Services - New York and New Jersey

Project Manager responsible for on-call basis asbestos and lead paint compliance and management services. Tasks involve communicating with clients, preparing proposals, coordinating staffing and field inspections, cost estimating and completing required client deliverables.



DMITRIY KHIMICH

EDUCATION

Technical College, Nijniy Novgorod, Russia

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Asbestos Investigator, City of New York, NYCDEP

Accredited AHERA Inspector, U.S. EPA

Certified Asbestos Inspector, NYSDOL

Certified Asbestos Project Monitor, NYSDOL

Certified Asbestos Air Sampling Technician, NYSDOL

Asbestos Investigator City of Philadelphia

Asbestos Inspector, PA

Asbestos Safety Technician, NJ

LBP Risk Assessor/Inspector, EPA

LBP Risk Assessor/Inspector, NY

LBP Risk Assessor/Inspector, NJ

LBP Risk Assessor/Inspector, PA

Niton XRF Analyzer Certificate

RMD XRF Analyzer Certificate

40 Hours Hazwoper Certificate

10 Hours OSHA Certificate

AREAS OF EXPERTISE

Mr. Khimich has experience in the following general areas:

- Asbestos Investigations
- Asbestos Surveys
- Asbestos Inspections
- Asbestos Project Monitor
- Asbestos Air Sampling
- LBP Risk Assessments
- LBP Inspections
- LBP Visual Assessments
- LBP Clearances
- Polychlorinated Biphenyls (PCBs) Bulk Sampling
- Man-Made Vitreous Fibers (MMVF) Wipe Sampling
- Indoor Air Quality (IAQ)
- Noise Dosimetry Assessments
- Mold Determination Investigations



REPRESENTATIVE EXPERIENCE

Mr. Khimich has over 22 years of experience in Asbestos field work and over 9 years in Lead Base Paint field work, also familiar with Man-Made Vitreous Fibers (MMVF) wipe sampling, Polychlorinated Biphenyls (PCBs) sampling, Noise Dosimetry Assessments, Indoor Air Quality (IAQ) and Microbial/Mold field work.

- Lead Based Paint Risk Assessments and Inspections including XRF testing using Niton and RMD Radiation Sours Instruments, XRF data report preparation, paint chips collection, visual inspections, scope of work inspections, Risk Assessment and final dust wipes sampling.
- Asbestos Investigations, Surveys and Inspections work including bulk sampling, drawings preparation with sample locations, pictures, final report preparation and providing NYC ACP5 form.
- Asbestos Abatement Project Monitoring and Air Sampling including managing and overseeing the job site; Background, Preparation, During and Final air sampling; OSHA Personal Sampling; editing of log books, time sheets, roster forms, chain of custodies and other forms related to asbestos abatement.
- Polychlorinated Biphenyls (PCBs) Bulk Sampling
- Man-Made Vitreous Fibers (MMVF) Wipe Sampling
- Indoor Air Quality (IAQ)
- Noise Dosimetry Assessments
- Mold Determination & Post-Remediation include mold/moisture investigations; technical reporting; visual inspections; drawings and pictures log with affected areas; abatement oversight; air-o-cell and swab sampling; final visual inspections.

Lead-Based Paint Services

- NYC Built It Back - Various Properties in NY
- New York State Rising - Various Properties in NY
- AIMCO – Various Properties in NY, PA & NJ
- New York University – Various Properties in NY
- NYC School Construction Authority – Various Properties in NY
- New York City Economic Development Corporation – Various Properties in NY
- National September 11 Memorial & Museum – Various Locations in NY
- National Grid PLC– Northport Power Plant, Port Jefferson Power Plant,
- E. F. Barrett Power Station, Glenwood Power Plant

Asbestos Services

- New York City Built It Back - Various Properties in NY
- New York State Rising - Various Properties in NY
- AIMCO – Various Properties in NY
- World Trade Center 9/11 Project
- NYC Housing Authority – Various Properties in NYC
- NYC School Construction Authority – Various Properties in NYC
- NYC Board of Education – Various Properties in NYC
- Con Edison – Various Properties in NYC
- Keyspan Energy – Various Properties in NYS
- Columbia University – Various Properties in NYC
- New York Medical College – Various Properties in NYS
- New York University – Various Properties in NYC
- Hospital for Special Surgery – Various Properties in NY



- Dormitory Authority of the State of New York – Various Properties in NY
- New York City Economic Development Corporation – Various Properties in NY
- National September 11 Memorial & Museum – Various Locations in NY
- National Grid PLC – Northport Power Plant, Port Jefferson Power Plant,
- E. F. Barrett Power Station, Glenwood Power Plant
- Wal-Mart Stores, Inc. – National Properties
- Simon Property Group – Various Properties in NY
- Regeneron Pharmaceutical, Inc. – Various Properties in NY

Polychlorinated Biphenyls (PCBs) Bulk Sampling

- NYC School Construction Authority – Various Properties in NYC
- AIMCO – Various Properties in NY
- Dormitory Authority of the State of New York – Various Properties in NY
- National Grid PLC – Northport Power Plant, Port Jefferson Power Plant,
- E. F. Barrett Power Station, Glenwood Power Plant

Man-Made Vitreous Fibers (MMVF) Wipe Sampling

- National September 11 Memorial & Museum – Various Locations in NY

Microbial/Mold Indoor Air Quality Services

- AIMCO – Various Properties in NY
- Wachovia Bank – 2 North Avenue W Cranford, NJ 07016
- Bank of America – 639 Route 18 & Arthur Street, East Brunswick, NJ 08816
- Deptford Mall – Hollister Co. #486 1750 Deptford Center Rd. Deptford, NJ 08096
- Cobblestone Court Mall – Road 96, Victor, NY 14564
- The Peninsula of New York Hotel - 700 5th Ave, New York, NY 10019

Noise Dosimetry Assessments

- Con Edison - Various Properties in NYC

SPECIALIZED TRAINING

- NYS DOH Asbestos Building Inspector
- NYS DOH Asbestos Project Monitor
- NYS DOH Asbestos Air Sampling Technician
- NJ DCA Asbestos Safety Technician
- EPA LBP Risk Assessor
- Niton XRF Analyzer Training
- RMD XRF Analyzer Training
- 40 Hours Hazwoper Training
- 10 Hours OSHA Training

KIMBERLY N. TISA

EDUCATION

M.B.A., Anna Maria College, Paxton, Massachusetts

M.S., Chemistry, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

B.S., Chemistry, Virginia Polytechnic Institute and State University, Blacksburg, Virginia

AREAS OF EXPERTISE

Kimberly N. Tisa has program management and technical experience in the following general areas:

- Federal Polychlorinated Biphenyl (PCB) regulations under the Toxic Substances Control Act (TSCA)
- Remediation of PCBs in environmental media, building materials and air
- PCB analytics and data analysis
- Public speaking and community communications

REPRESENTATIVE EXPERIENCE

Kimberly N. Tisa has over 35 years in the environmental field and is an expert in the federal polychlorinated biphenyl (PCB) regulations under the Toxic Substances Control Act (TSCA). Ms. Tisa has an extensive background with PCB remediation in soil, groundwater, sediment, and building materials, and has been involved in complex remedial investigations and remedial actions at hundreds of sites within New England. Ms. Tisa served as the lead U.S. Environmental Protection Agency (USEPA) regional contact for review and approval of PCB storage, disposal, treatment, and other PCB-permitting issues in the EPA New England region. She also served as an EPA expert witness on PCB-related matters. She has a strong background and experience in laboratory analysis of PCBs in environmental media, building materials, and indoor air. She has provided numerous informational and training presentations on TSCA PCB policies and regulations at local, regional and national conferences as well as to the Massachusetts BAR Association.

Confidential Industrial Client – Lawrence, Massachusetts (Project Manager)

\$100MM PCB cleanup project that included the demolition of manufacturing buildings, and remediation of PCBs in soil, water, and bedrock. Provided guidance to property owner, City and state agencies in developing an implementable approach to address historical PCB contamination from manufacturing activities. The project was successfully completed.

CSX-Brockton Yard, Massachusetts (Project Manager)

Provided technical review of the CSX plan to address PCB contamination at this former rail yard to support an accelerated cleanup and closure under the state regulations and requirements while pursuing a separate closure under the federal PCB regulations. This alternative approach resulted in expedited PCB risk reduction (high PCB-contaminated soil was removed and disposed of at a secure facility) and avoided penalties from the state. Federal approval of the plan without any further remedial work is expected.



Confidential Municipal Client – New Bedford, MA (Project Manager)

Provided technical guidance to support remediation at a 104-acre historical fill site that included three school properties, athletic fields, wetlands, and private residential properties. PCBs and other contaminants were identified in soil and sediments and in manufactured building materials.

Confidential Municipal Client – Somerville, MA (Project Manager)

Provided technical guidance to support the investigation and successful remediation of a former manufacturing facility property. The property has been divided and is currently under redevelopment for mixed use by private parties.

Confidential Power Plant Client – MA, CT, and ME (Project Manager)

Provided technical guidance to support remediation of PCBs at three nuclear power plants. PCBs were identified in manufactured building products which also contaminated the surrounding environment. PCBs were remediated to support decommissioning activities.

Confidential Utility Client – RI (Project Manager)

Provided technical guidance for the investigation and remediation of PCBs when contamination was discovered in a utility gas distribution system. A methodical investigation and remediation of all lines leading into commercial and private properties was successfully completed.

AWARDS

- Environmental Business Council – 2022 Paul G. Keough Award for Government Leadership in recognition of exceptional knowledge, guidance and leadership in the assessment, remediation and decontamination of PCB compounds in New England.
- USEPA National Notable Achievement Award for Brownfields and Land Revitalization – Team Award
- USEPA National Notable Achievement Award for Brownfields – Team Award
- USEPA National Notable Achievement Award for RCRA Corrective Action Outstanding Use of Innovative Approaches to Advance the PCB Disposal and Cleanup Program – Team Award
- USEPA Gold Medal for Exceptional Service in the cleanup and disposal of PCBs and for national leadership in the emerging issue of PCBs in caulk and other building materials
- USEPA Bronze Medal for Commendable Service PCBs in Building Materials Workgroup

LINDSAY O'HARA, CHMM

EDUCATION

B.A., Environmental Studies, Union College

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Certified Hazardous Materials Manager, February 2015

AREAS OF EXPERTISE

Ms. O'Hara possesses over 16 years of environmental consulting experience, primarily in connection with projects in New York State, encompassing:

- Project Management
- Environmental Site Assessments, Investigations and Audits
- Soil and Groundwater Investigation and Remediation
- Indoor Air Quality Assessments
- Feasibility Studies
- Ambient and Community Air Monitoring
- Remedial Activity Oversight and Management
- Hazardous Materials Building Inspections
- Regulatory Compliance

REPRESENTATIVE EXPERIENCE

Ms. O'Hara's experience includes: Project management, comprehensive due diligence investigations and assessments, polychlorinated biphenyls (PCB) soil investigations and remediation, hazardous materials building assessments, remediation oversight, LNAPL remediation systems installation oversight and operation, groundwater monitoring well sampling, monitoring well/product gauging and LNAPL extraction, monitoring well installation oversight, soil sampling, development and implementation of community air monitoring plans (CAMP), and fuel release investigations.

New York City School Construction Authority

Ms. O'Hara serves as a project manager performing site assessments in support of new construction and renovations of New York City public schools. Responsibilities include Phase I Environmental Site Assessments, Phase II Environmental Site Investigations, Indoor Air Quality Investigations, and Outdoor Air Assessments. Ms. O'Hara's responsibilities have included all aspects of preparation of reports and all elements of field investigations, subcontractor supervision, and report preparation associated with completion of due diligence assessments. In this capacity, Ms. O'Hara has been the primary author of over 75 Phase I ESAs for the NYCSCA. Additionally, Ms. O'Hara served as the TRC lead for the Universal Pre-Kindergarten due diligence investigations in the borough of Queens and the Universal 3-K due diligence investigations in the borough of Brooklyn.

Ms. O'Hara serves as Project Manager for tasks relating to investigation and remediation of a Brownfield Cleanup Program (BCP) site in Brooklyn, New York. Prior to preparation of the BCP Application, Ms. O'Hara managed the implementation of an Interim Remedial Measure consisting of excavation of over 350 tons of contaminated soil for off-Site disposal, post-excavation soil sampling and backfilling of the



excavation with clean fill material. Ms. O'Hara attended the pre-application meeting at the NYSDEC Region 2 office, prepared the BCP Application and RI Work Plan for the site for submission to the NYSDEC. Following acceptance of the Site into the BCP, Ms. O'Hara prepared the Citizen Participation Plan and managed the implementation of the Remedial Investigation (RI) which consisted of advancement of soil borings, installation and development of monitoring wells, installation of soil vapor points and collection and laboratory analysis of soil, groundwater and soil vapor samples, performance of a Site survey and preparation of an RI Report. Following NYSDEC approval of the RI Report, Ms. O'Hara provided a presentation to the NYSDEC of the Site history, results of the RI and proposed remedial actions for the Site. Based on the results of the meeting, the Remedial Action Work Plan was prepared for submission to NYSDEC and the remedial action is ongoing.

United States Postal Service – New York

Ms. O'Hara serves as Project Manager for tasks relating to environmental due diligence and indoor air quality investigations for USPS sites throughout New York State. Ms. O'Hara's responsibilities have included management of field staff and report preparation associated with completion of Phase I ESAs and Phase II ESIs. Additionally, Ms. O'Hara serves as Project Manager for tasks relating to spill case closure, including management of monitoring well installation, quarterly groundwater sampling, product removal activities, and reporting.

The City of New York Department of Parks and Recreation – New York City

Ms. O'Hara serves as a Project Manager providing consulting services in connection with the construction and reconstruction of park facilities in New York City. Specifically, Ms. O'Hara serves as Project Manager for the Former Bayside Fuel Oil Depot Site in Williamsburg, Brooklyn, New York, which will be developed as part of Bushwick Inlet Park. Responsibilities include consulting services related to closure of the Major Oil Storage Facility (MOSF) license including preparation of a Site investigation plan, consulting services in support of closure of the State Pollution Discharge Elimination System (SPDES) permit and management for review of contract drawings and specifications for demolition activities. Responsibilities include all aspects of scope of work and cost estimate preparation, client consultation, staff supervision, subcontractor supervision and work plan preparation and report writing including development of conclusions and recommendations.

The Port Authority of New York and New Jersey - Howland Hook Marine Terminal – Port Ivory Facility – Staten Island, New York

Ms. O'Hara serves as Project Manager for environmental tasks associated with three sites formerly in the Voluntary Cleanup Program (VCP) at the Howland Hook Marine Terminal (HHMT) – Port Ivory Facility (VCP Site No. V00615-2 (Site 1), VCP Site No. V00674-2 (Site 2) and VCP Site No. V00675-2 (Site 3)). Ms. O'Hara was responsible for remedial construction oversight during implementation of the Interim Remedial Work Plan for Site 3 which included excavation of petroleum-contaminated soil, the collection of post-excavation soil samples, post-excavation soil sampling, implementation of the CAMP, bi-weekly gauging activities including product removal, Site inspections, and annual landfill inspections. Additionally, Ms. O'Hara assisted the Port Authority's legal department by filing the required deed restrictions for Sites 1 and 2. Ms. O'Hara assumed responsibilities in connection with preparation of several reports for this Site, including the final Site Management Plans for Sites 1 and 2, the Final Engineering Reports for Sites 1 and 2, the Periodic Review Reports for Sites 1 and 2, the Interim Remedial Measure Work Plan and Remedial Action Work Plan for Site 3, Landfill Monitoring Summary Reports, and monthly progress



reports. Additionally, in support of termination of the VCP for Site 3, Ms. O'Hara provided a presentation to the NYSDEC at the Region 2 offices which included a summary of the site history, environmental sampling data and completed investigations and remedial actions, and proposed future actions.

New York State Department of Environmental Conservation, State Superfund-Related Projects – New York

Ms. O'Hara assists in the management of site characterizations, remedial investigations, and feasibility studies for sites throughout New York State. Responsibilities include the preparation of work plans, project execution, client interaction, and report preparation.

The Port Authority of New York and New Jersey – Red Hook Container Terminal - Brooklyn, New York

Ms. O'Hara served as Project Manager for closure and removal of four 4,000-gallon underground storage tanks at the Red Hook Container Terminal in Brooklyn. Responsibilities included management of soil and groundwater sampling, contractor oversight, communication with NYSDEC Project Managers, and preparation of a UST Closure Report and a Remedial Action Work Plan to address the residual petroleum impacts to soil and groundwater. Additionally, Ms. O'Hara manages the remediation at this property, which includes the implementation of focused vacuum truck extraction and sulfate injection events, groundwater monitoring and analytical groundwater data management and review.

SPECIALIZED TRAINING

- OSHA 40-Hour HAZWOPER Training and 8-hour Refresher
- OSHA 10-Hour Construction Safety Training

Nancy Weaver

Senior Chemist

EXPERIENCE OVERVIEW

Ms. Weaver has over thirty years combined laboratory, data validation and project management experience. She is the President and co-founder of EDS and is responsible for the technical data review and validation of laboratory data. Ms. Weaver has performed data validation on thousands of data validation projects. She has extensive knowledge in applying the various regional and project specific data validation guidelines and QAPPs. Her experience also includes writing Quality Assurance Project Plans (QAPPs), managing subcontracted analytical laboratories, performing laboratory audits, participating in field sampling activities and analyzing samples in a laboratory.

EDUCATION

Degree, University, Year

B.S., Chemistry, University of Colorado, Denver, Colorado

CERTIFICATIONS AND TRAINING

Certification, Year Received

State of New York Department of Environmental Conservation certified Asbestos Inspector

40-Hour OSHA Hazardous Waste Training

8-Hour Health and Safety Supervisor Training for Hazardous Waste Operations

PROJECT EXPERIENCE

Principal/Senior Chemist, Environmental Data Services, Inc., August 1994 - Present

As the Principal Chemist at Environmental Data Services, Inc., Ms. Weaver has provided Level IV, M3 and IM2 data review on more than 6000 Sample Delivery Groups (SDGs) generated through site investigations and/or remediations. These SDGs have included every analytical fraction possible including VOC, SVOC, pesticides, PCBs, herbicides, DRO, GRO, dioxin/furans, PCB congeners, metals, wet chemistry and radiological parameters. Sample matrices include water, soil, sediment, wipe, concrete and air. The SDGs have included CLP data packages produced under the CLP SOWs and CLP-like data packages with samples analyzed under SW-864 methodologies. Sample quantities validated may reach upwards of 120,000 per fraction over the past 20 years. Ms. Weaver has been using the Region III Modifications to the National Functional Guidelines since 1997 and has provided M2, M3, and IM-2 validation. Ms. Weaver has been using the National Functional Guidelines since 1993 and has provided both Level III and IV validation.

Chemist-Analyst Specialist, City & County of Denver, June 1992 - August 1994

As a Chemist-Analyst Specialist for the City and County of Denver, Ms. Weaver supervised performance and compliance sampling for O & M requirements at groundwater treatment facility. She provided assessment of analytical data for quarterly reports to local regulatory agencies. She also acted as liaison between the technical group and laboratory to coordinate sampling events and resolve problems with analyses. While in this capacity, she performed data validation for organic, inorganic and radiological analyses. Ms. Weaver reviewed over 2000 VOC, SVOC, pesticide, PCB, TPH, metals and wet chemistry samples. Ms. Weaver managed the database for groundwater and treatment plant sampling events and performed environmental site assessments for commercial and residential properties. She provided

technical review and recommendations of Phase I and Phase II site investigations performed by outside consultants. She also analyzed policy and interpreted city, state and federal environmental regulations.

Data Validation Specialist, C.C. Johnson & Malhotra, January 1990 to June 1992

While a Data Validation Specialist at C.C. Johnson & Malhorta, Ms. Weaver performed data validation and interpretation of organic analytical data generated from the EPA Contract Laboratory Program (CLP). Data analysis included VOC, SVOC, pesticides, PCBs, metals and wet chemistry. Ms. Weaver reviewed more than 600 SDGs and 9000 samples. She interpreted gas chromatograms, gas chromatography/mass spectral data and verified mathematical calculations.

Environmental Chemist, The Anschutz Corporation - SP Environmental Systems, Inc., July 1990 to January 1992

As an Environmental Chemist for The Anschutz Corporation - SP Environmental Systems, Inc., Ms. Weaver assisted in the management of site investigations and remediation for Southern Pacific Transportation Company properties. In this capacity, she performed environmental audits and site assessments and conducted site investigations at potential Superfund sites with state and federal agencies. She researched and prepared responses to regulatory agencies for non-compliant sites and defined the needs for hazardous waste disposal including the analysis required and disposal. Ms. Weaver also supervised the removal of underground storage tanks and remediation. She prepared closure reports for UST removals, as well as annual waste summary forms for TSD facilities throughout the state of Texas. She also constructed, developed, and sampled groundwater monitoring wells.

Environmental Specialist, Martin Marietta Astronautics Group, January 1988 to January 1990

While with Martin Marietta Astronautics Group as an Environmental Specialist, Ms. Weaver performed organic analysis and sampling of wastewater, groundwater, and drinking water in support of NPDES permit. She operated and maintained laboratory instrumentation including GC and GC/MS for volatile, semi-volatile, and pesticide/PCB analysis. Ms. Weaver also coordinated sample collection and preparation activities, developed and authored standard operating procedures for laboratory analysis, and followed EPA protocol for QA/QC requirements for analysis. She calculated and interpreted data and reported results.

Environmental Chemist, Camp, Dresser, & McKee, April 1986 to October 1987

As an Environmental Chemist with Camp, Dresser, & McKee, Ms. Weaver analyzed water/wastewater for organic compounds. She operated and maintained laboratory instrumentation including GC and infrared spectrophotometer for volatile, pesticide/PCB, and petroleum hydrocarbon analysis. She also calculated and interpreted data and reported results. Ms. Weaver analyzed more than 2000 samples.

EMPLOYMENT HISTORY

Environmental Data Services, Inc.	Principal/Senior Chemist	1994–Present
City & County of Denver	Chemist-Analyst Specialist	1992–1994
C.C. Johnson & Malhorta	Contractor/Data Validation Specialist	1990–1992
The Anschutz Corporation - SP Environmental Systems, Inc.	Environmental Chemist	1990–1992
Martin Marietta Astronautics Group	Environmental Specialist	1988–1990
Camp, Dresser, & McKee	Environmental Chemist	1986–1987

FRANK SANTALY

EDUCATION

B.S., Computer Science, Nassau College

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Asbestos Investigator in the City of New York, Department of Environmental Protection

Accredited AHERA Inspector, U.S. Environmental Protection Agency (EPA) Certified Asbestos

Inspector, New York State Department of Labor (NYSDOL) Accredited AHERA Management Planner,
U.S. Environmental Protection Agency (EPA)

Certified Asbestos Management Planner, New York State Department of Labor (NYSDOL)

Accredited AHERA Project Designer, U.S. Environmental Protection Agency (EPA)

Certified Asbestos Project Designer, New York State Department of Labor (NYSDOL)

Certified Mold Assessor, New York State Department of Labor (NYSDOL)

REPRESENTATIVE EXPERIENCE

Frank Santaly has over 36 years of experience and progressive responsibility in Asbestos and Lead Based Paint Consulting and Management Services. He has directed and managed personnel conducting Asbestos Abatement Design and Specification preparation; directed and managed personnel conducting large Asbestos Surveys programs; directed and managed personnel conducting Asbestos Abatement Construction Monitoring activities; directed and managed personnel conducting Asbestos Management Plan preparation; directed and managed personnel preparing lead-based paint inspection reports.

Port Authority of New York and New Jersey (PANYNJ), JFK Expressway to Van Wyck Expressway, Westbound Corridor, Queens, New York

Frank served as the TRC Design Engineer where TRC's Building Sciences and Industrial Hygiene (BSI) group conducted hazardous materials pre-demolition surveys to identify asbestos containing materials, lead paint, PCB containing materials, universal wastes and other hazardous and regulated materials with potential to be impacted by proposed new elevated roadway to be constructed to connect the JFK Expressway with the Van Wyck Expressway. TRC's survey work included investigating existing building structures, power distribution buildings, utility vaults and roadway ramps and bridges including the collection of several pavement cores. TRC developed design documents in strict accordance to PANYNJ's CADD Standards for the proper abatement, transportation, disposal and special handling of hazardous/regulated building materials prior to construction. The project is currently in the process of bidding.

Port Authority of New York and New Jersey (PANYNJ), JFK International Airport Buildings New Ground Transportation Center with Roadways and Utilities, Queens, New York

Frank served as the TRC Design Engineer where TRC's Building Sciences and Industrial Hygiene (BSI) group conducted hazardous materials pre-demolition surveys to identify asbestos containing materials, lead paint, PCB containing materials, universal wastes and other hazardous and regulated materials with potential to be impacted by proposed new Ground Transportation Center and associated utility systems required to service the new structures. TRC's survey work included investigating existing



building structures, power distribution buildings, utility vaults and roadway ramps and bridges including the collection of several pavement cores. TRC developed design documents in strict accordance to PANYNJ's CADD Standards for the proper abatement, transportation, disposal and special handling of hazardous/regulated building materials prior to construction. The project is currently under construction.

Port Authority of New York and New Jersey (PANYNJ), JFK International Airport Buildings Cooling Tower and Materials Management Area Demolition, Queens, New York

Frank served as the TRC Design Engineer where TRC's Building Sciences and Industrial Hygiene (BSI) group conducted hazardous materials pre-demolition surveys to identify asbestos containing materials, lead paint, PCB containing materials, universal wastes and other hazardous and regulated materials with potential to be impacted by proposed building demolitions on the site. Included on the site was an abandoned Cooling Tower structure of approximately 75 feet in height. TRC developed design documents in strict accordance to PANYNJ's CADD Standards for the proper abatement, transportation, disposal and special handling of hazardous/regulated building materials prior to demolition. The Cooling Tower structure was condemned and demolished with asbestos-containing transite side panels in place in accordance with NY State Regulations. The structure was successfully demolished without any change orders related to TRC's survey and design work.

Port Authority of New York and New Jersey (PANYNJ), JFK International Airport Farmers Electrical Substation Replacement, Queens, New York

Frank served as the TRC Design Engineer where TRC's Building Sciences and Industrial Hygiene (BSI) group conducted hazardous materials pre-demolition surveys to identify asbestos containing materials, lead paint, PCB containing materials, universal wastes and other hazardous and regulated materials with potential to be impacted by proposed replacement of the Farmers.

Port Authority of New York and New Jersey (PANYNJ), Electrical Substation at JFK International Airport, Queens, New York

TRC's survey work included investigating existing building structures, power distribution buildings, utility vaults and electrical transformers. TRC is coordinating with PANYNJ and Con Edison as part of the project to have removed the existing electrical transformers, which contain PCBs.

Dormitory Authority State of New York (DASNY), Queensborough Community College, 222-15 56th Avenue, Bayside, New York

Frank managed a project specific survey, preparation of an abatement design and performance of abatement project and air monitoring for the Science Building courtyard enclosure project. The survey and design were coordinated with the DASNY Architect and Engineer to determine the presence, quantity and condition of suspect asbestos-containing materials (ACM), hazardous materials and universal waste to be impacted by the project. The project involves the removal of asbestos containing plaster, sprayed on fireproofing, floor tile and window glazing compound.

Dormitory Authority State of New York (DASNY), Hostos Community College, 500 Grand Concourse, Bronx, New York

Frank managed a project specific survey, preparation of an abatement design and performance of abatement project and air monitoring for the roof, fifth floor, fourth floor and bathroom renovation projects. The survey and design were coordinated with the DASNY Architect and Engineer to determine the



presence, quantity and condition of suspect asbestos-containing materials (ACM), hazardous materials and universal waste to be impacted by the project. The project involves abatement of asbestos containing fireproofing, pipe insulation, floor tile and roofing as well as PCB containing caulking and the removal of universal waste.

Dormitory Authority State of New York (DASNY), Bronx Psychiatric Center, Waters Place, Bronx, New York

Frank managed a project specific survey, preparation of an abatement design and performed abatement project and air monitoring for the Clinic B and Food Services building demolition to facilitate construction of the new Adult Residence Building. The survey and design were coordinated with the DASNY Architect and Engineer to determine the presence, quantity and condition of suspect asbestos-containing materials (ACM), hazardous materials and universal waste to be impacted by the project. The project involved the abatement of asbestos containing ceiling plaster, floor tile, pipe insulation roofing and PCB window caulking.

New York State Office of Parks, Recreation and Historic Preservation (OPR&HP) - Environmental Remediation at Nissequogue River State Park, New York

Frank served as senior project/contract manager to provide asbestos, lead, and environmental consulting services associated with the former Kings Park Psychiatric Center. The facility contains over 50 abandoned buildings and associated structures (e.g., tanks, railroad piers, smokestack) and approximately 5 miles of underground steam tunnels that are in various states of disrepair. Managed tasks for the project including, but not limited to:

- Conducted asbestos, lead, and hazardous material assessments at over 50 Buildings and approximately 5 miles of Underground Steam Tunnels;
- Prepared remediation cost estimates for hazardous material abatement at Buildings and Underground Steam Tunnels;
- Prepared demolition cost estimates for Building and Underground Steam Tunnels;
- Prepared bid documents for the abatement of asbestos, lead, PCBs and other hazardous materials in buildings prior to demolition;
- Provided Project Management, Oversight and Project and Air Monitoring for the removal and abatement of hazardous materials prior to demolition; and
- Monitored Demolition with asbestos in place as well as “clean” demolitions.

SPECIALIZED TRAINING

- Project Manager Certification Program, PSI
- Occupational Respiratory Protection, EOHHSI
- NIOSH 582, ATC Environmental, Inc.
- 40 Hour HAZWOPER OSHA 29 CFR 1910.120(e)(3), BAOS
- 30 Hour OSHA Construction Safety and Health, HIS

ANTHONY SIGONA, PE, CIH, CSP, WELL AP & LEED AP BD+C

EDUCATION

B.E., Chemical Engineering, Manhattan College School of Engineering

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Professional Engineer and Land Surveyor, NY (#73727), NJ (#GE52670) CO (#PE.0064497)

National Council of Examiners for Engineers & Surveyors (#18343)

Certified Industrial Hygienist, American Board of Industrial Hygiene Certificate (#12248)

Certified Safety Professional, Board of Certified Safety Professionals (#24654)

LEED AP BD+C (#10929132) & WELL-AP-0000165757

NYSDOL/USEPA Asbestos Project Designer, Inspector

NYCDEP Asbestos Investigator (#123175)

NYSDOL Mold Assessor Certificate (#MA00960)

NJDOH Lead (#029743) Supervisor, Commercial Buildings & Superstructures

NJDEP Radon Measurement Specialist (MES15789)

OSHA §1910.120 40-Hour USEPA Sponsored Training, 1988

NYS Fire Prevention Hazardous Material Fires Level I & II, 1988

OSHA HAZWOPER Supervisor and Annual Fresher Training, 1989 to Present

OSHA §1926 30-Hour Training, Construction Safety & Health, 2011

AREAS OF EXPERTISE

Mr. Anthony Sigona has extensive management and technical expertise in the following areas:

- Asbestos and Lead Surveying, Monitoring, and Design
- PCB Building Materials Investigation, Assessment, and Remediation
- Environmental Health and Safety Planning
- Indoor Air Quality Investigations
- Phase I Environmental Site Assessments (ESAs)
- Phase II Environmental Site Investigations (ESIs)
- Environmental Assessments and Audits
- State and Local Environmental Permits and Regulatory Processes
- Hazardous Materials and Waste Management
- Petroleum and Chemical Bulk Storage Design and Construction

REPRESENTATIVE EXPERIENCE

Anthony Sigona is a Senior Project Manager in TRC's New York City office with responsibility for health and safety, quality assurance and control, technical report deliverables, and supervision of field activities. He has over 37 years of experience in environmental and chemical engineering. Mr. Sigona manages and supervised projects with significant interaction with leading public agencies and utilities, such as New York City Economic Development Corporation (NYCEDC), Dormitory Authority of the State of New York (DASNY), Port Authority of New York & New Jersey, NYC School Construction Authority, New York City Parks Department, and NYS Department of Environmental Conservation.



New York City Economic Development Corporation (NYCEDC) From 2012 to Present

Project management of survey and design services for asbestos and other regulated materials, such as lead-based paint, PCB caulk and lighting fixture ballasts. Development of environmental assessment reports and comprehensive abatement design plans and bid specifications in support of renovations of buildings, piers and wharfs at the South Street Seaport, Brooklyn Navy Yard, Bush Terminals and Brooklyn Army Terminal. Developed and implemented soil sampling plans for waste characterization for PCB Transformers and disposal operations. Preparation and review of NYSPE certified abatement design plans, certified workplace safety plans (WPSP), Asbestos variance permits, ACP-5, ACP-7, ACP-21 Reports, certified safety final inspections for NYC Department of Environmental Protection.

Dormitory Authority of the State of New York (DASNY) & Architectural Design Firms (2013 to Present)

Management of various environmental consulting services for its various client facilities throughout New York State in the investigation of suspect asbestos containing materials (ACM), polychlorinated biphenyls (PCB's) in caulking, lead paint, suspected microbial growth (mold), universal and hazardous waste impacting various construction projects. Developed and implemented soil sampling plans for waste characterization for hazardous material and soil waste excavation and disposal operations. Preparation and review of NYSPE certified abatement design plans, certified workplace safety plans (WPSP), certified safety final inspections for NYC Department of Buildings and Department of Environmental Protection.

Key DASNY projects: El Regreso Men's Residence Addition & Alterations, Lehman College, Bronx Community College, Hostos Community College, Brooklyn & Queensborough Community Colleges, and Rockland Psychiatric Center

Port Authority of New York & New Jersey (2012 to Present)

Airport Redevelopment at LaGuardia and John F. Kennedy Airports, World Trade Center – New York, NY

- Management of various asbestos and environmental consulting services for its Airport Redevelopment at LaGuardia and John F. Kennedy Airports in the investigation of suspect asbestos containing materials (ACM), polychlorinated biphenyls (PCB's) in caulking, lead paint, suspected microbial growth (mold), universal and hazardous waste impacting various construction projects. At the request of The Port Authority of NY & NJ, conducted investigation of J.F.K. Redevelopment Project, L.G.A. Airport Police & Security Buildings and prepared NYSPE certified abatement design plans and cost estimates for bid packages.
- Performed oversight of Hurricane Sandy Restoration at National September 11 Memorial and Museum, Tower No. 4, Parking and Retail Space, Vehicle Security Center, Transportation Hubs, and Fan Plants. Managed execution of restoration cleaning and sampling protocols for all affected areas, along with post-remediation decontamination for mold/bacterial impacts.

New York City School Construction Authority (NYCSCA) From 2012 to Present

Project Management of the USEPA-approved pilot study, which involved implementation of a plan to eliminate or control the airborne presence of PCBs in five select New York City public schools. Supervised Project Monitors overseeing abatement projects and technicians performing air, wipe and bulk sampling events.



New York City Parks Department (NYCPD) From 2018 to Present

Project management for oversight of asbestos, polychlorinated biphenyl (PCB), and lead testing for alterations at multiple comfort stations and recreational facilities stations.

U.S. Department of Veterans Affairs (2011-2012)

Green Environmental Management Services (GEMS) coordinator for environmental projects at Northport Veterans Affairs Medical Center for oversight of a Class IIB groundwater supply, fuel storage tanks, emergency generators, sewage treatment plant, power plant and air pollution controls, hazardous and nonhazardous waste streams, pharmaceutical, medical waste, and recycling programs.

New York City Design and Construction (2010-2011)

Project Manager for Asbestos, Lead and Mold Abatement, Phase I & II, Geotechnical Design and Investigation at City owned facilities. Review of Surveys, Project Design Drawings, Phase I ESA, Phase II ESI, Asbestos, Lead and Mold Inspection & Testing for various New York City facilities such as the Queens Botanical Gardens, Staten Island Children's Museum, New York City Fire Department Communications Center, and Manhattan and Queens Public Library Branches.

Government, Municipal Agencies and Other Private Clients (2004 to 2010)

Environmental Services Manager for a remediation contractor to ExxonMobil, National Grid, Suffolk and Nassau County Public Works, New York City Department of Environmental Protection (NYCDEP) and New York State Department of Environmental Conservation (NYSDEC), MTA Transit and Long Island Rail-Road and supervised the following activities:

- Waste Management/Fuel Storage Tank Management
- Professional Consulting Services
- Environmental Remediation
- Construction
- Compliance Management
- Emergency Response

New York State Department of Environmental Conservation (1988-2004)

Project Manager for Petroleum Bulk Storage and Spill investigation at various private and municipal transportation and housing facilities, major on-shore storage, and utility companies. Review and approval of engineering design plans and permits for substantial modifications of tanks, piping and equipment at Major Onshore Storage Facilities (MOSFs).

PROFESSIONAL AFFILIATIONS

American Society of Safety Professionals (ASSP)

American Industrial Hygiene Association (AIHA) (National and Metropolitan New York Chapters)

MAYA WELLS

EDUCATION

B.S., Environmental Resources Engineering, Minor in Computer and Information Technology, SUNY
College of Environmental Science and Forestry, Syracuse, NY, May 2022

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

40-Hour OSHA HAZWOPER Training
30-Hour OSHA Construction Safety Training
8-Hour OSHA Annual Refresher Training
Certified Profession in Erosion and Sediment Control-In Training (CPESC-IT)
NYSDEC 4-Hour Erosion and Sediment Control Training
Long Island Rail Road Roadway Worker Construction Training

AREAS OF EXPERTISE

Ms. Wells has technical experience in the following general areas:

- Environmental Media Sampling (Soil, Soil Vapor, Groundwater, Air)
- Waste Characterization
- Field Work Oversight/Monitoring
- Calibration and Use of Field Instruments
- Environmental Site Assessments and Investigations
- Environmental Regulatory Compliance
- Report Preparation
- Stormwater Pollution Prevention Plan Inspections
- Laboratory Data Analysis and Interpretation

REPRESENTATIVE EXPERIENCE

Ms. Wells serves as an Environmental Engineer based in TRC's Engineering, Construction and Remediation (ECR) Practice in midtown Manhattan and has over two (2) years of environmental consulting experience. Ms. Wells' experience includes preparation of Phase I Environmental Site Assessments (ESAs), performance of Phase II Environmental Site Investigations (ESIs) and environmental regulatory compliance monitoring including soil, groundwater, and soil vapor sampling, periodic review reporting, inspection of engineering controls and stormwater best management practices, data analysis and report preparation.

New York State Department of Environmental Conservation (NYSDEC), Standby State Superfund Contract, Environmental Engineer – New York, NY

Ms. Wells serves as an Environmental Consultant for the New York State Department of Environmental Conservation (NYSDEC) at 10 project NYSDCE State Superfund Sites in various stages of remediation. Her responsibilities include scheduling and conducting compliance groundwater monitoring/sampling; site-wide inspection of engineering controls; soil vapor intrusion investigation; oversight of operation, monitoring, and maintenance activities for on-site soil vapor extraction (SVE) and sub-slab depressurization (SSD) systems. Additionally, Ms. Wells coordinates with field staff and call-out contractors regarding field work preparation and scheduling. Ms. Wells provides office support in the



preparation of periodic review reports; work plans and completion reports for the evaluation of SVE system effectiveness assessments; and post-remediation site characterization plans and reports in support of SVE system shut down.

Enbridge, Stormwater Pollution Prevention Plan (SWPPP) Inspections, Environmental Inspector – Westchester and Putnam County, NY

Ms. Wells serves as an Environmental Inspector for monthly and biweekly SWPPP inspections of construction projects to maintain compliance with the State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharge from Construction Activity. Her responsibilities included inspecting soil erosion and sediment control measures and preparing associated reports.

Long Island Rail Road, Environmental Compliance, Project Engineer – Long Island, NY

Ms. Wells serves as a Project Engineer for the Long Island Rail Road (LIRR) Port Jefferson Train Yard project to assist with environmental compliance violation response in relation to a stormwater/wash water treatment system. The scope of work includes treatment system evaluation, oversight of operation and maintenance, Best Management Practices (BMP) and compliance sampling standard operating procedure (SOP) recommendations, and system sampling in relation State Pollutant Discharge Elimination System (SPDES) compliance work. Under management of a Professional Engineer, Ms. Wells prepared a Health and Safety Plan (HASP); BMP memorandum summarizing field activities, assessments, conclusions, and recommendations; and site-specific standard operation procedure (SOP) for SPDES compliance sampling.

The City of New York Department of Parks and Recreation, FY23 Sub-Surface Investigations for Capital Projects, Environmental Scientist – Multiple Sites, NY

Ms. Wells served as an Environmental Scientist performing oversight of excavation and backfilling activities and collecting post removal verification soil sampling for analysis of PCB. Ms. Wells provided detailed field documentation of sample locations and soil description and prepared a Post Removal Verification Soil Sampling Report for the client documenting all Site activities and final results/conclusions.

Ms. Wells also served to implement a Community Air Monitoring Program (CAMP) during the remediation and reconstruction of several ballfields under the direction of the USEPA located within the 57-acre Red Hook Recreation Area in Brooklyn, NY. Ms. Wells calibrated and utilized field instrumentation, including a photoionization detector (PID) and DustTrak, to monitor organic vapors and particulates. Ms. Wells observed construction activities to document and ensure proper use of personal protection equipment and appropriate work practices by site workers while conducting activities that produced potentially fugitive dust. In addition, Ms. Wells prepared daily reports summarizing the community air monitoring data and construction activities.

John F. Kennedy International Airport Bergen Electrical Substation, Waste Characterization, Environmental Scientist – New York, NY

Ms. Wells served as an Environmental Scientist during the performance of a waste characterization investigation at JFK Bergen Electrical Substation in Queens, NY. Ms. Wells inspected soil stockpiles for indications of contamination and collected composite and discrete soil samples for laboratory analyses for waste characteristics parameters to assess compliance with disposal facility requirements. Ms. Wells utilized appropriate field instruments to measure organic vapor content of the stockpiles and recorded



GPS coordinates of soil sampling locations. Ms. Wells also followed standard chain-of-custody procedures.

New York University Langone Health, Indoor Air Sampling, Environmental Scientist – New York, NY

Ms. Wells served as an Environmental Scientist for a Phase II Environmental Site Investigation (ESI) to support environmental due diligence related to the potential property transfer of a commercial/industrial facility located in Brooklyn, NY. Ms. Wells was responsible for the calibration and use of field instruments to screen the indoor and ambient air for organic vapors and collect indoor air quality (IAQ) samples for laboratory analysis. Prior to the IAQ sampling, Ms. Wells performed a building inspection and presampling chemical inventory in accordance with New York State Department of Health (NYSDOH) requirements. Additionally, Ms. Wells was responsible for quality assurance/quality control of the laboratory analytical data summary tables associated with the Phase II ESI report.

YORK GAVILANEZ

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

NYS DOL Air Sampling Technician (DOL Cert. # 24-6LQC3-SHAB)
NYS DOL Asbestos Project Monitor (DOL Cert. # 24-6LQC3-SHAB)
NYS DOL Asbestos Inspector (DOL Cert. # 24-6LQC3-SHAB)
NYS DOL Mold Assessor (DOL Cert. # MA02323)
NYS DEC Resource Conservation and Recovery Act (RCRA)
NYC DEP Asbestos Investigator (DEP Cert # 161376)
OSHA 10 Hour Construction Safety and Health (OSHA Cert # 36-005782672)
OSHA 30 Hour Construction Safety and Health (OSHA Cert # 21-602026108)
OSHA 40 Hour CSREGS HAZWOPER
OSHA CSREGS Confined Space Entry – General Industry
OSHA CSREGS Confined Spaces - Permit Required
OSHA CSREGS Radiation Safety
OSHA CSREGS IATA-Dangerous Goods Transportation
OSHA CSREGS Ionizing Radiation
DOT CSREGS Hazmat Transportation
EPA Lead-Based Paint Inspector (EPA Cert # LBP-I-I206043-1)

AREAS OF EXPERTISE

Mr. York Gavilanez has over eighteen (18) years' experience encompassing:

- Asbestos Services
- Microbial/Indoor/Outdoor Air Quality Services
- Industrial Hygiene Services
- Environmental Sampling
- Regulatory Compliance
- OSHA

REPRESENTATIVE EXPERIENCE

Mr. Gavilanez is an Environmental Scientist in the Building Science/Industrial Hygiene Practice at TRC. He has been employed at TRC since 2016. Mr. Gavilanez is a State of New York licensed asbestos inspector, air sampling technician and project monitor.

Mr. Gavilanez has conducted building assessments for the presence of asbestos and other hazardous materials. Further, he has also conducted numerous projects monitoring oversight during asbestos abatement and building demolition. His responsibilities include on-site project oversight, air sampling/analysis clearance inspections, and technical report writing.

Mr. Gavilanez also has extensive experience in working closely with such regulatory agencies as the NYSDOL, EPA, and the NYCDEP.



Unilever, 800 Sylvan Ave, Englewood Cliffs, NJ (Project Scientist: 04/29/2007 – 02/1/2008)

Mr. Gavilanez was responsible for the air sampling of abatement work areas. He was also responsible for ensuring that the work being performed by the contractor is compliant with the guidelines set forth by regulatory agencies.

Renovation 737 Park Avenue – New York, NY (Project Scientist: 8/18/2011 – 6/25/2012)

Mr. Gavilanez was responsible for the air sampling of abatement work areas. He was also responsible for ensuring that the work being performed by the contractor is compliant with the guidelines set forth by regulatory agencies. Enforced DEP and DOL rules, documented job/on-site activities (legal Documents) with attention to detail, punctuality, studying all DEP guidelines and making sure the abatement stayed on schedule and performed to the letter of the law.

Nissequogue River State Park, 799 St, Johnland Rd, Kings Park, New York (Project Scientist: 03/9/2016 –Present)

Mr. Gavilanez was responsible for the air sampling of backgrounds in Kings Park. He was also responsible for ensuring that the work being performed by the guidelines set forth by regulatory agencies.

Rockefeller University, 1230 York Avenue, New York, NY (Project Scientist: 04/29/2011 – 06/01/2011)

Mr. Gavilanez was responsible for the air sampling of abatement work areas. He was also responsible for ensuring that the work being performed by the contractor is compliant with the guidelines set forth by regulatory agencies.

DASNY, 300 Jay Street (NYC Tech-Namm Building), Brooklyn, NY (Project Scientist: 05/12/2016 – 05/14/2016)

Mr. Gavilanez was responsible for the air sampling of abatement work areas. He was also responsible for ensuring that the work being performed by the contractor is compliant with the guidelines set forth by regulatory agencies.

EPA, 245 Huntington Avenue (Growanus Canal Superfund Site), Brooklyn, NY (Project Scientist: 05/2021 - Present)

Mr. Gavilanez is responsible for assisting with CAMP monitoring implemented during the excavation and removal of soils from the proximity of the site providing a measure of protection for the downwind community, more specifically off-site receptors including residents and workers, from potential airborne contaminant releases as a result of remedial work activities performed at the site.

NYCHA, Lead Inspections, New York, NY (Project Scientist: 09/2020 – Present)

Mr. Gavilanez is responsible for lead inspections using special equipment known as an XRF analyzer to determine if the paint has lead. Inspections may also involve taking paint chip samples, which are sent to a lab for analysis.

Fort Meade, Mold Inspections, Brooklyn, NY (Project Scientist: 02/2019 – 06/2019)

Mr. Gavilanez was responsible for mold inspections to find all the places where mold and moisture have invaded military homes in order to come up with a comprehensive plan to fix the problem.

YURIY KLIMENKO

EDUCATION

Kingsborough Community College, Brooklyn NY

Associate Degree in Applied Science.

Professional Secondary School, Voronezh, Russia

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

NYCDEP Asbestos Investigator

NYSDOL Asbestos Project Monitor/Inspector/Air Sampling Technician

NYSDOL Mold Assessor

USEPA Lead-Based Paint Risk Assessor

NJDEP Asbestos Safety Technician

SSPC C3/C5 Competent Person for Deleading of Industrial Structures

AREAS OF EXPERTISE

Mr. Klimenko has technical experience in the following general areas:

- Corporate environmental health and safety
- Asbestos Abatement Project Monitoring
- Asbestos Air Sampling
- Ambient Air Monitoring
- Asbestos Surveys
- Asbestos Inspections
- Lead-Based Paint Risk Assessments
- Lead-Based Paint Inspection and Clearance

REPRESENTATIVE EXPERIENCE

Mr. Klimenko has more than 16 years of experience and progressive responsibility in consulting. His qualifications include:

- Maintained detailed records of work performed;
- Compiled and organized all necessary documentation for various reports;
- Conducted and maintained detailed logs;
- Managed the records of numerous projects conducted by TRC;
- Conducted and maintained/organized records of correspondence between TRC and clients, including, but not limited to, submittal of logs, email communications, and organized field notes;
- Managed and maintained all necessary equipment;
- Implemented various types of sampling for hazardous materials;
- Conducted visual inspections;
- Oversaw various hazardous material surveys throughout NYC schools; and
- Performed various types of sampling throughout NYC schools.

Mr. Klimenko's background includes extensive service to public and private-sector clients, including the NYSCSA, NYSDOT, DASNY, NYPA, MTA, and a wide range of private/commercial clients.

SPECIALIZED TRAINING

- 10 Hour OSHA



- 30 Hour OSHA
- 40 Hour OSHA HAZWOPER

APPENDIX 3

SPECIFICATIONS

SECTION 02 82 00

ASBESTOS REMOVAL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This asbestos abatement Project will consist of the removal and disposal of asbestos-containing materials (ACMs) and presumed asbestos-containing materials (PACMs) as regulated asbestos-containing material (RACM) at Bronx Psychiatric Center, Building 1, 1500 Waters Place, Bronx, NY, DASNY Project Number 3816609999.
- B. The work shall include but not be limited to the removal of the following materials:

Floor/level /location	Work Area Designation	Description of Asbestos Materials	Removal Method(s)	Approximate Quantity (SF/Unit)	Approximate Quantity (LF/Unit)
1 st Floor	Transformer Room #1	To Be Determined Miscellaneous Damaged Equipment and Debris	To Be Determined	To Be Determined	To Be Determined
1 st Floor	Transformer Room #2	To Be Determined Miscellaneous Damaged Equipment and Debris	To Be Determined	To Be Determined	To Be Determined
Total Quantity (SF/LF/Units)					

- C. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the Contractor of its obligation to furnish all labor and materials necessary to perform the Work.
- D. All Work shall be performed in strict accordance with the Project Documents and all governing codes, rules, and regulations. Where conflicts occur between the Project Documents and applicable codes, rules, and regulations, the more stringent shall apply.
- E. Working hours shall be as required and approved by the Owner or Owner's representative. Asbestos abatement activities including, but not limited to, work area preparation, gross removal activities, cleaning activities, waste removal, etc. may need to be performed during 'off-hours' (including nights and weekends). In addition, multiple mobilizations may be required to perform the work identified in this project. The Contractor shall coordinate and schedule all Work with the facility and Owner's representative.

1.02 SPECIAL JOB CONDITIONS

- A. Any special job conditions, including Variances obtained by the Owner or Owner's representative, are described below:
(Describe in detail or indicate "None") If trace asbestos materials were identified, indicate such with a reference to the pertinent asbestos survey and include what trade(s) is responsible for any disturbance to these regulated trace asbestos materials as per OSHA requirements. Identify how survey can be obtained.

1.03 PERMITS AND COMPLIANCE

- A. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local laws, rules, and regulations pertaining to Work practices, protection of Workers, authorized visitors to the site, persons, and property adjacent to the Work.
- B. Perform asbestos related Work in accordance with New York State Industrial Code Rule 56 (herein referred to as Code Rule 56), New York City Department of Environmental Protection Asbestos Control Program Title 15, Chapter 1 of the Rules of New York City (herein referred to as NYC DEP regulations), 40 CFR 61, and 29 CFR 1926. Where more stringent requirements are specified, adhere to the more stringent requirements.
- C. The Contractor is responsible for providing the Asbestos Inspection Report (ACP7) filing to NYC DEP as well as all Asbestos Abatement Permit applications with supporting documentation, including the Work Place Safety Plan (WPSP) and any other applicable documents as may be required by NYC DEP, if applicable.
- D. If applicable, the Contractor is responsible for obtaining any Asbestos Project Conditional Completion (ACP20) forms upon completion of each phase of asbestos abatement or as otherwise may be required during the course of the project as well as the Asbestos Project Completion (ACP21) form and any other applicable documents as may be required by NYC DEP. Owner or Owner's representative's Design Professional shall be responsible to submit the A-TR1 form to NYC DEP.
- E. The Contractor must maintain current licenses pursuant to New York State Department of Labor, New York City Department of Environmental Protection Asbestos Control Program, New York City Department of Sanitation, and New York State Department of Environmental Conservation for all Work related to this Project, including the removal, handling, transport, and disposal of asbestos-containing materials.
- F. The Contractor must have and submit proof upon request that any persons employed by the Contractor to engage in or supervise Work on any asbestos Project have valid NYS and NYC asbestos handling and supervisor certificates pursuant to Code Rule 56 and NYC DEP regulations.
- G. The Contractor shall comply fully with any existing or new Variance secured from regulatory agencies by the owner or Owners Representative in the performance of the Work. Any Variance applications previously submitted are included as an appendix of this specification.
- H. The Contractor shall be responsible for obtaining all other Variances as may be required for the Project or as requested by the Owner's representative, including variances necessary to obtain NYC Department of Buildings Work Permits prior to completion of all asbestos abatement activities. Approval of Owner or Owner's representative is required prior to submission of a Variance application to any regulatory agency. Failure to obtain Owner or Owner's representative's approval may result in Owner or Owner's representative's not permitting variance to be used on the Project.
- I. The Contractor shall be responsible for compliance with The New York State Uniform Fire Prevention and Building Code, or the New York City Building Code, as applicable, or its successor during all Work at the site.
- J. Failure to adhere to the Project Documents shall constitute a breach of the Contract and Owner or Owner's representative shall have the right to and may terminate the Contract provided,

however, the failure of Owner or Owner's representative to so terminate shall not relieve the Contractor from future compliance.

1.04 SUBMITTALS

- A. Pre-Work Submittals: Within seven (7) days prior to the pre-construction conference, the Contractor shall submit an electronic copy of the documents listed below to the Owner or Owner's representative's Project Manager and the Environmental Consultant for review and approval prior to the commencement of asbestos abatement activities:
1. Contractor license issued by New York State Department of Labor.
 2. A list of Projects performed within the past two (2) years and include the dollar value of all Projects. Provide Project references to include owner, Environmental Consultant, and air monitoring firm's name, contact persons, address, and phone number.
 3. Progress Schedule:
 - a. Show the complete sequence of abatement activities for each work area and the sequencing of Work within each building or building section listed in the contract.
 - b. Show the dates and hours of work for the beginning and completion of each major element of Work for all work areas including substantial completion dates for each Work Area, building, or phase.
 4. Project Notifications (original and all amendments in chronological order): As required by Federal, State, and NYC DEP (ACP-7) regulatory agencies together with proof of transmittal (i.e. certified mail return receipts). NYS DOL Site Specific Variance or Applicable Variance, if applicable.
 5. Building Occupant Notification: Provide the following information, as required by regulatory agencies:
 - a. Owner, Project Number, Site Name and Address, Building, Asbestos Project Location at Building, Start and End Dates.
 - b. Quantity and type of material to be removed.
 - c. Asbestos Contractor Name, Address, Contact Name and Phone Number, NYSDOL License Number.
 - d. Third Party Air Monitor Name, Address, Contact Name and Phone Number, NYSDOL License Number.
 - e. Air Monitoring Laboratory Name, Address, Contact Name and Phone Number, New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) Number.
 - f. NYSDOL Regional Office Phone Number.
 - g. Owner or Owner's representative Project Manager Name and Phone Number.
 - h. General Contractor Project Manager Name and Phone Number, if applicable
 6. Abatement Work Plan and Drawing(s): Provide a written work plan description of work and drawing(s) that clearly indicates the following:
 - a. All work areas/containments numbered sequentially.
 - b. Locations and types of all decontamination enclosures for each work area.
 - c. Entrances and exits to each work area/containment.
 - d. Type of abatement activity/technique for each work area/containment.
 - e. Number and location of negative air units and exhaust for each work area, when applicable. Also provide calculations for determining number of negative air pressure units.
 - f. Proposed location and construction of storage facilities and field office.
 - g. Location of water and electrical connections to building services for each work area/containment.
 - h. Waste transport routes through the building, or exterior to the waste storage container for each work area/containment.
 7. Disposal Site/Landfill Permit from applicable regulatory agency.
 8. Transfer Facility Permit (if used) from applicable regulatory agency.

9. Valid Waste Transporter NYS DEC Part 364 permit for all transporters.
 10. Valid State Waste Transport vehicle number / permit for all transporters for each State the waste is being transported through to reach the Disposal Facility/Landfill.
 11. Valid US DOT vehicle permits for all Transporters.
 12. Special Waste Characterization Profile, if required by the disposal site/landfill.
 13. Current ELAP Certificate for laboratory performing analysis of OSHA personal air monitoring samples. Refer to Section 1.09.
 14. Approved NYC DEP Asbestos Abatement Permits and Variances (ACP8, ACP9 and backup documentation [submitted Phasing Plan/Variance, Owners Hardship Letters, etc.], V2, V5, ACP-13, and WPSP), if applicable.
- B. On-Site Submittals: Refer to Part 3.01.B, C, D and E for all submittals, documentation, and postings required to be maintained on-site during abatement activities.
- C. Project Close-out Submittals: Within 30 days of the completion of each abatement phase, the **Abatement Contractor** shall submit an electronic copy of the documents listed below to the Owner or Owner's representative and the Environmental Consultant for review. Original fully executed waste records, original signed notarized Contractor's Acknowledgement Statements and any other original signed notarized documents required must be sent to the Owner or Owner's representative prior to final approval. Once the Environmental Consultant approves the close-out submittal, the Contractor shall provide 3 hard copy sets of the approved close-out documents (double-sided and bound) to the Owner or Owner's representative and Project Management for appropriate distribution, including 1 set to be distributed to the facility, prior to Contractor's final payment.
1. All Waste Shipment Records and Waste Shipment Record Logs (**Original** Waste Shipment Record(s) shall be sent to the Owner or Owner's representative).
 2. OSHA compliance air monitoring records (laboratory reports and chain of custodies) conducted during the Work (compiled in chronological order).
 3. Daily progress log, and the Work Area entry/exit log (s).
 4. Contractor's Acknowledgement Statement (Appendix C) that lists all Workers used in the performance of the Project, including name, NYS DOL and NYC DEP certification numbers and type of certification (i.e. supervisor, asbestos handler, etc.). The Statement shall be notarized (**Original** notarized statement shall be sent to the Owner or Owner's representative).
 5. Supervisor and Handlers/Workers NYS DOL and NYC DEP Asbestos (current at time of asbestos abatement) Certifications.
 6. Contractor licensed issued by New York State Department of Labor.
 7. Disposal Site/Landfill Permit from applicable regulatory agency.
 8. Transfer Facility Permit (if used) from applicable regulatory agency.
 9. Valid Waste Transporter NYS Part 364 permit for all transporters.
 10. Valid State Waste Transport vehicle permit for all transporters for each State the waste is being transported through to reach the Disposal Facility/Landfill.
 11. Valid US DOT vehicle permits for all Transporters.
 12. Special Waste Characterization Profile, if required by the disposal site/landfill.
 13. Current ELAP Certificate for laboratory performing analysis of OSHA personal air monitoring samples. Refer to Section 1.09.
 14. EPA, NYS DOL & NYCDEP Regulatory Project notifications and amended notifications, along with proof of transmittals, and NYS DOL Site-Specific Variances/Applicable Variances, if applicable. If required, NYC DEP Asbestos Abatement Permits and Variances (ACP7, ACP8, ACP9 and backup documentation [submitted Phasing Plan/Variance, owner's hardship letters, etc.], V2, V5, ACP13, ACP15, Work Place Safety Plan (stamped received by the DEP), Asbestos Project

Conditional Completion (ACP20) forms and/or Asbestos Project Completion (ACP21) form and fully executed ATR-1.

- D. Project Close-out Submittals: Within 30 days of the completion of the abatement phase, the **Environmental Consultant** shall submit 1 electronic copy of the closure report, including the documents listed below to the Owner or Owner's representative for review and approval. Once approved the final closeout submittals, the Environmental Consultant shall provide 3 hard copy sets of the approved submittals (double-sided and bound) to the Owner or Owner's representative.
1. Upon completion of the Project, the Environmental Consultant shall certify to Owner or Owner's representative, in writing, that the work is complete, acceptable and was performed in compliance with the Project Documents and all Local, State and Federal Regulations in an Executive Summary of the work.
 2. The Environmental Consultant shall review and approve or disapprove all necessary guarantees, certificates of compliance, and all other close-out documentation, which the Asbestos Contractor is required to submit.
 3. The Environmental Consultant shall provide to Owner or Owner's representative the final/closeout project report which must include
 - a. Consultant license issued by New York State Department of Labor.
 - b. Project Monitor(s) Certificate issued by New York State Department of Labor.
 - c. All daily logs and daily worker/handler rosters.
 - d. Summary of all visual inspections with the date of inspection and the date of signoff on the supervisor's log.
 - e. Air sampling logs, final lab reports (no drafts-must be signed by analyst and reviewer), chain of custody forms, and sample location plans.
 - f. Copies of Waste Shipment Records and Waste Shipment Record Logs.
 - g. EPA, NYS DOL & NYCDEP Regulatory Project notifications, amended notifications, along with proof of transmittals and NYS DOL Site-Specific Variances/Applicable Variances, if applicable. If required, NYC DEP Asbestos Abatement Permits and Variances (ACP7, ACP8, ACP9 and backup documentation [submitted Phasing Plan/Variance, owner's hardship letters, etc.], V2, V5, ACP13, ACP15, Work Place Safety Plan (stamped received by the DEP), Asbestos Project Conditional Completion (ACP20) forms and/or Asbestos Project Completion (ACP21) form, and fully executed ATR-1.
 - h. All pertinent correspondence related to the Project, including re-occupancy letters and elevated air results submission to NYS DOL documentation per 56-4.10 (a).

1.05 PRE-CONSTRUCTION CONFERENCE

- A. Prior to start of preparatory Work under this Contract, the Contractor shall attend a pre-construction conference attended by Owner or Owner's representative, Facility Personnel, and Environmental Consultant.
- B. Agenda for this conference shall include but not necessarily be limited to:
1. Contractor's scope of Work, Work plan, and schedule to include number of workers and shifts.
 2. Contractor's safety and health precautions including protective clothing and equipment and decontamination procedures.
 3. Environmental Consultant's duties, functions, and authority.
 4. Contractor's Work procedures including:
 - a. Methods of job site preparation and removal methods.
 - b. Respiratory protection.
 - c. Disposal procedures.
 - d. Cleanup procedures.

- e. Fire exits and emergency procedures.
 - 5. Contractor's required pre-work and on-site submittals, documentation, and postings.
 - 6. Contractor's plan for twenty-four (24) hour Project security both for prevention of theft and for barring entry of unauthorized personnel into Work Areas.
 - 7. Temporary utilities.
 - 8. Handling of furniture and other movable objects.
 - 9. Storage of removed asbestos-containing materials.
 - 10. Waste disposal requirements and procedures, including use of Owner's Representative supplied Waste Shipment Record, if applicable, and Waste Shipment Record Log.
- C. In conjunction with the conference the Contractor shall accompany Owner or Owner's representative and Environmental Consultant on a pre-construction walk-through documenting existing condition of finishes and furnishings, reviewing overall Work plan, location of fire exits, fire protection equipment, water supply and temporary electric tie-in.

1.06 APPLICABLE STANDARDS AND REGULATIONS

- A. The Contractor shall comply with the following codes and standards, except where more stringent requirements are shown or specified:
- B. Federal Regulations:
- 1. 29 CFR 1910.1001, "Asbestos" (OSHA)
 - 2. 29 CFR 1910.1200, "Hazard Communication" (OSHA)
 - 3. 29 CFR 1910.134, "Respiratory Protection" (OSHA)
 - 4. 29 CFR 1910.145, "Specification for Accident Prevention Signs and Tags" (OSHA)
 - 5. 29 CFR 1926, "Construction Industry" (OSHA)
 - 6. 29 CFR 1926.1101, "Asbestos, Tremolite, Anthophyllite, and Actinolite" (OSHA)
 - 7. 29 CFR 1926.500 "Guardrails, Handrails and Covers" (OSHA)
 - 8. 40 CFR 61, Subpart A, "General Provisions" (EPA)
 - 9. 40 CFR 61, Subpart M, "National Emission Standard for Asbestos" (EPA)
 - 10. 49 CFR 171-172, Transportation Standards (DOT)
- C. New York State Regulations:
- 1. 12 NYCRR, Part 56, "Asbestos", Industrial Code Rule 56 (DOL) (amended March 21, 2007).
 - 2. 6 NYCRR, Parts 360, 364, Disposal and Transportation (DEC)
 - 3. 10 NYCRR, Part 73, "Asbestos Safety Program Requirements" (DOH)
- D. Local Regulations:
- 1. New York City Department of Environmental Protection Asbestos Control Program Title 15, Chapter 1 of the Rules of New York City
 - 2. New York City Department of Sanitation Title 16, Chapter 8 of the Rules of New York City
- E. Standards and Guidance Documents:
- 1. American National Standards Institute (ANSI) Z88.2, Practices for Respiratory Protection
 - 2. ANSI Z9.2-79, Fundamentals Governing the Design and Operation of Local Exhaust Systems
 - 3. EPA 560/585-024, Guidance for Controlling Asbestos-containing Materials in Buildings (Purple Book)
 - 4. EPA 530-SW-85-007, Asbestos Waste Management Guidance
 - 5. ASTM Standard E1368 "Standard Practice for Visual Inspection of Asbestos Abatement Projects."

1.07 NOTICES

- A. The Contractor shall provide notification of intent to commence asbestos abatement activities as indicated below.
1. At least ten (10) Working days prior to beginning abatement activities, send written notification to:
U.S. Environmental Protection Agency Region 2
National Emissions Standards for Hazardous Air Pollutants (NESHAPS) Coordinator
Air Branch
290 Broadway, 21st Floor
New York, NY 10007-1866
 2. At least ten (10) calendar days prior to beginning abatement activities send written notification to:
New York State Department of Labor
Division of Safety and Health, Asbestos Control Program
State Office Campus
Building 12 - Room 161B
Albany, NY 12240
 3. At least seven (7) days prior to beginning abatement activities provide an electronic Asbestos Project Notification (ACP7) to New York City Department of Environmental Protection Asbestos Control Program in accordance with NYC DEP regulations.
- B. The Contractor is required to send notifications to U.S. Environmental Protection Agency and New York State Department of Labor via mail or package delivery service that will provide proof of delivery and receipt.
- C. The Contractor shall be responsible for maintaining current project filings with regulatory agencies for the duration of the project.
- D. The Contractor shall post and/or provide Building Occupant Notification at least 10 calendar days prior to beginning abatement activities as required by Code Rule 56.
- E. The Contractor shall post a floor plan as required by NYC DEP regulations, if applicable.

1.08 PROJECT MONITORING AND AIR SAMPLING

- A. Owner or Owner's representative shall engage the services of an Environmental Consultant who shall serve as Owner's third party oversight in regard to the performance of the asbestos abatement Project and provide direction as required throughout the entire abatement Project period. The Environmental Consultant and all subconsultants shall not have any contractual relationship with the Contractor for the duration of the asbestos project.
- B. The Contractor is required to ensure cooperation of its personnel with the Environmental Consultant for the air sampling and Project monitoring functions described in this section. The Contractor shall comply with all direction given by the Environmental Consultant during the course of the Project.
- C. The Environmental Consultant shall provide the following administrative services:
1. Review and approve or disapprove all submittals, shop drawings, schedules, and samples.
 2. Assure that all notifications to governmental agencies by the Contractor are submitted in a timely manner and are correct in content.

- D. The Environmental Consultant shall staff the Project with a trained and certified person(s) to act on Owner's behalf at the job site. This individual shall be designated as the Abatement Project Monitor (APM).
1. The APM shall be on-site at all times the Contractor is on-site. The Contractor shall not be permitted to conduct any Work unless the APM is on-site (except for inspection of barriers and negative air system during non-working days).
 2. The APM shall have the authority to direct the actions of the Contractor verbally and in writing to ensure compliance with the Project documents and all regulations. The APM shall have the authority to Stop Work when gross Work practice deficiencies or unsafe practices are observed, or when ambient fiber concentrations outside the removal area are equal to or greater than 0.01 f/cc or background level, whichever is greater.
 - a. Such Stop Work order shall be effective immediately and remain in effect until corrective measures have been taken and the situation has been corrected.
 - b. Standby time, re-cleaning time, and air sample collection time and analysis cost required to resolve the situation shall be at the Contractor's expense.
 - c. The APM shall track and provide a summary of standby, re-cleaning, and/or air sampling time to achieve satisfactory clearance, as well as a summary of any equipment used. These summaries shall be provided to the Owner or Owner's representative Project Manager.
 3. The APM shall provide the following services:
 - a. Inspection of the Contractor's Work, practices, and procedures, including temporary protection requirements, for compliance with all regulations and Project specifications including provisions required by Variances, the Work Place Safety Plan and Asbestos Work Permit.
 - b. Provide abatement Project air sampling as required by applicable regulations and Owner or Owner's representative. Sampling will include background, work area preparation, asbestos handling, final cleaning and aggressive clearance air sampling.
 - c. Verify daily that all Workers used in the performance of the Project are certified by the appropriate regulatory agency and include a worker roster in the daily log.
 - d. Monitor the progress of the Contractor's work and report any deviations from the schedule to the Owner or Owner's representative.
 - e. Monitor, verify, and document all waste load-out operations.
 - f. Verify that the Contractor is performing personal air monitoring daily, and that results are being returned and posted at the site as required.
 - g. The APM shall maintain a daily log on site that documents all project related and APM and Contractor actions, activities, and occurrences.
 - h. Verify landfill to be used for waste disposal with waste transporter (driver) and Contractor prior to waste trailer/hardtop dumpster leaving site. Confirm the waste transporter firm and landfill are listed on the regulatory notifications for the project and the waste transport vehicle license number is listed on the current NYS DEC Waste Transporter permit.
 4. The following minimum inspections shall be conducted by the APM, accompanied by the Contractor's supervisor. Additional inspections shall be conducted as required by Project conditions and/or at Owner or Owner's representative's direction. Progression from one (1) phase of Work to the next by the Contractor is only permitted with the written approval of the APM.
 - a. Pre-Construction Inspection: The purpose of this inspection is to verify the existing conditions of the Work Areas and to document these conditions.
 - b. Pre-Commencement Inspection: The purpose of this inspection is to verify the integrity of each containment system prior to disturbance of any asbestos-

- containing material. This inspection shall take place only after the Work Area is fully prepped for removal.
- c. Work Inspections: The purpose of this inspection is to monitor the Work practices and procedures employed on the Project and to monitor the continued integrity of the containment system. Inspections within the removal areas shall be conducted by the APM during all preparation, removal, and cleaning activities at least twice every Work shift. Additional inspections shall be conducted as warranted.
 - d. Pre-Encapsulation Inspection: The purpose of this inspection is to ensure the complete removal of Asbestos-Containing Material (ACM), from all surfaces in the Work Area prior to encapsulation.
 - e. Visual Clearance Inspection: The purpose of this inspection is to verify that: all materials in the scope of work have been properly removed; no visible asbestos debris/residue remains; no pools of liquid or condensation remains; and all required cleanings are complete. This inspection shall be conducted before final air clearance testing.
 - f. Post-Clearance Inspection: The purpose of this inspection is to ensure the complete removal of ACM, including debris, from the Work Area after satisfactory final clearance sampling and removal of all isolation and critical barriers and equipment from the Work Area.
 - g. Punch List Inspection: The purpose of this inspection is to verify the Contractor's certification that all Work has been completed as contracted and the existing condition of the area prior to its release to the Owner or Owner's representative.
- E. The APM shall provide abatement Project air sampling and analysis as required by applicable regulations. Sampling will include, but is not limited to, background, work area preparation, asbestos handling, and final cleaning and clearance air sampling.
- 1. Unless otherwise required by applicable regulations, the APM shall have samples analyzed by Phase Contrast Microscopy (PCM). Results shall be available at the Project site within 24 hours of completion of sampling.
 - 2. Samples shall be collected as required by applicable regulations and these specifications. Transmission Electron Microscopy (TEM) clearance air samples are required for work areas with abatement equal to or greater than 10,000 sq.ft./lin. ft. of ACM. If TEM clearance air sampling is utilized by owner or owner's representative, the clearance criteria and sampling protocols must be in compliance with AHERA. If PCM air sample analysis results exceed the satisfactory clearance criteria, then TEM analysis of the entire set of clearance air samples may be used, provided that a standard NIOSH/ELAP accepted laboratory analysis method is utilized that shall report each air sample result in fibers per cubic centimeter.
 - 3. If the air sampling during any phase of the abatement project reveals airborne fiber levels at or above 0.01 fibers/cc or the established background level, whichever is greater, outside the regulated Work Area, Work shall stop immediately and corrective measures required by applicable regulations shall be initiated. Notify the Owner or Owner's representative project personnel, as well as all employers and occupants in adjacent areas. The Contractor shall bear the burden of any and all costs incurred by this delay.
 - 4. The APM shall submit copies of all elevated air sampling results collected during abatement and all elevated final air clearance results to the Commissioner of Labor, as required by regulation.
 - 5. At the completion of each abatement phase, the APM shall provide the ACP15 Project Monitors Report to DEP, if applicable
 - 6. A minimum of 1,200 Liters for PCM air samples or 1,300 Liters for TEM air samples (whichever is applicable) shall be collected at a flow rate between 2 and 16 liters per minute (L/min) for PCM samples and a flow rate of between 2 and 10 L/min for TEM

AHERA air samples, as necessary to achieve proper sample collection and work practice duration.

1.09 CONTRACTOR AIR SAMPLING

- A. In addition to the requirements of OSHA 1926.1101, the Contractor shall be required to perform personal air monitoring **every Work shift in each Work Area** during which abatement activities occur in order to determine that appropriate respiratory protection is adequate and is being worn and utilized. **Negative Exposure Assessments are not allowed to be used in lieu of personal air monitoring.**
- B. The Contractor shall conduct air sampling that is representative of both the 8-hour time weighted average and 30-minute short-term excursion level exposures to indicate compliance with the OSHA Permissible Exposure Limits (PELs).
- C. The Contractor's laboratory analysis of air samples shall be conducted by a NYS DOH ELAP approved laboratory. The Environmental Consultant shall not collect, ship, transport or analyze the Contractor's air samples.
- D. Results of personal air sample analyses shall be available, verbally, within twenty-four 24 hours of sampling and results with associated chains of custody shall be posted upon receipt and documented in the supervisor's daily log book. Written laboratory reports shall be delivered and posted at the Work site within five (5) days. Failure to comply with these requirements may result in all work being stopped until compliance is achieved.

1.10 PROJECT SUPERVISOR

- A. The Contractor shall designate a full-time Project Supervisor who shall meet the following qualifications:
 - 1. The Project Supervisor shall hold New York State DOL and New York City DEP certification as an Asbestos Supervisor.
 - 2. The Project Supervisor shall meet the requirements of a "Competent Person" as defined by OSHA 1926.1101 and shall have a minimum of one (1) year experience as a supervisor.
 - 3. The Project Supervisor must be able to speak, read, and write English fluently, as well as communicate in the primary language of the Workers.
- B. If the Project Supervisor is not on-site at any time whatsoever, all Work shall be stopped. The Project Supervisor shall remain on-site until the Project is complete. The Project Supervisor cannot be removed from the Project without the written consent of the Owner or Owner's representative and the Environmental Consultant. The Project Supervisor shall be removed from the Project if so requested by owner or owner's representative.
- C. The Project Supervisor shall maintain the bound Daily Project Log and separate work area entry/exit logs for each work area, as required by applicable regulations and section 2.03 of the specifications and the Waste Shipment Record Log required by section 4.03 of the specifications.
- D. The Project Supervisor shall be responsible for the performance of the Work and shall represent the Contractor in all respects at the Project site. The Supervisor shall be the primary point of contact for the Abatement Project Monitor.

1.11 MEDICAL REQUIREMENTS

- A. Before exposure to airborne asbestos fibers, provide Workers with a comprehensive medical examination as required by 29 CFR 1910.1001, and 29 CFR 1926.1101.
 - 1. This examination is not required if adequate records show the employee has been examined as required by 29 CFR 1910.1001, and 29 CFR 1926.1101 within the past year.
 - 2. The same medical examination shall be given on an annual basis to employees engaged in an occupation involving asbestos fibers and within thirty 30 calendar days before or after the termination of employment in such occupations.

1.12 TRAINING

- A. As required by applicable regulations, prior to assignment to asbestos Work instruct each employee with regard to the hazards of asbestos, safety and health precautions, and the use and requirements of protective clothing and equipment.
- B. Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134, and 29 CFR 1926.1101. Provide respirator training and fit testing.

1.13 RESPIRATORY PROTECTION

- A. Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH).
- B. Respirators shall be individually fit-tested to personnel under the direction of an Industrial Hygienist on a yearly basis. Fit-tested respirators shall be permanently marked to identify the individual fitted, and use shall be limited to that individual. Fit-test records shall be maintained on site for each employee.
- C. Where fiber levels permit, and in compliance with regulatory requirements, Powered Air Purifying Respirators (PAPRs) are the minimum allowable respiratory protection permitted to be utilized during gross removal operations of OSHA Class I or OSHA Class II friable ACM.
- D. No respirators shall be issued to personnel without such personnel participating in a respirator training program.
- E. High Efficiency Particulate Air (HEPA) respirator filters shall be approved by NIOSH and shall conform to the OSHA requirements in 29 CFR 1910.134 and 29 CFR 1926.1101.
- F. A storage area for respirators shall be provided by the Contractor in the clean room side of the personal decontamination enclosure where they will be kept in a clean environment.
- G. The Contractor shall provide and make available a sufficient quantity of respirator filters so that filter changes can be made as necessary during the work day. Filters will be removed and discarded during the decontamination process. Filters cannot be reused. Filters must be changed if breathing becomes difficult.
- H. Filters used with negative pressure air purifying respirators shall not be used any longer than one eight (8) hour work day. Any loose respirator filters found within the regulated area, must be disposed of as RACM asbestos waste.
- I. Any authorized visitor, worker, or supervisor found in the Work Area not wearing the required respiratory protection shall be removed from the Project site and shall not be permitted to return.

- J. The Contractor shall have at least two (2) Powered Air Purifying Respirators stored on site designated for authorized visitors use. Appropriate respirator filters for authorized visitors shall be made available by the Contractor.

1.14 DELIVERY AND STORAGE

- A. Deliver all materials to the job site in original packages with containers bearing manufacturer's name and label.
- B. Store all materials at the job site in a suitable and designated area.
 - 1. Store materials subject to deterioration or damage away from wet or damp surfaces and under cover.
 - 2. Protect materials from unintended contamination and theft.
 - 3. Storage areas shall be kept clean and organized.
- C. Remove damaged or deteriorated materials from the job site. Materials contaminated with asbestos shall be disposed of as asbestos debris as herein specified.

1.15 TEMPORARY UTILITIES

- A. Shut down and lock out all electrical power to the asbestos Work Areas, including lighting circuits. Any electrical power passing through the Work Areas that can't be shut down due to health and safety reasons, shall be protected as per the requirements of applicable regulations and shall not be utilized within the work area.
- B. Provide temporary 120-240 volt, single phase, three (3) wire, 100 amp electric service with Ground Fault Circuit Interrupters (GFCIs) for all electric requirements within the asbestos Work Area.
 - 1. Where available, obtain from Owner's existing system. Otherwise provide power from other sources (i.e. generator).
 - 2. Provide temporary wiring and "weatherproof" receptacles in sufficient quantity and location to serve all HEPA equipment and tools.
 - 3. Provide wiring and receptacles as required by the APM for air sampling equipment.
 - 4. All power to the Work Area shall be brought in from outside the area through GFCIs at the source.
- C. Provide temporary lighting with "weatherproof" fixtures for all Work Areas including decontamination chambers.
 - 1. The entire Work Area shall be kept illuminated at all times.
 - 2. Provide lighting as required by the APM for the purposes of performing required inspections.
- D. All temporary devices and wiring used in the Work Area shall be capable of decontamination procedures including HEPA vacuuming and wet-wiping.
- E. Utilize domestic water service, if available, from Owner's existing system. Provide hot water heaters with sufficient capacity to meet Project demands.

PART 2 PRODUCTS

2.01 PROTECTIVE CLOTHING

- A. Provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, gloves and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber for comfort, but shall not be used alone. Make sleeves secure at the wrists and make foot coverings secure at the ankles by the use of tape, or provide disposable coverings with elastic wrists or tops.
- B. Provide sufficient quantities of protective clothing to assure a minimum of four (4) complete disposable outfits per day for each individual performing abatement Work.
- C. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.
- D. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, and footwear whenever they enter the Work Area.

2.02 SIGNS AND LABELS

- A. Provide bilingual (English-Spanish) warning signs and barrier tapes at all approaches to asbestos Work Areas. Locate signs at such distance that personnel may read the sign and take the necessary protective steps required before entering the area.
 - 1. Provide danger signs in vertical format conforming to 29 CFR 1926.1101, minimum 20" x 14" displaying the following legend:

DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY
WEAR RESPIRATORY PROTECTION AND
PROTECTIVE CLOTHING IN THIS AREA
 - 2. Provide 3" wide red barrier tape printed with black lettered, "DANGER ASBESTOS REMOVAL". Locate barrier tape across all corridors, entrances and access routes to asbestos Work Area. Install tape 3' to 4' above finished floor (AFF).
- B. Provide asbestos danger labels affixed to all asbestos materials, scrap, waste, debris and other products contaminated with asbestos.
 - 1. Provide asbestos danger labels of sufficient size to be clearly legible, displaying the following legend:

DANGER
CONTAINS ASBESTOS FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATHE DUST
AVOID CREATING DUST
 - 2. Provide the following asbestos labels, of sufficient size to be clearly legible, for display on waste containers (bags or drums) which will be used to transport asbestos contaminated material in accordance with United States Department of Transportation 49 CFR Parts 171 and 172:

3. Generator identification information shall be affixed to each waste container or any packaging used to containerize RACM asbestos waste indicating the following printed in indelible ink:

Generator Name
Facility Name
Facility Address
Date

2.03 DAILY PROJECT LOG & WORK AREA (Worker Decontamination Unit) ENTRY/EXIT LOG

- A. Provide a bound Daily Project Log. The log shall contain on title page the Project name and Owner or Owner's representative project number, name, address and phone number of Owner or Owner's representative; name, address and phone number of Environmental Consultant; name, address and phone number of Abatement Contractor; emergency numbers including, but not limited to local Fire/Rescue department and all other regulatory requirements.
- B. All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted.
- C. All persons entering and exiting the Work Area shall sign the Work Area (entry/exit log located in the decontamination unit clean room or airlock to the work area) and include name, certification number, and time.
- D. The Project Supervisor shall document all work performed daily and note all regulatory required inspections, maintain entry log records and ensure that they are recorded in accordance with the provisions of all applicable regulations.

2.04 SCAFFOLDING AND LADDERS

- A. Provide all scaffolding and/or staging as necessary to accomplish the Work of this Contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. All scaffolding shall be designed and constructed in accordance with OSHA, New York City Building Code, and any other applicable federal, state and local government regulations. Whenever there is a conflict or overlap of the above references the most stringent provisions are applicable.
- B. Provide scaffolding and ladders as required by the APM for the purposes of performing required inspections.

2.05 SURFACTANT (AMENDED WATER)

- A. Wet all asbestos-containing materials prior to removal with surfactant mixed and applied in accordance with manufacturer's printed instructions.

2.06 ENCAPSULANT

- A. Encapsulant shall be tinted or pigmented so that application when dry is readily discernible.
- B. The encapsulant solvent or vehicle shall not contain a volatile hydrocarbon.

2.07 FOAM/VISCOUS LIQUID

- A. Foam or viscous liquid shall be non-toxic, shall not require special respirator protection for handling, and shall not affect the handling and disposal of the asbestos waste.
- B. Foam or viscous liquid shall leave an identifiable colored residue when it dissipates.
- C. Foam or viscous liquid may be used for non-friable ACM roofing and/or flooring removals consistent with all applicable regulations.

2.08 WASTE DISPOSAL BAGS, DRUMS, AND CONTAINERS

- A. Provide 6 mil clear polyethylene disposal bags printed with asbestos caution labels. Bags shall also be imprinted with U.S. Department of Transportation required markings.
- B. Provide 30 or 55 gallon capacity fiber, plastic, or metal drums capable of being sealed air and water tight if asbestos waste has the potential to damage or puncture disposal bags. Affix asbestos caution labels on lids and at one-third points around drum circumference to assure ready identification.
- C. Containers and bags must be labeled in accordance with 40 CFR Part 61 NESHAPS and applicable regulations. When the bags/containers are moved to the lockable hardtop dumpster from the waste decontamination system washroom, the bags must also be appropriately labeled with the date they are moved on the bag/container in waterproof markings.
- D. Labeled ACM waste containers or bags shall not be used for non-ACM waste or trash. Any material placed in labeled containers or any material placed in bags, whether the bag is turned inside out or not, shall be handled and disposed of as RACM waste.

2.09 HEPA VACUUM EQUIPMENT

- A. All vacuuming performed under this contract shall be performed with High Efficiency Particulate Air (HEPA) filter equipped industrial vacuums conforming to ANSI Z9.2.
- B. Provide tools and specialized equipment including scraping nozzles with integral vacuum hoods connected to a HEPA vacuum with flexible hose.

2.10 POWER TOOLS

- A. Any power tools used to drill, cut into, or otherwise disturb asbestos material shall be manufacturer equipped with HEPA filtered local exhaust ventilation

2.11 FIRE RETARDANT POLYETHYLENE SHEETING

- A. All polyethylene (plastic) sheeting used on the Project (including but not limited to sheeting used for critical and isolation barriers, fixed objects, walls, floors, ceilings, and waste container) shall be at least 6 mil fire retardant sheeting.
- B. Decontamination enclosure systems shall utilize at least 6 mil opaque fire retardant plastic sheeting. At least two (2) layers of 6 mil reinforced fire retardant plastic sheeting shall be used for the flooring.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Should visible emissions or water leaks be observed outside the Work Area, immediately stop Work and institute emergency procedures per applicable regulations. Should there be elevated fiber levels outside the Work Area, immediately stop Work and institute emergency procedures per applicable regulations. All costs incurred in decontaminating such non-Work Areas and the contents thereof shall be borne by the Contractor, at no additional cost to the Owner.
- B. Current medical surveillance approval, fit test reports, Contractor's Worker Acknowledgments, and valid NYS DOL/NYC DEP Asbestos Handler certification cards shall be on site prior to admittance of any Contractor's employees to the asbestos Work Area.
- C. Hard Copies of the following submittals, documentation, and postings shall be maintained on-site by the Contractor during abatement activities at a location approved by the Abatement Project Monitor:
 - 1. Valid Contractor license issued by New York State Department of Labor.
 - 2. Certification, Worker Training, Medical Surveillance, Acknowledgment(s):
 - a. NYS DOL and NYC DEP Asbestos Handler certification cards for each person employed in the removal, handling, or disturbance of asbestos.
 - b. Evidence that Workers have received proper training required by the regulations and the medical examinations required by OSHA 29 CFR 1926.1101.
 - c. Documentation that Workers have been fit tested specifically for respirators used on the Project.
 - d. Contractor's Workers Acknowledgments (Appendix C): Statements listing all the employees and signed by the supervisor stating that the employee has received training in the proper handling of asbestos-containing materials; understands the health implications and risks involved; and understands the use and limitations of the respiratory equipment to be used.
 - 3. Daily OSHA personal air monitoring results.
 - 4. NYS Department of Health ELAP certification for the laboratory that will be analyzing the OSHA personal air samples.
 - 5. Disposal Site/Landfill Permit from applicable regulatory agency.
 - 6. Transfer Facility Permit (if used) from applicable regulatory agency.
 - 7. Valid Waste Transporter NYS Part 364 permit for all transporters.
 - 8. Valid State Waste Transport vehicle permit for all transporters for each State the waste is being transported through to reach the Disposal Facility/Landfill.
 - 9. Valid US DOT vehicle permits for all Transporters.
 - 10. Special Waste Characterization Profile, if required by the disposal site/landfill.
 - 11. Regulatory Project notifications and amended notifications.
 - 12. Applicable regulations.
 - 13. Safety Data Sheets of supplies/chemicals used on the Project.
 - 14. Approved Abatement Work Plan.
 - 15. List of emergency telephone numbers.
 - 16. Magnahelic manometer semi-annual calibration certification.
 - 17. Waste Shipment Record Log.
 - 18. Daily Project Log.
 - 19. Work Area Entry/Exit Logs, for each personal decontamination unit.
 - 20. Contract documents (environmental survey report, specifications and drawings).
- D. A floor plan showing the areas of the building under abatement and the location of all fire exits in said areas shall be prominently posted in the building lobby or comparable location,

along with a notice stating the location within the building of the negative air cutoff switch required under applicable regulations.

- E. Hard Copies of the following documentation shall be maintained on-site by the Abatement Project Monitor during abatement activities:
 - 1. Valid Contractor license issued by New York State Department of Labor.
 - 2. Air Sample Log.
 - 3. Air sample laboratory results with chain of custody and sample location plans.
 - 4. ACP15 Project Monitors Reports, if applicable.
 - 5. Project monitor daily log and a daily list of workers/supervisors onsite.
 - 6. A copy of ASTM Standard E1368 "Standard Practice for Visual Inspection of Asbestos Abatement Projects."
 - 7. Calibration Chart for rotometer(s) used on-site.
 - 8. Project documents (environmental survey report, specifications and drawings).
- F. The Work Area must be vacated by building occupants prior to decontamination enclosure construction and Work Area preparation.
- G. All demolition necessary to access asbestos-containing materials for removal must be conducted within negative pressure enclosures by licensed asbestos handlers. Demolition debris may be disposed of as construction and demolition debris provided the Abatement Project Monitor determines that it is not contaminated with asbestos and there has been no disturbance of ACM within the enclosure. If the demolition debris is determined to be contaminated or ACM has been disturbed, porous materials must be disposed of as RACM asbestos waste. Non-porous items may be cleaned and adequately decontaminated, or disposed of as RACM waste.

3.02 PERSONAL DECONTAMINATION ENCLOSURE

- A. Provide personal decontamination enclosure contiguous to the Work Area or as per Variance. The decontamination enclosure shall be attached to the Work Area and not located within it unless isolation barriers are installed. If the decontamination chamber is accessible to the public it shall be fully framed and sheathed to prevent unauthorized entry.
- B. Access to the Work Area will be from the clean room through an airlock to the shower and through an airlock to the equipment room. Each airlock shall be a minimum of three (3) feet from door to door. Additional airlocks shall be provided as required by applicable regulations for remote decontamination enclosures.
- C. The decontamination enclosure ceiling and walls shall be covered with one (1) layer of opaque 6 mil fire retardant polyethylene sheeting. Two (2) layers of reinforced 6 mil fire retardant polyethylene sheeting shall be used to cover the floor.
- D. The entrance to the clean room shall have a lockable door along with adequate small openings for Work Area make-up air. Provide suitable lockers for storage of Worker's street clothes. Storage for respirators along with replacement filters and disposable towels shall also be provided.
- E. Provide a temporary shower with individual hot and cold water supplies and faucets. Provide a sufficient supply of soap and shampoo. There shall be one (1) shower for every six Workers. The shower room shall be constructed in such a way so that travel through the shower chamber shall be through the shower. The shower shall not be able to be bypassed.
- F. Shower water shall be drained, collected and filtered through a system with at least a 5.0 micron particle size collection capability containing a series of several filters with progressively smaller

pore sizes to avoid rapid clogging of the system. The filtered waste water shall then be discharged in accordance with applicable codes and the contaminated filters disposed of as RACM asbestos waste.

- G. The equipment room shall be used for the storage of tools and equipment. A walk-off pan filled with water shall be located in the Work Area outside the equipment room for Workers to clean foot coverings when leaving the Work Area. A labeled 6 mil plastic ACM waste bag for collection of contaminated clothing shall be located in this room.
- H. The personal decontamination enclosure shall be cleaned and disinfected minimally at the end of each Work shift and as otherwise directed by the Abatement Project Monitor.

3.03 WASTE DECONTAMINATION ENCLOSURE

- A. Provide a waste decontamination enclosure contiguous to the Work area or as per Variance. The decontamination enclosure shall be attached to the Work Area and not located within it unless isolation barriers are installed. If the decontamination chamber is accessible to the public it shall be fully framed and sheathed to prevent unauthorized entry.
- B. The waste decontamination enclosure system shall consist of a holding area, airlock and washroom. The airlock shall be a minimum of three (3) feet from door to door. The entrance to the holding area shall have a lockable door.
- C. The decontamination enclosure ceiling and walls shall be covered with one (1) layer of opaque 6 mil fire retardant polyethylene sheeting on walls and ceiling. Two (2) layers of reinforced 6 mil fire retardant polyethylene sheeting shall be used to cover the floor.
- D. Where there is only one egress from the Work Area, the holding area of the waste decontamination enclosure system may branch off from the personal decontamination enclosure equipment room, which then serves as the waste wash room.
- E. The waste wash room water shall be drained, collected, and filtered through a system with at least a 5.0 micron particle size collection capability containing a series of several filters with progressively smaller pore sizes to avoid rapid clogging of the system. The filtered waste water shall then be discharged in accordance with applicable codes and the contaminated filters disposed of as RACM asbestos waste.
- F. In small asbestos Projects where only one (1) egress from the Work Area exists, the shower room may be used as a waste washroom. In this instance, the clean room shall not be used for waste storage, but shall be used for waste transfer to carts, which shall immediately be removed from this enclosure.

3.04 WORK AREA ENTRY AND EXIT PROCEDURES

- A. Access to and from the asbestos Work Area is permitted only through the personal decontamination enclosure unless otherwise stipulated in a Variance.
- B. Workers shall sign the Work Area entry/exit log (located in the decontamination clean room) upon every entry and exit.
- C. The following procedures shall be followed when entering the Work Area:
 - 1. Before entering the Work Area, Workers shall proceed to the clean room, remove all street clothes, and don protective clothing, equipment, and respirators.

2. Workers shall proceed from the clean room through the shower room and the equipment room and into the Work Area.
- D. The following procedures shall be followed when exiting the Work Area:
1. Before leaving the Work Area, gross asbestos contamination will be removed by brushing, wet cleaning and/or HEPA vacuuming.
 2. In the equipment room, Workers shall remove disposable clothing, but not respirators, and shall place clothing in plastic disposal bags for disposal as contaminated debris prior to entering the shower room.
 3. Workers shall shower thoroughly while wearing respirators then wash respirator with soap and water prior to removal.
 4. Upon exiting the shower, Workers shall don new disposable clothing if the Work shift is to continue or street clothes to exit area. Under no circumstances shall Workers enter public non-Work Areas in disposable protective clothing.
- E. If remote decontamination enclosures are permitted by applicable regulations or a Variance, workers shall wear two disposable suits for all phases of Work. Workers exiting the work area shall HEPA vacuum the outer suit, enter the airlock, remove the outer suit and then place it back into the Work Area. A clean second suit shall be donned before exiting the airlock and proceeding to the decontamination enclosure or another work area via the designated pathway.

3.05 WORK AREA PREPARATION

- A. Asbestos danger signs shall be posted at all approaches to the asbestos Work Area. Post all emergency exits as emergency exits only on the Work Area side; post with asbestos caution signs on the non-Work Area side. Provide all non-Work Area stairs and corridors accessible to the asbestos Work Area with warning tapes at the base of stairs and beginning of corridors. Warning tapes shall be in addition to caution signs.
- B. Shut down and lock out the building heating, ventilating, and air conditioning (HVAC) systems. Electrical systems and circuits shall also be shut down unless permitted to remain active per applicable regulations and appropriately protected and labeled. Existing lighting sources shall not be utilized. Provide temporary electric power and lighting as specified herein.
- C. All non-ACM surfaces and objects within the Work Area shall be pre-cleaned using HEPA vacuuming and/or wet-wiping methods. Dry sweeping and any other methods that raise dust shall be prohibited. ACM shall not be disturbed during pre-cleaning.
- D. Movable objects within the Work Area shall be HEPA vacuumed and/or wet-wiped and removed from the Work Area.
- E. All non-movable equipment in the Work Area shall be completely covered with two (2) layers of fire retardant polyethylene sheeting, at least 6 mil in thickness, and secured in place with duct tape and/or spray adhesive. Active Fire Protection System components in the Work Area shall not be covered with fire retardant plastic sheeting or any other obstruction.
- F. Provide enclosure of the asbestos Work Area necessary to isolate it from unsealed areas of the building in accordance with the approved asbestos Work plan and as specified herein.
- G. Provide critical barriers by sealing off all openings including but not limited to windows, diffusers, grills, electrical outlets and boxes, doors, floor drains, and any other penetrations of the Work Area enclosure, using two (2) layers of at least 6 mil fire retardant polyethylene sheeting.

- H. Provide isolation barriers by installing temporary framing and sheathing at openings larger than 32 square feet forming the limits of the asbestos Work Area. Sheathing thickness must be a minimum of 3/8 inch and all sheathing shall be caulked and the Work Area side sealed with two (2) layers of 6 mil fire retardant polyethylene sheeting.
- I. Isolation barriers shall be installed at all elevator openings in the Work Area. Elevators running through the regulated abatement work area shall be shut down or isolated as per applicable regulations. Elevator controls shall be modified so that elevators bypass the Work Area.
- J. Provide two (2) independent layers of 6 mil fire retardant polyethylene sheeting over all floor, wall, and ceiling surfaces. Each sheet/layer shall be individually applied and secured with tape, not folded over. Isolation barriers shall also be covered with two (2) independent layers (for a total of four (4) layers). Sheets shall be secured with duct tape. All joints in fire retardant polyethylene sheeting shall overlap 12" minimum. Carpeting left in place shall be covered with 3/8-inch plywood sheathing prior to plasticizing.
- K. Unless otherwise specified for removal, the Contractor shall either protect all fiberglass insulation on piping, ductwork, tanks, etc. in the Work Area using two (2) layers of 6 mil fire retardant polyethylene or remove the insulation as asbestos-containing waste. If the Contractor elects to remove the fiberglass insulation, he/she shall be responsible for reinsulation, if piping is required to be insulated.
- L. Frame out emergency exits. Provide double layer 6 mil fire retardant polyethylene sheeting and tape seal opening. Post as emergency exits only and mark with photoluminescent paint or signage. Provide a cutting tool on the Work Area side of exit.
- M. Remove all items attached to or in contact with ACM only after the Work Area enclosure is in place. HEPA vacuum and wet wipe with amended water all removed items prior to their removal from the Work Area and before the start of asbestos removal operations.
- N. Suspended ceiling tiles shall only be removed after Work Area preparation is complete. If possible, non-contaminated ceiling tiles shall be HEPA vacuumed and removed from the Work Area before asbestos removals begin. Contaminated ceiling tiles and porous ceiling tiles in work areas with ACM debris located above the ceiling shall be disposed of as RACM asbestos waste.

3.06 NEGATIVE AIR PRESSURE FILTRATION SYSTEM

- A. Provide a portable asbestos filtration system that develops a minimum pressure differential of negative 0.02 inches of water column within all full enclosure areas relative to adjacent unsealed areas and that provides a minimum of four (4) air changes per hour in the Work Area during abatement and six (6) air changes for non-friable flooring and/or mastic removal.
- B. Such filtration systems must be made operational after critical and isolation barriers are installed but before wall, floor, and ceilings are plasticized and shall be operated 24 hours per day during the entire Project until the final cleanup is completed and satisfactory results of the final air samples are received from the laboratory.
- C. The system shall include a series of pre-filters and filters to provide High Efficiency Particulate Air (HEPA) filtration of particles down to 0.3 microns at 100% efficiency and below 0.3 microns at 99.9% efficiency. Provide sufficient replacement filters to replace pre-filters every 2 hours, secondary pre-filters every 24 hours, and primary HEPA filters every 600 hours of operation. HEPA filter sides shall be marked with the date of installation during all new HEPA filter installations on the Project.

- D. A minimum of one (1) additional filtration unit of at least the same capacity as the primary unit(s) shall be installed and fully functional to be used during primary unit (s) filter changing and in case of primary failure.
- E. If the containment area includes either the entire floor of the building or an area greater than 15,000 square feet on any floor, install a negative air cut off switch as required by NYC DEP regulations.
- F. Upon electric power failure or shut-down of any filtration unit, all abatement activities shall stop immediately and only resume after power is restored and all filtration units are fully operating. For shut-downs longer than one-half hour, all openings into the Work Area, including the decontamination enclosures, shall be sealed.
- G. The Contractor shall provide a manometer to verify negative air pressure. Manometers shall be read twice daily and recorded within the Supervisor's Daily Project Log.
- H. There shall be at least a four (4) hour settling period after the Work Area is fully prepared, small and large projects only, as defined by 12 NYCRR Part 56, and the negative filtration units have been started to ensure integrity of the barriers.
- I. Once installed and operational, the Contractor's Supervisor shall conduct daily inspections of the Work Area to ensure the airtight integrity of the enclosure and operation of the negative air system. Findings shall be recorded within the Daily Project Log. Inspections shall also be conducted on days when no abatement activities are in progress.

3.07 REMOVAL OF ASBESTOS-CONTAINING MATERIALS

- A. If new (previously unidentified) suspect ACM is discovered during the course of a Project, Owner or Owner's Representative shall be notified. The Contractor is prohibited from collecting bulk samples. The Designer of Record shall have bulk samples collected by a dually certified NYS DOL asbestos inspector and NYC DEP asbestos investigator to determine asbestos content.
- B. Definition of Substrate – The underlying support, foundation or base (e.g. wood lathe, wire screen, concrete, etc.) to which a single layer or multilayered system (e.g. plaster, roofing, etc.) is applied.
- C. Asbestos-containing materials shall be removed in accordance with the Contract Documents and the approved Asbestos Work Plan. Only one (1) type of ACM shall be abated at a time within a Work Area. Where there are multiple types of ACM requiring abatement, applicable regulations procedures for sequential abatement shall be followed.
- D. Sufficiently wet asbestos materials with a low pressure, airless fine spray of surfactant to ensure full penetration to substrate prior to material removal. Re-wet material that does not display evidence of saturation.
- E. One (1) Worker shall continuously apply amended water while ACM is being removed. All layers of ACM shall be removed to the underlying substrate (e.g. concrete, roof deck, piping, etc.), unless stated otherwise in the contract documents.
- F. Perform cutting, drilling, abrading, or any penetration or disturbance of asbestos-containing material in a manner to minimize the dispersal of asbestos fibers into the air. Use equipment and methods specifically designed to limit generation of airborne asbestos particles. All power operated tools used shall be provided with manufacturer equipped HEPA filtered local exhaust ventilation.

- G. Upon removal of ACM from the substrate, the newly exposed surfaces shall be HEPA vacuumed and/or wet cleaned. Surfaces must be thoroughly cleaned using necessary methods and any required solvents to completely remove any adhesive, mastic, etc.
- H. All removed material shall be placed into 6 mil plastic disposal bags or other suitable container upon detachment from the substrate. ACM is not permitted to lie on the floor for any period of time. Cleanup of accumulations of loose debris or waste shall be performed whenever there is enough accumulation to fill a single bag or container and minimally at the end of each workshift.
- I. Large components shall be wrapped in two (2) layers of 6 mil polyethylene sheeting. Sharp components likely to tear disposal bags shall be placed in fiber drums or boxes and then wrapped with sheeting.
- J. Power or pressure washers are not permitted for asbestos removal. Power or pressure washers are allowed during clean-up procedures only if stated in an approved Site-Specific Variance and allowed by the Owner or Owner's representative.
- K. All open ends of pipe and duct insulation not scheduled for removal shall be encapsulated using lag cloth.
- L. All construction and demolition debris determined by the Environmental Consultant to be contaminated with asbestos shall be handled and disposed of as RACM asbestos waste.
- M. The use of metal shovels, metal dust pans, etc. are not permitted inside the work area.

3.08 EQUIPMENT AND WASTE CONTAINER DECONTAMINATION AND REMOVAL PROCEDURES

- A. External surfaces of contaminated containers and equipment shall be cleaned by wet cleaning and/or HEPA vacuuming in the Work Area before moving such items into the waste decontamination enclosure system airlock by persons assigned to this duty. The persons in the Work Area shall not enter the airlock. No gross removal operations are permitted when waste transfer is in progress.
- B. The containers and equipment shall be removed from the airlock by persons stationed in the washroom during waste removal operations. The external surfaces of containers and equipment shall be cleaned a second time by wet cleaning.
- C. The cleaned containers of asbestos material and equipment are to be dried of any excessive pooled or beaded liquid, placed in uncontaminated 6 mil plastic bags or sheeting, as the item's physical characteristics demand, and sealed airtight.
- D. The clean recontainerized items shall be moved into the airlock that leads to the holding area. Workers in the washroom shall not enter this airlock.
- E. Containers and equipment shall be moved from the airlock and into the holding area by persons dressed in clean personal protective equipment, who have entered from the holding area.
- F. The cleaned containers of asbestos material and equipment shall be placed in water tight carts with doors or tops that shall be closed and secured. These carts shall be held in the holding area until transfer to the waste trailer/container. The carts shall be wet cleaned and/or HEPA vacuumed at least once each day.

- G. The exit from the decontamination enclosure system shall be secured to prevent unauthorized entry.
- H. Where the waste removal enclosure is part of the personal decontamination enclosure, waste removal shall not occur during shift changes or when otherwise occupied. Precautions shall be taken to prevent short circuiting and cycling of air outward through the shower and clean room.

3.09 WORK AREA DECONTAMINATION, CLEANING, AND CLEARANCE PROCEDURES

- A. Following completion of gross abatement and after all accumulations of asbestos waste materials have been containerized, the following decontamination procedures shall be followed unless modified by a Variance.
- B. First Cleaning:
 - 1. All bagged asbestos waste and unnecessary equipment shall be decontaminated and removed from the Work Area.
 - 2. All surfaces in the Work Area shall be wet cleaned, except active fire protection system components that may be damaged by water. A wet-purpose shop vacuum may be used to pick up excess liquid, and may either be decontaminated prior to removal from the Work Area or disposed of as RACM asbestos waste.
 - 3. The Abatement Project Monitor shall conduct a visual inspection of the Work Area for cleanliness and completion of abatement and document the results in the project log accordingly.
 - 4. The Contractor shall then apply a thin coat of encapsulant to all surfaces in the Work Area that were not the subject of removal. In no event shall encapsulant be applied to any surface that was the subject of removal prior to obtaining satisfactory air monitoring results. Encapsulants shall be pigmented or tinted to provide an indication for completeness of coverage. The Abatement Project Monitor shall determine adequacy of coverage.
 - 5. After the encapsulant has been applied and the required waiting/settling and drying time has elapsed, the first layer of fire retardant polyethylene sheeting shall then be removed and bagged as RACM asbestos waste.
- C. Second Cleaning
 - 1. All surfaces in the Work Area shall be HEPA vacuumed and then wet cleaned. Wet cleaning of active fire protection system components is not necessary if damage may occur.
 - 2. The Abatement Project Monitor shall conduct a second visual inspection of the Work Area for cleanliness and document the results in the project log accordingly.
 - 3. After the required waiting/settling and drying time has elapsed, the second layer of fire retardant polyethylene sheeting shall be removed and bagged as RACM asbestos waste.
- D. Third Cleaning
 - 1. All surfaces in the Work Area shall be HEPA vacuumed and then wet cleaned. Wet cleaning of active fire protection system components is not necessary if damage may occur.
 - 2. After the required waiting/settling and drying time has elapsed, the Abatement Project Monitor shall conduct a third visual inspection of the Work Area for cleanliness and document the results in the project log accordingly.
 - 3. After satisfactory APM visual inspection, aggressive final clearance air sampling shall then be conducted by the APM provided no visible asbestos debris/residue; pools of liquid, or condensation remains. NOTE: TEM samples should be used vs. PCM if

demolition or other dust-generating evolutions are taking place in adjacent areas, as evident from excessive loading.

4. Upon receipt of satisfactory final clearance air sampling results, the negative air pressure equipment can be shut down and the isolation and critical barriers removed and bagged as RACM asbestos waste.
- E. After isolation and critical barriers are removed, the Abatement Project Monitor and Contractor's Supervisor shall inspect the Work Area for cleanliness. If necessary, additional cleaning shall be performed by the Contractor as directed by the Abatement Project Monitor. Following the satisfactory inspections, the decontamination enclosures shall be removed.
- F. As a result of any visual inspection by the Abatement Project Monitor or should air sampling results indicate high fiber levels, the Contractor will clean or reclean the affected areas at no additional expense to owner or owner's representative. Clearance air samples shall be collected again if previous results failed, at no additional expense to owner or owner's representative. The Contractor shall be back-charged for the additional clearance air sample collection and analysis.

3.10 TENT ENCLOSURES

- A. Tent enclosures may only be used where specifically permitted by applicable regulations following 1-105 Tent Procedures or a Variance.
- B. Tent procedures must be limited to the removal of less than 260 linear feet and 160 square feet of ACM on any individual floor and must not result in disturbance of ACM during tent erection.
- B. The Contractor shall restrict access to the immediate area where tent removal procedures are taking place using barrier tape and/or construction barriers. Caution signs shall be posted.
- C. Personal and waste decontamination enclosures shall be constructed. Configuration shall be as required by Project size. Remote personal decontamination enclosure may be allowed by variance.
- D. The Work Area shall be precleaned. All objects and equipment that will remain in the restricted area during abatement shall be sealed with two (2) layers of six mil fire retardant polyethylene and tape.
- E. The tent shall be a single use barrier constructed with a rigid frame and at least two (2) layers of 6 mil fire retardant polyethylene unless one (1) layer of 6 mil fire retardant polyethylene is otherwise permitted by applicable regulations. All seams shall be sealed airtight using duct tape and/or spray adhesive.
- F. The tent shall be constructed with at least one (1) airlock for worker/waste egress.
- G. A monometer shall be used for all enclosures.
- H. Negative air shall be maintained at four (4) air changes per hour for non-friable and glovebag abatement tent enclosure work areas. Eight (8) air changes shall be maintained for friable gross removal tent enclosure work areas.
- I. OSHA compliance air monitoring is required per section 1.09.
- J. ACM removal shall follow procedures defined in section 3.07.

- K. Waste material shall be placed in properly labeled 6 mil plastic bags or other appropriate containers. The outside of the bags or containers shall be wet wiped and/or HEPA vacuumed in the wash room and shall then be placed in a second bag/container before being transferred to the waste storage container. All transportation of waste bags and containers outside the Work Area shall be in watertight carts. These carts shall be held in the holding area until transfer to the waste storage container. The carts shall be wet cleaned and/or HEPA vacuumed at least once each day.
- L. Following completion of gross abatement and after all accumulations of asbestos waste materials have been containerized, the following decontamination procedures shall be followed.
 - 1. All bagged asbestos waste and unnecessary equipment shall be decontaminated and removed from the Work Area.
 - 2. All surfaces in the Work Area shall be wet cleaned. A wet-purpose shop vacuum may be used to pick up excess liquid, and shall be decontaminated prior to removal from the Work Area.
 - 3. The asbestos supervisor shall perform a visual inspection of the work area(s) followed by the APM prior to applying the encapsulation.
 - 4. The Contractor shall then apply a thin coat of encapsulant to all non-removal surfaces covered with plastic in the Work Area. In no event shall encapsulant be applied to any surface that was the subject of removal prior to obtaining satisfactory air monitoring results. Encapsulants shall be pigmented or tinted to provide an indication for completeness of coverage. The APM shall determine adequacy of coverage.
 - 5. After the waiting/settling/drying time requirements have elapsed, the Abatement Project Monitor shall conduct a visual inspection of the Work Area for cleanliness and completion of abatement. The APM shall document the results of the visual inspection in the Project Monitor Log and Contractor's Daily Project Log.
 - 6. After satisfactory APM visual inspection, aggressive final clearance air sampling shall then be conducted by the APM.
 - 7. Upon receipt of satisfactory final clearance air sampling results, the tent shall be collapsed into itself, placed in suitable disposal bags, and transported to the waste decontamination enclosure. Isolation and critical barriers shall then be removed and bagged as RACM asbestos waste followed by satisfactory visual inspections by the project supervisor and the APM for cleanliness.

3.11 GLOVEBAG REMOVAL

- A. Glovebag removals may only be used as specifically permitted by applicable regulations or a Variance following 1-105 Glovebag Procedures. Glovebags may only be used on piping.
- B. In addition to conformance with applicable regulations and Variances, glovebag removals are only permitted to be conducted within full containments or tent enclosures complying with these specifications.
- C. The Contractor shall restrict access to the immediate area where tent/glovebag removal procedures are taking place using barrier tape and/or construction barriers. Caution signs shall be posted.
- D. Personal and waste decontamination enclosures shall be constructed. Configuration shall be as required by Project size. Remote personal decontamination enclosure may be allowed by variance.
- E. Glovebag removals shall utilize commercially available glovebags of at least 6 mil thickness. Use shall be in accordance with the manufacturer's instructions and the following minimum requirements:

1. The sides of the glovebag shall be cut to fit the size pipe being removed. Tools shall be inserted into the attached tool pocket.
 2. The glovebag shall be placed around the pipe and the open edges shall be folded and sealed with staples and duct tape. The glovebag shall also be sealed at the pipe to form a tight seal.
 3. Openings shall be made in the glovebag for the wetting tube and HEPA vacuum hose. The opening shall be sealed to form a tight seal.
 4. All glovebags shall be smoke tested by the Abatement Project Monitor under negative pressure using the HEPA vacuum before removal operations commence. Glovebags that do not pass the smoke test shall be resealed and then retested.
 5. After first wetting the materials to be removed, removal may commence. ACM shall be continuously wetted. After removal of the ACM, the piping shall be scrubbed or brushed so that no visible ACM remains. Open ends of pipe insulation shall be encapsulated.
 6. After the piping is cleaned, the inside of the glovebag shall be washed down and the wetting tube removed. Using the HEPA vacuum, the glovebag shall be collapsed and then twisted and sealed with tape with the ACM at the bottom of the bag.
 7. A disposal bag shall be placed around the glovebag that is then detached from the pipe. The disposal bag is then sealed and transferred through the wash room to the waste storage container.
- F. After glovebag removals are complete, containment/tent decontamination procedures shall be followed.

3.12 REMOVALS OF EXTERIOR NON-FRIABLE ACM

- A. Except as modified by this section, removal of exterior non-friable ACM shall conform to all provisions of this specification and 1-107 Foam Procedures for Roof Removal .
- B. Unless Variances have been otherwise obtained, removals shall be conducted in accordance with the provisions of applicable regulations.
- C. Establish and maintain a warning line system and comply with OSHA 29 CFR 1936, Subpart M, Fall Protection, when applicable.
- C. The Work Area shall be the area from which ACM materials are being removed and shall extend 25 feet from the perimeter of the removal area.
- D. Non-certified Workers are not allowed in the Work Area until the Work Area is cleared by the Abatement Project Monitor.
- E. Personal and waste decontamination enclosures shall be constructed at a location in accordance with the approved Work Plan and applicable regulations. Unless located outside the Work Area, decontamination enclosures are not permitted to be constructed on the roof. Remote personal decontamination enclosure may be allowed by variance.
- F. All openings (including but not limited to operable windows, doors, hatches, vents, ducts, and grilles) one (1) story above, one (1) story below, and within 25 feet of the work area shall be sealed with two (2) layers of 6 mil fire retardant polyethylene.
- G. The removal of the ACM may require the use of scrapers, solvents, mastic removal chemicals, or other methods/procedures to ensure complete removal. Refer to Section 2.10 for other Power tool requirements.

- H. The Contractor is required to provide temporary protection of the building (i.e. roof, window openings, construction joints, etc.) at the end of each Work shift so as to maintain the building in a watertight condition.
- I. All asbestos waste generated shall be containerized in the work area, prior to transfer to waste storage trailer/container/dumpster. No waste shall remain in the work area at the end of each work shift. All waste shall be disposed of as RACM asbestos waste including projects where waste transfer procedures are modified by Site Specific Variance.
- J. Waste Containers used for waste storage shall be lined with two (2) layers of six mil polyethylene and shall have a hard top (fully enclosed). Canvas cover or open topped dumpsters shall not be used to store asbestos waste unless permitted by a Site-Specific Variance.
- K. Personal protective equipment, including respirators, shall be utilized and worn during all removal operations until the Work Area is cleared by the Abatement Project Monitor.
- L. If air samples collected during abatement indicate any airborne asbestos fiber concentration(s) at or above 0.01 f/cc or the background level, whichever is greater, Work shall be stopped immediately and Work methods shall be altered to reduce the airborne asbestos fiber concentration(s).
- M. Abatement will not be performed under bad weather (e.g. precipitation, high winds, temps below 32 degrees Fahrenheit, etc.).
- N. Following completion of gross abatement and after all accumulations of asbestos waste materials have been containerized, the following decontamination procedures shall be followed:
 - 1. All surfaces in the Work Area shall be HEPA vacuumed and then wet cleaned.
 - 2. The Abatement Project Monitor shall conduct a visual inspection of the Work Area for cleanliness and completeness of abatement, prior to conducting final air clearance.
 - 3. Upon obtaining satisfactory clearance air sample results, the isolation and critical barriers shall be removed and bagged as RACM asbestos waste. Following this, the decontamination enclosures shall be removed.

3.13 NON-FRIABLE FLOORING AND/OR MASTIC REMOVALS

- A. The following procedures may only be used for the removal of non-friable flooring and/or mastic materials using foam or viscous liquid (non-toxic) following 1-108 Foam/Viscous Liquid use in Flooring Removal. These procedures shall not apply to beadblaster use or other abrasive abatement methods.
- B. The Contractor shall restrict access to the immediate area where removals are taking place using barrier tape and/or construction barriers. Caution signs shall be posted.
- C. Personal and waste decontamination enclosures shall be utilized and shall be constructed at a location in accordance with the approved Work Plan. Remote personal decontamination enclosure may be allowed by variance.
- D. The Work Area shall be prepared per applicable regulations.
- E. Negative air shall be maintained at six (6) air changes per hour.
- F. OSHA compliance air monitoring is required per section 1.09.
- G. ACM removal shall follow procedures defined in section 3.07.

- H. Waste material shall be placed in properly labeled 6 mil plastic bags or other appropriate containers. The outside of the bags or containers shall be wet wiped and/or HEPA vacuumed before being passed into the wash room for double-bagging. The bags or containers shall then be transferred to the waste storage container. All transfer of waste bags and containers outside the Work Area shall be in watertight carts.
- I. Following completion of gross abatement and after all accumulations of asbestos waste materials have been containerized, the following decontamination procedures shall be followed.
 - 1. All bagged asbestos waste and unnecessary equipment shall be decontaminated and removed from the Work Area.
 - 2. All surfaces in the Work Area shall be wet cleaned. A wet-purpose shop vacuum may be used to pick up excess liquid, and shall be decontaminated prior to removal from the Work Area.
 - 3. The Abatement Project Monitor shall conduct a visual inspection of the Work Area for cleanliness and completion of abatement.
 - 4. The Contractor shall then apply a thin coat of encapsulant to all non-removal surfaces covered with plastic in the Work Area. In no event shall encapsulant be applied to any surface that was the subject of removal prior to obtaining satisfactory air monitoring results. Encapsulants shall be pigmented or tinted to provide an indication for completeness of coverage. The Abatement Project Monitor shall determine adequacy of coverage.
 - 5. After the encapsulant has been applied and the required waiting/settling and drying time has elapsed, aggressive final clearance air sampling shall then be conducted by the APM.
 - 6. Upon receipt of satisfactory final clearance air sampling results, the isolation and critical barriers shall be removed. Following this, the decontamination enclosures shall be removed.

3.14 RESTORATION OF UTILITIES, FIRESTOPPING, AND FINISHES

- A. If final inspection is required by NYC DEP regulations or Variance, Owner or Owner's representative's Design Professional shall be responsible to submit the A-TR1 form to NYC DEP.
- B. After final clearance, remove locks and restore electrical and HVAC systems. All temporary power shall be disconnected, power lockouts removed and power restored. All temporary plumbing shall be removed.
- C. Finishes damaged by asbestos abatement activities including, but not limited to, plaster/paint damage due to duct tape and spray adhesives, and floor tile lifted due to wet or humid conditions, shall be restored prior to final payment.
 - 1. Finishes unable to be restored shall be replaced under this Contract.
 - 2. All foam and expandable foam products and materials used to seal Work Area openings shall be completely removed upon completion of abatement activities.
- D. All penetrations (including, but not limited to, pipes, ducts, etc.) through fire rated construction shall be firestopped using materials and systems tested in accordance with ASTM E814 on Projects where reinsulation is part of the required work.

PART 4 DISPOSAL OF ASBESTOS WASTE

4.01 TRANSPORTATION AND DISPOSAL SITE

- A. The Contractor's Hauler and Disposal Site shall be approved by the Owner or Owner's representative. All waste generated during the asbestos project shall be disposed of as RACM asbestos waste.
- B. The Contractor shall give 24 hour notification prior to removing any waste from the site. Waste shall be removed from the site only during normal working hours unless otherwise specified. No waste may be taken from the site unless the Contractor and APM are present and the APM authorizes the release of the waste as described herein.
- C. All waste generated as part of the asbestos project shall be removed from the site within ten (10) calendar days after successful completion of all asbestos abatement work.
- D. Upon arrival at the Project Site, the Hauler must possess and present to the APM a valid US DOT Hazardous Waste Transporter Permit, New York State Department of Environmental Conservation Part 364 Asbestos Hauler's Permit and any New York City required permit/license. The APM may verify the authenticity of the hauler's permit with the proper authority.
- E. The Hauler, with the Contractor and the APM, shall inspect all material in the transport container prior to taking possession and signing the Asbestos Waste Shipment Records.
- F. Unless specifically approved by the Owner or Owner's representative, the Contractor shall not permit any off-site transfers of the waste or allow the waste to be transported or combined with any other off-site asbestos material. The Hauler must travel directly to the disposal site as identified on the notifications with no unauthorized stops.
- G. The APM shall verify the landfill to be used for waste disposal with the waste transporter (driver) and Contractor prior to the waste trailer/dumpster leaving the site. The APM shall confirm the waste transporter firm and landfill are listed on the regulatory notifications for the project and the waste transport vehicle license number is listed on the current NYS DEC Waste Transporter permit.

4.02 WASTE STORAGE CONTAINERS

- A. All waste containers shall be fully enclosed with a hard top and be lockable (i.e. enclosed dumpster, trailer, etc.). No open containers will be permitted on-site (i.e. open dumpster with canvas cover, etc.) unless specifically permitted by a Variance. When asbestos contaminated waste must be kept on the work site overnight or longer, it shall be double bagged and stored in accordance with Federal, State, and local laws, including New York City Department of Sanitation Title 16, Chapter 8 of the Rules of New York City.
- B. The APM shall verify that the waste storage container and/or truck tags (license plates) match the information listed on the New York State Department of Environmental Conservation Part 364 permit. Any container not listed on the permit shall be removed from the site immediately.
- C. The container shall be plasticized and sealed with two (2) layers of 6 mil polyethylene. Once on site, it shall be kept locked at all times, except during load out. The waste container shall not be used for storage of equipment or contractor supplies.

- D. While on-site, the container shall be labeled with EPA Danger signage:
- DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
- E. The New York State Department of Environmental Conservation Asbestos Hauler's Permit number shall be displayed on both sides and back of the container. The permit number shall be at least 3 inches high and in a color that contrasts with the container / vehicle background color.
- F. The container is not permitted to be loaded unless it is properly plasticized, has the appropriate danger signage affixed, and has the permit number appropriately displayed on the container.
- G. Waste generated off-site or from a different project is not permitted to be brought onto the Project site and/or loaded into the waste container.
- H. All asbestos waste removed from the Project site shall be transported directly to the disposal site without any additional waste being added to the container during transport.
- I. Owner or Owner's representative may initiate random checks at the Disposal Site to ensure that the procedures outlined herein are complied with.

4.03 OWNER'S REPRESENTATIVE AND HAULER'S ASBESTOS WASTE SHIPMENT RECORDS

- A. An Asbestos Waste Shipment Record shall be provided by the Owner's representative (Appendix A) and shall be utilized in conjunction with the Asbestos Hauler's Waste Shipment Record.
- B. Owner's representative's Waste Shipment Record and the Hauler's Waste Shipment Record shall be completed by the Contractor and verified by the APM that all the information and amounts are accurate and the proper signatures are in place.
- C. The Waste Shipment Records shall have the appropriate signatures of the APM, the Contractor, and the Hauler representatives prior to any waste being removed from the site.
- D. Copies of the completed Owner's representative Waste Shipment Record and the Hauler's Waste Shipment Record shall be retained by the APM and the Contractor and shall remain on site for inspection.
- E. The Contractor shall utilize the Waste Shipment Record Log provided by Owner or Owner's representative. This log shall be maintained by the Project Supervisor and shall be kept on site at all times. (See Appendix B.)
- F. Upon arrival at the Disposal Site, Owner's representative Waste Shipment Record and the Hauler's Waste Shipment Record shall be signed by the Disposal Facility operator to certify receipt of ACM covered by the Waste Shipment Record.
- G. The Disposal Facility operator shall return the original Owner's representative's Waste Shipment Record and the Hauler's Waste Shipment Record to the Contractor.
- H. The Contractor shall forward copies of Owner's representative's Waste Shipment Record and the Hauler's Waste Shipment Record to the APM within 14 days of the waste container being

removed from the site. Failure to do so may result in payment being withheld from the Contractor.

- I. Originals of all Waste Shipment Records, Contractor Acknowledgement Statements, and signed / notarized letters shall be submitted by the Contractor to Owner or Owner's representative with the final close-out documentation.

END OF SECTION 02 82 00

APPENDIX A

SAMPLE ASBESTOS WASTE SHIPMENT RECORD

**DASNY**

Asbestos Waste Shipment Record
Dormitory Authority State of New York
515 Broadway
Albany, New York 12207-2964

Record No.
A4001

DASNY PROJECT NUMBER: _____

Responsible Agency: EPA Region II - Air Branch
290 Broadway, 21st Floor, New York, NY 10007-1866

DASNY Project Name: _____

Generator Facility Name: _____

Generator Facility Address: _____

DASNY Contact Person: _____ Phone #: _____

Asbestos Abatement Contractor Firm Name & Address: _____

Contact Person _____ Phone # _____ Asbestos License # _____

Asbestos Consultant/Monitoring Firm Name and Address: _____

Contact Person _____ Phone # _____ Asbestos License # _____

Asbestos Abatement Contractor/Consultant Certification: I hereby declare that the contents of this consignment are fully described below and are packed, marked, and labeled in accordance with applicable governmental regulations.

Type of Material: _____ RQ, NA2212, RACM Asbestos, 9, PGIII

Type & Size of Container: _____ Type of Packaging & Volume (yd³ or m³): _____

Asbestos Abatement Contractor Name: _____

Date: _____ Signature: _____

Asbestos Consultant/Monitor Name: _____

Date: _____ Signature: _____

Transporter/Transfer Facility Acknowledgement of Receipt of Material:

Transporter #1 Company Name, Address, Phone #: _____

Name: _____ Signature: _____

Date & Time of Departure _____ State Transporter Permit # _____

Truck/Trailer License # _____ USDOT Permit # _____

Discrepancies Noted: _____

Transfer Facility (if applicable) Company Name, Address, Phone #: _____

Name: _____ Signature: _____

Date & Time of Departure _____ Permit (NYSDEC #) _____

Discrepancies Noted: _____

Transporter #2 (if applicable) Company Name, Address, Phone #: _____

Name: _____ Signature: _____

Date & Time of Departure _____ State Transporter Permit # _____

Truck/Trailer License # _____ USDOT Permit # _____

Discrepancies Noted: _____

Disposal Facility Owner or Operator: I hereby certify receipt of the asbestos waste covered by this shipment record including discrepancies noted above.

Disposal Facility Name, Address and Phone #: _____

Date & Time of Arrival: _____

Name: _____ Signature: _____

Disposal facility to return completed waste shipment record (white copy) to the Asbestos Abatement Contractor listed above.

White: DASNY Green: Disposal Facility Canary: Transporter Pink: Consultant Goldenrod: Contractor

**DASNY**

Asbestos Waste Shipment Record
Dormitory Authority State of New York
515 Broadway
Albany, New York 12207-2964

Record No.
A4001

DASNY PROJECT NUMBER: 12349999

Responsible Agency: EPA Region II - Air Branch
290 Broadway, 21st Floor, New York, NY 10007-1866

DASNY Project Name: Lake Placid University Snow Hall Renovation

Generator Facility Name: Lake Placid University

Generator Facility Address: 1234 Above and Beyond Ln, Lake Placid NY 12340

DASNY Contact Person: DASNY Construction Project Manager Phone #: (###) ###-####

Asbestos Abatement Contractor Firm Name & Address: QPN Abatement Services, Inc.
1234 Elm Street, Albany NY 12234

Contact Person Owner or Project Manager Phone # (###) ###-#### Asbestos License # NYSDOL License #

Asbestos Consultant/Monitoring Firm Name and Address: WUV Architecture & Engineering, Inc.
1130 Main Street, Albany NY 12234

Contact Person Project Manager Phone # (###) ###-#### Asbestos License # NYSDOL License #

Asbestos Abatement Contractor/Consultant Certification: I hereby declare that the contents of this consignment are fully described below and are packed, marked, and labeled in accordance with applicable governmental regulations.

Type of Material: TS1 & Miscellaneous RQ, NA2212, RACM Asbestos, 9, PGIII

Type & Size of Container: 100 yard trailer Type of Packaging & Volume (yd³ or m³): 2x 6 mil Bags

Asbestos Abatement Contractor Name: Taylor Doe

Date: 1/1/2021 Signature: X---

Asbestos Consultant/Monitor Name: Riley Smith

Date: 1/1/2021 Signature: X---

Transporter/Transfer Facility Acknowledgement of Receipt of Material:

Transporter #1 Company Name, Address, Phone #: Zeus Hauling, 2234 Spring Lane, Albany, NY 12234 (###) ###-####

Name: Driver Name Signature: X---

Date & Time of Departure 1/1/2021 @ 10:22 AM State Transporter Permit # State Permit #

Truck/Trailer License # ABC 2679 / XYZ 3489 USDOT Permit # Permit #

Discrepancies Noted: TBD by Transporter (if applicable)

Transfer Facility (if applicable) Company Name, Address, Phone #: SWS Env Solutions, Inc. 255 Main Street, Syracuse NY 12234 (###) ###-####

Name: Transfer Facility Representative Signature: X---

Date & Time of Departure 1/2/2021 @ 4:13 PM Permit (NYSDEC #) NYSDEC Permit #

Discrepancies Noted: TBD by Transfer Facility (if applicable)

Transporter #2 (if applicable) Company Name, Address, Phone #: See above for example text

Name: _____ Signature: X---

Date & Time of Departure _____ State Transporter Permit # _____

Truck/Trailer License # _____ USDOT Permit # _____

Discrepancies Noted: _____

Disposal Facility Owner or Operator: I hereby certify receipt of the asbestos waste covered by this shipment record including discrepancies noted above.

Disposal Facility Name, Address and Phone #: XYZ Landfill, 99 Plankton St. Shoretown, NY 14567 (###) ###-####

Date & Time of Arrival: 1/1/2021 @ 3:45 PM

Name: Disposal Facility Representative Signature: X---

Disposal facility to return completed waste shipment record (white copy) to the Asbestos Abatement Contractor listed above.

White: DASNY Green: Disposal Facility Canary: Transporter Pink: Consultant Goldenrod: Contractor

APPENDIX B

WASTE SHIPMENT RECORD LOG

WASTE SHIPMENT RECORD LOG

Facility Name: _____

Building Name/Number: _____

Project Name: _____

Owner Project Number: _____

Asbestos Contractor: _____

Asbestos Project Monitor: _____

Load No.	Hauler Name	NYSDEC #	License Plate No.	Size of Container	Disposal Facility Name	Date Depart from Site	Date Received at Disposal Site	Date Shipment Record Returned

Comments: _____

Page _____ of _____

APPENDIX C

CONTRACTOR'S ACKNOWLEDGEMENT STATEMENT

CONTRACTOR'S ACKNOWLEDGEMENT STATEMENT

Re: Abatement of Asbestos-containing Materials

(Owner Project Title)

(Project Location-Campus, Building ID, Floor)

(Owner Project Number)

Project Date(s) (Start/End)

(Asbestos Contractor)

In consideration of the following individuals' employment in connection with the abatement, handling, and disposal of RACM asbestos-containing materials at the referenced Project, I hereby certify that the employees: a) have received the medical examinations required by OSHA 29 CFR 1926.1101; b) have been fit tested specifically for respirators used on the Project; and c) have received training as required by OSHA 29 CFR 1926.1101 in the proper handling of asbestos-containing materials, including the health implications and risks involved, as well as the use and limitations of the respiratory equipment to be used.

Employee Name (Supervisor and Handlers) (Print Name)	Asbestos NYS DOL Certificate Number	Asbestos NYC DEP Certificate Number
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
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Project Supervisor: _____
Print Name Signature

(Notary block here)

Notary Name: _____

APPENDIX D

NYS DOL DRAFT VARIANCES

SECTION 02 83 10

LCP/LBP DISTURBANCES USING OSHA LEAD SAFE WORK PRACTICES

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. The work covered by this Specification shall consist of furnishing all labor, materials, tools, and equipment necessary to control and mitigate potential lead-based paint (LBP) and lead-containing paint (LCP) material hazards during demolition/renovation activities pertaining to the project **Transformer Rooms Nos. 1 & 2 – Bldg. 1 Bronx Psychiatric Center** at 1500 Waters Place, Bronx, NY 10461 DASNY Project Number 3816609999

This Specification shall be used as a guideline for Contractors who complete the demolition/renovation activities pertaining to this Project, as detailed within Section 1.01, B of this Specification. The intent of this Specification is to remain in conformance with Occupational Safety and Health Administration (OSHA) Regulation 29 CFR 1926.62 “Lead Exposure in Construction” and to maintain an airborne concentration of lead-dust below the Action Level. This Specification is written to provide pertinent information from OSHA for reference, and specifically regarding lead safe work practices.

- B. The following is a detailed listing of identified LBP and/or LCP, above the laboratory and/or device detection limit:

Location	Component	Substrate	Concentration	Color	Condition
To Be Determined					
To Be Determined					
To Be Determined					
To Be Determined					
To Be Determined					
<i>It should be noted that several components tested did contain minimal lead-concentrations below the EPA threshold level of 1.0 mg/cm² or 0.5% by weight for classification as LBP and are considered lead-containing paints or coatings by 29CFR 1926.62. OSHA does not recognize a minimum limit for lead concentration in paint for the purpose of disturbance. Personal Air monitoring of workers performing demolition/cleaning/disturbance of painted surfaces shall be completed as required by OSHA. Items containing any amount of lead concentration are considered lead-containing paints or coatings per 29 CFR 1926.62. See project environmental survey report for lead paint reports. Lead paint summary information is located within the Appendices of this specification.</i>					

For Storage, Transportation and Disposal requirements, refer to the DASNY Standard Specification for the Identification and Disposal of Hazardous Waste 028600.

- C. Manual demolition, scraping and sanding of lead-based paint or lead containing paint coated surfaces, power tool cleaning with dust collection systems shall be performed in conjunction with engineering and work practice controls meeting the requirements of 29 CFR 1926.62(e)(1).
- D. Components with LBP and LCP shall be removed intact to the extent practicable. A 6-mil polyethylene drop cloth shall be placed around and/or beneath the component, prior to its removal, to catch any paint chips that may become dislodged. Intact components shall be wrapped in a layer of clear polyethylene sheeting prior to movement to the disposal container. The area around the component removal shall be wet wiped and high-efficiency particulate air (HEPA) filter vacuumed, including the tent enclosure (if applicable). The polyethylene sheeting shall be carefully folded in on itself and placed in a clear disposal bag and sealed closed. All debris shall be properly disposed of in accordance with the respective waste

stream Resource Conservation Recovery Act (RCRA) Toxicity Characteristic Leaching Procedure (TCLP) testing results and applicable hazardous waste characteristic testing results.

- E. Chemical stripping may be used for LBP and LCP removal on surfaces that will be subjected to welding, cutting, torch burning or where it is the only acceptable procedure. No chemical strippers containing methylene chloride shall be used by the Contractor on this project. SDS for stripping and neutralizing chemicals must be reviewed and approved by the Consultant prior to use and a copy shall be posted at the site.
- F. The Contractor's use of a subcontractor (must be approved) shall not relieve the Contractor of full responsibility for the work to be performed.
- G. The Contractor shall complete an exposure assessment that is compliant with OSHA for LCP & LBP disturbances.
- H. The Contractor must provide to his workers the following: Respiratory protection in accordance with the Contractor's Respiratory Protection Program, personal protective clothing, lead-free change areas, hand washing/shower facilities, blood lead level monitoring and training per 29 CFR 1926.62. The Contractor shall provide additional respiratory protection as indicated by the SDS' as necessary, for any chemical products utilized for the removals. **Respiratory Protection is required for all LBP disturbances.**
- I. The Contractor shall ensure that any HVAC equipment intakes within and around the control areas are protected by shutting down the units. The Contractor shall alter the size and extent of the isolation barriers as necessary due to weather conditions, functional space use and density of building occupants in the vicinity, as required.

1.02 DEFINITIONS, REGULATIONS & REFERENCE STANDARDS

- A. Definitions (excerpted from 29 CFR 1926.62)
 - 1. **Action Level:** Employee exposure, without regard to the use of respirators, to an airborne lead concentration of 30 micrograms per cubic meter (30 ug/m³) calculated as an 8-hour time-weighted average (TWA). Exceedance of the Action Level requires blood lead monitoring implementation.
 - 2. **Competent Person:** One who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions and who has the authorization to take prompt corrective measures to eliminate them. For LBP work, the Competent Person shall also be the on-site Supervisor/Foreman in-charge of the work crew.
 - 3. **Exposure Assessment:** Each employer who has a workplace or operation covered by 29 CFR 1926.62 shall initially determine if any employee may be exposed to lead at or above the Action Level.
 - 4. **Lead:** Metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.
 - 5. **Lead-Based Paint (LBP):** Paint, varnish, shellac or other coatings on surfaces that contain 1.0 milligram per square centimeter (1.0 mg/cm²) or more lead or 0.5% or more lead by weight. The concentration 0.5% is equivalent to:
 - a. 5,000 parts per million (5,000 ppm) and;
 - b. 5,000 milligrams per kilogram (5,000 mg/kg)
 - 6. **Lead-Containing Paint (LCP):** Paint, varnish, shellac or other coatings on surfaces that contain measurable concentrations less than 1.0 milligrams per square centimeter (1.0 mg/cm²) lead or less than 0.5% or more lead by weight including equivalents less than 5,000 ppm and 5,000 mg/kg. This does not include paint, varnish, shellac or other

coatings on surfaces where the concentration is below the detection limit of the respective laboratory method / device.

7. **LBP Inspection:** A surface by surface investigation to determine the presence of LBP. A report is then issued that identifies if there is LBP present and where it is located.
8. **Lead Risk Assessor:** EPA trained and certified to conduct LBP inspections and collect samples for the presence of lead in air, dust and soil for the purposes of abatement clearance testing as well as conduct risk assessments.
9. **Permissible Exposure Limit (PEL):** The limit above which the employer shall not expose workers to lead. The current PEL for lead is 50 ug/m³ over an eight-hour time-weighted-average for all employees covered.

B. General Requirements

The Contractor is required to perform all work related to this project in strict accordance with all applicable Federal, State and Local regulations.

Where these requirements vary, the most stringent shall apply.

C. Specific Requirements

1. American National Standards Institute (ANSI)
ANSI Z9.2-79 – Fundamentals Governing the Design and Operation of Local Exhaust Systems.
2. Z88.2-80 – Practice for Respiratory Protection.
3. Code of Federal Regulations (CFR)
4. 29 CFR Part 1910.120 – Hazardous Waste Operations and Emergency Response.
5. 29 CFR Part 1910.134 – Respiratory Protection.
6. 29 CFR Part 1910.146 – Confined Space Entry Program.
7. 29 CFR Part 1910.1025 – Lead (General Industry Standard).
8. 29 CFR Part 1910.1200 – Hazard Communication.
9. 29 CFR Part 1926.55 – Gases, Vapors, Fumes, Dusts and Mists.
10. 29 CFR Part 1926.57 – Ventilation.
11. 29 CFR Part 1926.62 – Lead (Construction Industry Standard).
12. 40 CFR Part 260 – Hazardous Waste Management Systems: General.
13. 40 CFR Part 261 – Identification and Listing of Hazardous Waste.
14. 40 CFR Part 262 – Generators of Hazardous Wastes.
15. 40 CFR Part 263 – Transporters of Hazardous Waste.
16. 40 CFR Part 264 – Owners and Operators of Hazardous Waste Treatment, Storage & Disposal Facilities.

17. 40 CFR Part 265 – Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage & Disposal Facilities.
18. 40 CFR Part 268 – Land Disposal Restrictions.
19. 40 CFR Part 745 – Lead; Requirements for Lead-Based Paint Activities in Child Occupied Facilities
20. 49 CFR Parts 170-178 – Department of Transportation Regulations.
21. New York Codes of Rules and Regulations (NYCRR)
 - a. 6 NYCRR Part 360 – Solid Waste Regulations.
 - b. 6 NYCRR Part 364 – Waste Transporter Permits.
 - c. 6 NYCRR Part 370-373 – Hazardous Waste Regulations.
22. Steel Structures Painting Council (SSPC)
 - a. SSPC-Guide 6 – Guide for Containing Debris Generated During Paint Removal Operations.
 - b. SSPC-Guide 7 – Guide for the Disposal of Lead-Contaminated Surface Preparation Debris.
23. Underwriters Laboratories. Inc. (UL)
 - a. UL 586 – High Efficiency, Particulate Air Filter Units.

1.03 QUALITY ASSURANCE

The Contractor's Competent Person is required to maintain a copy of the following documents:

A. Qualifications

1. Contractor: Documentation that the Contractor has prior experience on LBP and LCP activity projects similar in nature and extent to ensure the capability to perform the required work procedures in a satisfactory manner.
2. Competent Person: Contractor's Certification that the Contractor's full-time on-site Competent Person meets the Competent Person requirements of 29 CFR Part 1926.62 and is experienced in administration and supervision of LBP and LCP activity projects, including work practices, protective measures for building and personnel, disposal procedures, etc. The Competent Person shall also be the project Supervisor.
3. Contractor's Testing Laboratory: Documentation that the laboratory performing the OSHA personal sample analysis is an EPA National Lead Laboratory Accreditation Program (NLLAP) accredited laboratory and that it is listed proficient in the NIOSH/EPA Environmental Lead Proficiency Analytical Testing Program (ELPAT), and is a New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) certified laboratory. Certification shall include accreditation for heavy metal analysis, and a Quality Assurance and Quality Control Program. Currently, the American Association for Laboratory Accreditation (ASLA) and the American Industrial Hygiene Association (AIHA) are the EPA recognized laboratory accreditors. Documentation shall include the date of accreditation or reaccreditation.
4. Blood Lead Testing Laboratory: Adequate documentation that the laboratory is certified to perform blood lead analysis for the State where the work site is located.

B. Respiratory Protection Devices

Manufacturer's NIOSH certification for respiratory protection devices utilized on the site.

C. Cartridges, Filters, and Vacuum Systems

Manufacturer's NIOSH certification of approval of respirator cartridges (organic vapor, acid gas, mist, dust, high efficiency particulate); High Efficiency Particulate Air (HEPA) filtration capabilities for all cartridges, filters, and HEPA vacuum systems.

D. Medical Examination and Records

1. Certification that employees who are involved in LBP and LCP work have received medical examinations and will receive continued medical surveillance, including blood lead level monitoring, as required by 29 CFR Part 1926.62, 29 CFR Part 910.1200, 29 CFR Part 1910.120 and by the state and local regulations pertaining to such work. Records shall be retained, at Contractor expense, in accordance with 29 CFR Part 1910.20.
2. Provide medical surveillance to workers until exposure monitoring reveals that workers are not exposed to airborne lead at or above the Action Level of 30 ug/m^3 . This consists of a blood test measuring the level of lead and zinc protoporphyrin by a licensed physician. Further testing and medical exams may be necessary depending on the results of initial blood tests and/or the initial exposure assessment.

E. Training

Training certification shall be maintained and posted at the site, prior to the start of work involving LBP and LCP work, for all of the Contractors' workers, supervisors and Competent Person. Training shall meet the requirements of 29 CFR Part 1926.62, 29 CFR Part 1926.59, 29 CFR Part 1910.1200 and 49 CFR 172. Training shall be provided prior to the time of job assignment and as required by the regulations thereafter. The project specific training shall, at a minimum, include the following.

1. Lead Paint Awareness Training as per 29 CFR 1926.62.
2. Specific nature of the operation, which could result in exposure to lead.
3. Purpose, proper selection, fitting, use and limitations of respirators.
4. Purpose and description of the medical surveillance program and the medical removal protection program, including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females, hazards to the fetus and additional precautions for employees who are pregnant).
5. Relevant engineering controls and good work practices.
6. The contents of any compliance plan in effect.
7. Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.
8. The employee's right of access to records under 29 CFR part 1910.20.

F. Respiratory Protection Program

1. Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least every 12 months thereafter as required by 29 CFR Part 1910.134 and 29 CFR Part 1926.62.
2. Establish and implement a respiratory protection program as required by ANSI Z88.2, 29 CFR Part 1910.134 and 29 CFR Part 1926.62.
3. All workers are required to don respirator(s) with the appropriate level of protection commensurate with the airborne concentrations of lead in which they are working. The

level of protection will be determined by the Contractor, based on objective air monitoring data.

1.04 ON-SITE SUBMITTALS

The Contractor's Competent Person is required to maintain a copy of the following documents on-site:

A. Certifications

Prior to the start of work, maintain the on-site, required certifications listed above in Section 1.03.

B. Equipment List

Maintain a list of equipment items to be used in the work, including brand names, model, capacity, performance characteristics, quantities, and other pertinent information.

C. LBP and LCP Safe Work Practice Compliance Plan

The contractor shall prepare a detailed LBP and LCP Safe Work Practice Compliance Plan that identifies the work procedures, health and safety measures to be used in LBP and LCP work procedures; and that addresses spill prevention, containment, and emergency response procedures. The Plan shall be maintained on-site. The plan shall address the methods to be undertaken during LBP and LCP disturbances to include all requirements of 1926.62(e)(2)(ii) including, but not limited to the following key elements:

1. LBP and LCP containment methods to control employee exposure to lead at or below the permissible exposure limit.
2. Training requirements as required by Federal, State, and Local regulations.
3. Unique problems associated with the LBP and LCP project.
4. Sketch of location and details of LBP and LCP control areas, and decontamination procedures. Refer to the DASNY Standard Specification for the Identification and Disposal of Hazardous Waste 028600 for waste storage area requirements.
5. Eating, drinking, smoking, and rest room procedures.
6. Sequencing of LBP and LCP related work.
7. Personal protective equipment and respiratory protection program, including controls.
8. Engineering controls, containment structures and safety measures. Refer to 1.07, D of this Section for HEPA filtered negative air unit requirements, as applicable.
9. Worker exposure assessment procedures.
10. Work Practice controls.
11. Housekeeping.
12. Hygiene facilities and practice.
13. Medical surveillance, including medical removal procedures.
14. Sampling, testing and analytical methods for personal air sampling requirements of 29 CFR Part 1926.62. Procedures must include frequency, locations, sampling, and analytical methods to be used.
15. Contractor to include the segregation and minimization of lead waste streams from construction and demolition waste in their lead-based paint management plan. For demolition projects, US EPA requires that the amount of hazardous waste to be

disposed be minimized. Therefore, the Contractor shall indicate the specific waste streams to be generated in the minimization and segregation plan.

16. Visual clearance log for each control area that is maintained by the Contractor's Competent Person.

D. Compliance Program

Contractor's Compliance Program prepared in accordance with 29 CFR Part 1926.62 (e) (2) shall be maintained on-site.

E. Sampling and Laboratory Analysis Reports

Maintain on-site all field sampling logs for all personal air samples taken, including copies of laboratory analysis reports and chain of custody records for all sample analyses.

F. Competent Person certification per Sections 1.02 and 1.03.

1.05 CLOSEOUT SUBMITTALS: At the conclusion of the LBP/LCP project, the Contractor shall provide the following closeout submittals:

1. Refer to DASNY Standard Specification for the Identification and Disposal of Hazardous Waste 02 86 00 for closeout document requirements related to the disposal of hazardous waste, if applicable.

1.06 POSTED WARNINGS & NOTICES

The following regulations, warnings and notices shall be posted at the work site in accordance with 29 CFR Part 1926.62.

A. Regulations

A copy of applicable Federal, State, and Local regulations shall be maintained at the work site.

B. Warning Signs

Warning signs shall be provided at approaches to LBP/LCP control areas. Signs shall be located at a distance from the LBP and LCP control areas that will allow personnel to read the sign and take the necessary protective actions required before entering the LBP/LCP control area. The signs shall comply with the requirements of 29 CFR Part 1926.62.

C. Worker Information

Right-to-know notices shall be placed in clearly visible areas of the work site in compliance with Federal, State and Local regulations.

D. Exposure Air Monitoring Results

Exposure air monitoring results shall be prepared in order to be easily understood by the workers and shall be placed in a clearly visible area of the work site.

E. Emergency Telephone Numbers

A list of telephone numbers shall be posted at the site. The list shall include numbers of the local hospital, emergency squad, police and fire departments, Government and Contractor

representatives who can be reached 24 hours per day as well as professional consultants directly involved in the project.

1.07 EQUIPMENT & MATERIALS

Sufficient quantities of health and safety materials required by 29 CFR Part 1926.62, and other materials and equipment needed to complete the project, shall be available and kept on the site.

A. Respirators

Air-purifying respirators shall be approved by NIOSH for use with dust, fumes and mists having permissible exposure limits less than 0.05 milligrams per cubic meter (i.e. have high-efficiency particulate air [HEPA] filters) and for other hazardous airborne contaminants that may be encountered, as determined by the Competent Person. The Contractor shall furnish, at no cost to personnel/employees, respirators to provide protection from airborne concentrations of lead. Respirators shall comply with the requirements of 29 CFR Part 1926.62 and shall be used in accordance with 29 CFR Part 1926.62, 29 CFR Part 1926.103 and 29 CFR Part 1910.134.

B. Respirator Cartridges

A sufficient supply of respirator cartridges shall be maintained at the work site to provide new cartridges to employees and authorized visitors throughout the duration of the project. Cartridges shall be replaced according to the manufacturer's recommendations, when breathing becomes difficult, or if the cartridges become wet.

C. Protective Clothing

1. The Contractor shall furnish, at no cost to personnel/employee, equipment/ clothing for protection from airborne and waterborne LBP and LCP debris. An adequate supply of these items shall be available for worker and authorized visitor use. Workers and visitors shall not take protective clothing and equipment off the work site at any time. Protective clothing includes:
 - a. Coveralls (Whole Body Protective Coverings): Full-body coveralls and head covers shall be worn by workers in the control area as necessary. Sleeves shall be secured at the wrist and pants legs at the ankle with tape. Permeable clothing shall be provided in heat-stress conditions. Where non-disposable coveralls are provided, these coveralls shall be cleaned after each wearing and kept within the control area or decon/airlock (bagged). Cleaning of coveralls and other non-disposable clothing shall be in accordance with the provisions for cleaning in 29 CFR Part 1926.62.
 - b. Boots: Work boots with nonskid soles or impermeable work boot covers shall be worn by workers. Where required by OSHA, safety boots (steel toe or steel toe and shank) shall be worn. Paint the uppers of boots red with waterproof enamel. Do not allow boots to be removed from the control area for any reason after being contaminated with LBP or LCP debris. Keep within control area or decon/airlock (bagged).
 - c. Gloves: Inner gloves, appropriate for items and hazards encountered, and disposable outer work gloves shall be provided to each worker and shall be worn while the worker is in the control area. Glove material shall be appropriate for the specific chemical exposure. Gloves shall not be removed from the control area and shall be disposed of as LBP or LCP contaminated waste at the end of the work.

- d. **Hard Hats:** Head protection (hard hats) shall be provided as required by OSHA for workers and authorized visitors. Protective plastic-strap suspension hats shall be used. Hard hats shall be worn at all times when work is in progress. Hard hats shall remain in the control area until the project is completed. Hard hats shall be thoroughly cleaned, decontaminated, dried and bagged before being removed from the control area at the end of the project.
- e. **Eye Protection:** Fog-proof goggles for personnel engaged in LBP and LCP operations shall be worn when the use of a full-face piece respirator is not required and kept within control area or decon/airlock (bagged) until completion of project.

D. Negative Air Pressure System

When a LBP or LCP control area requires the use of an airtight containment barrier, a negative air pressure system shall be used and pressure differential recordings taken. LBP and LCP shall not be removed from the LBP/LCP control area until the proper engineering controls and HEPA filtration systems are in place.

1. HEPA Filter Requirements

The negative air pressure system shall be equipped with approved HEPA filters per UL 586. Negative air pressure equipment shall be equipped with new HEPA filters, and shall be sufficient to maintain a minimum pressure differential of minus 5 Pascals (Pa), equivalent to 0.02 inch of water column relative to adjacent, unsealed areas. Negative air pressure system minimum requirements are listed below.

- a. The unit shall be capable of delivering its rated volume of air with a clean first stage filter, an intermediate filter and a primary HEPA filter in place. The units shall be clean and sealed (intake & exhaust) at all times when not operating in a control area.
- b. The HEPA filter shall be certified as being capable of removing particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent. 700 hours is the manufacturer life recommendation of a HEPA filter (approximately 1 month of continuous operating).
- c. The unit shall be capable of continuing to deliver no less than 70 percent of rated capacity when the HEPA filter is 70 percent full or measures 620 Pa (2.5 inches of water) static pressure differential on a magnehelic gauge.
- d. The unit shall be equipped with a manometer-type negative pressure differential monitor with minor scale division of 0.02 inch of water and accuracy within plus or minus 1.0 percent. The manometer shall be calibrated in accordance with the manufacturer's recommendations. Record manually manometer readings of the pressure differential between the LBP control area and adjacent unsealed areas at the beginning and end of each work day.
- e. The unit shall be equipped with a means for the operator to easily interpret the readings in terms of the volumetric flow rate of air per minute moving through the machine at any given moment.
- f. The unit shall be equipped with an electronic mechanism that automatically shuts the machine off in the event of a filter breach or absence of a filter.
- g. The unit shall be equipped with an audible horn that sounds an alarm when the machine has shut itself off.

- h. The unit shall be equipped with an automatic safety mechanism that prevents a worker from improperly inserting the main HEPA filter.
- i. The unit shall be ducted through the containment barrier wall to the exterior of the building. The unit shall not be exhausted into any interior areas. If exhausting to the exterior is not feasible, utilize an unoccupied area or room that is large enough to handle the volume of air with two units connected in series. Applicable warning signage shall be posted at this location. **DASNY CPM prior approval is required if exhausting into the interior of the building.**

2. Number of Units Required

The air within the containment barrier shall be changed at least once every 15 minutes by a continuously operating negative air pressure system, until the LBP/LCP control area barrier is removed. Filters shall be replaced as necessary to maintain the efficiency of the system. A back-up unit shall be maintained on-site.

3. Auxiliary Generator

If site conditions can't provide power, an auxiliary generator shall be provided. The generator shall not present a carbon monoxide hazard to workers.

4. Discontinuing Negative Air Pressure System

The negative air pressure system shall not be shut down during LBP/LCP work unless authorized by the DASNY's third-party Environmental Consultant. At the completion of the LBP/LCP work procedures and disposal project, units shall be run until removal is completed satisfactorily and full cleanup has been completed and satisfactory clearance has been achieved. Dismantling of the negative air pressure systems shall conform to the written decontamination procedures. Prefilters shall be removed and properly disposed. The intake and exhaust of the machines shall be sealed with polyethylene to prevent environmental contamination.

E. Expendable Materials

1. Polyethylene Sheet and Clear Bags - General

Polyethylene sheet and clear bags shall have pre-printed labels, and 5-inch (minimum) long plastic ties, pointed and looped to secure the filled bags. Polyethylene sheets shall be in roll sizes to minimize seams.

2. Polyethylene Sheet - Flame Resistant

Where a potential for fire exists, flame-resistant polyethylene sheets shall be provided. Polyethylene film shall conform to the requirements of NFPA 701.

3. Polyethylene Sheet - Reinforced

Reinforced polyethylene sheet shall be provided where high skin strength is required such as where it constitutes the only barrier between the LBP control area and the indoor and outdoor environments. The sheet stock shall consist of translucent, nylon-reinforced or woven-polyethylene thread laminated between two layers of polyethylene film. Film shall meet flame resistant standards of NFPA 701.

4. Tape and Adhesive Spray

Tape and adhesive shall be capable of sealing joints between polyethylene sheets and for attachment of polyethylene sheets to adjacent surfaces. After dry application, tape or adhesive shall retain adhesion when exposed to wet conditions, including amended water. Tape shall be minimum 2 inches wide, industrial strength.

5. Containers

DOT approved impermeable containers shall be used to receive and retain LBP and LCP waste and debris and lead contaminated material until disposal. Containers shall be labeled in accordance with EPA, DOT and OSHA standards, as applicable for the type of waste. Waste streams shall be segregated in a manner to reduce the potential volume of hazardous waste generated.

6. Chemicals

Chemicals, including caustics and paint strippers, shall be properly labeled, stored in leak-tight containers and properly/safely secured from the general public.

F. Vacuum Systems

HEPA filtered vacuum systems shall be used during LBP/LCP operations which generate dust. The systems shall be suitably sized for the project, and filters shall be capable of removing particles as small as 0.3 micrometers at a minimum efficiency of 99.97 percent. Vacuum opening, wands and hoses shall be sealed at all times when not in a control area.

G. Chemical Paint Strippers

Chemical paint strippers shall contain no methylene chloride.

H. Chemical Paint Stripper Neutralizer

Neutralizers for paint strippers shall be compatible with the substrate and suitable for use with the chemical stripper that has been applied to the surface.

I. Storage of Materials

Materials shall be stored in an approved enclosed structure, which protects them from damage, rain, wind, etc. and contamination. During periods of cold weather, plastic materials shall be protected from the cold. Regularly inspect materials to identify damaged or deteriorating items. Damaged or deteriorated items shall not be used and shall be removed from the site as soon as they are discovered. Stored materials shall not present a hazard or an inconvenience to workers, visitors, employees and/or other building occupants.

PART 2 – EXECUTION

2.01 WORK PROCEDURES

LBP and LCP work procedures and related work shall be performed in accordance with the accepted Contractor's LBP and LCP Safe Work Practice Compliance Plan, 29 CFR Part 1926.62 and as specified herein. LBP/LCP waste and debris, lead contaminated debris and personal protective clothing and equipment shall be disposed of in compliance with Federal, State, and Local regulations and in accordance with the respective waste stream 8 RCRA Metals TCLP testing results and applicable hazardous characteristic testing results.

A. Personal Protection Procedures

Respiratory Protection is required for all LBP disturbances. Personnel shall wear and use protective clothing and equipment as specified and required by 29 CFR Part 1926.62 and 29 CFR Part 1910.120. Eating, smoking, drinking, chewing tobacco, chewing gum, applying makeup and use of non-work-related walkie-talkies/phones shall not be permitted in the LBP and LCP control area. Personnel of trades not engaged in the LBP or LCP work procedures and disposal of LBP and LCP shall not be exposed at any time to airborne concentrations of lead equal to or in excess of 30 micrograms per cubic meter of air (30 ug/m³). Electrical service shall be disconnected when wet removal is performed, and temporary electrical service protected by a ground fault circuit interrupter (GFCI) shall be provided.

B. Safety and Health Procedures

The Competent Person shall be present on the work site throughout the LBP and LCP project to supervise, monitor and document the project's health and safety provisions. A daily log shall be maintained showing the results of air sampling tests throughout the project area. LBP and LCP work being conducted within a LBP or LCP control area where an airtight barrier is required shall be stopped if measured airborne lead concentrations, collected during LBP or LCP work procedures, exceed the Action Level.

C. Safety and Health Responsibilities

The Competent Person shall:

1. Verify that training meets applicable requirements.
2. Review and approve LBP/LCP Safe Work Practice Compliance Plan for conformance to the applicable referenced standards.
3. Inspect LBP and LCP removal work for conformance with the accepted Safe Work Practice Compliance Plan.
4. Ensure that worker exposure air monitoring activities are in accordance with 29 CFR Part 1926.62.
5. Ensure work is performed in strict accordance with specifications.
6. Ensure hazardous exposure to personnel and to the environment are adequately controlled.
7. The Contractor's Competent Person shall be responsible for directing personal air monitoring and shall also perform visual inspections prior to the visual inspection conducted by DASNY's third-Party Environmental Consultant (if applicable), to verify the control areas are free of all visible debris.
8. If required, the Contractor's Competent Person shall coordinate with DASNY and the DASNY's third-party Environmental Consultant for any control areas requiring final air/wipe testing clearance testing (Action Level/wipe) in accordance with OSHA and/or US Department of Housing and Urban Development (HUD) protocols.

D. Medical Surveillance Procedures

Medical surveillance shall be implemented in accordance with the accepted Contractor's LBP/LCP Safe Work Practice Compliance Plan and shall comply with the requirements of 29 CFR Part 1926.62, including the provisions for blood lead level monitoring, medical removal, protection and a physician's written opinion, signed by the physician performing the employee examination. The Contractor's Competent Person shall maintain on-site, a copy of the written opinion for Contractor's employees prior to each employee's commencement of work.

E. Engineering Controls and Containment Structures

Engineering and work practice controls are the primary means of maintaining exposures to lead below the PEL. Paint removal and surface preparation activities must keep dust levels at a minimum. Power tools must be equipped with manufacturer equipped vacuum shrouds including an attached HEPA filtered vacuum system.

1. LBP/LCP Control Area

The control area is where LBP/LCP work procedures occur and as such shall be considered contaminated. The LBP/LCP control area shall be isolated to prevent LBP/LCP containing dust or debris from passing into adjacent areas. The control area shall be decontaminated at the completion of the LBP/LCP work procedures and disposal work.

2. Boundary Requirements.

Physical boundaries along with Warning Signage shall be provided around exterior LBP/LCP control areas by taping off the area indicated in the Safe Work Practice Compliance Plan.

3. Control Barriers

The LBP/LCP control area shall be designated and separated from other outside areas with control barriers. The polyethylene sheeting shall mask and seal all openings. The LBP/LCP control area shall be erected according to the Contractors LBP/LCP Safe Work Practice Compliance Plan. Polyethylene sheeting shall be mechanically supported, independent of duct tape or spray adhesive.

4. Exterior Masking and Sealing

Exterior LBP/LCP control area requirements: Where the construction of a contained LBP/LCP control area is impractical or not required based on the method of lead work procedures, a taped-off perimeter shall be installed around the area where the LBP/LCP handling procedures are performed and other requirements for LBP/LCP control areas shall be maintained. Personal monitoring of airborne concentrations is still required and shall be conducted in accordance with 29 CFR Part 1926.62.

5. Hand Wash Station

An operational hand washing station shall be provided to all workers adjacent to each LBP/LCP control area utilizing polyethylene sheeting as a drop cloth. Water shall be hot and cold or warm. Soap dish, continuing supply of soap, and clean towels shall be provided. The hand wash station shall be maintained in a sanitary condition. Waste water shall be collected and placed within clear polyethylene bags and sealed. Bags shall be immediately placed within non-leaking drums and sealed.

6. Equipment Decontamination

An equipment decontamination area shall be installed at the entrance to each LBP/LCP control area to allow for the cleaning of all equipment utilized on the project. Polyethylene sheeting shall be utilized as a drop cloth, along with a utility tub to clean and capture debris/water during the cleaning process. Water shall be hot and cold or warm. Continuing supply of detergent and clean towels shall be provided. The

equipment decontamination area shall be maintained in a sanitary condition. Waste water shall be collected and placed within clear polyethylene bags and sealed. Bags shall be immediately placed within non-leaking drums and sealed.

F. Temporary Utilities

1. Temporary equipment as necessary to provide adequate power, light, heat, and water shall be installed, as needed, to accomplish the LBP/LCP operations properly and safely. The Contractor shall maintain the security and maintenance of the utility system in the LBP/LCP control areas. In the event of a failure of any utility system, the Owner will not be responsible for any loss of time or other expense incurred by the Contractor. In addition to any site-specific temporary utility requirements, the Contractor shall provide:
 - a. Back-flow protection on all water connections. Fittings installed by the Contractor shall be removed after completion of work with no damage or alteration to existing water piping and equipment.
 - b. When applicable, heavy-duty abrasion-resistant hoses to provide water to each control area and decontamination area.
 - c. A hot water heater, if necessary, to provide warm water to the decontamination showers, hand wash station and equipment decontamination area.
 - d. Electrical service to control areas. Electrical service shall comply with National Electric Code, State and Local requirements and UL standards. Warning signs shall be posted at power outlets, which are other than 110-120 volt power. Only grounded extension cords connected into a GFCI shall be used. Incandescent lamps and light fixtures shall be of adequate wattage to provide good illumination in LBP/LCP control areas.
 - e. Temporary heating units, when needed, that have been tested and labeled by UL, FM, or another recognized trade association related to the fuel being consumed. Forced air or fan type units shall not be utilized inside a control area. Units shall have tip-over protection.

2.02 LEAD-BASED/CONTAINING PAINT WORK PRACTICES (Use methods as applicable)

A. Component Removal:

Components shall be removed intact to the extent practicable. Following HEPA vacuuming and wet wiping precleaning of existing paint chips and debris, a polyethylene drop cloth shall be placed around and/or beneath the component, prior to its removal, to catch any paint chips that may become dislodged. The component shall be wrapped and sealed in a layer of clear polyethylene prior to movement to the disposal container. Follow proper disposal requirements. The area around the component removal shall be HEPA vacuumed and wet wiped. The polyethylene sheeting shall be carefully folded in on itself and placed in a clear disposal bag. Containment debris shall be properly stored of in accordance with respective waste stream as per the Contractor's LBP/LCP Safe Work Practice Compliance Plan

B. Chemical Stripping:

Chemical stripping may be used for LBP and LCP removal on surfaces that will be subjected to welding, cutting, torch burning or where it is the only acceptable procedure. No chemical strippers or associated neutralizer chemicals containing methylene chloride shall be used by the Contractor on this project.

1. Following HEPA vacuuming and wet precleaning of existing paint chips / debris, horizontal surfaces directly below and in a radial direction from the area where chemical stripping is to be performed shall be covered with plastic sheeting and shall

also extend ten (10) feet on either side of the control area or to the furthest practical distance to catch any paint chips that may become dislodged.

2. All LBP/LCP on specified surfaces shall be removed to the bare substrate. The job is not considered complete until the substrate is dry, free of paint, debris, and LBP/LCP residue.
3. LBP/LCP stripping agents shall be brushed or troweled on the designated surfaces, or otherwise applied to a minimum thickness in accordance with manufacturer's specifications.
4. The required application/reaction time for stripping will depend upon the ambient temperature, humidity, and thickness of LBP/LCP. If LBP/LCP is not completely removed following the initial application of stripper, additional applications and wet scrapings may be required.
5. Removed LBP/LCP shall not be deposited on the polyethylene containment surfaces but shall be transferred directly into clear polyethylene bags from the scraper and sealed. LBP/LCP shall be removed by wet scraping to the maximum extent feasible. If the substrate is to be reused, the removal activities shall not damage the substrate.
6. Any residue not removable by wet scraping shall be washed down to the bare metal substrate with an appropriate, pre-approved solution. LBP/LCP-contaminated wastewater shall be kept to a minimum using wet scrub brushes or sponges. These residues and disposable cleaning media shall also be directly transferred to clear polyethylene bags and sealed. Bags shall be immediately placed within non-leaking drums and sealed. Free standing water shall be eliminated by use of a drying agent. Contractor shall include the segregation and minimization of lead waste from construction and demolition waste in their LBP/LCP Safe Work Practice Compliance Plan.

C. Manual Demolition/Scraping/Cleaning:

1. Manual demolition, scraping, sanding and power tool cleaning with dust collection systems shall be performed in conjunction with engineering and work practice controls meeting the requirements of 29 CFR 1926.62(e)(1).
2. Following HEPA vacuuming and wet wipe precleaning of existing paint chips / debris, seal openings of HVAC ductwork and other penetrations (doors, windows, etc.) within the Control Area with two layers of polyethylene sheeting. For work on vertical surfaces, place a layer of polyethylene sheeting below the area prior to manual demolition/scraping/sanding/cleaning. The sheeting shall extend ten (10) feet on either side of the control area or to the furthest practical distance to catch any paint chips that may become dislodged.
3. Wet methods shall be used during manual scraping, sanding and power tool cleaning with dust collection systems. Local HEPA ventilation shall be utilized in conjunction with manual scraping, sanding and power tool cleaning with dust collection systems. In the case that local HEPA ventilation is not sufficient to control dust hazards, the Contractor shall be required to install engineering controls to meet requirements of specification section 1.06, D., "Negative Air Pressure System".
4. Removed LBP/LCP shall not be allowed to accumulate on surfaces within the Control Area but shall be HEPA vacuumed or placed directly into clear polyethylene bags. The Contractor shall maintain all surfaces as free as practicable of accumulated lead dust to prevent the dispersal of lead into the work places that are outside of the lead

paint control areas. LBP/LCP shall be removed by manual methods to the maximum extent feasible.

5. Debris shall be bagged in clear polyethylene bags, sealed, and secured in leak proof drums. The area around the surfaces subject to work shall be HEPA vacuumed and wet wiped, including the polyethylene sheeting. Upon a satisfactory clearance inspection by DASNY's Third-Party Environmental Consultant (as applicable) and the Contractor's Competent Person, the cleaned polyethylene sheeting shall be carefully folded in on itself and placed in a clear disposal bag. Containment debris shall be properly stored in accordance with the respective waste stream as indicated in the contractor's LBP/LCP Safe Work Practice Compliance Plan. The contractor shall coordinate with the DASNY's third-party Environmental Consultant to test the waste streams for disposal.

D. Alternative Lead Work Procedures

1. Any work procedure deviating from the outlined procedures above shall be submitted through the CPM to DASNY Code Compliance and the Owner's third-party Environmental Consultant for review and approval prior to the start of the project. As there are many different components in different areas of the building(s), it is impractical to address every potential lead work procedure. The intent of alternative lead work procedures shall be to maintain compliance with 29 CFR 1926.62 and maintain airborne concentrations of lead dust below the Action Level of 30 ug/m³.

2.03 PERSONAL AIR MONITORING & WASTE STREAM SAMPLING

During all LBP/LCP removal and disposal operations, the Contractor's OSHA Competent Person shall be on-site inspecting the work to ensure that the health and safety requirements of this contract are satisfied. DASNY may elect to have a Third-Party Environmental Consultant on-site to perform visual clearance inspections.

A. Personal Air Monitoring (Provided by the Contractor, as required by OSHA)

1. Personal air monitoring samples for airborne concentrations of lead shall be collected and analyzed in accordance with 29 CFR Part 1926.62

B. Waste Sampling and Testing (Provided by DASNY's Third Party Environmental Consultant)

1. Sampling and testing of all waste streams, shall be in accordance with 40 CFR Part 261, 6 NYCRR Part 371 and SW-846, Chapter 9, Sampling Plan. See Paragraph 2.05 C. of this specification section for waste sampling and analyses requirements. 8 RCRA Metals TCLP sampling and analysis shall be the minimum required for generated LCP/LBP waste streams. There has recently been an increase in additional testing parameters (i.e. PCBs) required by disposal facilities so this should be coordinated with the selected disposal facility and relayed to the Environmental Consultant prior to sampling activities. If chemical strippers are used during LBP and LCP removal process, then applicable hazardous characteristic sampling and analysis shall be required.

2.04 ADJACENT AREAS

Damage to adjacent areas shall be repaired by the Contractor to the approval of the Owner.

2.05 CLEAN-UP & DISPOSAL

A. Cleanup

1. Daily:
Surfaces in the LBP/LCP control area shall be maintained free of accumulations of paint chips, LBP/LCP debris and dust. Spread of dust and debris shall be restricted; waste shall not be distributed over the control area. Dry sweeping or compressed air shall not be used for cleanup. At the end of each shift, the area shall be cleaned of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner and wet wiping the area. LBP/LCP work procedures shall cease during the cleanup.
2. At completion of LBP/LCP work and a satisfactory visual inspection by DASNY's Third Party Environmental Consultant (if applicable) and OSHA Competent Person, a clean-up shall be performed by the Contractor. This clean-up includes removal of any contaminated material, equipment or debris including polyethylene sheeting from the control area. The polyethylene sheeting shall be sprayed or misted with water for dust control, construction debris removed and polyethylene sheeting wet wiped. Then the sheeting shall be removed by folding it in upon itself.
 - a. Lead-contaminated debris shall be containerized in accordance with the Contractor's LBP/LCP Safe Work Practice Compliance Plan. Waste bags shall not be overloaded and shall be securely sealed and stored in the designated area.
 - b. Removal of surface polyethylene sheeting shall begin from top to bottom. Removal of floor polyethylene sheeting shall begin at the corners and folded in the middle to contain the dust. Polyethylene shall be disposed of as per the Contractor's LBP/LCP Safe Work Practice Compliance Plan. The Contractor shall decontaminate the lead abatement equipment and equipment used in the control area. The wastewater from cleaning shall be contained, sampled and disposed of as specified within Section 2.01 E. 6. and 2.02 B. 7 *and as per contractor's LBP/LCP Safe Work Practice Compliance Plan.*

B. Certification

1. The Contractor's Competent Person shall certify and sign within the log that the respiratory protection for the employees was adequate, the work procedures were performed in accordance with 29 CFR Part 1926.62 and that there was no visible accumulations of LBP/LCP paint/coating or dust on the worksite. Do not remove warning signs at the lead control area or roped-off boundary signs prior to the completion of the Competent Person's signed certification. If applicable, the Contractor's Competent Person's certification shall be forwarded to the DASNY Project Manager and the DASNY's Third Party Environmental Consultant's for review prior to removing warning signs at the lead control area or roped-off boundary signs.

C. Waste Storage and Disposal (Provided by the Contractor) and Sampling/Analysis (Provided by DASNY's Third Party Environmental Consultant).

1. LBP/LCP Wastes and Lead-Contaminated Water. Refer to DASNY Standard Specification for the Identification and Disposal of Hazardous Waste section 02 86 00.

END OF SECTION 02 83 10

Appendix A: LBP and LCP Survey Report Documentation Summary:

For Details, refer to the Environmental Survey Report Included as Part of this Project Manual.

SECTION 02 84 00

NON-LIQUID PCB MATERIAL REMOVAL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. This demolition, renovation or removal/remediation Project will include the removal and disposal of non-liquid Polychlorinated Biphenyl (PCB) materials (herein referred to as PCB materials) at Bronx Psychiatric Center, Building 1, 1500 Waters Place, Bronx, NY, DASNY Project Number 3816609999.
- B. The work shall include but not be limited to the removal of the following.

Floor/level/ location/phase	Work Area Designation (i.e. WA-01)	Description of PCB Materials	Length (if applicable)	Width (if applicable)	# of Masonry Openings (if applicable)	Approximate Quantity (SF/LF/EA)
1st Floor	Transformer Room #1	PCB Remediation Waste Concrete Slab	N/A	N/A	N/A	N/A
1st Floor	Transformer Room #2	PCB Remediation Waste Concrete Slab	N/A	N/A	N/A	N/A
1st Floor	Transformer Room #1	PCB Remediation Waste Soil	N/A	N/A	N/A	N/A
1st Floor	Transformer Room #2	PCB Remediation Waste Soil	N/A	N/A	N/A	N/A
Total Quantity						N/A

- C. The PCB Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the PCB Contractor of its obligation to furnish all labor and materials necessary to perform the Work.
- D. All Work shall be performed in strict accordance with the Project Documents and all governing codes, rules, and regulations. Where conflicts occur between the Project Documents and applicable codes, rules, and regulations, the more stringent shall apply.
- E. Working hours shall be as required and approved by the Owner. PCB material removal activities including, but not limited to, work area preparation, gross removal activities, cleaning activities, waste removal, etc. may need to be performed during 'off-hours' (including nights and weekends). In addition, multiple mobilizations may be required to perform the work identified in this project. The PCB Contractor shall coordinate and schedule all Work with the facility and Owner's representative.

1.02 SPECIAL JOB CONDITIONS

- A. Any special job conditions are described below.
"None"

1.03 PERMITS AND COMPLIANCE

- A. The PCB Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and local laws, rules, and regulations pertaining to Work practices, protection of Workers, authorized visitors to the site, persons, and property adjacent to the Work.

- B. Perform PCB related Work in accordance with New York State Department of Environmental Conservation (DEC) Hazardous Waste Regulations (6 NYCRR 370-374, i.e. Hazardous Waste Rules), 40 CFR 761, 29 CFR 1926 and project documents, as specified herein. Where in conflict, always adhere to the more stringent requirements.
- C. The PCB Contractor must maintain current licenses or registrations pursuant to DEC and United States Environmental Protection Agency (EPA) regulations for all Work related to this Project, including the removal, handling, transport, and disposal of hazardous and industrial waste.
- D. The Environmental Consultant shall be prepared to obtain an EPA ID number if so directed by the Owner.
- E. Failure to adhere to the Project Documents shall constitute a breach of the Contract and the Owner shall have the right to and may terminate the Contract provided, however, the failure of the Owner to so terminate shall not relieve the PCB Contractor from future compliance.

1.04 SUBMITTALS

- A. PCB Pre-Work Submittals: Within 7 days prior to the pre-construction conference, the PCB Contractor shall submit an electronic copy of the documents listed below to the DASNY Project Manager, the DASNY Code Compliance Unit and the Environmental Consultant for review and Code Compliance approval prior to the commencement of PCB removal activities:

Pre-work Submittals	VSQG (CESQG)	SQG	LQG
<u>1. Training & Certifications</u>			
a. List of the employees scheduled to perform this work and their project function (Supervisor or Worker)	X	X	X
b. Certificate of on-site supervisor, for successful completion of OSHA 40-hour Health and Safety course [29 CFR 1910.120/1926.65] for handling hazardous waste and spills, including most recent refresher training.	X	X	X
c. OSHA 8-hour supervisor training [29 CFR 1910.120(e)(4)/1926.65(e)(4)] for hazardous waste.	X	X	X
d. Certificates of workers, for successful completion of OSHA 40-hour Health and Safety course [29 CFR 1910.120/1926.65] for handling hazardous waste and spills, including most recent refresher training.	X	X	X
e. Valid United States Department of Transportation (DOT) training [49 CFR172.704] for supervisor and all employees loading waste and maintaining on-site waste storage area. This training shall include: general awareness / familiarization training; function specific training; safety training; security awareness training; and in-depth security training.		X	X
f. Annual hazardous waste RCRA training as per 40 CFR 260.10, 262.17(a)(7), 264.16 & 265.16. Submit sign-in sheets for all employees and supervisors working on the project. This training may be either 2 hours, 4 hours or 8 hours, as applicable.		X	X
g. Employees managing Hazardous Waste must also meet the Personnel training requirements in section 6 NYCRR 373-3.2, 3.3, 3.4 & 376(g)(1)(v), as applicable. OSHA HAZWOPER training should suffice for this requirement.		X	X
h. Confined Space training certificates as per 29 CFR 1910.146 or 1926.1207, as applicable.	X	X	X
<u>2. Transportation & Disposal</u>			
a. Valid Hazardous Waste Transporter NYS Part 364 permit for all transporters.	X	X	X

Pre-work Submittals	VSQG (CESQG)	SQG	LQG
b. Valid Hazardous Waste Transport vehicle permit for all transporters for each state the waste is being transported through to reach the Treatment, Storage and Disposal Facility (TSDF), as applicable.	X	X	X
c. Valid US DOT vehicle registration for all transporters.	X	X	X
d. Transfer Facility Permit (if used) including the name, address and EPA ID No. of the facility, contact person. Include an acknowledgement letter stating that the facility has the capacity and is permitted to accept the waste from the project site and how the waste will be disposed [i.e. treatment (T) landfill (L), incineration (B), recycled (R)].	X	X	X
e. Final Disposal Facility permit including the name, address and EPA ID No. of the facility, contact person. Include an acknowledgement letter from the disposal facility stating that the facility has the capacity and is permitted to accept the waste from the project site and how the waste will be disposed [i.e. treatment (T) landfill (L), incineration (B), recycled (R)]. The final destination of waste must be within the United States.	X	X	X
f. The TSDF permit(s) must identify the waste material(s) to be received.	X	X	X
g. Draft Land Disposal Restriction (LDR) form (See Appendix C for PCB LDR)	X	X	X
h. Draft Waste Profile	X	X	X
i. Draft Waste Manifest	X	X	X
j. Draft c7 NYSDEC Notification form for any metals to be recycled, if applicable.	X	X	X
3. Site-specific			
a. Safety Data Sheet (SDS) for all materials to be removed.	X	X	X
b. If the PCB Contractor introduces any chemical into the work environment, a SDS for each chemical must be presented to the Owner's Representative prior to use.	X	X	X
4. Progress Schedule:			
a. Show the complete sequencing of removal activities and the sequencing of Work within each building, wing or section of building. <i>The schedules will be utilized to schedule facility and third-party environmental consultant requirements.</i>	X	X	X
b. Show the dates for the beginning and completion of each major element of Work including substantial completion dates for each Work Area, building or phase.		X	X
5. Scope of Work Plan:			
Removal Work Plan and Drawing(s)			
Provide a written work plan description of work and drawing(s) that clearly indicates the following:			
a. All work areas/phases numbered sequentially.	X	X	X
b. Locations and types of all decontamination enclosures for each work area/phase.	X	X	X
c. Proposed location and construction of storage facilities and field office (when applicable).		X	X
d. Location of water and electrical connections to building services for each work area/phase.	X	X	X
e. Type of removal activity/technique for each work area/phase.	X	X	X
f. List waste types and quantity being generated and stored (refer to 1.01, B).	X	X	X
g. Site/work area preparation and cleanup procedures.		X	X
h. Include in the plan, eating, drinking, and sanitary procedures, interface of trades and sequencing of hazardous waste generation.		X	X
i. The job specific plan for worker protection issues regarding personal protective equipment, the work procedures, and exposure assessment procedures.	X	X	X

Pre-work Submittals	VSQG (CESQG)	SQG	LQG
j. Include occupational and environmental sampling (if any by the PCB Contractor), frequency and duration of sampling.			X
k. PCB Contractor's Health and Safety Plan	X	X	X
l. PCB Contractor's Facility Contingency Plan revision information for material handling and emergency procedures.			X
m. Container Storage Area (CSA) construction details. (refer to 3.03.K.) [How is the waste being stored? (indoors or outdoors, drums, containers, or dumpsters, types, with cover?).]	X	X	X
n. Include waste transport routes to the CSA from each work area/phase	X	X	X
o. Collected wastewater disposal/treatment plan.		X	X
p. Include plan for hazardous waste segregation and minimization including metal recycling, as necessary.		X	X
q. PCB Contractor waste generation details (amount per day, per week or per quarter) in kgs or tons.			X
r. PCB Contractor emergency evacuation plan requirements and evacuation route for the project specific work areas/phases.			X
s. Duration of waste generation and contract.			X
t. DASNY PM, Facility Representative, and Project team emergency contact numbers. [to be posted at CSA (interior and exterior).]	X	X	X
Do not start work until submittals are returned with the Owner's Representative stamp indicating that the submittal is approved for unrestricted use.	X	X	X

VSQG: <220 lbs.; SQG: 220lbs – 2200lbs (180 Days); LQG - >2,200lbs (90 Day).

B. PCB On-Site and During Construction Submittal Requirements.

On-Site & During Construction	VSQG (CESQG)	SQG	LQG
1. The following submittals, documentation, and postings shall be maintained on-site by the PCB Contractor during removal activities at a location approved by the Environmental Consultant:			
a. Approved pre-work submittals.	X	X	X
b. Project Documents (specifications and drawings).	X	X	X
c. Applicable regulations.	X	X	X
d. Updated licenses/permits and acknowledgement letters for any changes in transporter or disposal site.	X	X	X
e. For each employee, current annual medical respiratory clearance.		X	X
f. For each employee, current satisfactory respiratory fit test results.		X	X
g. Copy of updated facility contingency plan (copy to be kept in the CSA) Coordinate with facility for an approximate 1-hour training session on the facility contingency plan requirements and PCB Contractor's emergency action plan. Maintain proof of contingency plan training for all on-site employees.			X
h. PCB Contractor shall provide weekly update, including initial container storage dates for each container stored, an approximate estimate of amount of waste being generated during each work-day, week or month that it is stored on-site. The actual weight of the waste, excluding the weight of the dumpster / container, shall be identified.			X
i. Toxicity Characteristic Leaching Procedure (TCLP) waste sample results. PCB Contractor shall notify DASNY and Environmental Consultant for waste stream sampling prior to any waste being removed from the site.	X	X	X
j. Completed Waste Profile form(s). PCB Contractor shall utilize analytical test results from the survey report and / or TCLP results provided by Environmental Consultant, as appropriate, to generate waste profile and LDR form.	X	X	X
k. Completed LDR form.	X	X	X
l. List of emergency phone numbers.	X	X	X
m. Waste disposal log.		X	X

On-Site & During Construction	VSQG (CESQG)	SQG	LQG
n. Daily Project Log.	X	X	X
o. Copy of Waste manifest for each load of waste that is removed from site.	X	X	X
p. Copy of completed hazardous waste manifest including legible transporter and disposal facility information, dates and times of waste shipment departures / arrivals, and signatures, for each load of waste, within 35 days of waste being removed from site.	X	X	X
2. The following documentation shall be maintained on-site by the Environmental Consultant during removal activities:			
a. Valid Environmental Consultant personnel OSHA, RCRA, and DOT training certifications.	X	X	X
b. Proof of current Facility Contingency Plan Training.			X
c. Consultant Daily Log.	X	X	X
d. Listing of all visual inspections with the date of inspection and the date of signoff on the supervisor's log.	X	X	X
e. Hazardous Materials Survey Report.	X	X	X
f. All TCLP waste sample laboratory results including completed chain of custody forms and valid laboratory NYS DOH ELAP certifications.	X	X	X
g. CSA Inspections – Initial Inspection and Weekly Inspections Thereafter.	X	X	X
h. All applicable waste documentation, including but not limited to Universal Hazardous Waste Manifests, waste profiles, LDR forms, and disposal facility letter(s).	X	X	X

C. PCB Project Close-out Submittals:

1. Within 30 days of the completion of each removal phase, the **PCB Contractor** shall submit an electronic copy of the documents listed below to DASNY Code Compliance and the Environmental Consultant for review. Original fully executed waste records, original signed notarized PCB Contractor's Acknowledgement Statements and any other original signed notarized documents required must be sent to Code Compliance prior to final approval. Once DASNY Code Compliance approves the close-out submittal, the PCB Contractor shall provide 3 hard copy sets of the approved close-out documents (double-sided and bound) to DASNY Project Management for appropriate distribution, including 1 set to be distributed to the facility, prior to PCB Contractor's final payment.
 - a. **Fully Executed Copies** of all completed hazardous waste disposal manifests, disposal logs, LDR forms, acceptance letters and certificates of disposal, shall be sent to DASNY Code Compliance including legible transporter and disposal facility information, departure / arrival times and dates, and signatures. Original hazardous waste manifests shall be sent to the Owner or disposal facility state, as applicable. With proof of their receipt.
 - b. Daily progress log, worker attendance sheets,
 - c. Entry/Exit Logs. Decontamination unit entry/exit log for PCB removals (must be separate from any documentation associated with PCB removals, unless the material is both PCB and ACM).
 - d. PCB Contractor's Acknowledgment Statement Forms. **Original** notarized statement shall be sent to DASNY Code Compliance.
 - e. If TSDF transfer facility is utilized, completed hazardous waste manifest from final destination must also be provided. **The final destination of waste must be within the United States.**
 - f. Documentation (i.e. daily log) of Container Storage Area (CSA) closure (if applicable) in accordance with applicable federal and state regulations.
2. Within 30 days of the completion of each removal phase, the **Environmental Consultant** shall submit one electronic copy of the documents listed below to DASNY Code Compliance for review and approval prior to Environmental Consultant's final payment. Once DASNY Code Compliance approves the close-out submittal, the Environmental Consultant shall

provide three sets of the approved close-out documents (double-sided and bound) to DASNY Project Management, including one set to be distributed to the facility.

- a. Upon completion of the Project, the Environmental Consultant shall certify to the Owner, in writing, that the work is complete and acceptable in an Executive Summary of the work.
- b. The Environmental Consultant shall review and approve or disapprove all necessary guarantees, certificates of compliance, and all other close-out documentation, which the PCB Contractor is required to submit.
- c. The Environmental Consultant shall provide to the Owner the final Project data binder to include:
 - 1) All daily logs.
 - 2) Summary of all visual inspections with the date of inspection and the date of signoff on the supervisor's log.
 - 3) Any applicable sampling logs, results, chain of custody forms, and sample location plans.
 - 4) Daily worker rosters.
 - 5) All TCLP waste sample laboratory results including completed chain of custody forms and valid laboratory NYS DOH ELAP certifications.
 - 6) All applicable waste documentation, including but not limited to: Uniform Hazardous Waste Manifests, waste profiles, LDR forms, and disposal facility letter(s).
 - 7) All pertinent correspondence related to the Project including but not limited to clearance letters and supplemental inspection findings performed during construction, copies of all weekly hazardous waste storage location inspections reports, etc.

- D. PCB Project Submittals shall be submitted as separate packages, not included with any other environmental or hazardous materials submittals.

1.05 PRE-CONSTRUCTION CONFERENCE

- A. Prior to start of preparatory Work under this Contract, the PCB Contractor shall attend a pre-construction conference attended by Owner, Facility Personnel, and Environmental Consultant.
- B. Agenda for this conference shall include but not necessarily be limited to:
 1. PCB Contractor's scope of Work, Work plan, and schedule to include number of workers and shift days and times.
 2. PCB Contractor's safety and health precautions including protective clothing and equipment and decontamination procedures.
 3. Environmental Consultant's duties, functions, and authority.
 4. PCB Contractor's Work procedures including:
 - a. Methods of job site preparation and removal methods.
 - b. Respiratory protection.
 - c. Disposal procedures.
 - d. Cleanup procedures.
 - e. Fire exits and emergency procedures.
 5. PCB Contractor's required pre-work and on-site submittals, documentation, and postings.
 6. PCB Contractor's plan for 24 hour Project security both for prevention of theft and for barring entry of unauthorized personnel into Work Areas and disposal container / CSA.
 7. Temporary utilities.
 8. Handling of furniture and other movable objects.
 9. Storage of removed PCB materials in CSA.
 10. Waste disposal requirements and procedures, including PCB Contractor notification to DASNY project management and Environmental Consultant for TCLP waste stream sampling, once waste stream generation has commenced, and prior to any waste being removed from site.
 11. If applicable, contingency plan training information.

- C. In conjunction with the conference, the PCB Contractor shall accompany the Owner and Environmental Consultant on a pre-construction walk-through documenting existing condition of finishes and furnishings, reviewing overall Work plan, location of disposal container / CSA, location of fire exits, fire protection equipment, water supply and temporary electric tie-in.

1.06 DEFINITIONS, APPLICABLE STANDARDS AND REGULATIONS

A. Definitions

1. Hazardous waste shall be any materials to be disposed that possess at least one of four characteristics (ignitability, corrosivity, reactivity or toxicity) as defined and regulated by the Resource Conservation and Recovery Act (RCRA) and applicable state and federal regulations, or a material specifically identified as hazardous waste by applicable Federal or State lists, in 40 CFR 261 or 6 NYCRR 371, respectively.
2. A Conditionally Exempt/Very Small Quantity Generator (CESQ/VSQG) of hazardous waste shall be a waste handler who generates no more than 100 kilograms per month of listed and/or characteristic hazardous waste, generates no more than 1 kilogram of acute hazardous waste in any calendar month, and stores no more than 1,000 kilograms of listed and/or characteristic hazardous waste or more than 1 kilogram of acute hazardous waste.
3. A Small Quantity Generator (SQG) of hazardous waste shall be a waste handler who generates no more than 1,000 kilograms per month of listed and/or characteristic hazardous waste, generates no more than 1 kilogram of acute hazardous waste per month, and stores no more than 6,000 kilograms of listed and/or characteristic hazardous waste or more than 1 kilogram of acute hazardous waste.
4. Large Quantity Generator (LQG) of hazardous waste shall be a waste handler who generates more than 1,000 kilograms per month of listed and/or characteristic hazardous waste, generates more than 1 kilogram of acute hazardous waste per month, or stores more than 6,000 kilograms of hazardous waste or 1 kilogram of acute hazardous waste.
5. The Owner's Environmental Consultant Abatement Project Monitor (APM): The Owner shall provide a third-party Environmental Consultant APM to provide pre-work assessments, project monitoring assessments for the construction procedures for the work area and surrounding areas waste sampling, submittal review, initial and thence weekly disposal container / CSA inspection summaries, inspection and signoff of all hazardous waste shipments, and final clearance assessments. The PCB Contractor shall be responsible for the worker protection requirements.

- B. The PCB Contractor shall comply with the following codes and standards, except where more stringent requirements are shown or specified:

C. Federal Regulations:

1. 29 CFR 1910.1200, "Hazard Communication" (OSHA)
2. 29 CFR 1910.134, "Respiratory Protection" (OSHA)
3. 29 CFR 1910.145, "Specification for Accident Prevention Signs and Tags" (OSHA)
4. 29 CFR 1926, "Construction Industry" (OSHA)
5. 29 CFR 1926.500 "Guardrails, Handrails and Covers" (OSHA)
6. 40 CFR 761, "PART 761—POLYCHLORINATED BIPHENYLS (PCBs)" (EPA)
7. 49 CFR 171-173, Transportation Standards (DOT)

D. New York State Regulations:

1. 6 NYCRR, Parts 360, 364, Disposal and Transportation (DEC)
2. 6 NYCRR, Parts 370-373, "Hazardous Waste Management System"

E. New York City Regulations (as applicable):

1. NYC DEP regulations.
2. NYC Fire Department (FDNY) regulations.

F. Standards and Guidance Documents:

1. American National Standards Institute (ANSI) Z88.2, Practices for Respiratory Protection

1.07 PROJECT MONITORING

- A. The Owner shall engage the services of a Third-Party Environmental Consultant who shall serve as the Owner's Representative in regard to the performance of the PCB removal Project and provide direction as required throughout the entire removal Project period.
- B. The PCB Contractor is required to ensure cooperation of its personnel with the Environmental Consultant for the sampling and project monitoring functions described in this section. The PCB Contractor shall comply with all direction given by the Environmental Consultant during the Project.
- C. The Environmental Consultant shall provide the following administrative services:
 1. Review and approve or disapprove all submittals, shop drawings, schedules, and samples.
 2. Assure that all notifications to governmental agencies or landfills by the PCB Contractor are submitted in a timely manner and are correct in content.
- D. The Environmental Consultant shall staff the Project with a trained and certified person(s) [see training required in 1.04(A), excluding OSHA 8 hr. supervisor training], to act on the Owner's behalf at the job site. This individual shall be designated as the Abatement Project Monitor (APM).
 1. The APM shall be on-site at all times the PCB Contractor is on-site. The PCB Contractor shall not be permitted to conduct any Work unless the APM is on-site (except for inspection and planning purposes during non-working days).
 2. The APM shall have the authority to direct the actions of the PCB Contractor verbally and in writing to ensure compliance with the Project documents and all regulations. The APM shall have the authority to Stop Work when gross Work practice deficiencies or unsafe practices are observed.
 - a. Such Stop Work order shall be effective immediately and remain in effect until corrective measures have been taken and the situation has been resolved.
 - b. Standby time required to resolve the situation shall be at the PCB Contractor's expense.
 3. The APM shall provide the following services:
 - a. Inspection of the PCB Contractor's Work, practices, and procedures, including temporary protection requirements, for compliance with all regulations and Project specifications.
 - b. Monitor the progress of the PCB Contractor's Work, and report any deviations from the schedule to the Owner.
 - c. Monitor, verify, inspect and document all waste load-out operations and sign waste manifest on behalf of DASNY and owner unless the Owner requires their personnel signature (i.e. OMH, some SUNY schools, etc.).
 - d. The APM shall maintain a log on site that documents all project related and Environmental Consultant and PCB Contractor actions, activities, and occurrences.
 - e. The APM shall take air, swipe, wipe, or bulk samples upon the Owner's request.
 - f. The APM shall collect waste stream samples for Toxicity Characteristic Leaching Procedure (TCLP) analysis and provide results to DASNY and PCB Contractor, along with chain of custody documentation.
 4. The following inspections shall be conducted by the APM. Additional inspections shall be conducted as required by Project conditions. Progression from one phase of Work to the next by the PCB Contractor is only permitted with the written approval of the APM.
 - a. Pre-Construction Inspection: The purpose of this inspection is to verify the existing conditions of the Work Areas and to document these conditions.
 - b. Pre-Commencement Inspection: This inspection shall take place only after the Work Area is fully prepped for removal.
 - c. Work Inspections: The purpose of this inspection is to monitor the Work practices and procedures employed on the Project and to monitor the continued integrity of the containment system. Inspections within the removal areas shall be conducted by the APM during all preparation, removal, and cleaning activities at least twice every Work shift. Additional inspections shall be conducted as warranted.

- d. On-site hazardous waste CSA inspections: Initial CSA inspection and weekly inspections thereafter.
 - e. Inspection and signoff, on behalf of owner where permitted, of all hazardous waste shipments that are removed from the site.
 - f. Visual Clearance Inspection: The purpose of this inspection is to verify that all materials in the scope of work have been properly removed and no visible PCB material debris/residue remains.
 - g. Punch List Inspection: The purpose of this inspection is to verify the PCB Contractor's certification that all Work has been completed as contracted and the existing condition of the area prior to its release to the Owner.
5. The Owner may, at their discretion, choose to conduct air sampling. If air samples collected during removal indicate any airborne PCB concentration(s) above the OSHA Permissible Exposure Limit (PEL) Time Weighted Average (TWA) of 0.5 mg/m³ or EPA recommended thresholds, work shall be stopped immediately, and Work methods shall be altered to reduce the airborne PCB concentration(s).

1.08 PROJECT SUPERVISOR

- A. The PCB Contractor shall designate a full-time Project Supervisor who shall meet the following qualifications:
 - 1. The Project Supervisor shall be trained in PCB removal and hazardous waste management in NYS, via a 40-hour HAZWOPER and 8-hour Supervisor training course, as well as appropriate RCRA and DOT training, as listed in 1.04 A.
 - 2. The Project Supervisor shall have a minimum of one year experience as a supervisor.
 - 3. The Project Supervisor must be able to read and write English fluently, as well as communicate in the primary language of the Workers.
- B. If a Project Supervisor is not on-site at any time whatsoever, all Work shall be stopped. The Project Supervisor shall remain on-site until the Project is complete. The Project Supervisor cannot be removed from the Project without the written consent of the Owner and the Environmental Consultant. The Project Supervisor shall be removed from the Project if so requested by the Owner or DASNY.
- C. The Project Supervisor shall maintain a bound Daily Project Log that includes the Waste Disposal Log required by section 4.03 of this specification.
- D. The Project Supervisor shall be responsible for the performance of the Work and shall represent the PCB Contractor in all respects at the Project site. The Supervisor shall be the primary point of contact for the APM.
- E. As required by applicable regulations, prior to assignment to hazardous waste work, instruct each employee with regard to the hazards of the generated waste, safety and health precautions, and the use and requirements of protective clothing and equipment, as well as the facility contingency plan and/or PCB Contractor emergency action plan. The PCB Contractor shall also determine whether work will be performed in confined spaces. If so, properly trained personnel shall be required.

1.09 TRAINING

- A. As required by applicable regulations, prior to assignment to PCB Work, instruct each employee with regard to the hazards of PCB, safety and health precautions, and the use and requirements of protective clothing and equipment, as well as the facility contingency plan and/or PCB Contractor emergency action plan.
- B. Employees managing Hazardous Waste as described in Section 3.03 of this specification must also meet the Personnel training requirements in section 6 NYCRR 373-3.2, as required in 1.04 A.

1.10 RESPIRATORY PROTECTION

- A. Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134. Provide respirator training.
- B. Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services. High Efficiency Particulate Air (HEPA) respirator filters shall be approved by NIOSH and shall conform to the OSHA requirements in 29 CFR 1910.134.
- C. Respirators shall be individually fit-tested to personnel under the direction of an Industrial Hygienist initially and on a yearly basis thereafter. Fit-tested respirators shall be permanently marked to identify the individual fitted, and use shall be limited to that individual.
- D. A storage area for respirators shall be provided by the PCB Contractor in the clean portion of the decontamination enclosure where they will be kept in a clean, dry environment.
- E. The PCB Contractor shall provide and make available a sufficient quantity of respirator filters so that filter changes can be made as necessary during the work day. Filters will be removed and discarded during the decontamination process. Filters cannot be reused. Filters must be changed if breathing becomes difficult.
- F. Filters used with negative pressure air purifying respirators shall not be used any longer than one eight (8) hour work day.
- G. Any authorized visitor, Worker, or supervisor found in the Work Area not wearing the required respiratory protection shall be removed from the Project site and shall not be permitted to return.
- H. The PCB Contractor shall have at least two (2) Powered Air Purifying Respirators stored on site designated for authorized visitors use. Appropriate respirator filters for authorized visitors shall be made available by the PCB Contractor.

1.11 DELIVERY AND STORAGE

- A. Deliver all materials to the job site in original packages with containers bearing manufacturer's name and label.
- B. Store all materials at the job site in a suitable and designated area.
 - 1. Store materials subject to deterioration or damage away from wet or damp surfaces and under cover.
 - 2. Protect materials from unintended contamination and theft.
 - 3. Storage areas shall be kept clean and organized.
- C. Remove damaged or deteriorated materials from the job site. Materials contaminated with PCBs shall be disposed of as PCB material as specified herein.

1.12 TEMPORARY UTILITIES

- A. Where available, obtain power from Owner's existing system. Otherwise provide power from other sources (i.e. generator).
 - 1. Provide temporary 120-240 volt, single phase, three (3) wire, 100 amp electric service with Ground Fault Circuit Interrupters (GFCIs) for all electric requirements within the Work Area.
 - 2. Provide temporary wiring and "weatherproof" receptacles in sufficient quantity and location to serve all HEPA equipment and tools.
 - 3. Provide wiring and receptacles as required by the APM for air sampling equipment.

4. All power to the Work Area shall be brought in from outside the area through GFCIs at the source.
- B. Provide temporary lighting for all Work Areas.
 1. The entire Work Area shall be kept illuminated at all times.
 2. Provide lighting as required by the Environmental Consultant for the purposes of performing required inspections.
- C. Utilize domestic water service, if available, from Owner's existing system. Provide hot water heaters with sufficient capacity to meet Project demands.

PART 2 PRODUCTS

2.01 PROTECTIVE CLOTHING

- A. Provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, and foot coverings. Provide disposable nitrile, neoprene, butyl or Viton® gloves, suitable to prevent PCB skin contact, to protect hands.
- B. Provide sufficient quantities of protective clothing to assure a minimum of four (4) complete disposable outfits per day for each individual performing removal Work.
- C. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.
- D. Authorized visitors shall be provided with suitable protective clothing, headgear, hand protection, eye protection, ear protection and footwear whenever they enter the Work Area.

2.02 SIGNS AND LABELS, CONTAINERS

- A. Products for signs, labels and containers shall be as indicated in this section, or as directed by the Owner and / or their representative
- B. Provide warning signs and barrier tapes at all approaches to PCB Work Areas. Locate signs at such distance that personnel may read the sign and take the necessary protective steps required before entering the area.
- C. Each container used for on-site hazardous waste accumulation must be labeled or marked clearly with the words "Hazardous Waste," an indication of the hazards of the contents, and the date on which accumulation began (sections 262.16(b)(6) and 262.17(a)(5)).

Example:

- D. Provide the appropriate "Large PCB Mark" or "Small PCB Mark" (M_L or M_S per 40 CFR 761) as shown below, of sufficient size to be clearly legible, for display on waste containers (bags, boxes, rollofs or

Hazardous Waste Marking Example:

1. Hazardous warning statement
2. Generator name and address
3. Generator EPA ID number
4. Accumulation start date
5. EPA waste number
6. Manifest tracking number
7. Proper shipping name, technical name, special hazard warning (if applicable) and DOT special permits (if applicable)

HAZARDOUS WASTE

FEDERAL LAWS PROHIBIT IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE OR
PUBLIC SAFETY AUTHORITY OR THE
U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERATOR INFORMATION:

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

EPA ID NO. _____ EPA WASTE NO. _____

ACCUMULATION START DATE: _____ MANIFEST TRACKING NO. _____

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

HANDLE WITH CARE!

drums) which will be used to contain or transport PCB contaminated material, in accordance with 40 CFR 761. In addition, U.S. Department of Transportation (DOT) 49 CFR Parts 171 and 172 requires the name and UN number of the material to be on the bags or drums, and, if shipped in bulk (rollofs, Gaylord boxes, etc.), the bulk container must also be labeled: Polychlorinated Biphenyl, solid mixture UN 3432.

**CAUTION
CONTAINS
PCBs**

(Polychlorinated Biphenyls)

A toxic environmental contaminant requiring special handling and disposal in accordance with U.S. Environmental Protection Agency Regulation 40 CFR 761 - For Disposal Information contact the nearest U.S. E.P.A. Office.

In case of accident or spill, call toll free the U.S. Coast Guard National Response Center:
800-424-8802

Also contact: _____

Tel. _____

No.: _____

M_L

**CAUTION
CONTAINS
PCBs**

(Polychlorinated Biphenyls)

FOR PROPER DISPOSAL INFORMATION
CONTACT U.S. ENVIRONMENTAL
PROTECTION AGENCY

M_S

- E. The PCB materials are also NYS Hazardous Waste, and must have a label stating the following on each container :

HAZARDOUS WASTE--Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority, or the U.S. Environmental Protection Agency.

Proper DOT Shipping Name _____
Generator's Name, Address, City, State, ZIP and phone _____
Generator's EPA Identification Number, Waste code _____
Accumulation Start Date _____
Manifest Tracking Number _____

- F. Provide 6 mil plastic disposal bags with PCB caution labels.
1. The "Small PCB Label" (Ms per 40 CFR 761) may be used as shown above. Bags shall also be labeled with U.S. DOT required markings per 49 CFR 172, Polychlorinated Biphenyl, solid mixture UN 3432.
 2. Labeled PCB waste containers or bags shall not be used for non-PCB waste or trash. Any material placed in labeled containers or bags, whether turned inside out or not, shall be handled and disposed of as PCB waste.

2.03 DAILY PROJECT LOG

- A. Provide a Daily Project Log. The log shall contain on title page: the DASNY Project name and number; name, address and phone number of Owner; name, address and phone number of Environmental Consultant / APM; name, address and phone number of PCB Contractor; and emergency numbers including, but not limited to, local Fire/Rescue department.
- B. All entries into the log shall be made in non-washable, permanent ink, and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted.
- C. The Project Supervisor shall document all Work performed daily and note all inspections.

2.04 SCAFFOLDING AND LADDERS

- A. Provide all scaffolding and/or staging as necessary to accomplish the Work of this Contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding and ladders shall comply with all applicable OSHA construction industry standards.
- B. Provide scaffolding and ladders as required by the APM for the purposes of performing required inspections.

2.05 SHIPPING CONTAINERS AND PACKAGING

- A. Provide packaging in accordance with 49 CFR 173 Packaging Group 9, such as 30 or 55 gallon capacity fiber, plastic, or metal drums, Gaylord Boxes or other Intermediate Bulk Containers (IBCs), or non-siftable bulk containers, capable of being sealed air and water tight if PCB waste has the potential to damage or puncture disposal bags, or as specified by the waste disposal facility. Affix PCB caution labels on lids of drums, and opposite sides of drums or bulk containers, as well as the ends of bulk containers. Recovery or salvage drums must be acceptable for disposal of hazardous waste. Prior approval of drums is required. Drums or containers must meet the required OSHA, EPA (40 CFR Parts

260-264 and 300), and DOT Regulations (49 CFR Parts 171-178). Use of damaged containers shall not be allowed.

2.06 EQUIPMENT AND MATERIALS

- A. All dry vacuuming performed under this contract shall be performed with HEPA filter equipped industrial vacuums conforming to ANSI Z9.2.
- B. Any power tools used to drill, cut into, or otherwise disturb PCB material shall be manufacturer equipped with HEPA filtered local exhaust ventilation, unless specified otherwise.
 - 1. Electromechanical tools using aggressive methods (e.g. angle grinders, masonry groove cutters, circular saws, and slot mills, etc.) are not allowed to be used for exterior open-air PCB caulk/sealant or glazing compound removals. Local HEPA exhaust is not sufficient for these tools. A negative pressurized enclosure is required for these operations, in addition to the localized ventilation.
- C. All polyethylene (plastic) sheeting used on the Project (including but not limited to sheeting used for critical and isolation barriers, fixed objects, walls, floors, ceilings, waste container) shall be at least 6 mil fire retardant sheeting.
- D. Absorbant Material: Clay, soil or any commercially available absorbent used for the purpose of absorbing hazardous or potentially hazardous materials.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Should visible PCB debris be observed outside the Work Area, immediately stop work, notify the Owner, and institute emergency procedures as directed. All costs incurred in decontaminating such non-Work Areas and the contents thereof shall be borne by the PCB Contractor, at no additional cost to the Owner.

3.02 WORK AREA PREPARATION

- A. PCB caution signs shall be posted at all approaches to the PCB Work Area. Post all emergency exits as emergency exits only on the Work Area side, post with PCB caution signs on the non-Work Area side. Provide all non-Work Area stairs and corridors accessible to the PCB Work Area with warning tapes at the base of stairs and beginning of corridors. Warning tapes shall be in addition to caution signs.
- B. Access to areas of work shall be regulated to prevent unauthorized visitors.
- C. Personal/Equipment Decontamination Room or Area. An existing room or area that is adjacent to the work area shall be used for the decontamination of personnel and equipment. The room or area shall be covered by an impermeable dropcloth on the floor or horizontal working surface. The room or area must be of sufficient size to accommodate cleaning of equipment and removing personal protective equipment. Work clothing must be cleaned with a HEPA vacuum before it is removed. All equipment and surfaces of waste containers must be cleaned prior to removing them from the decontamination room or area. All personnel must enter and exit the PCB work area through the decontamination room or area.
- D. Work Area Preparation For Exterior Removal:
 - 1. Prior to placement of plastic sheeting, the ground / surface shall be pre-cleaned using HEPA vacuum and / or collection of visible PCB debris.
 - 2. All ground surfaces exterior to the work area shall have a layer of 6 mil fire retardant plastic sheeting, attached to the building face and laid down on the surface below the exterior removal work area, at least 10 feet wide or to the furthest point of gravity fall for dislodged debris by methods used,

- whichever is further. For work at the second story and above, extend 6 mil fire retardant plastic sheeting as necessary. For work above third story, by sidewalk, street, or property boundary, scaffolding sides shall be covered in 6-mil fire retardant plastic sheeting.
3. All operable windows within the work area and 25 feet from all sides of the work area shall be closed and cordoned off with caution tape, with "do not open" warnings.
 4. In the work area, isolate all HVAC equipment intakes by temporarily shutting down units during removals and installing plastic sheeting over the opening. Seal all openings (i.e. drain/grates) within 25 feet of work area, or within 10 feet of building.
- E. Work Area Preparation For Interior Removal:
1. Isolate all HVAC equipment, including installing plastic sheeting and sealing airtight with duct tape all air returns and exhausts. Turn off all HVAC systems serving work area when feasible.
 2. Prior to placement of plastic sheeting, the floor / surface shall be pre-cleaned using HEPA vacuum and / or collection of visible PCB debris.
 3. All floor areas adjacent to the work area shall have a layer of 6 mil fire retardant plastic sheeting, attached to the interior wall and laid down on the surfaces below the removal work area, at least five (5) feet wide or to the furthest point of gravity fall for dislodged debris by methods used, whichever is further.
 4. All movable objects shall be removed from the immediate work area. All non-movable objects shall be covered with one layer of 6 mil fire retardant plastic sheeting and sealed at the edges.
 5. All operable windows within the work area shall be closed. "do not open" warnings.
 6. Temporary dust barriers consisting of a minimum of 6-mil fire-retardant plastic sheeting shall be installed at hallways, corridors, doorways, and other openings to the work area not used for passage during removals to establish work area containment enclosure.
 7. A 6-mil fire retardant plastic sheeting overlapping curtained doorway shall be installed at the entrance to the work area.
 8. For all work areas with use of aggressive electromechanical grinding tools for PCB removals, HEPA filtered negative air ventilation units must be installed in work area and shall operate continuously during removal operations to establish negative pressure. A minimum of 4 air changes per hour must be maintained within work area during removals and cleanings until work area clearance is obtained from the APM.

3.03 REMOVAL OF PCB MATERIALS - GENERAL

- A. PCB-containing materials shall be removed in accordance with the Contract Documents and the approved PCB Work Plan.
- B. Non-PCB items remaining, such as windows, doors, masonry, and all other building construction and components from which PCB materials are removed, shall be decontaminated by physical or chemical means (such as stripper) such that no visible residue remains. The removal of the PCB materials may require the use of scrapers, solvents, mastic removal chemicals, or other methods/procedures to ensure complete removal.
- C. Use tools that generate the least amount of dust and that will still complete the PCB caulk/sealant or glazing compound removal. See current EPA regulations and recommendations regarding tools and protective measures to be used for PCB caulk/sealant or glazing compound removals.
- D. Electromechanical tools using aggressive methods (e.g. angle grinders, masonry groove cutters, circular saws, and slot mills, etc.) are not allowed to be used for exterior open-air PCB caulk/sealant or glazing compound removals. Local HEPA exhaust is not sufficient for these tools to control release of fugitive emissions into the open air. Negative Pressurized enclosure(s) are necessary, in addition to localized ventilation for these types of aggressive removals. Stated above 2.06 B.1.
- E. For exterior removals, take appropriate precautions (e.g. install windscreens, etc.) to prevent dust and debris from migrating due to windy conditions.

- F. Remove accessible caulk/sealant or glazing compound that could be disturbed before cutting building components, such as window frames. Cutting of components will occur on the ground within a negative pressurized work area enclosure.
- G. All removed PCB material shall be placed into 6 mil plastic disposal clear bags or other suitable container upon detachment from the substrate, or containers as specified by the waste disposal facility. Large components with PCB material or PCB residue shall be wrapped in one layer of 6 mil plastic sheeting. Sharp components likely to tear disposal bags shall be placed in fiber drums or boxes and then wrapped with 6 mil plastic sheeting.
- H. Power or pressure washers are not permitted for PCB removal or clean-up procedures.
- I. All construction and demolition debris determined by the Environmental Consultant APM to be contaminated with PCBs shall be handled and disposed of as PCB waste. If non-porous (e.g. metal) removed components previously in contact with non-liquid PCBs are to be cleaned and decontaminated prior to disposal as non-PCB waste, the requirements of 40 CFR 761 Subpart D shall be met, including cleaning to Visual Standard No. 2, Near-White Blast Cleaned Surface Finish of the National Association of Corrosion Engineers (NACE). The APM shall verify compliance with Standard No. 2, by visually inspecting all cleaned removed components. The PCB Contractor shall note that a near-white metal blast cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dust, dirt, mill scale, rust, coating, oxides, corrosion products, and other foreign matter.
- J. All PCB waste must be located at or near the point of generation, under the control of the Project Supervisor. Up to 55 gallons may be stored at the point of generation for an indefinite period, but any greater than 55 gallons must be moved within three 3 days to a Container Storage Area (CSA) as specified in 6 NYCRR Section 372.2 “Standards Applicable to Generators of Hazardous Waste”, or off-site. Waste may be stored at the CSA for 90 days (large quantity generator) or 180 days (small quantity generator), during which labeling, inspections, and other requirements must be met as described in 6 NYCRR Section 372.2, Section 373-3.1(d) and Subpart 373-3.
- K. On-site CSA Requirements:
1. Each waste dumpster/container shall have completed hazardous waste label with facility name, correct EPA ID number, full address, waste codes and waste information.
 2. Appropriate hazardous waste storage and contents labels shall also be posted on the containers.
 3. Since this is considered a main storage area for the project, third-party DASNY Environmental Consultant APM shall be completing initial and thence weekly hazardous waste storage area inspection logs and these records should be provided to DASNY and the facility each week. Inspection logs shall document observations including but not limited to: number and type of containers; disposition (empty, full, partially full); oldest container accumulation date; whether containers are sealed; description of CSA securitization (i.e. lock); and whether CSA is fully framed and sealed. Weekly inspection records shall be maintained for three years.
 4. Each dumpster/container shall also post all relevant DOT labels to indicate proper waste types.
 5. Each dumpster/container shall identify the accumulation start date.
 6. All dumpsters and containers being stored outside shall meet EPA RCRA container requirements and shall not leak. All dumpsters and containers must be fully covered and protected from elements.
 7. A spill kit shall be maintained in the CSA.
 8. Regarding the posting of emergency numbers, PCB Contractor shall coordinate with facility and DASNY and post all required emergency numbers including facility contact(s), DASNY field office, PCB Contractor emergency numbers and local fire, police and medical facility numbers. Signage shall be posted in the lockable CSA, which must be protected from the elements.
- L. The CSA and personnel managing it must also meet the following requirements of 6 NYCRR 373:
1. Preparedness and Prevention provisions of Section 373-3.3
 2. Secondary containment requirements of 373-2.9(f)(1)

3. Personnel training in section 373-3.2
 4. Contingency plans and emergency procedures in section 373-3.4 subparagraph 376.1(g)(1)(v)
 5. The containers must be dated when placed in storage, and accumulation times must be observed.
 6. The total amount of hazardous waste stored in the CSA at any given time must not exceed the maximum for the current generator status (6,000kg-SQG, no limit LQG).
 7. A label or sign stating "Hazardous Waste" must identify all areas and containers used to accumulate hazardous waste.
- M. Closure of the CSA. If a CSA was created specifically for the PCB removal work, once the removal work is complete, the PCB Contractor shall immediately close out the CSA, as per 373-3.7(b) and (e). This shall be observed and documented by the Environmental Consultant APM.
- N. The PCB Contractor is required to provide temporary protection of the building (i.e. roof, window openings, construction joints, etc.) at the end of each Work shift so as to maintain the building in a watertight condition. Any damage to the facility caused by inadequate PCB Contractor protection shall be the responsibility of the PCB Contractor.
- O. Personal protective equipment, including respirators, shall be utilized and worn during all removal operations until the Work Area is cleared by the APM.
- P. Following completion of gross removal and after all accumulations of PCB waste materials have been containerized, the decontamination procedures in Section 3.04 shall be followed.
- Q. Finishes damaged by PCB removal activities shall be restored by the PCB Contractor prior to final payment. Finishes unable to be restored shall be replaced under this Contract.
- R. Dry sweeping and any other methods that raise dust shall be prohibited.

3.04 EQUIPMENT AND AREA DECONTAMINATION

- A. When removal of PCB materials is completed, the decontamination process shall consist of HEPA vacuuming, wet wiping/mopping and a repeated HEPA vacuuming of the entire work area. All surfaces in and around the work area must be free of dust generated during the work.
- B. Decontaminate all tools and equipment before removal from the work area.
- C. If dust or debris has migrated to areas of the building other than the immediate work area, those areas shall be incorporated into the work area and thoroughly decontaminated to ensure all visible dust generated by the activity is eliminated.
- D. Uncontaminated dust barriers and other protective sheeting shall be placed in disposable construction bags and disposed of as normal trash.
- E. Visually inspect the area for any remaining dust or debris. HEPA vacuum and wet wipe until space is clean. Dispose of vacuum contents as PCB waste.
- F. Upon completion of decontamination and removal of temporary dust barriers, a final inspection shall be performed by the PCB Contractor accompanied by the APM. As a result of any visual inspection by the APM, the PCB Contractor will clean or reclean the affected areas at no additional expense to the Owner.

PART 4 DISPOSAL OF PCB WASTE

4.01 TRANSPORTATION AND DISPOSAL SITE

- A. The PCB Contractor's Hauler and Disposal Facility shall be approved by the Owner. Prior to the hazardous waste being removed from the site, written notice must be provided and confirmation received from the intended disposal facility, indicating proper authority to receive the PCB bulk product hazardous waste, as well as the ultimate disposal method for the waste. The notice shall be acknowledged in writing via a disposal facility representative's signature, printed name and title, as well as phone number, in compliance with 6 NYCRR 372.2(b)(2). For disposal within New York State, facilities must be specifically permitted to accept PCB waste. In addition, The PCB Contractor is responsible for securing appropriate treatment or disposal for the generated hazardous waste streams at a permitted TSDF, if necessary, in compliance with all regulatory requirements, and for obtaining a copy of the waste manifest and waste profile of the treated waste as executed by the TSDF. If the manifest is not returned within 35 calendar days from removal from the site, the PCB Contractor shall notify the Owner and the NYS DEC, and initiate an investigation as required and contact the EPA and file an Exception report if not returned within 45 days.
- B. The PCB Contractor shall give at least 24 hour notification prior to removing any waste from the site. Waste shall be removed from the site only during normal working hours unless otherwise specified. No waste may be taken from the site unless the PCB Contractor and Environmental Consultant APM are present, and the Environmental Consultant APM authorizes the release of the waste. The DOT-trained Environmental Consultant APM must be on-site for all hazardous waste shipment. They may also be required to signoff on the hazardous waste manifest on behalf of the owner and DASNY to allow the hazardous waste shipment to leave the site. This responsibility shall be coordinated and executed in accordance with the Owner's direction.
- C. All waste generated as part of the PCB project shall be removed from the site within ten (10) calendar days after successful completion of all PCB removal work. However, all disposal facility permits/licenses, waste profiles, LDR forms, hauler permit(s), and all other necessary paperwork must be submitted and approved by the Environmental Consultant APM before the waste is removed from the site. Waste stream samples shall be collected by the Environmental Consultant APM for TCLP analysis and the results utilized by the PCB Contractor for waste stream characterization and disposal determination.
- D. Upon arrival at the Project Site, the Hauler must possess and present to the Environmental Consultant APM a valid DEC Part 364 Waste Hauler's Permit. The Environmental Consultant APM may verify the authenticity of the hauler's permit with the proper authority.
- E. The Hauler, with the PCB Contractor and the Environmental Consultant APM, shall inspect all material in the transport container prior to taking possession and signing the Hazardous Waste Manifests.

4.02 WASTE SHIPMENT STORAGE CONTAINERS

- A. All waste shipment storage containers shall be fully enclosed and lockable (i.e. enclosed dumpster, trailer, etc.).
- B. The Environmental Consultant / APM shall verify that the waste shipment storage container and/or truck tags (license plates) match that listed on the DEC Part 364 permit. Any waste shipment storage container not listed on the permit shall be removed from the site immediately prior to storage of any material from the site.
- C. The waste shipment storage container shall be plasticized and sealed with one layer of clear 6 mil plastic. Once on-site, it shall be kept locked at all times, except during load out. The waste shipment storage container shall not be used for storage of equipment or PCB Contractor supplies.

- D. While on-site, the waste shipment storage container shall be labeled with DEC Hazardous Waste Warning Labels as specified in Section 2.02.
- E. The New York State Department of Environmental Conservation Hauler's Permit number shall be displayed on both sides and back of the container. The permit number shall be at least 3 inches high and in a color that contrasts with the container / vehicle background color.
- F. Waste generated off-site or from a different on-site non-DASNY project is not permitted to be brought onto the Project site and/or loaded into the waste container.
- G. The waste shipment storage container is not permitted to be loaded unless it is properly plasticized, has the appropriate danger signage affixed, and has the permit number appropriately displayed on the container.
- H. The Owner may initiate random checks at the Disposal Site to ensure that the procedures outlined herein are complied with.

4.03 HAZARDOUS WASTE MANIFESTS & DISPOSAL DOCUMENTATION

- A. Based on New York State's consideration of PCBs as hazardous waste, a Uniform Hazardous Waste Manifest shall be utilized solely as the waste Manifest for transportation. A hauler billing form or bill of lading may be used if the hauler needs an independent record but shall not be used as the primary shipping document.
- B. The Manifest shall be completed by the PCB Contractor and verified by the Environmental Consultant that all the information and amounts are accurate, and the proper signatures are in place.
- C. The Manifest shall have the appropriate signatures of the Owner's Representative (the Generator) and the Hauler representative prior to any waste being removed from the site.
- D. Copies of the completed Manifest shall be retained by the Environmental Consultant and shall remain on-site for inspection.
- E. Upon arrival at the Disposal Site, the Manifest shall be signed by the Disposal Facility operator to certify receipt of PCB materials covered by the manifest.
- F. The Disposal Facility operator shall return the original Manifest to the Owner's Representative or the disposal facility state as required by the DEC in 6 NYCRR 372 within 35 days. The Environmental Consultant must call the facility to investigate if the Manifest is not returned within 35 days and contact the DEC and file an Exception report if not returned within 45 days.
- G. The PCB Contractor shall utilize the Waste Disposal Log provided by the Owner. This log shall be maintained by the Project Supervisor and shall be kept on-site at all times. (See Appendix A.)
- H. Copies of all waste disposal manifests and disposal logs (copies are acceptable for electronic closeout submittal review) shall be submitted by the PCB Contractor to the Owner with the final close-out documentation.
- I. The PCB Contractor must also submit reports and records per the requirements of 6 NYCRR 372.2.
- J. Payment for disposal of hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of hazardous waste delivered is returned for each load of waste removed from the site. The waste disposal log originals must be provided to the Owner, and copies provided to DASNY Code Compliance.

- K. The Owner shall be provided the necessary information to file the annual report and fee report, if applicable, for the hazardous waste shipped.

END OF SECTION

APPENDIX A

WASTE DISPOSAL LOG



DASNY

DORMITORY AUTHORITY STATE OF NEW YORK WASTE DISPOSAL LOG

Facility: _____

Building: _____

Project: _____

DASNY Project Number: _____

PCB Contractor: _____

Environmental Consultant: _____

Load No.	Hauler Name	NYSDEC #	License Plate No.	Size of Container	Disposal Facility Name	Date Depart from Site	Date Received at Disposal Site	Date Shipment Record Returned

Comments: _____

Page _____ of _____

APPENDIX B

PCB CONTRACTOR'S ACKNOWLEDGEMENT STATEMENT

PCB CONTRACTOR'S ACKNOWLEDGEMENT **STATEMENT**

Re: Removal of Non-Liquid PCB Materials

(DASNY Project Title)

(Project Location-Campus, Building ID, Floor)

(DASNY Project Number)

Project Date(s) (Start/End)

(PCB Contractor)

In consideration of the following individuals' employment in connection with the removal, handling, and disposal of Non-Liquid PCB Materials at the referenced project, I hereby certify that the employees: a) have received the medical examinations required by OSHA 29 CFR 1926.134; b) have been fit tested specifically for respirators used on the Project; and c) have received training in the proper handling of Non-Liquid PCB materials, including the health implications and risks involved, as well as the use and limitations of the personal protective equipment to be used.

Employee Name (Supervisor and Handlers) (Print Name)	Social Security Number (last four digits)	State Driver License ID#
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Project Supervisor: _____

Print Name

Signature

Notary block here)

Notary Name: _____

Page ___ of ___

APPENDIX C

SAMPLE BLANK PCB LDR FORM

NEW YORK STATE GENERATOR RESTRICTED WASTE NOTIFICATION/CERTIFICATION FOR PCB WASTES

ALL NEW YORK STATE GENERATORS WHO GENERATE PCB WASTES MUST ATTACH THIS
ADDENDUM TO THE UNIFORM HAZARDOUS WASTE MANIFEST
(THIS NOTIFICATION/CERTIFICATION IS ONLY APPLICABLE WITHIN THE STATE OF NEW YORK)

GENERATOR NAME:

EPA ID NO.:

SIGNATURE:

DATED:

MANIFEST NO:

This addendum to the uniform hazardous waste manifest must be completed for any New York State regulated hazardous waste generated in the State of New York. This form ensures that New York State generators comply with the notification requirements of 6 NYCRR Part 376. All New York State generators shipping PCB waste which is a New York State regulated hazardous waste must check the box and indicate the applicable waste code below.

- ☐ Check Here: The waste associated with the above manifest includes New York State Regulated PCB waste which is land restricted in the State of New York and is subject to 6 NYCRR Part 376.4(f). This waste shall be disposed of in accordance with 40 CFR 761. Pursuant to 376.4(f) (l) (i), B002 waste from any source other than a spill may not be stabilized or mixed with any other substance to conform with any provision of 40 CFR Part 761 regarding land disposal if the disposal occurs in the state of New York.

Check all which apply:

- ☐ B001 - PCB oil (concentrated) from transformers, capacitors, etc.
- ☐ B002 - Petroleum oil or other liquid containing 50 ppm or greater of PCBs, but less than 500 ppm PCBs.
- ☐ B003 - Petroleum oil or other liquid containing 500 ppm or greater of PCBs.
- ☐ B004 - PCB articles containing 50 ppm or greater of PCBs, but less than 500 ppm PCBs, excluding small capacitors.
- ☐ B005 - PCB articles, other than transformers, that contain 500 ppm or greater of PCBs, excluding small capacitors.
- ☐ B006* - PCB transformers. *PCB transformers* means any transformer that contains 500 ppm PCB or greater.
- ☐ B007* - Other PCB wastes, including contaminated soil, solids, sludges, clothing, rags and dredge material.

* Generators are required to certify that their B006 and/or B007 waste can be land disposed in accordance with 40 CFR Part 761 without further treatment if:

- a. The waste is a B006 and is a transformer which has been drained and flushed pursuant to 40CFR761.60(b)(l)(i)(B) or
- b. The waste is a B007 and does not contain PCBs which have been deliberately solicited.
- ☐ Check here if the B006 and/or B007 waste associated with this manifest conforms with either "a" or "b" and is intended for land disposal and sign this form at the top of the page. In accordance with 6 NYCRR Part 376.1 (g) (l)(ii) the generator makes the following certification:

"I certify under penalty of law that I personally have examined and am familiar with the waste, through analysis and testing or through knowledge of the waste, to support this certification that the waste complies with the treatment standards specified in part 376, section 376.4 and all applicable prohibitions set forth in subdivision 376.3(b) of Part 376 or RCRA section 3.04(d). I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment. "

SECTION 02 86 00

IDENTIFICATION AND DISPOSAL OF HAZARDOUS WASTE

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. This specification covers the identification and disposal of hazardous waste, and related hazardous materials at **Bronx Psychiatric Center, Building 1, 1500 Waters Place, Bronx, NY, DASNY Project Number 3816609999**). Demolition and removal of materials shall be as required to support the work.
- B. Special Wastes:
1. Asbestos-Containing Materials (ACM): ACM is regulated by United States Environmental Protection Agency (EPA) Toxic Substances Control Act (TSCA) Rules, NY Code Rule 56 and United State Occupational Safety and Health Administration (OSHA) standards and is not Hazardous Waste. Asbestos-Containing materials are governed under DASNY Specification 028200 Asbestos Removal.
 2. PCB Bulk Waste and non-liquid PCB materials (NLPCB): Interior and exterior caulk / sealant and glazing materials may contain NLPCB; if so, when disposed these materials are EPA-regulated PCB Bulk Waste under TSCA and are NYS hazardous waste. PCB light ballasts are also to be disposed of as NYS Hazardous Waste. NLPCB are governed under DASNY Specification 028400 Non-liquid PCB Material Removal.
- C. The work shall include but not be limited to the removal of the following.

Building & Floor	Description of Material	Approximate Quantity (lbs/units)
Building 1 Transformer Room 1	PCB Remediation Waste Concrete Slab	60,000 Lbs
Building 1 Transformer Room 2	PCB Remediation Waste Concrete Slab	60,000 Lbs
Building 1 Transformer Room 1	PCB Remediation Waste Soil	370,000 Lbs.
Building 1 Transformer Room 2	PCB Remediation Waste Soil	370,000 Lbs.
Total Quantity		860,000 Lbs.

- D. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed (See General Conditions Article 3 – Site Conditions). Failure to do so shall not relieve the Contractor of its obligation to furnish all labor and materials necessary to perform the Work.
- E. If any hidden materials are encountered during construction that when impacted by the project may generate hazardous waste, these materials shall be adequately assessed by the environmental consultant. This specification section shall be followed as appropriate for any impact to these hidden materials.
- F. All Work shall be performed in strict accordance with the Project Documents and all governing codes, rules, and regulations. Where conflicts occur between the Project Documents and applicable codes, rules, and regulations, the more stringent shall apply.

- G. Working hours shall be as required and approved by the Owner. Removal activities including, but not limited to, work area preparation, gross removal activities, cleaning activities, waste removal, etc. may need to be performed during 'off-hours' (including nights and weekends). In addition, multiple mobilizations may be required to perform the work identified in this project. The Contractor shall coordinate and schedule all Work with the facility and Owner's representative.

1.02 SPECIAL JOB CONDITIONS

- A. Any special job conditions are described below:
"None".

1.03 DEFINITIONS

- A. Hazardous waste shall be any generated waste stream that possesses at least one of four characteristics (ignitability, corrosivity, reactivity or toxicity) as defined and regulated by the Resource Conservation and Recovery Act (RCRA) and applicable state and federal regulations, or a material specifically identified as hazardous waste by applicable Federal or State lists, in 40 CFR 261 or 6 NYCRR 371, respectively.
1. Exception – Hazardous waste metal scrap, lead shielding, and metal with lead-based paint that has been segregated for recycling. A blank C7 NYS DEC notification form is included in appendices.
- B. A Conditionally Exempt/Very Small Quantity Generator (CESQ/VSQG) of hazardous waste shall be a waste handler who generates no more than 100 kilograms per month of listed and/or characteristic hazardous waste, generates no more than 1 kilogram of acute hazardous waste in any calendar month, and stores no more than 1,000 kilograms of listed and/or characteristic hazardous waste or more than 1 kilogram of acutely hazardous waste.
- C. A Small Quantity Generator (SQG) of hazardous waste shall be a waste handler who generates more than 100 kilograms but less than 1,000 kilograms per month of listed and/or characteristic hazardous waste, generates no more than 1 kilogram of acute hazardous waste per month, and stores no more than 6,000 kilograms of listed and/or characteristic hazardous waste or more than 1 kilogram of acutely hazardous waste.
- D. Large Quantity Generator (LQG) of hazardous waste shall be a waste handler who generates more than 1,000 kilograms per month of listed and/or characteristic hazardous waste, generates more than 1 kilogram of acute hazardous waste per month, or stores more than 6,000 kilograms of hazardous waste or 1 kilogram of acutely hazardous waste.
- E. The Owner's Environmental Consultant: The Owner shall provide a third-party environmental consultant to provide pre-work assessments, project monitoring assessments for the construction procedures for the work area, surrounding areas waste sampling, and container storage area, submittal review, and inspection and signoff of all hazardous waste shipments as well as final clearance assessments. The Contractor shall be responsible for the worker protection requirements.

1.04 SUBMITTALS

- A. Pre-Work Submittals: Within 7 days prior to the pre-construction conference, the Contractor shall submit an electronic copy of the documents listed below to the DASNY Project Manager, the DASNY Code Compliance Unit and the Environmental Consultant for review. Code Compliance approval must be obtained, prior to the commencement of removal activities.

Pre-work Submittals	VSQG (CESQG)	SQG	LQG
1. Training & Certifications			
a) List of the employees scheduled to perform this work and their project function (Supervisor or Worker)	X	X	X
b) Certificate of on-site supervisor, for successful completion of OSHA 40-hour Health and Safety course [29 CFR 1910.120/1926.65] for handling hazardous waste and spills, including most recent refresher training.	X	X	X
c) OSHA 8-hour supervisor training [29 CFR 1910.120(e)(4)/1926.65(e)(4)] for hazardous waste.	X	X	X
d) Certificates of workers, for successful completion of OSHA 40-hour Health and Safety course [29 CFR 1910.120/1926.65] for handling hazardous waste and spills, including most recent refresher training.	X	X	X
e) Valid United States Department of Transportation (DOT) training [49 CFR 172.704] for supervisor and all employees loading waste and maintaining on-site waste storage area. This training shall include: general awareness / familiarization training; function specific training; safety training; security awareness training; and in-depth security training.	X	X	X
f) Annual hazardous waste RCRA training as per 40 CFR 260.10, 262.17(a)(7), 264.16 & 265.16. Submit sign-in sheets for all employees and supervisors working on the project. This training may be either 2 hours, 4 hours or 8 hours, as applicable.	X	X	X
g) For projects involving Lead-based Paint, Lead Paint certification for each of the employees and supervisors per EPA, as applicable.	X	X	X
h) Employees managing Hazardous Waste must also meet the Personnel training requirements in section 6 NYCRR 373-3.2, 3.3, 3.4 & 376(g)(1)(v), as applicable. OSHA HAZWOPER training should suffice for this requirement along with the addition of site-specific required training.	X	X	X
2. Transportation & Disposal			
a) Valid Hazardous Waste Transporter NYS Part 364 permit for all transporters.	X	X	X
b) Valid Hazardous Waste Transport vehicle permit for all transporters for each state the waste is being transported through to reach the Treatment, Storage and Disposal Facility (TSDF), as applicable.	X	X	X
c) Valid US DOT vehicle registration for EACH Transporter.	X	X	X
d) Transfer Facility Permit (if used) including the name, address and EPA ID No. of the facility, phone number and contact person. Include an acknowledgement letter stating that the facility has the capacity and is permitted to accept the waste from the project site and how the waste will be disposed [i.e. treatment (T) landfill (L), incineration (B), recycled (R)]. Transfer Facilities must be located within the US.	X	X	X
e) Final Disposal Facility permit including the name, address, phone number and EPA ID No. of the facility, and contact person. Include an acknowledgement letter from the disposal facility stating that the facility has the capacity and is permitted to accept the waste from the project site and how the waste will be disposed [i.e. treatment (T) landfill (L), incineration (B), recycled (R)]. The final destination of waste must be within the United States.	X	X	X
f) The TSDF permit(s) must identify the waste material(s) to be received.	X	X	X
g) Draft Land Disposal Restriction (LDR) form (See Appendix A for PCB LDR).	X	X	X

Pre-work Submittals	VSQG (CESQG)	SQG	LQG
h) Draft Waste Profile(s).	X	X	X
i) Draft Waste Manifest.	X	X	X
j) Draft C7 NYSDEC Notification form for any metals to be recycled, if applicable (See Appendix B).	X	X	X
3. Site-specific:			
a) Safety Data Sheet (SDS) for all materials to be removed.	X	X	X
b) If the Contractor introduces any chemical into the work environment, a SDS for each chemical must be presented to the Owner's Representative prior to use.	X	X	X
4. Progress Schedule:			
a) Show the complete sequencing of removal activities and the sequencing of Work within each building, wing or section of building. <i>The schedules will be utilized to schedule facility and third-party environmental consultant requirements.</i>	X	X	X
b) Show the dates for the beginning and completion of each major element of Work including substantial completion dates for each Work Area, building or phase.	X	X	X
5. Scope of Work Plan:			
Removal Work Plan and Drawing(s)			
Provide a written work plan description of work and drawing(s) that clearly indicates the following:			
a) All work areas/phases numbered sequentially.	X	X	X
b) Locations and types of all decontamination enclosures for each work area/phase.	X	X	X
c) Proposed location and construction of storage facilities and field office (when applicable).	X	X	X
d) Type of removal activity/technique for each work area/phase.	X	X	X
e) List waste types and quantity being generated and stored (refer to 1.01, C).	X	X	X
f) Site/work area preparation and cleanup procedures.	X	X	X
g) Include in the plan, eating, drinking, and sanitary procedures, interface of trades and sequencing of hazardous waste generation.		X	X
h) Include occupational and environmental sampling (if any by the Contractor), frequency and duration of sampling.		X	X
i) Contractor's Health and Safety Plan		X	X
j) Contractor's Facility Contingency Plan revision information for material handling and emergency procedures, that has been accepted by owner.			X
k) Container Storage Area (CSA) location and construction details. (refer to 3.03.H.) [How is the waste being stored? (indoors or outdoors, drums, containers, or dumpsters, types, with cover?).]	X	X	X
l) Include waste transport routes to the CSA from each work area/phase	X	X	X
m) Collected wastewater disposal/treatment plan.			X
n) Include plan for hazardous waste segregation and minimization including metal recycling, as necessary.	X	X	X
o) Contractor waste generation details (amount per day, per week or per quarter) in kgs or pounds.			X
p) Contractor emergency evacuation plan requirements and evacuation route for the project specific work areas/phases.			X

Pre-work Submittals	VSQG (CESQG)	SQG	LQG
q) DASNY PM, Facility Representative, and Project team emergency contact numbers. [to be posted at CSA (interior and exterior).]	X	X	X
Do not start work until submittals are returned with the Owner's Representative approval for unrestricted use.	X	X	X

VSQG: <220 lbs.; SQG: 220lbs – 2200lbs (180 Days); LQG - >2,200lbs (90 Day).

B. On-Site and During Construction Submittal Requirements.

On-Site & During Construction	VSQG (CESQG)	SQG	LQG
The following submittals, documentation, and postings shall be maintained on-site by the Contractor during abatement activities at a location approved by the Environmental Consultant:			
1. Approved pre-work submittals.	X	X	X
2. Project Documents (environmental reports, specifications and drawings).	X	X	X
3. Applicable regulations.	X	X	X
4. Updated licenses/permits and acknowledgement letters for any changes in transporter or disposal site.	X	X	X
5. For each employee, current annual medical respiratory clearance.		X	X
6. For each employee, current satisfactory respiratory fit test results.		X	X
7. Confined Space training certificates as per 29 CFR 1910.146 or 1926.1207, as applicable.	X	X	X
8. Coordinate with facility for a 30-minute training on the facility contingency plan requirements and contractors emergency action plan. Submit proof of contingency plan training. A copy of the contingency plan, including any revisions, shall be posted at each CSA			X
9. Contractor shall provide weekly update, including initial container storage dates for each container stored, an approximate estimate of amount of waste being generated during each work-day, week or month that it is stored on-site. The actual weight of the waste, excluding the weight of the dumpster / container, shall be identified.			X
10. Toxicity Characteristic Leaching Procedure (TCLP) waste sample results. Contractor shall notify DASNY and Environmental Consultant for waste stream sampling prior to any waste being removed from the site. Painted component waste streams shall be tested by the 8 RCRA Metals TCLP methodology.	X	X	X
11. Completed Waste Profile form(s). Contractor shall utilize analytical test results from the survey report and / or TCLP results provided by Environmental Consultant, as appropriate, to generate waste profile and LDR form.	X	X	X
12. Completed LDR form.		X	X
13. Completed C7 form along with NYS DEC submission documentation (email delivery), if applicable	X	X	X
14. List of emergency phone numbers.	X	X	X
15. Waste disposal log.		X	X
16. Daily Project Log.	X	X	X

On-Site & During Construction	VSQG (CESQG)	SQG	LQG
17. Copy of Waste manifest for each load of waste that is removed from site.	X	X	X
18. Copy of completed hazardous waste manifest including legible transporter and disposal facility information, dates and times of waste shipment departures / arrivals, and signatures, for each load of waste, within 35 days of waste being removed from site.	X	X	X
The following documentation shall be maintained on-site by the Environmental Consultant during abatement activities:			
19. Valid Environmental Consultant personnel OSHA, RCRA, and DOT training certifications.	X	X	X
20. Proof of current Facility Contingency Plan Training.			X
21. Consultant Daily Log.	X	X	X
22. Listing of all visual inspections with the date of inspection and the date of signoff on the supervisor's log.	X	X	X
23. Hazardous Materials Survey Report.	X	X	X
24. All TCLP waste sample laboratory results including completed chain of custody forms and valid laboratory NYS DOH ELAP certifications.	X	X	X
25. CSA Inspections – Initial Inspection and Weekly Inspections Thereafter.	X	X	X
26. All applicable waste documentation, including but not limited to Universal Hazardous Waste Manifests, waste profiles, LDR forms, c7 forms and disposal facility letter(s).	X	X	X

C. Project Close-out Submittal Requirements:

1. Within 30 days after project and/or phase completion, the **Contractor** shall submit one electronic copy of the closeout-out submittal (requirements listed below) to DASNY Code Compliance and one copy to the Environmental Consultant for review and approval prior to the Contractor's final payment. Once DASNY Code Compliance approves the electronic close-out submittal, the Contractor shall provide hardcopy or e-copy of the approved close-out documents, as per DASNY Project Management. DASNY Project Management shall provide the Facility with a copy of the approved closeout submittals.
 - a. **Fully Executed Copies** of all completed hazardous waste disposal manifests, recycling certificates for recycled metal and disposal logs (see Appendix C), not yet submitted and approved, shall be sent to DASNY Code Compliance including legible transporter and disposal facility information, departure / arrival times and dates, and signatures. Original hazardous waste manifests shall be sent to the Owner/Generator.
 - b. Copies of all executed waste profile forms, disposal facility acknowledgement letters and LDR forms.
 - c. Daily progress log.
 - d. Entry/Exit Logs. Decontamination unit entry/exit log for Hazardous Waste generation work areas (must be separate from any documentation associated with Asbestos removals, unless the material is both Hazardous and ACM).
 - e. If TSDF transfer facility is utilized, completed hazardous waste manifest from final destination must also be provided along with a certificate of disposal/recycling. Final destination of waste must be within the United States.
 - f. Documentation (i.e. daily log) of Container Storage Area (CSA) closure (if applicable) in accordance with applicable federal and state regulations.
2. Within 30 days of project and/or phase completion, the **Environmental Consultant** shall submit one electronic copy of the documents listed below to DASNY Code Compliance for

review and approval prior to Environmental Consultant's final payment. Once DASNY Code Compliance approves the electronic close-out submittal, the Environmental Consultant shall provide three sets of the approved close-out documents (double-sided and bound) to DASNY Project Management. Project Management shall provide the Facility with one copy of the approved closeout submittals.

- a. Upon completion of the Project, the Environmental Consultant shall certify to the Owner, in writing, that the work is complete and acceptable in an Executive Summary of the work.
- b. The Environmental Consultant shall review and approve or disapprove all necessary guarantees, certificates of compliance, and all other close-out documentation, which the Contractor is required to submit.
- c. The Environmental Consultant shall provide to the Owner the final Project data binder to include:
 - 1) All daily logs.
 - 2) Summary of all visual inspections with the date of inspection and the date of signoff on the supervisor's log.
 - 3) Sampling logs, Laboratory results, chain of custody forms, and sample location plans, if applicable.
 - 4) Daily worker rosters.
 - 5) All TCLP waste sample laboratory results including completed chain of custody forms and valid laboratory NYS DOH ELAP certifications, if applicable.
 - 6) All applicable waste documentation, including but not limited to Uniform Hazardous Waste Manifests, waste profiles, LDR forms, C7 forms, certificate of disposal/recycling and disposal facility acknowledgment/acceptance letter(s)/documentation.
 - 7) All pertinent correspondence related to the Project including but not limited to clearance letters and supplemental inspection findings performed during construction, copies of all weekly hazardous waste storage location inspections, etc.

- D. Hazardous Waste Project Submittals shall be submitted as separate packages, not included with any other environmental or hazardous materials submittals.

1.05 PRE-CONSTRUCTION CONFERENCE

- A. Prior to start of preparatory Work under this Contract, the Contractor shall attend a pre-construction conference attended by Owner, Facility Personnel, and Environmental Consultant.
- B. Agenda for this conference shall include but not necessarily be limited to:
 1. Contractor's scope of Work, Work plan, and schedule to include number of workers and shift days and times.
 2. Contractor's safety and health precautions including protective clothing and equipment and decontamination procedures.
 3. Environmental Consultant's duties, functions, and authority.
 4. Contractor's Work procedures including:
 - a. Methods of job site preparation and removal methods.
 - b. Respiratory protection.
 - c. Disposal procedures.
 - d. Cleanup procedures.
 - e. Fire exits and emergency procedures.
 5. Contractor's required pre-work and on-site submittals, documentation, and postings.
 6. Contractor's plan for 24-hour Project security both for prevention of theft and for barring entry of unauthorized personnel into Work Areas.

7. Temporary utilities.
 8. Handling of furniture and other movable objects.
 9. Hazardous waste segregation and minimization plan, including metals intended for recycling.
 10. Storage of Hazardous waste in CSA.
 11. Waste disposal requirements and procedures, including Contractor notification to DASNY project management and Environmental Consultant for TCLP waste stream sampling, once waste stream generation has commenced, and prior to any waste being removed from site.
 12. If applicable, contingency plan training information.
- C. In conjunction with the conference, the Contractor shall accompany the Owner and Environmental Consultant on a pre-construction walk-through documenting existing condition of finishes and furnishings, reviewing overall Work plan, location of CSA, location of fire exits, fire protection equipment, water supply and temporary electric tie-in.

1.06 APPLICABLE STANDARDS AND REGULATIONS

- A. All activities related to the work shall be conducted in compliance with all applicable laws, regulations, and requirements which may include, but not be limited to: EPA, DOT, RCRA, TSCA, OSHA, New York State Department of Environmental Conservation (NYS DEC), New York City Department of Environmental Protection (NYC DEP), and New York City Fire Department.
- B. The Contractor is required to secure and maintain all required regulatory permits necessary to perform all aspects of the work.
- C. The Contractor shall containerize and store waste in accordance with all applicable regulations. All containers shall be appropriately marked/labeled, including the accumulation start date indicated on each package.

1.07 PROJECT SUPERVISOR

- A. The Contractor shall designate a full-time Project Supervisor who shall meet the following qualifications:
 1. The Project Supervisor shall be trained in hazardous waste removal/generation procedures and hazardous waste management in NYS, via a 40-hour HAZWOPER and 8-hour Supervisor training course, as well as appropriate RCRA and DOT training.
 2. The Project Supervisor shall have a minimum of one year experience as a supervisor.
 3. The Project Supervisor must be able to read and write English fluently, as well as communicate in the primary language of the Workers.
- B. If the Project Supervisor is not on-site at any time whatsoever, all Work shall be stopped. The Project Supervisor shall remain on-site until the Project is complete. The Project Supervisor cannot be removed from the Project without the written consent of the Owner and the Environmental Consultant. The Project Supervisor shall be removed from the Project if so requested by the Owner or DASNY.
- C. The Project Supervisor shall maintain a Daily Project Log that includes the Waste Disposal Log required by section 4.03 of this specification.
- D. The Project Supervisor shall be responsible for the performance of the Work and shall represent the Contractor in all respects at the Project site. The Supervisor shall be the Contractor primary point of contact for the Environmental Consultant.
- E. As required by applicable regulations, prior to assignment to hazardous waste work, instruct each employee with regard to the hazards of the generated waste, safety and health precautions, and the

use and requirements of protective clothing and equipment, as well as the facility contingency plan and/or Contractor emergency action plan. The contractor shall also determine whether work will be performed in confined spaces. If so, properly trained personnel shall be required. Valid initial and refresher confined space training documentation shall be maintained at the site.

PART 2 PRODUCTS

2.01 PROTECTIVE CLOTHING

- A. Provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, and foot coverings. Provide appropriate disposable gloves (i.e. neoprene or butyl gloves for handling PCBs), suitable to prevent hazardous waste skin contact, to protect hands.
- B. Provide sufficient quantities of protective clothing to assure a minimum of four (4) complete disposable outfits per day for each individual performing abatement Work.
- C. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.
- D. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, gloves, and footwear whenever they enter the Work Area.

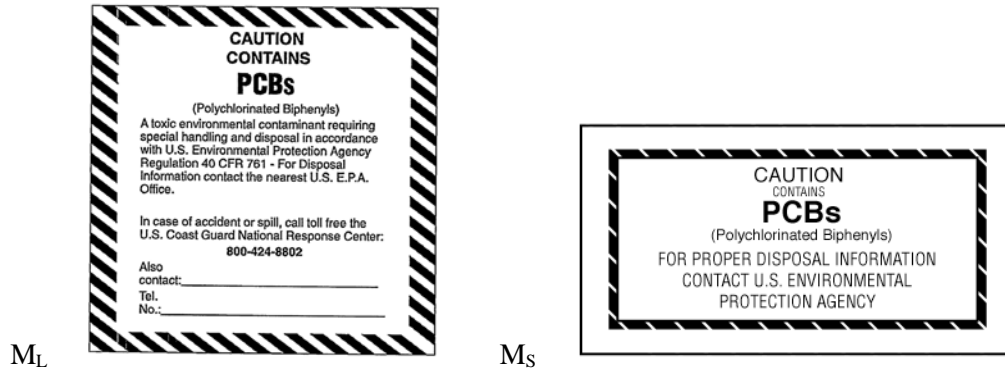
2.02 SIGNS AND LABELS, CONTAINERS

- A. Products for signs, labels and containers shall be as indicated in this section, or as directed by the Owner and / or their representative.
- B. Provide warning signs and barrier tapes at all approaches to Hazardous Waste generation Work Areas. Locate signs at such distance that personnel may read the sign and take the necessary protective steps required before entering the area.
- C. Each container used for on-site hazardous waste accumulation must be labeled or marked clearly with the words "Hazardous Waste," an indication of the hazards of the contents, and the date on which accumulation began (sections 262.16(b)(6) and 262.17(a)(5)).

Example:

Hazardous Waste Marking Example: <ul style="list-style-type: none">1. Hazardous warning statement2. Generator name and address3. Generator EPA ID number4. Accumulation start date5. EPA waste number6. Manifest tracking number7. Proper shipping name, technical name, special hazard warning (if applicable) and DOT special permits (if applicable)	<p>HAZARDOUS WASTE</p> <p>FEDERAL LAWS PROHIBIT IMPROPER DISPOSAL</p> <p>IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY</p> <p>GENERATOR INFORMATION:</p> <p>NAME: _____</p> <p>ADDRESS: _____</p> <p>CITY: _____ STATE: _____ ZIP: _____</p> <p>EPA ID NO. _____ EPA WASTE NO. _____</p> <p>ACCUMULATION START DATE: _____ MANIFEST TRACKING NO. _____</p> <p>[_____]</p> <p>D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX</p> <p>HANDLE WITH CARE!</p>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

- D. For PCB Hazardous Waste, provide the appropriate “Large PCB Mark” or “Small PCB Mark” (M_L or M_S per 40 CFR 761) as shown below, of sufficient size to be clearly legible, for display on waste containers (bags, boxes, rolloffs or drums) which will be used to contain or transport PCB contaminated material, in accordance with 40 CFR 761. In addition, U.S. Department of Transportation (DOT) 49 CFR Parts 171 and 172 requires the name and UN number of the material to be on the bags or drums, and, if shipped in bulk (rolloffs, Gaylord boxes, etc.), the bulk container must also be labeled: Polychlorinated Biphenyl, solid mixture UN 3432.



- E. The PCB materials are also NYS Hazardous Waste, and must have a label stating the following on each container :

HAZARDOUS WASTE—Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority, or the U.S. Environmental Protection Agency.

Proper DOT Shipping Name _____
Generator’s Name, Address, City, State, ZIP and phone _____
Generator’s EPA Identification Number, Waste code _____
Accumulation Start Date _____
Manifest Tracking Number _____

- F. Provide 6 mil clear plastic disposal bags with PCB caution labels.
1. The “Small PCB Label” (M_S per 40 CFR 761) may be used as shown above. Bags shall also be labeled with U.S. DOT required markings per 49 CFR 172, Polychlorinated Biphenyl, solid mixture UN 3432.
 2. Labeled PCB waste containers or bags shall not be used for non-PCB waste or trash. Any material placed in labeled containers or bags, whether turned inside out or not, shall be handled and disposed of as PCB waste.

2.03 DAILY PROJECT LOG

- A. Provide a Daily Project Log. The log shall contain on title page the DASNY Project name, phase (if applicable) and number; name, address and phone number of Owner; name, address and phone number of Environmental Consultant; name, address and phone number of Abatement Contractor; and emergency numbers including, but not limited to, local Fire/Rescue department.
- B. All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted.
- C. The Project Supervisor shall document all Work performed daily and note all inspections.

2.04 SCAFFOLDING AND LADDERS

- A. Provide all scaffolding and/or staging as necessary to accomplish the Work of this Contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding and ladders shall comply with all applicable OSHA construction industry standards.
- B. Provide scaffolding and ladders as required by the Environmental Consultant for the purposes of performing required inspections.

2.05 SHIPPING CONTAINERS AND PACKAGING

- A. Products for containerization and packaging shall be as indicated in this section, or as directed by the Owner and / or their representative.
- B. Provide packaging in accordance with 49 CFR 173 Packaging Group 9, such as 30 or 55 gallon capacity fiber, plastic, or metal drums, Gaylord Boxes or other Intermediate Bulk Containers (IBCs), or non-siftable bulk containers, capable of being sealed air and water tight if hazardous waste has the potential to damage or puncture disposal bags. Affix hazardous waste caution labels on lids of drums, and opposite sides of drums or bulk containers, as well as the ends of bulk containers. Recovery or salvage drums must be acceptable for disposal of hazardous waste. Prior approval of drums is required. Drums or containers must meet the required OSHA, EPA (40 CFR Parts 260-264 and 300), and DOT Regulations (49 CFR Parts 171-178). Use of damaged containers shall not be allowed.

2.06 EQUIPMENT AND MATERIALS

- A. All dry vacuuming performed under this contract shall be performed with HEPA filter equipped industrial vacuums conforming to ANSI Z9.2.
- B. Any power tools used to drill, cut into, or otherwise disturb hazardous material shall be manufacturer equipped with HEPA filtered local exhaust ventilation, unless specified otherwise.
- C. All polyethylene (plastic) sheeting used on the Project (including but not limited to sheeting used for critical and isolation barriers, fixed objects, walls, floors, ceilings, and waste container) shall be at least 6 mil clear fire retardant sheeting.
- D. Absorbent Material: : Clay, soil or any commercially available absorbent used for the purpose of absorbing hazardous or potentially hazardous materials.

2.07 RESPIRATORY PROTECTION

- A. Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134. Provide respirator training.
- B. Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services. High Efficiency Particulate Air (HEPA) respirator filters shall be approved by NIOSH and shall conform to the OSHA requirements in 29 CFR 1910.134.
- C. Respirators shall be individually fit-tested to personnel under the direction of an Industrial Hygienist initially and on a yearly basis thereafter. Fit-tested respirators shall be permanently marked to identify the individual fitted, and use shall be limited to that individual.

- D. A storage area for respirators shall be provided by the Contractor in the clean portion of the decontamination enclosure where they will be kept in a clean, dry environment.
- E. The Contractor shall provide and make available a sufficient quantity of respirator filters so that filter changes can be made as necessary during the work day. Filters will be removed and discarded during the decontamination process. Filters cannot be reused. Filters must be changed if breathing becomes difficult. Filters provided to the personnel shall be appropriate to the hazardous waste(s) being handled as well as any chemicals brought on site and used to facilitate the removals.
- F. Filters used with negative pressure air purifying respirators shall not be used any longer than one eight (8) hour work day.
- G. Any authorized visitor, Worker, or supervisor found in the Work Area not wearing the required respiratory protection shall be removed from the Project site and shall not be permitted to return.
- H. The Contractor shall have at least two (2) Powered Air Purifying Respirators stored on site designated for authorized visitors use. Appropriate respirator filters for authorized visitors shall be made available by the Contractor.

PART 3 EXECUTION

3.01 HAZARDOUS WASTE GENERATION AND ON-SITE STORAGE

- A. All waste shall be stored, handled, transported and disposed of in accordance with all federal, state, and local guidelines and regulations. The Contractor shall obtain all permits, licenses, etc., which are necessary for the storing, transporting and disposing of hazardous waste. The Contractor shall develop all applicable manifests, Waste Profile Sheets, LDR Forms, C7 forms and any other documentation and coordinate with the Owner regarding proper signatures.
- B. All hazardous waste generated shall be placed into 6 mil clear plastic disposal bags or other suitable container upon detachment from the substrate. Large components with residue shall be wrapped in one layer of clear 6 mil plastic sheeting. Sharp components likely to tear disposal bags shall be placed in fiber drums or boxes and then wrapped with clear 6 mil plastic sheeting.
- C. All construction and demolition debris determined by the Environmental Consultant to be potentially contaminated with hazardous waste shall be handled and disposed of as hazardous waste. If the project is at an OPWDD hostel and hazardous waste is limited to lead based paint from non-demolition/deconstruction activity, the owner may elect to have waste temporarily stored on-site, transported and disposed of as household waste, at a Municipal Solid Waste (MSW) permitted landfill, as per all pertinent NYS DEC requirements. If the owner selects this option, the owner would be responsible for transport to an MSW as well as appropriate disposal at the MSW. TCLP samples are not necessary for characterization of household waste.
- D. All generated hazardous waste must be stored at or near the point of generation, under the control of the Project Supervisor. Up to 55 gallons may be stored at the point of generation for an indefinite period, but any greater than 55 gallons must be moved within three (3) days to a CSA as specified in 6 NYCRR Section 372.2 "Standards Applicable to Generators of Hazardous Waste", or off-site. Waste may be stored at the CSA for 90 days (large quantity generator), 180 days (small quantity generator with TSDF within 200 miles of site), or 270 days (small quantity generator with TSDF greater than 200 miles from the site) during which labeling, inspections, and other requirements must be met as described in 6 NYCRR Section 372.2, Section 373-3.1(d) and Subpart 373-3.

- E. The Contractor shall identify and classify the hazardous waste generated through the performance of the work as per the governing regulations, and in accordance with the waste stream TCLP results provided by the Owner's third-party Environmental Consultant. The Contractor shall utilize the TCLP results to confirm the requirements for handling, storing, transporting and disposing of the hazardous waste.
- F. The Third-Party Environmental Consultant shall sample all potential hazardous waste streams for TCLP listed hazardous and characteristic (if applicable) analyses prior to disposal, in accordance with 40 CFR 261 for hazardous waste. It should be noted that the disposal facility may have more stringent requirements for hazardous waste acceptance (i.e. PCB testing for painted wastes). Therefore, the Environmental Consultant shall be informed in writing, so that they may indicate analytical testing accordingly. The waste profile, LDR and C7 forms and waste transporter permit must be reviewed and approved by the Owner's Environmental Consultant prior to any hazardous waste leaving the site. The DOT-trained Environmental Consultant must be on-site for all hazardous waste shipment removals and will be responsible for inspection of the waste shipment as well as signoff on the hazardous waste manifest, on behalf of the owner and DASNY, to allow the hazardous waste shipment to leave the site. If at an Office of Mental Health (OMH) facility, a properly trained OMH site representative must also be present for the waste pickup.
- G. On-site Storage Requirements.
1. Each waste dumpster/container shall have completed hazardous waste label with facility name, correct EPA ID number, full address, waste codes, and waste information.
 2. Appropriate hazardous waste storage and contents labels shall also be posted on the containers.
 3. Since this is considered a main storage area for the project, the third-party DASNY Environmental Consultant shall be completing an initial and weekly hazardous waste storage area inspection logs and these records shall be provided to DASNY and the facility each week. Weekly inspection records shall be maintained for three (3) years.
 4. Each dumpster/container shall also post all relevant DOT labels to indicate proper waste types.
 5. Each dumpster/container shall identify the accumulation start date. Maximum storage limit is 90-270 days from the date of accumulation.
 6. All dumpsters and containers being stored outside shall meet EPA RCRA container requirements and shall not leak. All dumpsters and containers must be fully covered and protected from the elements as well as secured by lock when not in use.
 7. A spill kit shall be maintained in the CSA.
 8. Regarding the posting of emergency numbers, Contractor shall coordinate with facility and DASNY and post all required emergency numbers including facility contact(s), DASNY field office, Contractor emergency numbers and local fire, police and medical facility numbers. Signage shall be posted on the lockable CSA.
- H. The CSA and personnel managing it must also meet the following requirements of 6 NYCRR 373:
1. Preparedness and Prevention provisions of Section 373-3.3
 2. Secondary containment requirements of 373-2.9(f)(1)
 3. Personnel training in section 373-3.2
 4. Contingency plans and emergency procedures in section 373-3.4 subparagraph 376.1(g)(1)(v)
 5. The containers must be dated when placed in storage, and accumulation times must be observed.
 6. The total amount of hazardous waste stored in the CSA at any given time must not exceed the maximum for the current generator status (6,000 kg-SQG, no limit-LQG).
 7. A label or sign stating "Hazardous Waste" must identify all areas and containers used to accumulate hazardous waste.

- I. Closure of the CSA. If a CSA was created specifically for the Hazardous waste generation work, once the work is complete, the Contractor shall immediately close out the CSA, as per 373-3.7(b) and (e). This shall be observed and documented by the Environmental Consultant.
- J. The Contractor is required to provide temporary protection of the building (i.e. roof, window openings, construction joints, etc.) as applicable for the work, at the end of each Work shift so as to maintain the building in a watertight condition. Any damage to the facility caused by inadequate Contractor protection shall be the responsibility of the contractor.

PART 4 DISPOSAL OF HAZARDOUS WASTE

4.01 TRANSPORTATION AND DISPOSAL SITE

- A. The Contractor's Hauler and Disposal Facility shall be approved by the Owner. Prior to the hazardous waste being removed from the site, written communication from the disposal facility must be provided, confirming proper authority to receive the particular hazardous waste, as well as the ultimate disposal method for the waste. The written communication shall be from a disposal facility representative including signature, printed name and title, as well as phone number, in compliance with 6 NYCRR 372.2(b)(2). For disposal within New York State, facilities must be specifically permitted to accept hazardous waste. In addition, the Contractor is responsible for securing appropriate treatment or disposal for the generated hazardous waste streams at a permitted TSDF, if necessary, in compliance with all regulatory requirements, and for obtaining a copy of the waste manifest and waste profile of the treated waste as executed by the TSDF. If the manifest is not returned within 35 calendar days from removal from the site, the contractor shall notify the Owner and the NYS DEC, and initiate an investigation as required.
- B. The Contractor shall give at least 24-hour notification prior to removing any waste from the site. Waste shall be removed from the site only during normal working hours unless otherwise specified. No waste shall be removed from the site unless the Contractor, Environmental Consultant and authorized/qualified facility personnel are present, and the Environmental Consultant authorizes the release of the waste. The DOT-trained Environmental Consultant must be on-site for all hazardous waste shipment removals and will be responsible for inspection of the waste shipment. They may also be required to signoff on the hazardous waste manifest on behalf of the owner and DASNY, if the authorized/qualified facility personnel is unavailable, to allow the hazardous waste shipment to leave the site. This responsibility shall be coordinated and executed in accordance with the Owner's direction.
- C. The Contractor shall supply all required placard and labeling and shall have an appropriately DOT - trained individual to prepare the waste container and inspect the packaging of the hazardous waste.
- D. All hazardous waste generated as part of the project shall be removed from the site within ten (10) calendar days after successful completion of all hazardous waste generation work. However, all disposal facility permits/licenses, waste profiles, LDR forms, C7 forms, hauler permit(s), and all other necessary paperwork must be submitted to and approved by the Environmental Consultant before the waste is removed from the site. Waste stream samples shall be collected by the Environmental Consultant for TCLP analysis and the results utilized by the Contractor for proper waste stream characterization and appropriate disposal determination.
- E. Upon arrival at the Project Site, the Hauler must possess and present to the Environmental Consultant a valid DEC Part 364 Waste Hauler's Permit. The Environmental Consultant may verify the authenticity of the hauler's permit with the proper authority.
- F. The Hauler, with the Contractor and the Environmental Consultant, shall inspect all material in the transport container prior to taking possession and signing the Hazardous Waste Manifests.

- G. Transporters shall maintain waste manifest and shipment record forms. All transporters are required to obtain and maintain NYS DEC Part 364 Waste Transporter permits and, if applicable, a NYC Fire Department permit for transporting flammables. The Part 364 Permit shall have the license plate number of the vehicle, the expiration date of the permit, the type of waste the hauler can transport and the TSDF to which the hauler can transport the waste. The transporter must also have all applicable, current waste transportation permits for the states where the proposed disposal facilities are located.

4.02 WASTE SHIPMENT STORAGE CONTAINERS

- A. All waste shipment storage containers shall be fully enclosed and lockable (i.e. enclosed dumpster, trailer, etc.).
- B. The Environmental Consultant shall verify that the waste shipment storage container and/or truck tags (license plates) match that listed on the DEC Part 364 permit. Any waste shipment storage container not listed on the permit shall be removed from the site immediately.
- C. The valid waste shipment storage container shall be plasticized and sealed with one layer of clear 6 mil plastic. Once on-site, it shall be kept locked at all times, except during load out. The waste shipment storage container shall not be used for storage of equipment or contractor supplies.
- D. While on-site, the waste shipment storage container shall be labeled with DEC Hazardous Waste Warning Labels as specified in Section 2.02.
- E. The New York State Department of Environmental Conservation Hauler's Permit number shall be displayed on both sides and back of the container. The permit number shall be at least 3 inches high and in a color that contrasts with the container / vehicle background color.
- F. Waste generated off-site or from a different, on-site non-DASNY project is not permitted to be brought onto the Project site and/or loaded into the waste container.
- G. The waste shipment storage container is not permitted to be loaded unless it is properly plasticized, (C above) has the appropriate danger signage affixed, and has the permit number appropriately displayed on the container. (B above)
- H. The Owner may initiate random checks at the Disposal Site to ensure that the procedures outlined herein are complied with.

4.03 HAZARDOUS WASTE MANIFESTS & DISPOSAL DOCUMENTATION

- A. The Contractor is responsible for securing appropriate treatment or disposal for the waste streams at a permitted TSDF, in compliance with all requirements, and for obtaining a copy of the waste manifest (interim storage and final disposal) as executed by the TSDF. If the manifest is not returned within 35 calendar days from removal from the site, the Contractor shall notify the Owner and the NYS DEC, and initiate an investigation as required. The Contractor shall contact the EPA and file an Exception report if the manifest is not returned within 45 days. All hazardous waste metals intended for recycling, shall have the appropriate completed C7 form accompanying the shipment and this form must be emailed to the DEC one (1) to two (2) weeks prior to the shipment leaving the site. Documentation of submission (i.e. delivery receipt and read receipt) shall be provided upon request.

- B. A Uniform Hazardous Waste Manifest shall be utilized solely as the waste Manifest for transportation. A hauler billing form or bill of lading may be used if the hauler needs an independent record, but shall not be used as the sole shipping document.
- C. The Manifest shall be completed by the Contractor and verified by the Environmental Consultant that all the information and amounts are accurate and the proper signatures are in place.
- D. The Manifest shall have the appropriate signatures of the Owner's Representative (the Generator) and the Hauler representative prior to any waste being removed from the site.
- E. Copies of the completed Manifest, shall be retained by the Environmental Consultant and shall remain on-site for inspection.
- F. Upon arrival at the Disposal Site, the Manifest shall be signed by the Disposal Facility operator to certify receipt of hazardous and asbestos (if applicable) wastes covered by the manifest.
- G. The Disposal Facility operator shall return the original Manifest and certificate of recycling for recycled metals to the Owner's Representative or the project facility as required by the DEC in 6 NYCRR 372 within 35 days. The Environmental Consultant must call the facility to investigate if the Manifest is not returned within 35 days and contact the DEC and file an Exception report if not returned within 45 days.
- H. The Contractor shall utilize the Waste Disposal Log provided by the Owner. This log shall be maintained by the Project Supervisor and shall be kept on-site at all times. (See Appendix C.)
- I. Copies of all waste disposal manifests, C7 forms, certificates of recycling, as well as originals of all manifests and disposal logs (copies are acceptable for electronic closeout submittal review) shall be submitted by the Contractor to the Owner with the final close-out documentation.
- J. The Contractor must also submit reports and records per the requirements of 6 NYCRR 372.2.
- K. Payment for disposal of hazardous waste will not be made until a fully executed signed copy of the manifest and certificate of recycling from the treatment or disposal facility certifying the amount of hazardous waste delivered is returned for each load of waste removed from the site and proof the original hazardous waste manifest was provided to the Owner, and copies provided to DASNY Code Compliance.
- L. The Owner shall file the annual report and fee report, if applicable, for the hazardous waste shipped.

END OF SECTION 02 86 00

APPENDIX A
SAMPLE BLANK PCB LDR FORM

NEW YORK STATE GENERATOR RESTRICTED WASTE NOTIFICATION/CERTIFICATION FOR PCB WASTES

ALL NEW YORK STATE GENERATORS WHO GENERATE PCB WASTES MUST ATTACH THIS
ADDENDUM TO THE UNIFORM HAZARDOUS WASTE MANIFEST
(THIS NOTIFICATION/CERTIFICATION IS ONLY APPLICABLE WITHIN THE STATE OF NEW YORK)

GENERATOR NAME:

EPA ID NO.:

SIGNATURE:

DATED:

MANIFEST NO:

This addendum to the uniform hazardous waste manifest must be completed for any New York State regulated hazardous waste generated in the State of New York. This form ensures that New York State generators comply with the notification requirements of 6 NYCRR Part 376. All New York State generators shipping PCB waste which is a New York State regulated hazardous waste must check the box and indicate the applicable waste code below.

- ☐ Check Here: The waste associated with the above manifest includes New York State Regulated PCB waste which is land restricted in the State of New York and is subject to 6 NYCRR Part 376.4(f). This waste shall be disposed of in accordance with 40 CFR 761. Pursuant to 376.4(f) (l) (i), B002 waste from any source other than a spill may not be stabilized or mixed with any other substance to conform with any provision of 40 CFR Part 761 regarding land disposal if the disposal occurs in the state of New York.

Check all which apply:

- ☐ B001 - PCB oil (concentrated) from transformers, capacitors, etc.
- ☐ B002 - Petroleum oil or other liquid containing 50 ppm or greater of PCBs, but less than 500 ppm PCBs.
- ☐ B003 - Petroleum oil or other liquid containing 500 ppm or greater of PCBs.
- ☐ B004 - PCB articles containing 50 ppm or greater of PCBs, but less than 500 ppm PCBs, excluding small capacitors.
- ☐ B005 - PCB articles, other than transformers, that contain 500 ppm or greater of PCBs, excluding small capacitors.
- ☐ B006* - PCB transformers. *PCB transformers* means any transformer that contains 500 ppm PCB or greater.
- ☐ B007* - Other PCB wastes, including contaminated soil, solids, sludges, clothing, rags and dredge material.

* Generators are required to certify that their B006 and/or B007 waste can be land disposed in accordance with 40 CFR Part 761 without further treatment if:

- a. The waste is a B006 and is a transformer which has been drained and flushed pursuant to 40CFR761.60(b)(l)(i)(B) or
- b. The waste is a B007 and does not contain PCBs which have been deliberately solicited.
- ☐ Check here if the B006 and/or B007 waste associated with this manifest conforms with either "a" or "b" and is intended for land disposal and sign this form at the top of the page. In accordance with 6 NYCRR Part 376.1 (g) (l)(ii) the generator makes the following certification:

"I certify under penalty of law that I personally have examined and am familiar with the waste, through analysis and testing or through knowledge of the waste, to support this certification that the waste complies with the treatment standards specified in part 376, section 376.4 and all applicable prohibitions set forth in subdivision 376.3(b) of Part 376 or RCRA section 3.04(d). I believe that the information I submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment. "

APPENDIX B

SAMPLE BLANK C7 NYSDEC NOTIFICATION FORM

“C7” NOTIFICATION FOR GENERATORS

To: Training & Technical Support Section
Bureau of Technical Support
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7020

Date: _____

Please be advised that _____
(generator's company name)

(generator's street address)
intends to use the

(description and citation of exemption or exclusion; e.g., scrap metal exemption of 6 NYCRR 371.1(g)(1)(iii)(b)) for

(describe waste stream)

that will be shipped from the above address to _____
(receiving company e.g., scrap metal dealer, recycler or smelter)

(receiving company address)

Please contact the undersigned at _____ if you have any questions.
(phone number)

Sincerely,

(print name of generator company representative)

(Optional – email address)

(signature of generator company representative)

Submission by email to info.sgg@dec.ny.gov is preferred.

If submitting by mail to the address above or by fax to 518-402-9020, please direct to Attn: Training & Technical Support Section

Please call (518) 402-9553 if you have any questions about how to complete this form.

APPENDIX C

WASTE DISPOSAL LOG



DASNY

**DORMITORY AUTHORITY STATE OF NEW YORK
WASTE DISPOSAL LOG**

Facility Name: _____

Building Name/Number: _____

Project Name: _____

DASNY Project Number: _____

Abatement/Remediation Contractor: _____

Project Monitor Firm: _____

Load No.	Hauler Name	NYSDEC #	License Plate No.	Size of Container	Disposal Facility Name	Date Depart from Site	Date Received at Disposal Site	Date Shipment Record Returned

Comments: _____

Page _____ of _____

SECTION 02 87 00

REMOVAL AND DISPOSAL OF UNIVERSAL WASTE

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. This specification covers the removal and disposal of Universal Waste, including lamps such as fluorescent and high-intensity discharge (HID) lamps, mercury-containing equipment (MCE) such as thermostats, switches, batteries and pesticides (not PCB lighting ballasts), as well as aerosol cans, at Transformer Rooms Nos. 1 & 2 – BLDG. 1 Bronx Psychiatric Center **1500 Waters Place, Bronx, NY 10461 DASNY Project Number 3816609999**

The federal universal waste regulations are found in Title 40 of the Code of Federal Regulations (CFR) in part 273 and apply to five types of universal waste:

- Batteries
- Pesticides
- Mercury-Containing Equipment (To be recycled as per NYS DEC – see details below)
- Lamps
- Aerosol Cans

Universal Wastes are regulated by the United States Environmental Protection Agency (EPA) under 40 CFR Part 273 and by New York State Department of Environmental Conservation (NYS DEC) under 6 NYCRR (New York Codes, Rules and Regulations) Part 374-3. Both the EPA and DEC regulations identify Universal Waste that includes MCE and aerosol cans. MCE shall be recycled as per current regulations, instead of disposed as Universal Waste. Demolition and removal of materials shall be as required to support the work.

- B. The work shall include but not be limited to the removal of the following.

Building & Floor	Description of Material	Approximate Quantity (lbs/units)
Transformer Room No. 1	Fluorescent Light Bulbs	To Be Determined
Transformer Room No. 1	Mercury Switches	To Be Determined
Transformer Room No. 2	Fluorescent Light Bulbs	To Be Determined
Transformer Room No. 2	Mercury Switches	To Be Determined
Total Quantity		

- C. The Contractor shall be aware of all conditions of the Project and is responsible for verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the Contractor of its obligation to furnish all labor and materials necessary to perform the Work.
- D. All Work shall be performed in strict accordance with the Project Documents and all governing codes, rules, and regulations. Where conflicts occur between the Project Documents and applicable codes, rules, and regulations, the more stringent shall apply.
- E. Working hours shall be as required and approved by the Owner. Removal activities including, but not limited to, work area preparation, gross removal activities, cleaning activities, waste removal, etc. and may need to be performed during ‘off-hours’ (including nights and weekends). In addition, multiple mobilizations may be required to perform the work identified in this project. The Contractor shall coordinate and schedule all Work with the facility and Owner’s representative.

1.02 SPECIAL JOB CONDITIONS

- A. Any special job conditions are described below:
Describe in detail or indicate “None”.

1.03 DEFINITIONS

- A. Universal Waste consists of the following discarded materials, as identified in 40 CFR Part 273 and 6 NYCRR 374-3: Fluorescent light and high-intensity discharge (HID) lamps, MCE, batteries, aerosol cans and pesticides. Removed or replaced MCE must be delivered to a designated mercury collection site as per current NYC DEC regulations. Disposal of MCE in a solid waste management facility is prohibited. PCB ballasts/capacitors from light fixtures shall not be treated as Universal Waste; they shall be handled and disposed of as hazardous waste. See the Hazardous Waste Disposal Specification for these wastes.
- B. Large Quantity Handler (LQH) of Universal Waste shall be a waste handler who accumulates 5,000 kilograms or more of Universal Waste at any time. This designation as a large quantity handler of Universal Waste is retained through the end of the calendar year in which 5,000 kilograms (11,000 pounds) or more total of Universal Waste is accumulated. The LQH shall notify the EPA, acquire or coordinate with a facility regarding an EPA identification number, and provide records for each shipment. The LQH shall ensure all employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal facility operations and emergencies.
- C. Small Quantity Handler of Universal Waste (SQH) shall be a waste handler who does not accumulate 5,000 kilograms (11,000 pounds) or more of total Universal Waste (batteries, pesticides, MCE, or lamps, calculated collectively) at any time.
- D. Destination Facility shall be a facility that can legally accept Universal Waste from off-site so that the Universal Waste can be treated, disposed, or recycled in accordance with regulatory requirements.
- E. Universal Waste Transporter shall be anyone who transports Universal Waste. In New York, Universal Waste Transporters that transport greater than 500 pounds of Universal Waste in a single shipment must be a permitted Universal Waste Transporter pursuant to Federal and State regulations. Proper notification with the receiving handler agreeing to receive the shipment is required by the Universal Waste Transporter.
- F. The Owner’s Environmental Consultant: The Owner shall provide a third-party environmental consultant to provide pre-work assessments, project monitoring assessments for the construction procedures for the work area, surrounding areas waste sampling, and container storage area, submittal review, and inspection and signoff of all universal waste shipments as well as final clearance assessments. The Contractor shall be responsible for the worker protection requirements.
- G. Battery: a device consisting of one or more electrically connected electrochemical cells which is designed to receive, store, and deliver electric energy.
- H. Pesticide: a substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or desiccant.
- I. Mercury-containing equipment: a device or part of a device (including thermostats, but excluding batteries and lamps) that contains elemental mercury integral to its function.
- J. Lamp: a bulb or tube portion of an electric lighting device.

- K. Aerosol can: a non-refillable receptacle containing a gas compressed, liquefied, or dissolved under pressure, the sole purpose of which is to expel a liquid, paste, or powder and fitted with a self-closing release device allowing the contents to be ejected by the gas.

1.04 SUBMITTALS

- A. Pre-Work Submittals: Within 7 days prior to the pre-construction conference, the Contractor shall submit an electronic copy of the documents listed below to the DASNY Project Manager, the DASNY Code Compliance Unit and the Environmental Consultant for review and Code Compliance approval prior to the commencement of removal activities:

Pre-work Submittals	SQH	LQH
1. Training & Certifications		
a) List of the employees scheduled to perform this work and their project function (Supervisor or Worker)	X	X
b) Certificates of on-site workers and supervisor, for successful completion of OSHA 40-hour Health and Safety course [29 CFR 1910.120/1926.65] for handling hazardous waste and spills, including most recent refresher training.	X	X
c) OSHA 8-hour supervisor training [29 CFR 1910.120(e)(4)/1926.65(e)(4)] for hazardous waste.	X	X
d) Valid United States Department of Transportation (DOT) training [49 CFR 172.704] for supervisor and all employees loading waste and maintaining on-site waste storage area. This training shall include: general awareness / familiarization training; function specific training; safety training; security awareness training; and in-depth security training.	X	X
e) Employees managing Universal Waste as large quantity handler must also meet the Personnel training requirements of EPA 40 CFR Section 273.36. Provide proof of training for these employees.		X
f) Employees managing Universal Waste as small quantity handler must also meet the Personnel training requirements of EPA 40 CFR Section 273.16. Provide proof of training for these employees.	X	
2. Transportation & Disposal		
a) Valid Waste Transporter NYS Part 364 permit for all transporters.	X	X
b) Valid Waste Transport vehicle permit for all transporters for each State the waste is being transported through to reach the Treatment, Storage and Disposal Facility (TSDF).	X	X
c) Valid US DOT vehicle permit for all transporters.	X	X
d) Transfer Facility Permit (if used) including the name, address and EPA ID No. of the facility, contact person. Include an acknowledgement letter stating that the facility has the capacity and is permitted to accept the waste from the project site and how the waste will be disposed [i.e. treatment (T) landfill (L), incineration (B), recycled (R)].	X	X
e) Final Disposal Facility permit including the name, address and EPA ID No. of the facility, contact person. Include an acknowledgement letter from the disposal facility stating that the facility has the capacity and is permitted to accept the waste from the project site and how the waste will be disposed [i.e. treatment (T) landfill (L), incineration (B), recycled (R)]. The final destination of waste must be within the United States.	X	X
f) The TSDF permit(s) must identify the waste material(s) to be received.		X
g) Draft waste profile form.	X	X
h) Draft waste shipment record/manifest.	X	X

Pre-work Submittals	SQH	LQH
3. Site-specific		
a) Safety Data Sheet (SDS) for all materials to be removed.	X	X
b) If the Contractor introduces any chemical into the work environment, a SDS for each chemical must be presented to the Owner's Representative for review and approval prior to use.	X	X
4. Progress Schedule:		
a) Show the complete sequencing of removal activities and the sequencing of Work within each building, wing or section of building. <i>The schedules will be utilized to schedule facility and third-party environmental consultant requirements.</i>	X	X
b) Show the dates for the beginning and completion of each major element of Work including substantial completion dates for each Work Area, building or phase.	X	X
5. Scope of Work Plan:		
Removal Work Plan and Drawing(s)		
Provide a written work plan description of work and drawing(s) that clearly indicates the following:		
a) All work areas/phases numbered sequentially.	X	X
b) Locations and types of all decontamination enclosures for each work area/phase, if necessary	X	X
c) Proposed location and construction of storage facilities and field office (when applicable).	X	X
d) Type of removal activity/technique for each work area/phase.	X	X
e) List waste types and quantity being generated and stored (refer to 1.01, B).	X	X
f) Site/work area preparation and cleanup procedures.	X	X
g) Include in the plan, eating, drinking, and sanitary procedures, interface of trades and sequencing of Universal waste generation.	X	X
h) Include occupational and environmental sampling (if any by the Contractor), frequency and duration of sampling.	X	X
i) Container Storage Area (CSA) construction details). [How is the waste being stored? (indoors or outdoors, drums, containers, or dumpsters, types, with cover?).]	X	X
j) Include waste transport routes to the CSA from each work area/phase.	X	X
k) Include plan for universal waste segregation and minimization including metal recycling, as necessary.	X	X
l) Contractor waste generation details (amount per day, per week or per quarter) in kgs or tons.		X
m) Contractor emergency evacuation plan requirements and evacuation route for the project specific work areas/phases.	X	X
n) DASNY PM, Facility Representative, and Project team emergency contact numbers. [to be posted at CSA (interior and exterior).]	X	X
Do not start work until submittals are returned with the Owner's Representative stamp indicating that the submittal is approved for unrestricted use.	X	X

A. On-Site & During Construction:

1. The following submittals, documentation, and postings shall be maintained on-site by the Contractor during removal activities at a location approved by the Environmental Consultant:
 - a. Approved pre-work submittals.
 - b. Project Documents (specifications and drawings).
 - c. Applicable regulations.
 - d. Updated licenses/permits and acknowledgement letters for any changes in transporter or disposal site.

- e. For each employee, current annual medical respiratory clearance and current satisfactory respiratory fit test results, if required.
 - f. Contractor shall provide weekly update, including initial container storage dates for each container stored, an approximate estimate of amount of waste being generated during each workday, week or month that it is stored on-site. The actual weight of the waste, excluding the weight of the dumpster, shall be identified.
 - g. Completed and signed Waste Profile form(s).
 - h. List of emergency phone numbers.
 - i. Waste disposal log.
 - j. Daily Project Log.
 - k. Copy of completed Universal Waste manifest(s)/shipment record(s) including legible transporter and disposal facility information, dates and times of waste shipment departures / arrivals, and signatures, for each load of waste, within 35 days of waste being removed from site.
2. The following documentation shall be maintained on-site by the Environmental Consultant during removal activities:
 - a. Valid Environmental Consultant personnel OSHA and DOT training certifications.
 - b. Consultant Daily Log.
 - c. Listing of all visual inspections with the date of inspection and the date of signoff.
 - d. Environmental Survey Report.
 - e. All applicable waste documentation, including but not limited to Universal Waste Manifest/shipment records, waste profiles, and disposal facility letter(s).

C. Close-out:

1. Within 30 days after phase or project completion, the **Contractor** shall submit one electronic copy of the closeout-out submittal (requirements listed below) to DASNY Code Compliance and one copy to the Environmental Consultant for review and approval prior to the Contractor's final payment. Once DASNY Code Compliance approves the complete electronic close-out submittal, the Contractor shall provide three (3) hardcopy sets of the approved close-out documents (double-sided and bound) to DASNY Project Management, including one set to be distributed to the facility. DASNY Project Management shall provide the Facility with one copy of the approved closeout submittals.
 - a. **Fully Executed Copies** of all completed waste disposal manifests, recycling certificates, disposal facility letter(s), disposal logs shall be sent to DASNY Code Compliance including legible transporter and disposal facility information, departure / arrival times, dates, and signatures. Original waste manifests shall be sent to the Owner or disposal facility state with proof of this submission, as applicable.
 - b. Copies of all executed waste profile forms and disposal facility acknowledgement letters.
 - c. Daily progress log.
 - d. If TSDF transfer facility is utilized, provide valid permit including name, address, EPA number of facility and contact person along with completed waste manifest from final destination must also be provided. Final destination of waste must be within the United States.
 - e. Valid Waste Transporter NYS Part 364 permit for all transporters.
 - f. Valid Waste Transport vehicle permit for all transporters for each state the waste is being transported through to reach the Treatment, Storage and Disposal Facility (TSDF).
 - g. Valid US DOT vehicle permit for Transporters, if applicable.
 - h. Final Disposal Facility permit including the name, address and EPA ID No. of the facility, and contact person.
2. Within 30 days of the completion of each removal phase, the **Environmental Consultant** shall submit one electronic copy of the documents listed below to DASNY code compliance for review and approval prior to Environmental Consultant's final payment. Once DASNY Code Compliance approves the complete electronic close-out submittal, the Environmental

Consultant shall provide three sets of the approved close-out documents (double-sided and bound) to DASNY Project Management, including one set to be distributed to the facility.

- a. Upon completion of each phase or Project, the Environmental Consultant shall certify to the Owner, in writing, that the work is complete and acceptable in an Executive Summary of the work.
- b. The Environmental Consultant shall review and approve or disapprove all necessary guarantees, certificates of compliance, and all other close-out documentation, which the Contractor is required to submit, or note that the documents were never received.
- c. The Environmental Consultant shall provide to the Owner the final Project data binder to include:
 - 1) All daily logs.
 - 2) Summary of all visual inspections with the date of inspection, if applicable.
 - 3) Any applicable sampling logs, results, chain of custody forms, and sample location plans.
 - 4) All applicable waste documentation, including but not limited to Universal Waste manifests, completed and signed waste profile forms, LDR forms, and disposal facility acknowledgment/acceptance letter(s)/documentation.
 - 5) All pertinent correspondence related to the Project including but not limited to supplemental inspection findings performed during construction, prior submittal reviews, etc.

- D. Universal Waste Project Submittals shall be submitted as separate packages, not included with any other environmental or hazardous waste submittals.

1.05 PRE-CONSTRUCTION CONFERENCE

- A. Prior to start of preparatory Work under this Contract, the Contractor shall attend a pre-construction conference with the Owner, Facility Personnel, and Environmental Consultant.
- B. Agenda for this conference shall include but not necessarily be limited to:
1. Contractor's scope of Work, Work plan, and schedule to include number of workers, shift days and times.
 2. Contractor's safety and health precautions including protective clothing, equipment and decontamination procedures.
 3. Environmental Consultant's duties, functions, and authority.
 4. Contractor's Work procedures including:
 - a. Methods of job site preparation and removal methods.
 - b. Respiratory protection.
 - c. Disposal procedures.
 - d. Cleanup procedures.
 - e. Fire exits and emergency procedures.
 5. Contractor's required pre-work and on-site submittals, documentation, and postings.
 6. Contractor's plan for 24-hour Project security both for prevention of theft and for barring entry of unauthorized personnel into Work Areas.
 7. Temporary utilities.
 8. Handling of furniture and other movable objects.
 9. Universal waste segregation and minimization plan, including metals intended for recycling.
 10. Storage of Universal waste in CSA.
 11. Waste disposal requirements and procedures, including Contractor notification to DASNY project management and Environmental Consultant once waste stream generation has commenced, and prior to any waste being removed from site.
 12. If applicable, contingency plan training information.

1.06 APPLICABLE STANDARDS AND REGULATIONS

- A. All activities related to the work shall be conducted in compliance with all applicable laws, regulations, and requirements which may include, but not be limited to: EPA, DOT, RCRA, TSCA, OSHA, New York State Department of Environmental Conservation (NYS DEC), New York City Department of Environmental Protection (NYC DEP), and New York City Fire Department.
- B. The Contractor is required to secure and maintain all required regulatory permits necessary to perform all aspects of the work.
- C. The Contractor shall containerize and store waste in accordance with all applicable regulations. All containers shall be appropriately marked/labeled.

1.07 PROJECT SUPERVISOR

- A. The Contractor shall designate a full-time Project Supervisor who shall meet the following qualifications:
 - 1. The Project Supervisor shall be trained in hazardous waste removal/generation procedures and hazardous waste management in NYS, via a 40-hour HAZWOPER and 8-hour Supervisor training course, as well as appropriate DOT training.
 - 2. The Project Supervisor shall have a minimum of one year experience as a supervisor.
 - 3. The Project Supervisor must be able to read and write English fluently, as well as communicate in the primary language of the Workers.
- B. If the Project Supervisor is not on-site at any time whatsoever, all Work shall be stopped. The Project Supervisor shall remain on-site until the Project is complete. The Project Supervisor cannot be removed from the Project without the written consent of the Owner and the Environmental Consultant. The Project Supervisor shall be removed from the Project if so requested by the Owner or DASNY.
- C. The Project Supervisor shall maintain a bound Daily Project Log that includes the Waste Disposal Log required by section 4.03 of this specification.
- D. The Project Supervisor shall be responsible for the performance of the Work and shall represent the Contractor in all respects at the Project site. The Supervisor shall be the Contractor primary point of contact for the Environmental Consultant.
- E. As required by applicable regulations, prior to assignment to Universal Waste work, instruct each employee with regard to the hazards of the generated waste, safety and health precautions, and the use and requirements of protective clothing and equipment, as well as the Contractor emergency action plan.

PART 2 - PRODUCTS

2.01 PROTECTIVE CLOTHING

- A. Provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, and foot coverings, as applicable. Provide appropriate disposable gloves, suitable to prevent skin contact, to protect hands.
- B. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.

2.02 SIGNS AND LABELS, CONTAINERS

- A. Provide warning signs and barrier tapes at all approaches to Universal Waste generation Work Areas. Locate signs at such distance that personnel may read the sign and take the necessary protective steps required before entering the area.
- B. Universal waste containers must be marked with the words that clearly indicate the type of waste in the container, for example, **“Universal waste – Batteries”** or **“Universal waste – Bulbs”** as per 40 CFR 273.13 and 273.34;

UNIVERSAL WASTE

STATE AND FEDERAL LAWS PROHIBIT IMPROPER DISPOSAL.
USE PROPER CONTAINMENT (NON-LEAKING COMPATIBLE CONTAINERS)

ACCUMULATION START DATE:

Mark (X) the Universal Waste:

<input type="checkbox"/> UNIVERSAL WASTE -- BATTERY(IES)	<input type="checkbox"/> UNIVERSAL WASTE -- MERCURY-CONTAINING EQUIPMENT
<input type="checkbox"/> UNIVERSAL WASTE -- ELECTRONIC DEVICE(S)	<input type="checkbox"/> UNIVERSAL WASTE -- CRTs and CRT GLASS
<input type="checkbox"/> UNIVERSAL WASTE -- LAMP(S)	<input type="checkbox"/> UNIVERSAL WASTE -- NON-EMPTY AEROSOL CANS
<input type="checkbox"/> UNIVERSAL WASTE -- PESTICIDES	<input type="checkbox"/> OTHER(S) <input type="text"/>

Examples (State Dependent): Various Medical Devices, Pesticides, Pressure or Vacuum Gauges, Dilators and Weighted Tubing, Dental Amalgam, Tooth Filling Materials, etc.

HANDLER INFORMATION (Generator / Owner)
Name: Telephone: ()
Address:

152.40mm 6.0 inch (vertical dimension)
152.40mm 6.0 inch (horizontal dimension)
Pink line is the die line.

2.03 DAILY PROJECT LOG

- A. Provide a Daily Project Log. The log shall contain on the title page; the DASNY Project name and number; name, address, and phone number of Owner; name, address and phone number of Environmental Consultant; name, address and phone number of Contractor; and emergency numbers including, but not limited to, local Fire/Rescue department.
- B. All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted.
- C. The Project Supervisor shall document all Work performed daily and note all inspections.

2.04 SCAFFOLDING AND LADDERS

- A. Provide all scaffolding and/or staging as necessary to accomplish the Work of this Contract. Scaffolding may be of suspension type or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding and ladders shall comply with all applicable OSHA construction industry standards.
- B. Provide scaffolding and ladders as required by the Environmental Consultant for the purposes of performing required inspections.

2.05 SHIPPING CONTAINERS AND PACKAGING

- A. Provide packaging in accordance with 49 CFR 173 Packaging Group 9, such as 30- or 55-gallon capacity fiber, plastic, or metal drums, Gaylord Boxes or other Intermediate Bulk Containers (IBCs), or non-siftable bulk containers. Affix Universal Waste caution labels on lids of drums, and opposite sides of drums or bulk containers, as well as the ends of bulk containers. Recovery or salvage drums must be acceptable for disposal of Universal Waste. Prior approval of drums is required. Drums or containers must meet the required OSHA, EPA (40 CFR Parts 260-264, 273 and 300), and DOT Regulations (49 CFR Parts 171-180). Use of damaged containers shall not be allowed.

2.06 EQUIPMENT AND MATERIALS

- A. All dry vacuuming performed under this contract shall be performed with HEPA filter equipped industrial vacuums conforming to ANSI Z9.2.
- B. All polyethylene (plastic) sheeting used on the Project (including but not limited to sheeting used for critical and isolation barriers, fixed objects, walls, floors, ceilings, waste container) shall be at least 6 mil clear fire retardant sheeting.
- C. Absorbent Material shall be Clay, soil or any commercially available absorbent used for the purpose of absorbing hazardous or potentially hazardous materials.

2.07 RESPIRATORY PROTECTION

- A. Establish a respirator program as required by ANSI Z88.2 and 29 CFR 1910.134. Provide respirator training.
- B. Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services. High Efficiency Particulate Air (HEPA) respirator filters shall be approved by NIOSH and shall conform to the OSHA requirements in 29 CFR 1910.134.
- C. Respirators shall be individually fit-tested to personnel under the direction of an Industrial Hygienist initially and on a yearly basis thereafter. Fit-tested respirators shall be permanently marked to identify the individual fitted, and use shall be limited to that individual.
- D. A storage area for respirators shall be provided by the Contractor in the clean portion of the decontamination enclosure where they will be kept in a clean, dry environment.
- E. The Contractor shall provide and make available a sufficient quantity of respirator filters so that filter changes can be made as necessary during the work day. Filters will be removed and discarded during the decontamination process. Filters cannot be reused. Filters must be changed if breathing becomes difficult. Filters provided to the personnel shall be appropriate to the hazardous waste(s) being handled as well as any chemicals brought on site and used to facilitate the removals.
- F. Filters used with negative pressure air purifying respirators shall not be used any longer than one eight (8) hour work day.
- G. Any authorized visitor, Worker, or supervisor found in the Work Area not wearing the required respiratory protection shall be removed from the Project site and shall not be permitted to return.
- H. The Contractor shall have at least two (2) Powered Air Purifying Respirators stored on site designated for authorized visitors use. Appropriate respirator filters for authorized visitors shall be made available by the Contractor.

PART 3 EXECUTION

3.01 GENERATING UNIVERSAL WASTE AND ON-SITE STORAGE

- A. Employee training shall ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal operations and emergencies, as well as to the type of waste they are handling.
- B. MCE shall be segregated from other Universal Wastes to allow for required recycling.
- C. Battery Labels: The container(s) holding intact batteries shall be labeled or marked as “Universal Waste – Battery(ies)”, “Waste Battery(ies)”, or “Used Battery(ies)”.
- D. Lamp Labels: The container(s) holding lamps shall be labeled or marked as “Universal Waste – Lamp(s)”, “Waste Lamp(s)”, or “Used Lamp(s)”.
- E. MCE Labels: The container(s) holding MCE shall be labeled or marked as “Universal Waste – Mercury-Containing Equipment”, “Waste - Mercury-Containing Equipment”, or “Used Mercury-Containing Equipment”.
- F. Mercury Thermostat Labels: The container(s) holding mercury thermostats only may be labeled or marked as “Universal Waste – Mercury Thermostat(s)”, “Waste Mercury Thermostat(s)”, or “Used Mercury Thermostat(s)”.
- G. Pesticide Labels: The container(s) holding pesticides shall be labeled or marked as “Universal Waste – Pesticide(s)” or “Waste Pesticide(s)”.
- H. Aerosol Cans: The container(s) holding aerosol cans shall be labeled or marked as “Universal Waste – Aerosol Cans” or “Waste Aerosol Cans”.
- I. Once the properly labeled containers holding the Universal Waste have been filled and sealed, they shall be stored in designated accumulation areas as agreed upon by the Owner’s Representative and Contractor. They shall not be stored in transportation vehicles, or on-site for more than one year from the date the waste storage was initiated.
- J. Documentation when Universal Waste in storage was first accumulated shall be provided. This is to be done by labeling the waste with the date of the earliest accumulation. Thus, the length of time the Universal Waste has been accumulated can be readily determined / documented.
- K. Maintenance of an inventory system on-site that identifies the earliest date that any Universal Waste in a group of Universal Waste items became a waste was received.
- L. Any waste developed from the work that exhibits one or more characteristics of hazardous waste, that are not specifically identified by EPA and NYS DEC as Universal Waste, must be handled accordingly and not as a Universal Waste. See the Hazardous Waste Disposal Specification section 02 86 00 for those waste types.
- M. On-site Storage Requirements.
 - 1. Each waste dumpster/container shall have completed universal waste label with facility name, correct EPA ID number (if required), full address, and waste information.

2. Appropriate universal waste storage and contents labels shall also be posted on the containers.
3. Since this is considered a main storage area for the project, the third-party DASNY Environmental Consultant shall be completing an initial and thence weekly hazardous waste storage area inspection logs and these records shall be provided to DASNY and the facility each week. Weekly inspection records shall be maintained for three (3) years.
4. Each dumpster/container shall also post all relevant DOT labels to indicate proper waste types.
5. Each dumpster/container shall identify the accumulation start date. Maximum storage limit is 360 days from the date of accumulation.
6. All dumpsters and containers being stored outside shall meet EPA RCRA container requirements and shall not leak. All dumpsters and containers must be fully covered and protected from the elements as well as locked when not in use.
7. A spill kit shall be maintained in the CSA.
8. Regarding the posting of emergency numbers, Contractor shall coordinate with facility and DASNY and post all required emergency numbers including facility contact(s), DASNY field office, Contractor emergency numbers, local fire, police and medical facility numbers. Signage shall be posted on the lockable CSA.

PART 4 DISPOSAL OF UNIVERSAL WASTE

4.01 TRANSPORTATION AND DISPOSAL

- A. The Contractor's Hauler and Disposal Facility shall be approved by the Owner. The Contractor is responsible for securing appropriate treatment or disposal for the generated Universal Waste streams at a permitted TSDF, if necessary, in compliance with all regulatory requirements, and for obtaining a copy of the waste manifest/shipping record and waste profile of the treated waste as executed by the TSDF.
- B. The Contractor shall give at least 24-hour notification prior to removing any waste from the site. Waste shall be removed from the site only during normal working hours unless otherwise specified. No waste may be taken from the site unless the Contractor and Environmental Consultant are present, and the Environmental Consultant authorizes the release of the waste. The DOT-trained Environmental Consultant must be on-site for all Universal Waste shipment removals and will be responsible for inspection of the waste shipment as well as signoff on the Universal Waste manifest/shipping record on behalf of the owner and DASNY to allow the Universal Waste shipment to leave the site.
- C. All Universal Waste generated as part of the project shall be removed from the site within 10 calendar days after successful completion of work. However, all disposal facility permits/licenses, waste profiles, hauler permit(s), and all other necessary paperwork must be submitted and approved by the Environmental Consultant before the Universal Waste is removed from the site. Waste stream samples, if required, shall be collected by the Environmental Consultant for TCLP analysis and the results utilized by the Contractor for waste stream characterization and disposal determination.
- D. Upon arrival at the Project Site, the Hauler must possess and present to the Environmental Consultant a valid NYSDEC Part 364 Waste Hauler's Permit. The Environmental Consultant may verify the authenticity of the hauler's permit with the proper authority.
- E. The Hauler, with the Contractor and the Environmental Consultant, shall inspect all material in the transport container prior to taking possession and signing the Universal Waste Manifest/shipping record.

4.02 WASTE SHIPMENT STORAGE CONTAINERS

- A. All waste shipment storage containers shall be fully enclosed and lockable (i.e. enclosed dumpster, trailer, etc.).
- B. The Environmental Consultant shall verify that the waste shipment storage container and/or truck tags (license plates) match that listed on the NYSDEC Part 364 permit. Any waste shipment storage container and/or truck not listed on the permit shall be removed from the site immediately prior to storage of any material from the site.
- C. Once on-site, it shall be kept locked at all times, except during load out. The waste shipment storage container shall not be used for storage of equipment or contractor supplies.
- D. While on-site, the waste shipment storage container shall be labeled with Universal Waste Labels.
- E. The waste shipment storage container is not permitted to be loaded unless it is properly plasticized and has the appropriate danger signage affixed.
- F. The Owner may initiate random checks at the Disposal Site to ensure that the procedures outlined herein are complied with.

4.03 WASTE MANIFEST/SHIPMENT RECORDS & DISPOSAL DOCUMENTATION

- A. A Universal Waste Manifest/Shipping Record (UWMSR) shall be utilized solely as the waste record documentation for transportation. A hauler billing form or bill of lading may be used if the hauler needs an independent record, but it shall not be used as the sole shipping document.
- B. The UWMSR shall be completed by the Contractor and verified by the Environmental Consultant that all the information and amounts are accurate, and the proper signatures are in place.
- C. The UWMSR, if applicable, shall have the appropriate signatures of the Owner's Representative and the Hauler representative prior to any waste being removed from the site.
- D. Copies of the UWMSR shall be retained by the Environmental Consultant and shall remain on-site for inspection.
- E. The Contractor shall utilize the Waste Disposal Log provided by the Owner. This log shall be maintained by the Project Supervisor and shall be kept on-site at all times (See Appendix A).
- F. Originals of all UWMSRs and disposal logs (copies are acceptable for electronic closeout submittal review) shall be submitted by the Contractor to the Owner with the final close-out documentation.
- G. Payment for disposal of Universal Waste will not be made until a signed copy of the manifest/shipment record from the treatment or disposal facility certifying the amount of Universal Waste delivered is returned for each load of waste removed from site, the originals are furnished to the Owner, and fully executed copies provided to DASNY Code Compliance.
- H. Off-Site Shipment of Universal Waste
 - 1. Off-Site shipments shall meet the requirements for off-site shipments and handlers / transporters are prohibited from sending or taking Universal Waste to a place other than a designated Universal Waste handler or a Universal Waste destination facility.
 - 2. LQHs of Universal Waste must notify EPA in writing and develop an EPA identification number or coordinate with the facility regarding use of their EPA identification number, prior to exceeding 5,000 kilograms of Universal Waste on-site.

3. SQHs do not need to notify EPA, receive an EPA identification number or keep records of shipments of Universal Waste.
4. LQHs must keep a record of all Universal Waste shipments received or sent off-site and must retain those records for at least three (3) years from the date of receipt or shipment. Records may include invoices, manifest/shipment records, logs, bills of lading, or other shipping documents.
5. The Contractor shall provide certified copies of all receipts obtained from designated mercury recycling collection sites within 30 days of MCE acceptance by collection, as applicable.
6. The Contractor shall furnish all certified copies of manifest/shipment records (interim storage and final disposal) within regulatory requirements. Within 30 days from acceptance of the waste by the disposal facility, the Contractor shall provide the Owner with Certificate of Disposal documents, as a requirement for final payment.

END OF SECTION 02 87 00

APPENDIX A

WASTE DISPOSAL LOG



DASNY

**DORMITORY AUTHORITY STATE OF NEW YORK
WASTE SHIPMENT RECORD LOG**

Facility Name: _____

Building Name/Number: _____

Project Name: _____

DASNY Project Number: _____

Contractor: _____

Environmental Consultant: _____

Load No.	Hauler Name	NYSDEC #	License Plate No.	Size of Container	Disposal Facility Name	Date Depart from Site	Date Received at Disposal Site	Date Shipment Record Returned

Comments: _____

Page _____ of _____

SECTION 02 61 00

REMOVAL, TRANSPORT AND DISPOSAL OF CONTAMINATED SOIL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Project will include the excavation, handling, stockpiling, temporary on-site storage, transportation and disposal of soils generated during construction activities that will not be reused on-site at Bronx Psychiatric Center, Building 1, 1500 Waters Place, Bronx, NY, DASNY Project Number 3816609999. Soils eligible for reuse at the Site are discussed under Section 1.02 Special Job Conditions.

B. The work shall include but not be limited to the removal of the following materials:

Excavation Area	Description of Soil to be Removed (Category of waste/type of contaminant)	Depth of Soil Removal	Approximate Quantity (cubic yards and tons)
Building 1 Transformer Room 1	PCB Remediation Waste Soil	10 Feet	100 Cubic Yards 200 Tons
Building 1 Transformer Room 2	PCB Remediation Waste Soil	10 Feet	100 Cubic Yards 200 Tons
Total			200 Cubic Yards 400 Tons

C. Preliminary waste characterization sampling was completed by **Remedial Investigation Report, dated November 2016, prepared by URS** (see Appendix A). A brief description of soil boring locations and sampling scheme is provided below.

- Details of soil boring locations and sample results, as compared to current New York State Department of Environmental Conservation (NYSDEC) Soil Cleanup Objectives (SCOs) or current guidance are provided in the November 2016 (Original August 2012- Revised January 2015) - Remedial Investigation Report.**
- The results of the laboratory analyses were compared to [6 NYCRR Part 375 Unrestricted Use Soil Cleanup Objectives (SCOs), Residential Use SCOs, Restricted Residential Use SCOs, Commercial Use SCOs and Industrial Use SCOs] or current guidance. A summary of the contaminants and levels exceeding any of the SCOs listed above in section 1.01 B. is presented below in section 1.01 C. 3. **Remedial Investigation Report, dated November 2016, prepared by URS** complete Soil Report is provided in Appendix A of this Section.

D. Soil sample results of contaminants and levels exceeding any of the SCOsPCB Remediation Waste. The Contractor shall be aware of all conditions of the Project and is responsible for

verifying quantities and locations of all Work to be performed. Failure to do so shall not relieve the Contractor of their obligation to furnish all labor and materials necessary to perform the Work.

- E. All Work shall be performed in strict accordance with the Project Documents and all governing codes, rules, and regulations. Where conflicts occur between the Project Documents and applicable codes, rules, and regulations, the more stringent shall apply.
- F. Working hours shall be as required and approved by the Owner. Soil excavation activities including, but not limited to, pre-work area preparation, excavation activities, stockpiling, waste removal, etc. may need to be performed during 'off-hours' (including nights and weekends). In addition, multiple mobilizations may be required to perform the work identified in this Project. The Contractor shall coordinate and schedule all Work with the facility and Owner's representative.
- G. The Contractor shall provide labor, materials, equipment and incidentals required for the excavation, transportation and disposal of materials generated during construction activities that are deemed unsuitable for reuse.

1.02 SPECIAL JOB CONDITIONS

- A. Any special job conditions are described below.
 - 1. Add special job conditions here or indicate there are no special job conditions. **Groundwater Dewatering and Treatment Plan Required. Secure NYCDEP de-watering permit and required approval from NYSDEC pursuant to the existing Order on Consent.**

1.03 STANDARDS AND REFERENCES

The Contractor shall comply with the following codes and standards, except where more stringent requirements are shown or specified:

- A. Federal Regulations:
 - 1. 42 USC §6901 et. Seq.
 - 2. 15 USC §2601
 - 3. 29 CFR 1910.1200, "Hazard Communication" (OSHA)
 - 4. 29 CFR 1926, "Construction Industry" (OSHA)
 - 5. 29 CFR 1926 Subpart P "Excavations"
 - 6. 29 CFR 1926.500 "Guardrails, Handrails and Covers" (OSHA)
 - 7. 49 CFR 171-172, Transportation Standards (DOT)
 - 8. 29 CFR 1910.146 Confined Space
 - 9. 29 CFR 1926.21 Safety Training and Education
- B. New York State Regulations:
 - 1. 6 NYCRR, Parts 360, 364, Disposal and Transportation (NYSDEC)
 - 2. 6 NYCRR Parts 370-374
 - 3. 6 NYCRR Parts 610-614
- C. Latest version of the New York State Uniform Fire Prevention and Building Code.
- D. Latest version of American Society for Testing and Materials (ASTM) standards.

- E. ACI-318 latest edition-Building Code Requirements. (NYC ONLY)
 - 1. All work shall comply with requirements of the New York City Building Code (NYCBC), requirements of the New York State Department of Labor, requirements of United States Department of Labor Occupational Safety and Health Administration (OSHA), requirements of New York State Department of Health (NYSDOH), requirements of the New York State Department of Environmental Conservation (NYSDEC), requirements of the New York City Department of Environmental Protection (NYCDEP), requirements of the New York State Department of Transportation (NYSDOT), requirements of New York City Department of Transportation (NYCDOT), the requirements of the New York City Transit Authority (NYCTA), the requirements of United States Environmental Protection Agency (USEPA), requirements under the Resource Conservation and Recovery Act (RCRA), applicable requirements under 6 NYCRR Parts 360, 364, and 370 through 375 and with applicable requirements of all other authorities having jurisdiction.

1.04 PERMITS AND COMPLIANCE

- A. The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State, and Local laws, rules, and regulations pertaining to Work practices, protection of Workers, authorized visitors to the Site, persons, and property adjacent to the Work.
- B. Obtain all required permits and notifications for removals (excavation/dewatering), on-site storage, transportation and disposal of contaminated wastes, including sanitary sewer discharge.
- C. Perform contaminated soil excavation related Work in accordance with NYS DEC Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation. Where more stringent requirements are specified, adhere to the more stringent requirements. See Section 1.01 E.
- D. The Contractor shall comply with all applicable regulations of the OSHA in performance of the work and take all required precautions to ensure the safety and health of personnel. The Contractor has been provided with information on current Site conditions for the Contractor to prepare a Site Health and Safety Plan (HASP) for the execution of the work.
- E. The Contractor shall be responsible for compliance with The New York State Uniform Fire Prevention and Building Code, or its successor during all Work at the Site.
- F. Contractor shall be responsible for notification to the Environmental Consultant for the collection and sampling of wastewater (for permit compliance or disposal facility requirements). Contractor is responsible for treatment (if necessary), and disposal of generated waste water. Waste water disposal may be permitted for sanitary sewer discharge or taken off-site for disposal at a licensed facility.

1.05 SUBMITTALS

- A. Pre-Work Submittals: Within seven (7) days prior to the pre-construction conference, the Contractor shall submit an electronic copy of the documents listed below to the DASNY Project Manager, the DASNY Code Compliance Unit and the Environmental Consultant for review and approval prior to the commencement of removal/excavation activities:
 - 1. The Contractor shall submit a schedule, arranged in chronological order, by dates required by the construction schedule.

2. The Contractor shall prepare and submit to the Owner a Health and Safety Plan (HASP) for work associated with any potential contaminated soils at the Site, as defined in Section 1.07. This plan shall address all of the activities which the Contractor will perform in fulfillment of the contract, and shall comply in all aspects with OSHA regulations for solid and hazardous waste operations (29 CFR 1910.120). The Contractor shall make the HASP available to authorized personnel who require access to any contaminated area or exclusion zone. The health and safety of the Contractor's employees remains solely the responsibility of the Contractor.
3. The Contractor shall perform excavation markouts and contact Dig Safely New York (DSNY) as required by law. Contractor shall provide valid DSNY ticket number along with associated documentation.
4. An Excavated Soils Management Plan including re-use and disposal options prepared in accordance with Section 4.01 B. of this Specification.
 - a. Work Plan requirements should include a site plan showing stock pile locations and protection methods, soil grid, equipment decon locations, excavation methods, dewatering, wastewater storage, and traffic direction at the site for trucks.
5. The Contractor shall prepare and maintain all material shipment records required by applicable Federal, State, and Local laws and regulations. These records shall include but not be limited to: scale tickets, bill of lading, and manifests. The Contractor shall provide copies of all documentation to the Owner/Owner's Representative. Drafts of the following documents (as applicable) related to waste soil transport shall be submitted for prior review and approval:
 - a. A draft shipping document.
 - b. NYSDEC waste tracking document.
 - c. NYSDEC Notification of Fill Material Reuse form.
 - d. NYSDEC Use of Predetermined Beneficial Use Determination form.

Copies of these forms are provided in Appendix B.

6. Transfer Facility Permit (if applicable) and letter of acknowledgement from the Transfer Facility stating they intend to accept the material.
7. Treatment Facility Permit (if applicable) and letter of acknowledgement from the Treatment Facility stating they intend to accept the material.
8. Disposal Facility Permit for material disposed of at an off-site facility (if applicable) and letter of acknowledgement from the Disposal Facility stating they intend to accept the material.
9. Copy of a valid NYSDEC Waste Transporter Permit and permits for any other State(s) the material will travel through to reach the disposal facility.
10. Valid US DOT permit for hauler, if applicable.
11. Spills Management Plan and a Spills Kit to be accessible on-site.

B. On-Site Submittals: The following documentation shall be maintained on-site by the Contractor during site activities at a location approved by the Project Manager.

1. Copy of the Approved Pre-Work Submittal, as described in Section 1.05 A.
2. Health and Safety Plan (HASP) for work associated with any potential contaminated soils at the Site. This plan shall address all of the activities which the Contractor will perform in fulfillment of the contract and shall comply with all aspects of applicable OSHA regulations for solid and hazardous waste operations (29 CFR 1910.120).
3. Copy of DSNY ticket documentation.

4. Proof of worker training in accordance with OSHA 29 CFR 1910.120 for all workers with the potential to come in contact with contaminated soils and hazardous materials.
 5. Soil Management Plan (SMP). This plan should include, at a minimum: equipment specifications; methods of excavation, waste water management plan for dewatering, waste water storage, on-site drainage, and decontamination of equipment; procedures for management of soil designated for off-site disposal; methods for documenting tracking of contaminated soil/material from the origin to disposal; methods for removal, loading and transport of the contaminated soil; certification of clean fill in accordance with NYSDEC if applicable; contractor health and safety procedures including personnel certifications; and identification of licensed transporter(s) and disposal facility or facilities to be used by the Contractor.
- C. Close-Out Submittals
1. Within two (2) business days of receipt from the facility, the Contractor shall submit copies of all receipts and other paperwork from disposal/treatment facilities which indicate the actual quantity of waste received.
 2. Within 30 days of the completion of the project, the Contractor shall submit 1 electronic copy of the documents listed below to DASNY and the Environmental Consultant for review and approval prior to Contractor's final payment. Once DASNY Code Compliance approves the electronic close-out submittal, the Contractor shall provide 3 hard copy sets of the approved close-out documents (double-sided and bound) to DASNY Project Management, including 1 set to be distributed to the facility.
 - a. All Waste Shipment Records, Forms, and Waste Shipment Record Logs.
 - b. Completed waste tracking documents, as applicable.
 - c. Daily progress log.
 - d. Transfer/Treatment/Disposal Site/Landfill Permits from applicable regulatory agency.
 - e. Copy of NYSDEC Waste Transporter Permit and permits for any other State(s) the material traveled through to reach the disposal facility.

1.06 PRE-CONSTRUCTION CONFERENCE

- A. Prior to start of preparatory Work under this Contract, the Contractor shall attend a pre-construction conference attended by the Owner, Facility Personnel, and Environmental Consultant.
- B. Agenda for this conference shall include but not necessarily be limited to:
1. Contractor's scope of Work, Work plan, and schedule.
 2. Contractor's safety and health precautions including protective clothing, equipment, and decontamination procedures.
 3. OSHA excavation and trenching requirements if applicable (≥ 4 feet and ≥ 5 feet in depth, respectively)
 4. Environmental Consultant's duties, functions, and authority.
 5. Contractor's Work procedures including:
 - a) Methods of job site preparation and removal methods.
 - b) Contacting Dig Safely New York for Utility Clearance (if necessary).
 - c) Equipment and process of initial clearing of vegetation (if necessary).
 - d) Process of clearing the construction areas, excavation pathways for subgrade materials, stockpiling soil, separating waste from earthen materials, etc.
 - e) Truck loading procedure near active roadway/traffic controls/safety.
 - f) Disposal procedures.

- g) Cleanup procedures.
 - h) Emergency procedures.
 - 6. Contractor's required pre-work and on-site submittals, and documentation.
 - 7. Contractor's plan for 24-hour Project security both for prevention of theft and for barring entry of unauthorized personnel into work areas.
 - 8. Waste disposal requirements and procedures.
- C. In conjunction with the conference, the Contractor shall accompany the Owner and Environmental Consultant on a pre-construction walk-through documenting work to be completed at the Site.

1.07 DEFINITIONS

- A. Wherever the word "excavating", "excavate", "excavation", "carried down", or "remove" are used, they shall be understood to include the removal of all existing work, including brick work, rubble work, former foundation remnants, rubbish, and earth as well as rock, boulders, steel grillages, concrete and all other materials and obstructions encountered. They shall also be understood to include all sheet piling, bracing, pumping, operations and items needed for the proper execution of the work. Excavation is considered unclassified.
- B. Rough grading consists of cutting or filling to the elevation established on the Contract Drawings.
- C. Material Definitions
- 1. Non-Hazardous Excavated Contaminated Soil:
Soil that may include or contain mixtures of the following: soil (including, but not limited to, natural undisturbed soil), Clean (below SCO), and Contaminated (above SCO). This material includes material that will exceed 6 NYCRR 375-6 Restricted Residential Use Soil Cleanup Objectives and NYSDEC CP-51: Soil Cleanup Guidance Supplemental Soil Cleanup Objectives.
 - 2. Non-Hazardous Excavated Soil (Clean Fill):
Soil that is at or below the SCO for unrestricted use. This material includes material defined in Title 6 NYCRR 375-6.3 and does not exceed NYSDEC CP-51: Soil Cleanup Guidance Supplemental Soil Cleanup Objectives.
 - 3. Petroleum-Contaminated Soil:
Material (soil, concrete, sediment, UST contents, fill, debris, etc.) that meets the NYSDEC STARS Memo #1 definition of petroleum-contaminated material from known source areas. Petroleum-contaminated material shall be evidenced by the following observations and be from a known source area: producing higher than background responses on a portable vapor meter such as a photo ionization detector or flame ionization detector, petroleum-like odor, visual impacts (e.g., staining or discoloration), proximity to known releases from existing or historic petroleum storage tanks or systems, and exceed the soil cleanup levels for gasoline and/or fuel oil contaminated soil provided in the NYSDEC CP-51: Soil Cleanup Guidance. The determination as to whether the excavated material is petroleum-contaminated or is non-petroleum contaminated material will be made by analytical testing of representative material samples. The Environmental Consultant shall perform all required testing. The Environmental Consultant shall make the final determination as to whether or not the material is petroleum-contaminated and the appropriate disposal.

4. Hazardous Waste:

Material meeting the definition of a Resource Conservation and Recovery Act (RCRA) hazardous waste as defined in 40 CFR Part 261, New York State ECL Section 27-09 or 6 NYCRR Part 371.

1.08 PROJECT CONDITIONS

- A. Preliminary waste characterization sampling was completed (see Appendix A). Any additional waste characterization sampling required to complete the excavation and disposal of material generated during the project will be directed by the Contractor and, upon concurrence with the Architect/Owner, will be performed by DASNY's on-site Environmental Consultant.
- B. The Contractor, by careful examination, shall inform themselves as to the nature and location of the work; the conformation of the ground; the nature of the subsurface conditions; the locations of the groundwater table; the character, quality and quantity of the materials to be encountered; the character of the equipment and facilities needed preliminary to and during the execution of the work; and all other matters which can in any way affect the work.
- C. The Contractor shall have visited the site and familiarized themselves with the existing conditions of adjoining properties, utilities and buildings.
- D. The Contractor shall investigate the conditions of public thoroughfares and roads as to availability, clearances, loads, limits, restrictions, and other limitations affecting transportation to, ingress and egress of the site of the work. The Contractor shall conform to all Federal, State and Local regulations in regard to the transportation of materials to and from and at the job site and shall secure in advance such permits as may be required.
- E. Existing Utilities: The Contractor shall locate existing underground utilities in and beyond the areas of work. This shall include, at a minimum, notification to Dig Safely New York (DSNY) as required by law. The Contractor shall mark out the project areas and allot 3 business days for the ticket request to be completed; such off-set time shall be included in the proposed schedule. The DSNY ticket number shall be recorded for inclusion in project record documentation. If utilities are indicated to remain in place, provide adequate means of support and protection during the work.
 - 1. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, immediately cease excavation activities and consult with the utility owner for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner or compensate repair of same at Contractor's cost.
 - 2. Do not interrupt existing utilities serving facilities occupied by Owner or others, during occupied hours, except when permitted in writing by the Construction Manager and then only after acceptable temporary utility services have been provided. Provide minimum of 48-hour notice to the Construction Manager, and receive written notice to proceed before interrupting any utility.
- F. The Contractor shall examine drawings to determine sequence of operations, and relation to work of other trades. Start of work will signify acceptance of field conditions and will acknowledge coordination with other trades.

- G. The Contractor shall comply with the Work Plan and associated documentation in the Approved Pre-Work Submittal, all Federal, State and Local environmental regulations, and health and safety regulations, including but not limited to OSHA.

1.09 PROTECTION

- A. The work shall be executed so that no damage or injury will occur to the existing public and adjoining or adjacent structures, streets, paving, sewers, gas, water, electric or any other pipes. Should any damage or injury be caused by the Contractor, or anyone in the Contractor's employ, or by the work under this Contract occur, the Contractor shall repair such damage and shall assume all responsibility for such injury and costs.
- B. The above shall also include the protection of all existing utilities (including but not limited to sewers, water lines, electrical lines and telecommunication lines) to remain in use within and adjacent to the area affected by the work of this project.
- C. Monuments, bench marks and other reference features on streets bounding this project, shall be protected. Should these be disturbed in any manner, the Contractor shall have them replaced.
- D. Excavation sides of any pits within the site and adjacent structure foundations shall be protected by means of adequate bracing, shoring and anchoring at all times in accordance with applicable OSHA regulations. No site excavation shall proceed until adequate support for excavation sides is provided. The Contractor is solely responsible for the stability, safety and protection of excavation sides.
- E. The Contractor shall provide barricades, warning lights, and barriers to prevent accidents, and to prevent all hazards to protect the public and property at all times, including Saturdays, Sundays, and Holidays.
- F. It is the Contractor's responsibility to ensure that contaminated materials will not be spilled, placed, or otherwise discharged into areas other than those specified in the Contract Documents. Any unauthorized placement, spill, or discharge of contaminated material by the Contractor will be completely and properly removed by the Contractor at their own expense.
- G. It is the Contractor's responsibility to ensure that adequate erosion control and stockpile protection measures are put in place and maintained at the Site.
- H. Any unauthorized placement, spill, or discharge of contaminated material by the Contractor must be reported immediately to DASNY, the Construction Manager, and the Owner's Engineer.
- I. All costs associated with repairing any damage will be the Contractor's sole responsibility, and such repairs will be made to the satisfaction of the respective Owner(s).

1.10 ERRORS IN DEPTH

- A. In the event that any part of the excavation is carried, through error, beyond the depth and the dimensions indicated on the drawings or called for in the specifications, then the Contractor, at his own expense, shall furnish and install certified clean fill, gravel, stone, or structural concrete

with which to backfill to the required level at all locations, subject to approval of the Owner and Geotechnical Engineer.

1.11 SUBSURFACE STRUCTURES AND UTILITIES

- A. The Contractor shall become acquainted with the existence and location of all surface and subsurface structures and utilities within the project area and beneath the surrounding streets. The Contractor shall not damage any of those utilities that are to remain and shall leave them accessible and make the necessary provision by sheeting, hanging, supporting or other means necessary to obtain this result, subject to the approval of the New York City Building Department (NYC only), the New York State Department of Transportation, and the utility companies involved.

1.12 PROJECT SUPERVISOR

- A. The Contractor shall designate a full-time Project Supervisor who shall meet the following qualifications:
 - 1. If excavated soils are determined by sample analysis to be contaminated, the Project Supervisor shall be an OSHA competent person for excavation. The OSHA Construction Standard defines a competent person as someone who is: capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
 - 2. The Project Supervisor shall have a minimum of one year experience as a supervisor.
 - 3. The Project Supervisor must be able to read and write English fluently, as well as communicate in the primary language of the Workers.
- B. If the Project Supervisor is not on-site at any time whatsoever, all Work shall be stopped. The Project Supervisor shall remain on-site until the Project is complete. The Project Supervisor cannot be removed from the Project without the written consent of the Owner and the Environmental Consultant. The Project Supervisor shall be removed from the Project if so requested by the Owner or DASNY.
- C. The Project Supervisor shall maintain a bound Daily Project Log that includes a Waste Shipment Record Log included in Appendix C.
- D. The Project Supervisor shall be responsible for the performance of the Work and shall represent the Contractor in all respects at the Project site. The Supervisor shall be the Contractor primary point of contact for the Environmental Consultant.
- E. As required by applicable regulations, prior to assignment of work, instruct each employee with regard to the hazards of the generated waste, safety and health precautions, and the use and requirements of protective clothing and equipment, as well as the Contractor's HASP.

PART 2 EXECUTION

2.01 PREPARATION OF PROJECT SITE

- A. Obtain all necessary permits to perform the work from the appropriate authorities and agencies prior to start of such work. Obey all applicable Federal, State, and Local work safety rules and

regulations. Ensure DSNY markings indicative of utilities are maintained and visible in areas not impacted by the work.

- B. Install all necessary protection equipment and structures such as fences, signs, scaffolding, etc. prior to start of work.
- C. Remove all existing structures, utilities, and pavement in accordance with the Contract Documents.
- D. Protect all utility lines, which are not to be disturbed or abandoned. Contractor shall be solely responsible for any damage to utilities that may occur.
- E. Protective Clothing.
 - 1. Provide personnel utilized during the Project with disposable protective whole body clothing, head coverings, and foot coverings. Provide appropriate disposable gloves suitable to protect hands and prevent skin contact.
 - 2. Eye protection and hard hats shall be provided and made available for all personnel entering any Work Area.
 - 3. Authorized visitors shall be provided with suitable protective clothing, headgear, eye protection, and footwear whenever they enter the Area, if necessary.
 - 4. Provide ladders as required by the Environmental Consultant for the purposes of performing required inspections.

2.02 DAILY PROJECT LOG

- A. Provide a Daily Project Log. The log shall contain on the title page the DASNY Project name and number; the name, address and phone number of the Owner; the name, address and phone number of the Environmental Consultant; the name, address and phone number of the Contractor; and emergency numbers including, but not limited to, local Fire/Rescue department. The log shall also include the DSNY Ticket number along with a summary of the utilities in the vicinity of the work.
- B. All entries into the log shall be made in non-washable, permanent ink and such pen shall be strung to or otherwise attached to the log to prevent removal from the log-in area. Under no circumstances shall pencil entries be permitted.
- C. The Project Supervisor shall document all Work performed daily and note all inspections.

2.03 GENERAL EXCAVATION

- A. General
 - 1. Contractor shall perform all excavation required to complete the Work as shown and specified. All material excavated shall be non-classified. It shall include all materials such as

but not limited to earth, sand, clay, gravel, hardpan, boulders, organic materials, rock, miscellaneous fill and debris.

2. Excavations shall be open type, sheeted, shored and braced or sloped where necessary to prevent injury to workmen and to new and existing structures or pipelines.
3. All excavations shall be made in dry material.
4. All equipment shall be decontaminated and free from debris, caked soil, contamination, and any other foreign materials prior to mobilization to the site. Equipment utilized during the excavating of contaminated materials shall be decontaminated in accordance with project decontamination requirements.
5. The bottom of excavations shall be leveled off and graded to receive foundations, slabs, pits, trenches and grade beams.
6. All excavation work must also adhere to the Construction Health and Safety Plan.

PART 3 HANDLING AND MANAGEMENT OF CONTAMINATED MATERIALS

3.01 GENERAL INSTRUCTIONS

- A. This Section is a description of responsibilities for proper handling and management of contaminated materials on Site. The requirements of the Contract Documents, including Scope of Work, will apply to the Work in this Section.
- B. The Contractor will be required to handle environmentally contaminated materials at the Site in compliance with all Federal, State and Local regulations. Contractor's Work will include handling of these contaminated materials.
 1. For the purpose of this Specification, contaminant levels shall be compared to NYSDEC USCOs and RSCOs (NYSDEC Regulation 6 NYCRR Subpart 375-6) and the approved disposal facility acceptance criteria.
- C. The Environmental Consultant shall create and implement a Community Air Monitoring Plan (CAMP), if required by DASNY Project Management, to manage real-time monitoring for particulates at the upwind and downwind perimeters and adjacent to the nearest structure within the work area when particulate-generating activities are in progress at the Site. 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.
- D. Engineering Inspections and Observations:
 1. The Owner's Engineer will inspect the movement and handling of all contaminated materials. Contractor will notify Construction Manager and Owner's Engineer a minimum of 72 hours prior to start of Work involving handling of contaminated materials.
 2. Owner's Engineer will observe the contaminated material removal procedures and methods and will notify the Contractor, Construction Manager, and Owner of any part of the Work of this Section not in compliance with these specifications. Such notification will not relieve the Contractor from the responsibility of properly implementing, performing, and maintaining contaminated material removal as specified herein and as required by the Work.
 3. Contractor will cooperate with the Construction Manager and Owner's Engineer to facilitate the progress of the Work.

4. Contractor will provide at least one supervisory person who must be present at all times during execution of the Work and who is thoroughly familiar with the type of work being performed and its best methods for completion. This person will have the authority to act on behalf of Contractor.

PART 4 SOIL CHARACTERIZATION, MANAGEMENT AND DISPOSAL

4.01 SOIL CHARACTERIZATION

A. Soil Characterization

1. The Contractor shall confirm with the disposal facility that a sufficient quantity of soil samples was obtained to fully characterize the site soils scheduled for disposal prior to removing any soils from the site. The contractor shall notify the DASNY on-site representative if additional waste characterization samples are needed to satisfy targeted disposal facility requirements. Any additional samples that are required will be collected by DASNY's on-site Environmental Consultant. The results of all waste characterization analyses shall be submitted to DASNY Code Compliance prior to removal of soils from Site.
 2. In-situ soil characterization should be completed in accordance with the sampling procedures in the Soil Management Plan (SMP), described in Section 4.02 B. of this Specification. Sampling should be biased to soil encountered that exhibits staining, free product and/or elevated photo-ionization detector (PID) readings.
 3. Soils proposed for reuse on-Site will be managed as directed by the Environmental Consultant.
- B.** Uncontaminated, non-hazardous soil (i.e. soil meeting NYSDEC's Unrestricted Use Soil Cleanup Objectives cited in 6 NYCRR Part 375-6.3) is not subject to approval from NYSDEC's Division of Hazardous Materials Management. If the material is stockpiled on-Site, it must follow the stockpiling procedures set forth in the SMP.
- C.** The Contractor shall protect and maintain excavation areas until completion of the work and acceptance by the Environmental Consultant. Excavated contaminated soil designated for off-site management may be containerized in roll-off containers at designated area(s), as directed by the Environmental Consultant.

4.02 TRANSPORTATION AND DISPOSAL OF EXCAVATED MATERIAL

A. Description of Work

1. Non-Hazardous Excavated Material, as defined in Section 1.07, that has been excavated as part of the construction project and slated for disposal shall be transported to an off-site disposal facility meeting the requirements of 6 NYCRR Part 360, or equivalent out-of-state facility, approved by the appropriate regulatory agency of that State with a permit to receive non-hazardous excavated material. This facility shall be identified and approved in the Pre-Work Submittal referenced in Section 1.05 A. prior to the start of work.
2. Clean Fill for reuse, as defined by NYSDEC under 6 NYRR Part 360 Article 12 Beneficial Use as material that is not considered Solid Waste when a Pre-determined Beneficial Use or a Case-specific Beneficial Use is determined for the excavated material.
3. All petroleum-contaminated material, as defined in 6 NYCRR Part 360 Article 1.5, if discovered, shall be transported to an off-site disposal facility permitted to receive petroleum-contaminated material from known source areas. All hazardous waste, as defined in Article

1.5, if discovered, shall be transported to an off-site disposal facility meeting the requirements of 40 CFR Part 265 and 6 NYCRR Part 373, or equivalent out-of-state facility, approved by the appropriate regulatory agency of that State with a permit to receive hazardous waste. This facility shall be identified and approved in the Pre-Work Submittal referenced in Section 1.05 A. prior to the start of work.

4. Soils may be reused on-site, if the criteria are met for pre-determined (SCO).
5. The Contractor must inform the Owner a minimum of one week prior to the start of excavation activities. Excavation and disposal activities must be supervised by the Owner or Owner's representative.

B. Excavated Soil Management Plan

An Excavated Soil Management Plan (SMP) shall be prepared by the Contractor and approved by the Owner for non-hazardous excavated material a minimum of 7 days prior to the start of excavation. A separate Excavated Material Disposal Plan for any additional categories of material (petroleum-contaminated or hazardous), as defined in Section 1.07 C. 3. and 1.07 C. 4., if encountered during excavation, shall be prepared by the Contractor and approved by the Owner prior to removing the material off-site. Soil may be re-used on-site in accordance with NYSDEC Beneficial Use Determination (BUD) regulation. There are 28 predetermined BUDs listed in 6 NYCRR Part 360.12(c). Refer to Section 1.04 for submittal requirements. In the Excavated Soil Management Plan, the Contractor shall, at a minimum:

1. Indicate how buried utilities (e.g. electric, gas, water, sewers, telephone, etc.) will be located and provide copies of the resulting information to the Owner.
2. Provide a to-scale figure indicating the excavation areas, the estimated depths of excavation, and estimated quantities of excavated material.
3. Provide a listing, including company name, name of owner contact, phone number, and address of facility, of the off-site disposal facility(ies) meeting the requirements listed in Item A above, for each specific material to be disposed and a copy of each facility's permit (NYSDEC or equivalent out of state).
4. Provide a listing, including company contact name, phone number and address, of proposed waste haulers. Provide a copy of the valid 6 NYCRR 364 Waste Transporter Permit for each proposed waste hauler.
5. Provide a certification from the proposed waste disposal facility(ies) that material from the site is acceptable for disposal. This letter must be on the disposal facility letterhead and must be received prior to removal of excavation material from the site.
6. Provide a plan for re-use of uncontaminated soil on-site, dependent upon the appropriate SCO determination, prior to excavation.

- C. All excess material, including earth, rock, and fill, shall be removed from site and legally disposed of by the Contractor.
- D. All lumber, forms and metal work shall be removed immediately after completion of local areas. The Contractor shall be responsible for removal of all debris produced by work to this section from the site.
- E. Sidewalk and streets adjoining the property shall be broom cleaned and free of debris, rubbish, trash and obstructions of any kind caused by the work of this Section by the Contractor.

- F. The Contractor must confirm characterizing for disposal has been performed on all material prior to removing material from the Site. DASNY's on-site Environmental Consultant will collect additional waste characterization samples, if needed, to satisfy targeted disposal facility requirements. The results of all waste characterization analyses shall be submitted to the Owner prior to removal of waste from the Site.
- G. The Contractor shall be responsible for handling and transporting contaminated materials removed from the Site to a permitted disposal/treatment facility licensed to accept such waste soil. Materials removed from the Site shall only be transported to facilities which have received prior approval of the Owner and which have provided written approvals indicating they are permitted to accept such materials.
- H. No materials shall be added to or removed from transport vehicles between their time of departure from the Site and their time of arrival at the approved facility for their disposal.
- I. The Contractor shall use only properly permitted Owner-approved waste transporters. All vehicles and drivers shall be permitted and licensed in accordance with all applicable Federal, State and Local laws and regulations including the laws and regulations of governing agencies which have jurisdiction over areas through which the waste will be transported.
- J. Vehicles shall be designed, equipped, operated and maintained to prevent leakage, spillage or airborne emissions of waste during transport. Appropriate controls shall be used to contain odors during loading and shipping of waste. Only safe, suitable and well-maintained vehicles, which are properly labeled/placarded, manned, permitted and registered to perform the required transportation services shall be used. All vehicles shall be decontaminated as necessary, including truck tires and undercarriages, prior to leaving the Site. The Contractor shall be responsible for supplying all labor, materials, equipment and supplies for decontaminating the vehicles used and shall be responsible for the off-site disposal of wastes resulting from any decontamination.
- K. Certified weight scale tickets showing the weight of the vehicle at the time of arrival and departure from the disposal facility shall be provided for all waste material transported off-site. The weight tickets shall be signed and dated by a representative of the Contractor certifying the accuracy of all measurements, the date and time of arrival and departure of each vehicle, the disposal location and the vehicle identification number.
- L. The Contractor shall continuously monitor the regulatory compliance status of all waste transporters and disposal facilities used and proposed for use. If, at any time, the Contractor becomes aware of a potential or actual change in the regulatory compliance status of any waste transporters or disposal facilities used or proposed for use, the Contractor shall immediately notify the Architect, Owner or Owner's Representative of such potential or actual change and, in consultation with the Owner, make arrangements to divert waste to alternate approved transporters and disposal facilities.
- M. The Contractor shall complete all required manifest forms and bills of lading as required by applicable laws and regulations for transportation and disposal of materials off-site. The Contractor shall provide completed copies of all required manifests and bills of lading to the Owner along with all requested backup documentation. DASNY's on-site Environmental Consultant shall sign manifests and bills of lading. The Contractor shall be responsible for assuring that all notifications, labeling, documentation, sampling, analysis, transportation and disposal requirements of the disposal facility, and Federal, State and Local governments are complied with and properly documented.

- N. The Contractor's Hauler and Disposal Site shall be approved by the Owner.
- O. The Contractor shall give 24-hour notification prior to removing any waste from the site. Waste shall be removed from the site only during normal working hours unless otherwise specified. No waste may be taken from the site unless the Contractor and Environmental Consultant are present and the Environmental Consultant authorizes the release of the waste as described herein.
- P. The Environmental Consultant shall verify the landfill to be used for waste disposal with the waste transporter (driver) and Contractor prior to the waste storage trailer/dumpster leaving the site. The Environmental Consultant shall confirm the waste transporter firm and landfill are listed on the regulatory notifications for the Project and the waste transport vehicle license number is listed on the current NYS DEC Waste Transporter permit.
- Q. Payment for disposal of contaminated soils will not be made until a signed copy of all required manifests and bills of lading from the treatment or disposal facility certifying the amount of contaminated soils delivered is returned for each load removed from the site. This original manifest and bill of lading documentation as well as the waste disposal log originals must be provided to the Owner or appropriate state if applicable, and copies provided to DASNY Code compliance.

END OF SECTION 02 61 00

APPENDIX A

SOIL REPORT

APPENDIX B

SOIL TRANSPORT FORMS



(08/18)

NOTIFICATION OF FILL MATERIAL REUSE

OFFICIAL USE ONLY

DATE RECEIVED

--	--	--

GENERATOR NUMBER

--

DESTINATION NUMBER

--

STAFF INITIALS

--

6 NYCRR Part 360.13 requires notification to the Department for the use of fill material in the following cases:

- At least five days in advance of transfers of general fill, restricted-use fill and limited-use fill generated in, imported to, or relocated within the City of New York in amounts greater than 10 cubic yards.
- At least five days in advance of delivery of restricted-use fill and limited-use fill in amounts greater than 10 cubic yards anywhere in the State of New York.

Notification to the Department is not required when the destination is a facility authorized under 6 NYCRR Part 361-5; however, the facility may request information required by this form as part of its waste control plan.

1. Generating Site Location and Contact

Project Name:

--

**Location of
Generating
Site:**

Street Address

City/Town

County

Zip Code

Contact:

Last

First

M.I.

Office Phone:

()	
-----	--

Mobile Phone:

()	
-----	--

E-mail

--

**Company
Name:**

--

**Company
Address:**

Street Address

--

City

State

Zip

2. Fill Material Generated at Remediation Sites

a. Is the fill material generated from a site being remediated pursuant to a program administered by the Department or EPA?

☐ Yes ☐ No

b. If Yes to question 2a, do you have approval from the Department or EPA to reuse this material at the proposed destination?

☐ Yes ☐ No

If No to question 2b, contact the Department prior to transporting fill material to the destination site.

NOTIFICATION OF FILL MATERIAL

3. Generating Site Information

a. Overall quantity of fill material this project will generate _____ Cubic yards

b. Indicate fill material classifications found on the site:

☐ General Fill ☐ Limited use fill ☐ Restricted use fill ☐ Other

c. Quantity of fill material covered under this notification _____ Cubic yards

d. Indicate fill material classifications proposed to be reused under this notification:

☐ General Fill ☐ Limited use fill ☐ Restricted use fill ☐ Other

e. Have other notifications for this project been submitted to the Department? ☐ Yes ☐ No

If yes, indicate destination region(s). _____

f. Will additional notifications be sent in the future? ☐ Yes ☐ No

g. Estimated start date and end date of overall project: _____

(Start Date)

(End Date)

h. Estimated start and end date of fill transfer for reuse under this notification:

(Start Date)

(End Date)

4. Fill Material Physical Characteristics

Describe Fill Material

Provide a description of the fill material, including estimated composition by percent volume of soil, rock, concrete, brick, ash, cinders, slag, etc.). If more space is needed, attach an additional sheet.

5. Qualified Environmental Professional

Contact:

Last First M.I.

Office Phone: () _____ Mobile Phone: () _____

E-mail: _____

Company Name: _____

Company _____

Address: _____

Street Address

City

State

Zip

6. Destination Site Location and Contact

Project Name: _____

Location of Destination Site: _____

Street Address *City/Town*

County *Zip Code*

Contact: _____

Last *First* *M.I.*

Phone: () _____ **Mobile Phone:** () _____

E-mail: _____

Company Name: _____

Company Address: _____

Street Address

City *State* *Zip*

7. Destination Site Information

- a. Quantity of fill material required for this project? _____ **Cubic Yards**
- b. Type(s) of fill material to be used (check all that apply):
- General Fill ☐ Limited use fill ☐ Restricted use fill ☐ Other ☐
- c. For restricted- and limited-use fill, has a local building permit or other municipal authorization been issued for this project that includes need for fill? ☒ Yes ☐ No
- d. Are additional fill material notifications to be submitted for this project? ☐ Yes ☐ No
- e. Describe the area(s) on the site where this fill material is to be used:

Please note that both the generator and the receiver of the fill material must retain records of fill material quantities, with analytical data, for a minimum of three years after fill material is removed or received, as applicable. To demonstrate compliance with applicable requirements of this notification, a log of all loads of fill material and corresponding tracking documents should be maintained as part of these records. The Department reserves the right to inspect any site of generation or placement of fill material.

Transport of fill material that originates in the City of New York, or limited-use fill and restricted-use fill generated outside of New York City, is also subject to the requirements of Part 364.

8. Certification by Qualified Environmental Professional

I certify, under penalty of law that the data and other information provided in this notification have been prepared under my direction and supervision in compliance with the system designed to ensure that qualified personnel properly and accurately gather and evaluate this information. I am aware that any false statement I make in this notification is punishable pursuant to Section 71-2703(2) of the Environmental Conservation Law and Section 210.45 of the Penal Law.

Name:

Last Name

First Name

M.I.

Signature:

Date

License

Information:

Number

State

Profession:

☐ Engineer

☐ Geologist

☐ Other (see 6 NYCRR 360.2(b)(213))

(Engineer or Geologist seal above)

In the event the Qualified Environmental Professional identified in Item 5 above is not a Professional Engineer or Geologist licensed in New York State, the QEP's basis for credential must be attached to this form.

All notifications must be sent to the Regional Office of the Department in which the destination is located (see <http://www.dec.ny.gov/about/558.html>).

Pursuant to 6 NYCRR Subdivision 360.13(g), all notifications must be made on forms and in a manner acceptable to the Department. Before submitting this notification, please ensure this form is complete and all supporting documentation is formatted in a manner acceptable to the Department as recommended in the checklist below.

- ☐ **Completed Form.** All fields of the application are complete, including the certification.
- ☐ **Analytical Data Comparison.** Analytical data is compared with the following, for the respective fill material type for the receiving site, and exceedances clearly identified as follows (see also 6 NYCRR Part 360.13(f)):
 - General Fill: protection of groundwater and residential soil cleanup objectives found in 6 NYCRR Part 375, Section 375-6.8.
 - Restricted-Use Fill: In addition to general fill requirements, benzo (a) pyrene equivalent.
 - Limited-Use Fill: In addition to restricted use requirements, commercial soil cleanup objectives for metals found in 6 NYCRR Part 375, Section 375-6.8.
- ☐ **Summary Table - Recommended Formatting.** Summary tables are attached that show standards and analytes on the left; sample IDs, depths and locations on the top; and detection limits are indicated for those constituents that are listed as 'non-detects'. The summary table should list all analytes. All data for the generating site should be provided, even if not to be transported, as part of this notification.



Department of
Environmental
Conservation

Part 360 Series Waste Tracking Document - Construction & Demolition Debris

This form may be used to satisfy the tracking document requirements of both section 361-5.6 and section 364-5.1 for the transport of C&D Debris

TYPE OF C&D DEBRIS:	<input type="checkbox"/> Limited-Use Fill <input type="checkbox"/> Restricted-Use Fill <input type="checkbox"/> Contaminated Fill <input type="checkbox"/> Fill Material - Unknown <input type="checkbox"/> General Fill <input type="checkbox"/> Residue <input type="checkbox"/> Construction Waste <input type="checkbox"/> Demolition Waste <input type="checkbox"/> Other (specify): _____
WASTE QUANTITY:	_____Tons _____Cubic Yards Check box to indicate quantity is estimated: <input type="checkbox"/>
LOCATION WHERE WASTE WAS PICKED UP:	Source Name: _____ Address: _____ City: _____ State: _____ Zip Code: _____
GENERATOR: Name: _____ DEC Permit/Reg. No. (if applicable): _____ Address: _____ City: _____ State: _____ Zip: _____ Authorized Representative of Generator: _____ Phone: _____ Transporter Name: _____ Receiving Facility Name: _____ Chosen by Transporter Address: _____ City: _____ State: _____ Zip: _____ <small>I have completed this tracking document describing the waste and identifying the transporter and receiving facility. I certify, under penalty of law, that the information provided in this waste tracking document has been prepared under my direction and supervision and further certify that the information contained herein is true and accurate. I am aware that any false statement made on this document is punishable pursuant to Section 210.45 of the Penal Law.</small> Signature: _____ Date: _____	
TRANSPORTER: <i>To be completed by Transporter</i> DEC Permit/Registration No.: _____ Transporter Company Name: _____ Describe all Discrepancies in type or quantity of waste: _____ _____ Driver Name (print): _____ Phone: _____ Plate No.: _____ Signature: _____ Date: _____	

RECEIVING FACILITY: *To be completed by Receiving site* DEC Permit/Reg. No. (if applicable): _____

Name: _____ Address: _____

City: _____ State: _____ Zip: _____ Put [X] for: interim processor, or final site

Describe all Discrepancies in type or quantity of waste: _____

I certify, under penalty of law, that the information contained herein is true and accurate.
I am aware that any false statement made on this document is punishable pursuant to Section 210.45 of the Penal Law.

Print Name: _____ Phone: _____

Signature: _____ Date: _____

The completed tracking document for all waste types must be returned to the Generator within two weeks of receipt of the waste.

Statewide for restricted-use fill, limited-use fill and contaminated fill, and for all waste types, except residue, generated in the City of New York, a copy of the completed tracking document **must also be provided to NYS DEC within 15 days** of waste delivery to the receiving facility.

[ref: 6 NYCRR 364-5.1(b)(5)]

Rev: May2018, Ver 1

**Return completed forms to NYS DEC by e-mail to transport@dec.ny.gov OR fax to 518-402-9034
OR mail to 625 Broadway, 9th Floor, Albany, NY 12233-7251.**



Department of
Environmental
Conservation

New York State Department
of Environmental
Conservation Division of
Materials Management

USE OF PREDETERMINED BENEFICIAL USE DETERMINATION

Pursuant to 6 NYCRR
360.12(c)

COMPANY NAME:	
COMPANY ADDRESS:	
LOCATION/ADDRESS OF SITE OF REUSE:	
<p>This material is being used in compliance with the pre-determined beneficial use determination described at 6 NYCRR 360.12(c)(1)(ii):</p> <p><i>“The following cease to be waste when used as described in this paragraph.... (ii) fill material generated outside of New York City with no evidence of historical impacts such as reported spill events, or visual or other indication (odors, etc.) of chemical or physical contamination.”</i></p> <p>Transportation of this material does not require a Part 364 Waste Transporter permit or registration.</p>	
CONTACT NAME:	TITLE:
COMPANY NAME:	
PHONE:	EMAIL:
SIGNATURE:	DATE:

With any questions, please contact (518) 402-8678 or benuse@dec.ny.gov.

APPENDIX C

WASTE SHIPMENT RECORD LOG



DASNY

**DORMITORY AUTHORITY STATE OF NEW YORK
WASTE SHIPMENT RECORD LOG**

Facility Name: _____

Building Name/Number: _____

Project Name: _____

DASNY Project Number: _____

Abatement/Remediation Contractor: _____

Project Monitor: _____

Load No.	Hauler Name	NYSDEC #	License Plate No.	Size of Container	Disposal Facility Name	Date Depart from Site	Date Received at Disposal Site	Date Shipment Record Returned

Comments: _____

Page _____ of _____

APPENDIX 4

HEALTH AND SAFETY PLAN

CONFIDENTIAL

HEALTH AND SAFETY PLAN

FOR

TRANSFORMER ROOMS NOS. 1 & 2 – BLDG. 1

BRONX PSYCHIATRIC CENTER

1500 WATERS PLACE, BRONX, NY 10461

Prepared For:



**New York State Office of Mental Health
75 New Scotland Avenue, Albany NY 12208**

Prepared by:

TRC Engineers, Inc.

1407 Broadway, 33rd Floor

New York, New York 10018

Phone: (212) 221-7822

TRC Project No. 411323.0000.0022

January 2026



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Bronx Psychiatric Center

January 2026

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ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-Containing Material
ANSI	American National Standards Institute
APR	Air Purifying Respirator
CFC	Chlorofluorocarbon
CFR	Code of Federal Regulations
CPR	Cardiopulmonary Resuscitation
dBA	A-Weighted Decibel
EHS	Environmental Health and Safety
USEPA	U.S. Environmental Protection Agency
fiber/cc	fiber/cubic centimeter
RWP	Remedial Work Plan
GFCI	Ground Fault Circuit Interrupter
HASP	Health and Safety Plan
HSO	Health and Safety Officer
IDLH	Immediately Dangerous to Life or Health
LCP	Lead-Containing Paint
LEL	Lower Explosive Limit
mg/m ³	Milligram per cubic meter
MSHA	Mine Safety and Health Administration
NIOSH	National Institute of Occupational Safety and Health
OMH	New York Office of Mental Health
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PEL	Permissible Exposure Limit
PPE	personal protective equipment
ppm	Parts per million

ACRONYMS AND ABBREVIATIONS (cont'd)

PRCS	Permit Required Confined Space
REL	Recommended Exposure Limit
SDS	Safety Data Sheet
TLV	Threshold Limit Values
TRC	TRC Engineers, Inc.
TWA	Time Weighted Average

1.0 INTRODUCTION

This Health and Safety Plan (HASP) was prepared in accordance with Occupational Safety and Health Administration (OSHA) 1910.120 requirements to protect TRC Engineers, Inc. (TRC) employees and its subcontractors during implementation of the scope of work in support of the Transformer Room No. 1 and Transformer Room No. 2 in Building No. 1 at the Bronx Psychiatric Center (the Facility), located at 1500 Waters Place in Bronx County of New York City, tax block 4226, lot 30. The Facility is operated by the New York Office of Mental Health (OMH) referred to as the “Client.”

This HASP defines the potential hazards expected to be encountered during the work activities as outlined in the Remedial Work Plan (RWP) for the Facility and also addresses the health and safety requirements and procedures to be followed by all field personnel including; appropriate exposure controls including engineering, administrative, and personal protective equipment required for each task.

Revisions and/or alterations to the HASP will be necessary as more site-specific information becomes available, such as after the commencement of the investigation and remediation activities at the Facility, per the RWP. TRC will prepare a site-specific HASP Addendum to document such revisions/alterations and include it with the submittal of the RWP. In addition, any changes in the scope of work may require that the HASP be revised. Any proposed changes to the HASP will be approved by the TRC Health and Safety Officer (HSO) and then by OMH prior to implementation, and recorded in the HASP Amendment Form, as included in Appendix A.

All on-site personnel are required to review the HASP and attachments, as well as review and sign the HASP Review Acknowledge Form in Appendix B. All personnel must strictly comply with the requirements detailed in the HASP and its addenda. It is the responsibility of the TRC Program Director, Health & Safety Officer (HSO), and Project Manager to ensure that this HASP and its subsequent addenda are implemented and enforced. Like other project-related documents, the HASP may contain sensitive or confidential information and should not generally be disclosed to persons other than those working on-site and on this project.

2.0 SCOPE OF WORK

The Transformer Rooms Nos. 1 & 2 are located at Building No. 1 on a 0.1-acre portion of the 5-acre Bronx Psychiatric Center campus, which is considered an urban area. (the "Site"). The transformer rooms at the psychiatric center were operated for over 50 years for electric power supply to the building. There are transformers and associated electrical equipment in the rooms. The prior transformers used at the facility contained PCB dielectric fluid, which leaked within the rooms, impacting the concrete floors beneath and near the transformers and the soils below the floor.

Transformer Room No. 1 and Transformer Room No. 2 in Building No. 1 in October 2023. The recent monitoring event in October 2023 was planned to include the inspection and PCB wipe sampling of epoxy coatings on the concrete floors inside the Transformer Rooms. The inspection and sampling were postponed because of unforeseen vandalism which included damaged electrical equipment and other materials covering the floor areas. The epoxy coated floor area must be cleared of damaged mechanical and electrical equipment, dust and debris which is currently interfering with the facility operations, maintenance, and routine monitoring activity.

Work will include performing limited bulk sampling consisting of collecting asbestos, polychlorinated biphenyls (PCB) and RCRA Metals samples which may be mixed with the vandalized equipment and debris throughout the Transformer Rooms. Bulk sampling of the damaged/vandalized equipment and associated debris will be performed before removal and recycling/disposal.

The remediation of the Transformer Rooms aside from asbestos abatement (based on asbestos sampling and separate HASP) shall consist of the removal and clearing of all contents (transformers and equipment) from transformer rooms to prepare removal of the concrete pads. The following are sequential order for this activity.

1. Remove overgrown vegetation to create access to remove transformer and waste materials from the building.
2. Establish Egress to the Transformer Rooms. Temporary removal of Fire Rated Doors and Louvres within the existing limits of the Basement exterior foundation wall. These entry doors and Louvre panels shall be assessed for suspect materials (i.e., asbestos, lead paint) such as insulation.
3. Clean and remove non-porous scrap metal; Additional PCB-wipe sampling may be necessary to confirm the materials have been thoroughly cleaned for recycling.
4. Remove the other porous materials and debris as Toxic Substances and Control Act (TSCA) Regulated PCB Remediation Waste and/or Potentially Hazardous Waste depending on the results of waste characterization sampling activities.
5. The four (4) transformers along with all associated equipment will be de-energized and removed from Transformer Rooms 1 & 2, as non-porous scrap metal for recycling depending on waste characterization.

2.1 Concrete Pad Demolition and Removal

The maximum feasible removal of concrete slabs from Transformer Room 1 and 2 will be based upon the recommendations of the Structural Engineer. The bottom elevation of the concrete slab is expected to be above groundwater based on historical data. The maximum concrete slab area to be removed is estimated to be 800 square feet in Transformer Room 1 and approximately 850 square feet in Transformer Room 2. The total volume of concrete to be removed may vary depending on the thickness of the concrete slab which

is estimated as 6.5-inches to 18-inches thick. The estimated volume of removal is 60 cubic yards with an assumed weight of 120 tons if the slab is steel-reinforced.

2.2 Soil Excavation

To achieve re-classification of the site from a Class 3 to a Class 4 Inactive Hazardous Waste Disposal Site, the post-excavation PCB soil concentrations in the Transformer Rooms must demonstrate to NYSDEC that the PCB concentrations in subsurface soil beneath the building meet the cleanup criteria of 10 ppm.

The soils underneath the transformers will be excavated and end point samples will be collected. All on-site soils which exceed restricted-residential soil cleanup objectives (SCOs) for PCBs (1 ppm) shallow soil (0-2 feet) and 10 ppm in subsurface soil, as set forth in NYSDEC's CP-51 and Part 375-6.8, will be excavated and transported off-site for disposal.

The soil area to be removed is estimated to be less than 250 square feet in Transformer Room 1, and less than 250 square feet in Transformer Room 2. The total volume of soil to be removed will vary depending on the depth of groundwater and corresponding de-watering activity required, soil type(s), types of shoring and shielding required. The soil excavation is required to remove and safely access PCB contaminated soil greater than 10 ppm, based on remedial investigations and the ROD selected for this site.

A site map of the facility, a road map and directions to the closest hospital are presented in Appendix G. A site evacuation map (which will be provided by the OMH for the facility), and any site-specific health and safety considerations not included in this HASP, will be provided in a HASP Addendum to the OMH.

3.0 PROJECT PERSONNEL RESPONSIBILITIES

The TRC management team along with all its employees, share the responsibilities of enforcing and implementing the health and safety requirements stated in the HASP and its subsequent addenda. The following outlines the responsibilities of each of the designated key personnel, TRC employees, and subcontractors.

3.1 Program Director

The Program Director is responsible for the overall implementation of all work activities under the RWP. The Program Director has the overall responsibility for the project and to assure that the requirements of the contract are attained in a manner consistent with the required health and safety procedures. For this project, Mr. Josh Cupriks, CIH will be the designated Program Director.

3.2 Corporate Health and Safety Officer

The Corporate Health and Safety Officer (HSO) is responsible for developing and implementing appropriate health and safety policies and practices for the field personnel under the RWP.

The HSOs responsibilities include the following:

- Coordinating the overall health and safety program.
- Reviewing of HASP and its subsequent addenda.
- Ensuring that appropriate health and safety-related training is adequate.
- Developing and maintaining a database of employee training and medical surveillance.

- Managing the company health and safety records.

For this project, Mr. Daren Bryant will be the designated TRC HSO.

3.3 Project Manager

The Project Manager is responsible for the performance of all field personnel and subcontractors under the RWP. The Project Manager coordinates with the Program Director and the HSO to assure that the work is completed in a manner consistent with the HASP. Prior to beginning the project monitoring work, the Project Manager will provide project documents, such as the approved RWP as well as the HASP and its addenda, to the Field Team Task Leaders, TRC employees, and subcontractors for review and signature. In addition, the Project Manager will conduct bi-weekly and unannounced audits at the sites to ensure the work activities are conducted in accordance with the approved RWP and this HASP. In addition, the Program Manager serves as a liaison between the OMH, TRC, and works closely with the TRC HSO and Field Team Task Leader to ensure the field personnel observe the health and safety requirements specified in this HASP and its subsequent addenda. For this project, Mr. Anthony Sigona, PE, CSP, CIH is designated as the Project Manager.

3.4 Field Team Task Leader

When the HSO or the Project Manager is absent from the Site, the Field Team Task Leader, Ms. Nancy Guevara, will assume the on-site responsibilities of the HSO. The Field Team Task Leader will oversee daily safety issues and ensure that all applicable OSHA, State, and Local health and safety standards, as well as OMH environmental health and safety policies are applied. If there is any dispute with regard to health and safety or project activities, on-site personnel will attempt to resolve the issue with the Field Team Task Leader. If the issue cannot be resolved, the Project Manager will be consulted.

The Field Team Task Leader is authorized to suspend work based on safety concerns and is responsible for:

- Indoctrinating field personnel with regard to all of the information in this HASP and any other safety requirements to be observed during the performance of the RWP, including, but not limited to, decontamination procedures, designation of work areas, levels of protection, air monitoring, and emergency procedures dealing with fire and medical situations;
- Coordinating safety decisions with the Project Manager and the on-site OMH representatives;
- Maintaining the work area on a daily basis;
- Monitoring the condition and status of all known on-site hazards and maintenance and implementation of the air monitoring program specified in this HASP;
- Maintaining records of safety problems encountered, mitigative action taken, and documentation of any chemical exposure or physical injuries.

The Field Team Task Leaders will document these conditions in a bound log-book, which should be kept at the Site, when on-site, and made available to the OMH. For this project, Ms. Nancy Guevara will be the assigned Field Team Task Leaders. Additional Field Team Task Leaders may be added as the project progresses.

3.5 TRC Employees

TRC employees are responsible for their personal safety, and the safety of others, in the work area. Employees are expected to follow the procedures set forth in the HASP and its addenda. All project personnel have the authority to stop work if, in their judgment, serious injury could result from continued activity. The HSO and Project Manager should be notified immediately if this becomes necessary. Any person who observes safety concerns or potential hazards that have not been addressed in the daily safety

meetings should immediately report observations and/or concerns to the Field Team Task Leader or to other appropriate key personnel.

Safety requirements to be observed by TRC employees include:

- Reading this HASP, as well as any amendments, prior to on-site work and complying with these documents;
- Signing the HASP Review Acknowledgement Form;
- Providing documentation of medical surveillance and training to the HSO;
- Attending pre-entry briefing prior to entering site and other safety meetings;
- Bringing forth any questions or concerns regarding the content of HASP prior to start of work, and
- Reporting all potentially dangerous situations, incidents, injuries, and illnesses, regardless of their severity, to the Field Team Task Leader or appropriate key personnel.

3.6 Subcontractors

Each subcontractor is responsible for the health and safety of its own employees, in addition to following the health and safety requirements specified in this HASP.

Subcontractors will be responsible for:

- Reading the HASP and its addenda, and signing the HASP Review Acknowledgement Form;
- Reading and adhering to all OMH standard operating procedures (SOP);
- Informing TRC of the name and qualifications of its on-site safety representative;
- Providing the names of personnel and appropriate documentation of OSHA HAZWOPER training (including refreshers), and any other task-specific proof of training (e.g., confined space entry);
- Submitting for evaluation the Subcontractor's complete HASP;
- Performing work in a safe manner and observing established health and safety practices at all times while on the project site; and
- Informing HSO of any changes or recognized hazards identified during the project.

TRC will be responsible for providing the Subcontractors with all information related to health and safety requirements as specified in the HASP and ensuring that Subcontractor adheres to HASP, HASP addenda and all OMH OPs.

Contact telephone numbers for key personnel are included in Section 13.0.

4.0 TRAINING PROGRAM

4.1 Environmental Training

All environmental field personnel, including subcontractors, who will be involved in the RWP shall have previously received the following training on handling potential exposure to toxic chemicals or hazardous environments. The training must be taught by experienced professionals and promotes safe work conditions through both classroom and field instructions.

- HAZWOPER – for those employees performing sampling of building materials;
- NYSDOL/NYCDEP Certified Asbestos Inspector – for those employees involved in sampling of asbestos-containing materials;
- NYSDOL Certified Asbestos Project Monitor – for those employees involved in overseeing asbestos abatement activities, if applicable;
- NYSDOL Certified Asbestos Air Sampling Technician – for those employees performing asbestos abatement project air sampling; if applicable.
- USEPA Lead Inspector – for those employees performing lead sampling;
- Hazard Communication Training (Right-to-Know);
- Training required under specific OSHA Standards, State, Local, and OMH environmental health and safety policies.

In addition, the following training is required for the specific hazards, as dictated by the scope of work, such as:

- Biological hazards (including mold, bacteria and blood borne pathogens)
- Electrical hazards
- Lift equipment/working at elevation
- Lock out/Tag out

TRC will maintain documentation that shows that each on-site employee or subcontractor has the necessary health and safety training.

Subcontractors involved in project work acknowledging the HASP must provide the TRC HSO with documentation of their employees OSHA training prior to commencing site work. If this training is inadequate, these personnel may be excluded from certain aspects of this project.

In addition, all visitors are required to check in with the on-site TRC HSO or Field Team Task Leader to be briefed on the hazards associated with the site; to explain emergency procedures; train them in the use of protective gear, if required during the visit; and if they are to enter the work area to verify that they have received, prior to the site visit, the required preliminary training and medical surveillance.

Personnel of TRC and its subcontractors will follow OMH Rules and Regulations presented in Appendix H.

4.2 Daily Safety Meetings

A brief safety meeting will be held each day before work begins to ensure that all field personnel understand any changing activity or new site conditions or operating procedures and to address safety questions and concerns. The meetings will be called and conducted by the Project Manager or the Field Team Task Leader. Daily safety meeting time and attendance will be recorded in the field log book along with a log of daily site activities. All field personnel must attend the meeting. All visitors and assigned OMH personnel will also attend the meetings.

5.0 MEDICAL SURVEILLANCE

5.1 Medical Monitoring

All personnel and visitors entering the work areas must have completed appropriate medical monitoring requirements required under OSHA 29 CFR 1910.120 (f). Medical monitoring enables a physician to monitor each employee's health and physical condition, fitness to wear respiratory protective equipment and fitness to carry out on-site tasks.

If there are additional medical monitoring requirements for this project, evidence of compliance must be included. Documentation of all field personnel medical monitoring is maintained on file by the HSO. Subcontractors working on this project must provide the HSO with documentation on their medical monitoring programs. The HSO will also be responsible for maintaining documentation of all subcontractor medical monitoring.

As stated in Section 4.0, all visitors are required to check in with the HSO prior to visiting the Site. The HSO will verify if the visitors have the required medical surveillance.

5.2 Fit-Testing Requirements

TRC monitoring teams will utilize respiratory protection in the event hazardous materials are anticipated to be encountered. Therefore, TRC personnel will observe the fit testing requirements in Section 8.0 – Respiratory Protection of this HASP. TRC personnel have been successfully fit-tested and trained with the respirator they are to wear within the previous 12 months in accordance with OSHA 29 CFR 1910.134 or the American National Standards Institute (ANSI). Documentation of all field personnel fit-testing and training are maintained on file by the HSO.

6.0 HAZARD ANALYSIS

The potential for exposure to hazards will vary depending on the location where the monitoring work is being performed. The buildings within the scope of work are varied, therefore, the associated hazards potentially encountered will vary as well. Although the potential for exposure to hazards also exists within the Facility, they generally are not expected to vary widely during the implementation of the RWP. As stated previously, the approach to the RWP includes preparation of this HASP, followed by completion of Phase 1 outlined in the RWP. Based on the results of the initial reconnaissance and Phase 1, TRC shall develop site specific HASP addenda that address the specific hazards identified in the Walk-through that are anticipated to be encountered during the subsequent Hazardous Materials Assessment. The following is a summary of the currently identified hazards that are anticipated to be encountered during scoped work at the Facility.

Building No.	Chemical Hazards identified in 6.1	Physical Hazards identified in 6.2	Biological Hazards identified in 6.3	Environmental Hazards identified in 6.4
Transformer Room No. 1 in Building No. 1	All	All except Confined Spaces & Water Hazards	All except bloodborne pathogens	All except noise
Transformer Room No. 2 in Building No. 1	All	All except Confined Spaces & Water Hazards	All except bloodborne pathogens	All except noise

6.1 Chemical Exposure Hazards

6.1.1 Site-Specific Known and Potential Contaminants

Based on the scope of services for the RWP, TRC assumes the following compounds as potential contaminants:

- Asbestos
- Select metals (e.g. lead, mercury, nickel, lithium, silver)
- PCBs
- Dielectric oil
- Carbon Monoxide
- Carbon Dioxide
- Hydrogen Sulfide
- Pesticides

The source of these potential contaminants of concern may be from on-site building components, as well as from historical operations within the facility.

Analytical methods to be utilized in the analyses of samples collected during this sampling event shall comply with federal, state, and local requirements.

6.1.2 Chemicals to be Used On-Site

For the purposes of equipment calibration, the following table summarizes the chemicals that could be brought on-site:

- Cleaning detergent (Simple Green®)
- Nitrogen
- Carbon Monoxide mixture in air
- Carbon Dioxide
- Hydrogen Sulfide in air
- Hexane
- Chlorine Compound

Safety Data Sheets (SDS) for these chemicals are provided in Appendix F.

6.1.3 Exposure Limits

The following chemical hazards are anticipated for this project:

<u>X</u>	Inhalation	<u>X</u>	Ingestion	<u>X</u>	Skin/Eye Contact
<u>X</u>	Water Reactive	<u> </u>	Explosive	<u>X</u>	Flammable
<u> </u>	Radioactive	<u> </u>	Pressure Sensitive	<u> </u>	Other:

The following table provides a summary of chemical hazards that could potentially be encountered by personnel during the implementation of the field tasks. Based on the scope of the field work activities, the anticipated routes of exposure for the following listed potential contaminants are inhalation, ingestion, skin and/or eye contact. Appropriate PPEs by all field personnel and air monitoring, as specified in Section 9 in this HASP, will be employed during field activities to minimize exposure to the following contaminants.

Potential Contaminant	Exposure Limits	Symptoms of Over-Exposure
Asbestos	TLV: 0.1 fibers/cc OSHA PEL: 0.1 fibers/cc NIOSH REL: 0.1 fibers/cc IDLH: not established	No acute symptoms
Lead	TLV: 0.05 mg/m ³ OSHA PEL: 0.05 mg/m ³ NIOSH REL: 0.05 mg/m ³ IDLH: 100 mg/m ³	Fatigue, personality changes, gastrointestinal discomfort, headache, hearing loss, tremors, seizures, coma, reduced sensation, constipation.
Mercury	TLV: 0.025 mg/m ³ OSHA PEL Ceiling: 0.1 mg/m ³ NIOSH REL: 0.05 mg/m ³ (skin) IDLH: 10 mg/m ³	Eye irritation, headaches, cough, chest pain, breathing difficulty, mental disturbances, memory loss, skin rashes, weakness, speech, vision, and hearing impairment, lack of coordination, sensation disturbances.

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Potential Contaminant	Exposure Limits	Symptoms of Over-Exposure
Nickel	TLV: 0.1 mg/m ³ OSHA PEL: 1 mg/m ³ NIOSH REL: 0.015 mg/m ³ (skin) IDLH: 10 mg/m ³	Sensitization dermatitis, allergic asthma, pneumonitis
Lithium	TLV: 0.025 mg/m ³ OSHA PEL: 0.025 mg/m ³ NIOSH REL: 0.025 mg/m ³ (skin) IDLH: 0.5 mg/m ³	Irritation eyes, skin; eye, skin burns; mouth, esophagus burns (if ingested); nausea; muscle twitches; mental confusion; blurred vision
Silver	TLV: 0.01 mg/m ³ OSHA PEL: 0.01 mg/m ³ NIOSH REL: 0.01 mg/m ³ (skin) IDLH: 10 mg Ag/m ³	Blue-gray eyes, nasal septum, throat, skin; irritation, ulceration skin; gastrointestinal disturbance
PCBs	TLV: 0.5 mg/m ³ OSHA PEL: 0.5 mg/m ³ NIOSH REL: 0.001 mg/m ³ IDLH: 5 mg/m ³	Eye irritation, nausea, vomiting, abdominal pain, jaundice.
Carbon Monoxide	TLV: 25 ppm OSHA PEL: 50 ppm NIOSH REL: 35 ppm IDLH: 1,200 ppm	Headaches, nausea, weakness, dizziness, confusion, hallucinations, depression, angina
Carbon Dioxide	TLV: 5,000 ppm OSHA PEL: 5,000 ppm NIOSH REL: 5,000 ppm IDLH: 40,000 ppm	Headaches, dizziness, restlessness, sweating, increased heart rate, elevated blood pressure, pulse pressure, coma, asphyxia, convulsions, frostbite (dry ice).
Hydrogen Sulfide	TLV: 10 ppm OSHA PEL Ceiling: 20 ppm NIOSH REL: 10 ppm IDLH: 100 ppm	Apnea, coma, convulsions, irritated eyes, conjunctivitis pain, photophobia, respiratory system irritation, dizziness, headaches, fatigue, insomnia, GI disturbances.
Chlorine Compound	TLV: 0.5 ppm OSHA PEL Ceiling: 1 ppm NIOSH REL: 0.5 ppm IDLH: 10 ppm	Eye, nose, mouth, skin burns; lacrimation; rhinorrhea; coughing, choking; nausea, vomiting; headache; dizziness, syncope; pulmonary edema; persistent airways obstruction, bronchial hyper-responsiveness; hypoxemia; dermatitis; CNS impairment; decreased grip strength.

Notes:

fibers/cc

fibers per cubic centimeter

mg/m³

milligram per cubic meter

ppm

parts per million

Ceiling

An airborne concentration that cannot be exceeded at any time

OSHA PEL

OSHA, Permissible Exposure Limit - Time Weighted Average (8-hour shift, 40 hours per week)

TLV ACGIH, Threshold Limit Value - Time Weighted Average
 NIOSH REL NIOSH, Recommended Exposure Limit
 IDLH Immediately Dangerous to Life or Health Concentration

6.2 Physical Hazards

Hot Work <u> </u>	Lift Equipment <u> X </u>	Heavy Machinery <u> X </u>
Hand Tools <u> X </u>	Utilities <u> X </u>	Working at Elevations <u> X </u>
Overhead hazard <u> X </u>	Unguarded floor opening <u> X </u>	
Weights/Lifting <u> X </u>	Pressured Air <u> </u>	Rough Terrain
Compressed Gases <u> </u>	Ladders <u> X </u>	Scaffolds <u> X </u>
Excavation <u> </u>	Water Hazards/Drowning	
Confined Space <u> X </u>	Electrical Hazard <u> X </u>	Lockout/Tag Out <u> X </u>
Other:		

The following table provides a summary of physical hazards that could potentially be encountered by personnel during the implementation of the field tasks.

Physical Hazard	Exposure Control Procedures
Hand Tools	<ul style="list-style-type: none"> Inspect hand tools for defects that will impair their strength or render them unsafe. Unsafe hand tools will not be used. Maintain tools in good repair. Use tools only for their designed purpose.
Rough Terrain	<ul style="list-style-type: none"> May include uneven surfaces; changes in grade; and excessive ground cover or vegetation. This also increases risk for vehicle and foot passage. Clear vegetation in heavy traffic (vehicle, foot) areas, where possible. Mark excessively rough areas and minimize travel to and through such areas. Plan equipment placement and activities accordingly. Wear ankle high (or higher) steel-toe/shank work boots. Discuss slip/trip/fall hazards associated with daily tasks at pre-work job planning and safety meetings

Physical Hazard	Exposure Control Procedures
Confined Spaces	<ul style="list-style-type: none"> Evaluate space to determine if meets criteria for identification as Permit-Required Confined Space: <ol style="list-style-type: none"> Large enough and so configured that an employee can enter and perform assigned work, AND Limited access/egress, AND Not originally designed for continuous human occupancy. If space meets all three of the above criteria, then the space is considered a confined space. Determine if Confined Space exhibits any of the following four characteristics: <ol style="list-style-type: none"> Contains or has the potential to contain a hazardous atmosphere (toxic, oxygen deficient, flammable) Contains a material that has the potential to engulf an entrant (cave-in, water, stored product) Has an internal configuration that the entrant could be trapped or asphyxiated by inwardly converging walls or a downward sloping floor (physical design and inner mechanisms) Contain any other recognized serious health and safety hazard (electrical, mechanical) If the space exhibits any of the above four characteristics, then the space is a Permit-Required Confined Space. A permit system must be in place and the Confined Space Entry Plan in Section 7.0 must be followed. Special training is required. Observe requirements in OMH EHS Policies and Procedures: Confined Space Entry Program.
Unguarded Floor Opening	<ul style="list-style-type: none"> Floor openings must be protected with standard railings, defined as a top railing mounted about 42 inches from the floor and an intermediate railing located midway between the top railing and floor. A toe board must be provided to prevent tools and debris from accidentally being kicked into the opening. Open sided floors and wall openings must be similarly guarded. Do not enter floor openings that are not protected with standard railings.
Overhead Utilities	<ul style="list-style-type: none"> Identify all overhead utilities around the work area before work commences. Appropriately-rated hard hats will be worn by personnel working with or near the heavy equipment for protection against overhead hazards.

Physical Hazard	Exposure Control Procedures
Lift Equipment Operation – Manlifts	<ul style="list-style-type: none"> • Lift must be operated by competent individuals familiar with safety and operating instructions. • Daily inspections must be conducted and recorded by the competent individuals utilizing the equipment. Observations should include: structural welds, lifting cables/chains, control lines, lift controls, and electrical connections. • Lift must be equipped with a device to prevent free-fall if power or primary suspension system fails. • Lift must be equipped with secondary controls capable of overriding platform controls, and emergency decent systems must be provided in case of failure of primary systems. • Capacity, height limits, restrictions/warnings/cautions must be displayed or outlined in a manual kept with or near the lift. • Operator must have unobstructed view of path (vertical and horizontal path) prior to and during movement. • Driver must always maintain a safe speed. • Observe requirements in OMH EHS Policies and Procedures: Walking/Working Surfaces – Scaffolding and Aerial Lifts. • Observe requirements in OMH General Guidance: Fall Protection.
Heavy Machinery	<ul style="list-style-type: none"> • Heavy machinery must be operated by competent individuals familiar with safety and operating instructions. • Daily inspections must be conducted and recorded by the competent individuals utilizing the equipment. • Ensure all moving parts are safeguarded. • Train workers on equipment risks. • Use protective gear and follow safety guidelines. • Operator must have unobstructed view of path prior to and during movement. • Machine operators must always maintain a safe speed. • Observe requirements in OMH EHS Policies and Procedures.

Physical Hazard	Exposure Control Procedures
Electrical Hazards	<ul style="list-style-type: none"> • Coordinate with OMH personnel for de-energizing equipment. • Work in electrically hazardous locations requires intrinsically safe equipment. Non-conductive protective footwear and gloves should be used. • Any work performed on live electrical system must be performed by licensed electrician. Any electrical installations, repairs, inspections, as well as startup and shut down must be performed by licensed electricians. No work will be done without onsite approval from OMH representative. • Consider all electrical systems as energized until verified, de-energized and grounded. • Do not work on or in close proximity to electrical circuits unless the circuit is de-energized, grounded, or guarded. • Keep work areas dry so water cannot become an electrical conductor. • Only fiberglass or wood ladders are used when working near electrical hazards. • Electrical insulating gloves with leather protectors, a face shield, safety glasses, a hard hat and flame retardant clothing are to be used by electricians working on energized circuits. • Insulation mats are placed on floors and on frames of equipment when working on energized equipment. • Observe requirements in OMH EHS Policies and Procedures: Control of Hazardous Energy, Lock Out/Tag Out.
Lock Out/Tag Out	<ul style="list-style-type: none"> • Coordinate with OMH personnel for de-energizing equipment. • Turn off all point of operation controls. • After the supply of power has been disconnected by a qualified person, the person working on the equipment must put their personal lock on the disconnect switch and any other hazard. • Test the equipment to ensure that the equipment is de-energized. • The personal locks will have signed OSHA-acceptable tag identification on them. • The employee working on the equipment will remove the lock upon completion of the work. • Before de-energizing, a check must be made to ensure that all employees are clear. • A personal lock must not be removed by any other person except for the person who attached it. • Observe requirements in OMH EHS Policies and Procedures: Control of Hazardous Energy, Lock Out/Tag Out.

Physical Hazard	Exposure Control Procedures
Working at Elevations	<ul style="list-style-type: none"> • Fall protection provisions will be instituted when working on platforms (greater than 4 feet), scaffolding, or in situations where a fall of greater than 6 feet may occur. • Provide handrails and toe boards on all open sides of work platforms and scaffolding 4 feet above grade. Place handrails at 42 inches with midrail, toe boards should be 4 inches high, supports must be at intervals greater than or equal to 8 feet. Hand rail should extend around the entire platform/scaffold. Mesh should be placed between and affixed to the midrail and toe board to prevent falling objects from striking individuals working below. • Use personal protective equipment (PPE) when handrails cannot be used. PPE must meet the following requirements: <ol style="list-style-type: none"> 1. Lifeline system anchorage point (tie off or securing point) will be able to support a shock load of 5,000 pounds. 2. Lifelines will be of ¾ inch manila or equivalent and will have a minimum shock load of 5,000 pounds. One life line will be provided for each worker. 3. Safety lanyard will possess a shock absorber and meet the requirements of ANSI Z359.1. Lanyards will be able to withstand a shock load of 5,000 pounds. 4. D-rings, double locking snap hooks and carabineers and metal links will be able to bear a shock load of 5,000 pounds. 5. All hardware shall be drop forged or pressed steel. 6. System will include a full body harness for connection and tie-off with 6 feet safety lanyard. 7. All system components will be inspected prior to and after use. Lifeline system components which show signs of stress or damage, or which have been used to break a free fall will be removed from service and destroyed. • Observe requirements in OMH EHS Policies and Procedures: Walking/Working Surfaces – Scaffolding and Aerial Lifts. • Observe requirements in OMH General Guidance: Fall Protection.

Physical Hazard	Exposure Control Procedures
Scaffolds	<ul style="list-style-type: none"> • Implement OSHA’s Scaffold Safety Standard during scaffold erection, use, and dismantling. • Ensure scaffold design by a qualified person. • Conduct daily inspection of scaffolds by a competent person before work commences. • Implement Fall Protection: <ul style="list-style-type: none"> – Utilizing personal fall arrest systems. – Installing guardrails, mid-rails, and top rails on open sides of scaffolds. – Using personal protective equipment (PPE) like hardhats and anti-slip boots. – Avoiding work on snow-covered or iced scaffolds during winter weather conditions. • Implement protection Against Falling Objects <ul style="list-style-type: none"> – Employing PPE such as hardhats. – Installing toe-boards or screens to prevent materials from sliding off platforms. – Maintaining guardrail systems with small openings to prevent object slipping. – Employing debris nets, catch platforms, or canopies to stop falling objects. – Keeping hand tools and objects away from scaffold edges. • Comprehensive worker training is crucial for scaffold safety. Workers should be well-versed in scaffold types, requirements, safe access, fall protection, and hazard mitigation. OSHA’s Scaffolding Safety course follows the relevant regulations and provides necessary training to ensure worker safety. • Observe requirements in OMH EHS Policies and Procedures.

Physical Hazard	Exposure Control Procedures
Using Ladders	<p>PORTABLE LADDERS</p> <ul style="list-style-type: none"> • Portable ladders must be inspected prior to use. Inspection should include observations for: <ol style="list-style-type: none"> 1. Tight, secure rungs and steps that are free from defects. 2. Secure hardware, fittings, and rivets. 3. Lubricated metal bearings of locks, wheels, and pulleys. 4. Adequate rope (if necessary) in good condition. • Defective ladders should be tagged and taken out of service. • Portable ladders should be placed such that: <ol style="list-style-type: none"> 1. Bottom located on flat firm surface. 2. Secured through one of two means: a) individual holding bottom, b) top tied off/bottom safety feet. 3. Vertical to Horizontal ratio is 4:1. 4. Ladders are to extend 36 inches above the landing. 5. Metal ladders are not used near electrical conductors. 6. Ladders are not to be placed in front of, or immediately adjacent to, an operating door (block pen, post guard or lock closed) 7. Workers are not to lean over the ladder rails. Portable ladders must meet ANSI A-14.1 and 14.2, and OSHA 29 CFR 1910.25 and 1910.26 requirements: <ol style="list-style-type: none"> a. 12 inches between rails and rung b. Metal ladders-corrosion treatment c. Metal ladders-slip resistant treatment on rungs d. Single section less than 30 feet, 2-section less than 48 feet, 3+ section less than 60 feet. e. Overlap requirements: 36 inches for up to 36 feet, 48 inches for 36-48 feet, and 60 inches for 48-60 feet. <p>FIXED LADDERS</p> <ul style="list-style-type: none"> • Fixed ladders must be inspected prior to use: <ol style="list-style-type: none"> 1. Secure, corrosion-free handrails and rungs 2. Adequate clearance on both non-climbing (7 inches behind) and climbing (30-36 inches) side of the ladder. 3. Adequate extension of hand rails above the landing surface (40 inches) 4. Cages or other fall protection if more than 20 feet in height • Fixed ladders which do not meet OSHA 29 CFR 1910.27 requirements upon inspection shall not be used. A substitute ladder or lift device will be used to access elevated surface. • Observe requirements in OMH EHS Policies and Procedures: Crane and Hoist Safety.

Physical Hazard	Exposure Control Procedures
Housekeeping	<ul style="list-style-type: none"> • Provide adequate storage space for site equipment and supplies. • Assign time and responsibilities for daily clean-up prior to departure from the site. • Ensure lunch areas are maintained free of empty bottle, containers and paper. Provide trash receptacles with enclosed tops/covers in the designated lunch area and throughout the site as necessary. • Do not accumulate flammable or combustible liquids on floors, walls, etc. Spill must be cleaned immediately. • Provide adequate lighting in and around all work areas, passageways, stairs and ladders. Keep all such areas clear of debris, supplies, and any other objects. • Mark and/or secure any object (extension cord) which must traverse a passageway. • Ensure that supplies are stored in neat stockpiles and that access aisles are created and kept clear of stored objects. • Remove combustible materials routinely, do not allow accumulation in areas where flammable and combustible liquids are stored, handled or processed. • Paint chips and other work debris will not be disposed in common trash.
Vehicular Travel	<ul style="list-style-type: none"> • All drivers must be appropriately licensed when operating a vehicle. • All traffic rules and regulations, and all traffic control signs and devices should be followed. • Drivers of rental or unfamiliar vehicles should become familiar with all controls before operating the vehicle. • Drivers should operate vehicles defensively, exercise special care when operating on unfamiliar roads or during inclement weather, and should yield to pedestrians. • Trucks are to be backed under the direction of a signal person when operator cannot view rear area clearly. • Seat belts should be provided and used by each individual in the vehicle. • Personnel must not ride on outside or back of vehicles. • Materials should be loaded within limits of vehicle weight capacity, should be secured, and should not protrude from rear of truck. • Maintain road flares, fire extinguishers, first aid kits, and other safety equipment where necessary.

6.3 Biological Hazards

The following biological hazards are anticipated for this project:

Poison Plant: X

Blood Borne Pathogen: X

Mold and Bacteria: X

Insect Bites: X

Wasps and Stingers: X

Animal Bites: X

Guano: X

The following table provides a summary of biological hazards that could potentially be encountered by personnel during the implementation of the field tasks.

Biological Hazard	Exposure Control Procedures
Poison Plant	<ul style="list-style-type: none"> • Giant Hogweed: Avoid direct contact, wear long sleeve/pants. • Poison Ivy: Avoid direct contact, wear long sleeve/pants. If contacted, wash affected area immediately with cold water.
Insect Bites	<ul style="list-style-type: none"> • Insects: Be aware of insect born disease outbreaks in the facility. Use insect repellent and wear long sleeves/pants. • Ticks: same as those for insects, tuck pant leg into socks and boots, conduct tick checks during breaks and at end of shift, wear light colored clothing, remove and save tick immediately. • Fire ants: same as those for insects, tuck pant leg into socks and boots. Avoid fire ants. Severe reactions to fire ant bites (chest pain, nausea, sweating, loss of breath, serious swelling and/or slurred speech) require immediate medical treatment.
Bloodborne Pathogen	<ul style="list-style-type: none"> • Avoid direct contact with blood or potentially affected materials. • Contact HSO for the use of appropriate PPE. • Dispose potentially infectious waste in accordance with applicable medical waste regulation. • Observe requirements in OMH EHS Policy and Procedures: Bloodborne Pathogens.
Mold and Bacteria	<ul style="list-style-type: none"> • Avoid direct contact with visible mold or bacteria or generating dust wherever possible. • Wet all contaminated materials before disturbing them. • Handle or remove contaminated materials in a way that minimizes dust or debris. • No eating, drinking, or smoking should take place in contaminated areas. • Wash up thoroughly after work with soap and water. • Contact HSO for the use of appropriate PPE.
Bees, Wasps and Hornets	<ul style="list-style-type: none"> • Avoid insect nest areas and habitats inside and outside work areas. • Report bites/stings and obtain medical treatment.
Guano	<ul style="list-style-type: none"> • Avoid areas and habitats inside and outside work areas that are contaminated with bat or bird droppings. • Employ work practices and dust control measures that eliminate or reduce dust generation during the removal and disposal of the bat or bird manure. • Contact HSO for the use of appropriate PPE.

Biological Hazard	Exposure Control Procedures
Animal Bites	<ul style="list-style-type: none"> • Rodents and Wild or Stray Animals <ul style="list-style-type: none"> ○ Avoid contact with wild or stray animals. ○ Avoid contact with rats or rat-contaminated buildings. If you can't avoid contact, wear protective gloves and wash your hands regularly. ○ If bitten/scratched, get medical attention immediately. • Snakes <ul style="list-style-type: none"> ○ Watch where you place your hands and feet when removing debris. If possible, don't place your fingers under debris you are moving. Wear heavy gloves. ○ If you see a snake, step back and allow it to proceed. ○ Wear boots at least 10 inches high. ○ Watch for snakes sunning on fallen trees, limbs or other debris. ○ A snake's striking distance is about 1/2 the total length of the snake. ○ If bitten, note the color and shape of the snake's head to help with treatment. ○ Keep bite victims still and calm to slow the spread of venom in case the snake is poisonous. Seek medical attention as soon as possible. ○ Do not cut the wound or attempt to suck out the venom. Apply first aid: lay the person down so that the bite is below the level of the heart, and cover the bite with a clean, dry dressing.

6.4 Environmental Hazards

The following environmental hazards are anticipated for this project:

Noise: X Cold: X Heat: X
Near Water: _ Rain: X Snow: X
Other: ___

The following tables provide a summary of environmental hazards that could potentially be encountered by personnel during the implementation of the field tasks.

Environmental Hazard	Exposure Control Procedures
Noise	<ul style="list-style-type: none"> • Hearing protection will be worn when working around heavy equipment and appropriate powered hand tools. • Hearing protection must be able to attenuate noise below 85 dBA (8 hour TWA). • Non-mandatory personnel will maintain clearance from excessive noise generating equipment. • Personnel will use the following rule of thumb to determine the need for hearing protection under other circumstances i.e. worn when normal conversation is not audible at a distance of 2 feet. • Observe requirements in OMH EHS Policies and Procedures: Hearing Conservation.
Cold	<ul style="list-style-type: none"> • Prevention protocol will be instituted at air temperature below 40°F. • Clothing should include: loose layers, masks, woolen scarves, and hats in extreme cold weather. Clothing should be kept dry by wearing water and wind resistant layers and footwear. • Rest breaks should be taken in a warm, sheltered area (van, trailer, etc.). The outer layer of clothing should be removed, and remaining clothing should be loosened. • Where appropriate, wind breaks will be designed and constructed at individual work locations. • Non-caffeinated warm liquids (water, juice, decaffeinated teas) will be maintained on-site throughout the work shift. Dehydration may increase the susceptibility of employees to cold injury due to the change in blood flow to the extremities. • Signs of frost bite and hypothermia will be reviewed (attached). Employees will monitor each other for observance of these signs.
Snow	<ul style="list-style-type: none"> • To prevent slips, trips, and falls on snow and ice, employers should clear snow and ice from walking surfaces, and spread deicer, as quickly as possible after a winter storm. When walking on snow or ice is unavoidable workers should be trained to: • Clothing should include: loose layers, masks, woolen scarves, and hats in extreme cold weather. Clothing should be kept dry by wearing water and wind resistant layers and footwear. • Wear footwear that has good traction and insulation (e.g. insulated and water resistant boots or rubber over-shoes with good rubber treads) • Take short steps and walk at a slower pace to react quickly to changes in traction • Ensure equipment are used safely (e.g. clearing snow and ice from surfaces) • Use extreme caution when working near power lines • Prevent harmful exposure to cold temperatures and physical exertion

Environmental Hazard	Exposure Control Procedures
Heat	<ul style="list-style-type: none"> • Prevention protocol and biological monitoring will be instituted at temperatures exceeding 70°F. • Physiological monitoring will be conducted. • Work/Rest cycles will be instituted based on physiological monitoring results. • Personnel should consume 16 ounces of water prior to beginning work and at intervals (breaks and lunches) throughout the day. • Non-caffeinated liquids (water, electrolyte drinks, juice kept at 50°-60°F) will be maintained on site throughout the work shift. • Signs of heat exhaustion and stroke will be reviewed (attached). Employees will monitor each other for observance of these signs.
Rain	<ul style="list-style-type: none"> • May increase risk of hypothermia, see hazard preventions listed in the “Cold” Section of this table. • Rain repellant outer gear should be worn by employees. An additional change of clothing should be maintained for removal and replacement of wet clothing. • Rest breaks shall be taken in a warm, sheltered area (van, trailer, nearby commercial space). • Work areas where water may accumulate and create additional slip/trip/fall hazards should be provided with drainage or barriers. • Employees should maintain and increase awareness of their physical surrounding, particularly when working outside around heavy equipment.

TEMPERATURE EXTREMES: SIGNS OF EXCESSIVE EXPOSURE

Temperature Extremes	Sign/Symptom of Excessive Exposure
Heat Exhaustion	<p>State of weakness or exhaustion caused by the loss of fluids from the body: Pale, clammy, moist skin; profuse perspiration and extreme weakness; body temperature may be normal; weak/rapid pulse; shallow breath.</p> <p>Treatment: Remove individual to cool, air-conditioned, or temperature controlled area; loosen clothing; place in head-low position; provide rest. Have patient drink 1-2 cups of water immediately, and every 20 minutes until symptoms subside.</p>

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Heat Stroke	<p>Acute, dangerous reaction to heat stress caused by failure of body's heat regulating mechanisms resulting in a rapid rise in body temperature, brain damage, and death: red, hot, dry skin; confusion; extremely high body temperature; rapid respiratory and pulse rate; unconsciousness or coma.</p> <p>Treatment: Remove from heat source and cool victim rapidly by placing cool wet towels on the extremities and forehead. Contact emergency medical services and transport to the hospital immediately.</p>
Heat Cramps	<p>Acute painful spasms of voluntary muscles caused by inadequate electrolyte intake: muscle spasms, most notably the abdomen and extremities.</p> <p>Treatment: Remove victim to cool area and loosen clothing. Provide salted liquids.</p>
Cold-Frostbite	<p>Local freezing of tissue resulting when heat loss from an extremity is faster than heat replacement by the circulating blood. Frost bite occurs in stages; incipient (sudden blanching or whitening of skin); superficial (waxy or white skin which is firm to the touch, underlying tissue is resilient); and deep (cold, pale or darkened skin which is solid).</p> <p>Treatment: Move individual to warm environment, warm affected area by placing next to warm skin (avoid fires, hot water, external heaters) provide warm non-caffeinated drinks. After re-warming affected area evaluate, bandage (if necessary) and do not allow blisters to be broken. Do not rub frostbitten area, obtain medical care as necessary.</p>
Cold-Hypothermia	<p>Occurs when a heat loss in excess of heat gain results in a core body temperature drop. Most cases develop in air temperatures between 30°-50°F when compounded with water immersion or soaking and windy conditions. Symptoms include: uncontrolled fits of shivering; vague, slow, slurred speech; irrational actions; memory lapses; incoherence; fumbling hands, frequent stumbling, lurching gait; apathy, listlessness, and sleepiness; glassy stare; slow pulse and respiration.</p> <p>Treatment: Move individual to warm environment, remove any wet clothing, provide additional heat sources (warm blanket, bath, body contact); provide warm non-caffeinated fluids, candy and sweetened food, obtain medical assistance.</p>

7.0 CONFINED SPACE ENTRY PLAN

7.1 General

OSHA published its Final Rule on Permit Required Confined Spaces (PRCSs) for General Industry at 29 CFR 1910.146 et seq., on January 14, 1993, with an effective compliance date of April 15, 1993. The Final Rule defines confined space as a space that:

- Is large enough and so configured that an employee can bodily enter it and perform assigned work;
- Has limited or restricted areas for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits may have limited entry); and
- Is not designed for continuous employee occupancy.

OSHA further requires that an "Entry Supervisor is to decide whether the space is permit required or non-permit required space at the time of entry."

A PRCS is defined as a confined space that has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere;
- Contains a material that has the potential to engulf the entrant;
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly covering walls or by a floor which slopes downward tapers to a smaller cross section; or
- Contains any other recognized serious or health hazard. OSHA defined a hazardous atmosphere as:
 - Flammable gas, vapor, or mist in excess of 10 percent of its LEL;
 - **NOTE:** This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 meter) or less.
 - Airborne combustible dust at a concentration that meets or exceeds its LEL;
 - Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
 - Atmospheric concentration of any substance for which a dose or permissible exposure limit is published in 29 CFR 1910 Subpart G, Occupational Health Environmental Control, or in Subpart Z, Toxic and Hazardous Substances (Appendix B), of 29 CFR 1910 and which could result in employee exposure in excess of its dose or permissible exposure limit; or
 - Any other atmospheric condition that is immediately dangerous to life or health (IDLH).

Select field personnel may be required to enter PRCSs, such as manholes and steam tunnels, as part of their duties in carrying out this project. All personnel involve with confined space entry will follow the requirements in the OMH EHS Policies and Procedures: Confined Space Entry Program. TRC may utilize rescue equipment (i.e. tripod) provided by OMH due to logistical concern regarding multiple equipment in one confined location. TRC will provide a competent person to inspect OMH equipment prior to TRC use. The HSO will be consulted to determine the necessity for entering a confined space. Rescue procedures and operations associated within a confined space entry will be performed by TRC personnel utilizing appropriate confined space retrieval mechanisms. If the PRCS does not require/allow a retrieval line, TRC's policy is to notify the Fire Department of the intent to enter a confined space and contact them in

the event of an emergency. In addition, a telephone call will be placed to 911 for assistance, if deemed necessary by the HSO.

As stated previously, the approach to the RWP includes preparation of this HASP, followed by performing an initial reconnaissance. Based on the results of the initial reconnaissance and Phase 1, TRC shall develop site specific HASP addenda that address the specific confined space hazards identified initial reconnaissance that are anticipated to be encountered during the subsequent Hazardous Materials Assessment.

All management and field personnel conducting sampling activities have experience in the implementation of field sampling programs.

7.2 Description Of Permit-Required Confined Space

Physical entry into any existing space over 5 feet deep is considered PRCS entry work.

7.3 Confined Space Protocol

Field personnel may enter a PRCS during their normal work activities. This section outlines site-specific protocol, which will be followed in relation to PRCS entry.

7.3.1 General Protocol

Only specific, qualified field personnel will be allowed to enter a PRCS. These persons will be trained in accordance with 29 CFR 1910.146 (g) prior to any PRCS entry and will receive site-specific briefing on the project PRCS.

The only hazard expected to be associated with the PRCS described in this HASP is a potentially hazardous atmosphere (e.g., oxygen deficiency), which will be checked using a multigas personal protection meter prior to entry. Atmospheric monitoring and training of entry personnel are required in all cases.

The following general protocol will be followed during all PRCS entries. A PRCS will only be opened during the scheduled work period. At all other times, a PRCS will be secured from unauthorized entry.

Prior to any PRCS entry, the space will be monitored using appropriate instrumentation to measure hazardous atmospheres. Trained field personnel will be responsible for utilizing and maintaining air monitoring equipment. Once the PRCS has been monitored and it is determined that the atmosphere is not hazardous, a written certification will be made by the individual who monitored the space on the Confined Space Entry Permit (Appendix C). During entry, the space will be periodically monitored every 15 minutes for all the parameters indicated on the entry permit by an attendant outside of the PRCS and the monitoring results will be recorded on the pre-entry/entry checklist.

If a hazardous atmosphere forms at any point, the space will be evacuated immediately and TRC will notify the OMH. A Notification of Immediate Health Risk, as shown in Appendix D, will be generated by the Field Team Task Leader and submitted to the TRC Project Manager within 24 hours for further evaluation. If TRC Project Director agrees with the assessment, the form will be completed and submitted to the OMH Manager within 24 hours. TRC will not enter the confined space until the hazardous atmosphere is abated.

7.3.2 Air Monitoring Instrumentation Operation and Maintenance

TRC will be responsible for the operation and maintenance of the multigas personal protection meter used for all PRCS work. All instrumentation utilized for evaluating environmental conditions related to PRCS work shall be intrinsically safe. The instrument will be calibrated twice a day, prior to morning start up and prior to start up after lunchtime break. Calibration efforts will be recorded in a bound instrument calibration log book, which will remain with the instrument case. The instrument will be battery operated/or rechargeable. If the instrument is rechargeable, a back-up instrument will be available. If the instrument is non-operational, the work will be shut down. The field team task leader will have on-site necessary back-up supplies to ensure an operational multigas personal protection meter. The HSO, or an appropriately trained designee, will confirm the hazardous levels of activity.

7.3.3 Air Monitoring Protocol

A specific regimen of hazardous atmospheres must be monitored prior to entering the PRCS. The hazards associated with entering PRCS are the result of potential lack of oxygen, the presence of combustible gases, the presence of carbon monoxide, and/or the presence of hydrogen sulfide. These spaces will be monitored using a multigas personal protection meter prior to and during all entries. The meter will be operated, available, and maintained by the trained field personnel. Initial measurements of the confined space's atmosphere prior to entry will be recorded and then every 15 minutes until he/she determines the atmosphere is stable and the monitoring frequency can be reduced. All readings and reports that are conducted will be reviewed by HSO, or an appropriately trained designee, prior to, and during, any confined space entry. The following action levels will apply.

1. **Percent oxygen greater than 19.5 and less than 23.5** - Entry may occur.
 Percent oxygen less than 19.5 or greater than 23.5 - Space must be evacuated.

2. **Percent combustible gas less than 5 percent LEL** - Entry may occur.
 Percent combustible gas between 5 and 10 percent LEL - Proceed with caution, determine the source of combustible gas, and mitigate.
 Percent combustible gas greater than 10 percent LEL - Space must be evacuated.

3. **Reading of 0 ppm to 5 ppm hydrogen sulfide** – Entry may occur.
 Reading of 5 to 10 ppm hydrogen sulfide - Proceed with caution, determine the source of the hydrogen sulfide, and mitigate.
 Reading over 10 ppm hydrogen sulfide - Space must be evacuated.

4. **Reading of 0 ppm to 20 ppm carbon monoxide** - Entry may occur.
 Reading of 20 to 35 ppm carbon monoxide - Proceed with caution, determine the source of carbon monoxide gas, and mitigate.
 Reading of over 35 ppm carbon monoxide - Space must be evacuated.

8.0 RESPIRATORY PROTECTION

In any work areas where respirators are necessary to help protect the health of the TRC monitoring personnel, TRC will implement a written respiratory protection program with site-specific procedures, following the provisions of OSHA 29 CFR 1910.134. In addition, TRC will also observe OMH EHS Policies and Procedures for Respiratory Protection.

The overall implementation of this program is the responsibility of the TRC HSO. TRC will provide its field personnel with all necessary respiratory protective equipment whenever such equipment is required for the protection of the personnel. TRC will provide, repair, or replace respiratory protective equipment, as necessary, due to wear and deterioration.

8.1 Air Purifying Respirator

All air purifying respirators (APRs) and their parts utilized by TRC personnel will be approved by the National Institute of Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA). Proper selection of respirators will be made in accordance with the guidance of the ANSI/ASSE Z88.2-2015.

8.2 Fit Testing Procedures

Before using any APR, TRC personnel must first successfully pass a qualitative fit test to ensure the selection of the proper make, model, and size respirator. From then on, the personnel will undergo the fit test procedure at least annually to ensure a continued proper fit. The entire qualitative fit test procedure consists of the initial size selection, negative pressure test, positive pressure test, and irritant smoke test. Upon successful completion of the fit test procedure, the test instructor will fill out a “Respirator Fit Test Record”, which will be maintained in the TRC personnel’s health and safety file.

8.2.1 Initial Size Selection

Various sizes and types of APRs will be made available to the TRC personnel for initial size selection. A competent person will assist in choosing the proper size. TRC personnel will be properly instructed on how to don the respirator including how to put it on, set the strap tension, and determine a comfortable fit. Particular attention will be paid to the seal across the forehead and beneath the chin. If the fit seems faulty to the TRC personnel or the observer, another size, make, or model respirator will be tried. When a comfortable fit has been achieved, initial size selection will be considered complete.

8.2.2 Positive and Negative Pressure Tests

Following the initial size selection, a positive and negative pressure test will be conducted. TRC personnel will perform the positive and negative test each time they don their respirators.

Positive Pressure Test

With face piece on and the exhalation valve closed by covering it with his hand, the TRC personnel exhales gently into the face piece. The fit is considered satisfactory if a slight positive pressure can be maintained inside the face piece and there is no evidence of outward leakage.

Negative Pressure Test

This test can be performed on any respirator with an intake that can be covered with the palm of the hand. The TRC employee dons the face piece and covers the intakes with his/her hands. He/she inhales so that the face piece collapses slightly and holds his/her breath for 10 seconds. The face seal is considered satisfactory if the face piece remains slightly collapsed and no inward leakage of air is noted.

Various sizes and types of APRs will be made available to the TRC personnel for initial size selection. A competent person will assist in choosing the proper size. TRC personnel will be properly instructed on how to don the respirator including how to put it on, set the strap tension, and determine a comfortable fit. Particular attention will be paid to the seal across the forehead and beneath the chin. If the fit seems faulty to the TRC personnel or the observer, another size, make, or model respirator will be tried. When a comfortable fit has been achieved, initial size selection will be considered complete.

8.2.3 Irritant Smoke Test

Upon completion of the positive and negative pressure tests, an irritant smoke test will be performed. For this protocol, the APR will be equipped with high efficiency particulate air (HEPA) filters. Irritant smoke is injected around the facepiece to test the seal and fit of the respirator while the personnel are asked to perform the following exercises:

- Practice normal breathing for 30 seconds by taking deep, regular breaths.
- Turn the head from side to side, making sure the chin line is parallel with the shoulders. Take a deep breath each time the head is turned to either side. Be sure not to bump the respirator.
- Move the head up and down but be sure not to bump the chest. Take a deep breath while the head is in the full upright position.
- Read aloud the entire “Rainbow Passage” test as defined in 29 CFR 1910.1001 Appendix C.

The respirator fit will be considered unacceptable if the personnel coughs or sneezes at any time during the test. If a satisfactory fit cannot be obtained, another APR will be selected and the entire fit testing protocol repeated.

8.3 Cleaning

Respirators will be cleaned and disinfected as frequently as necessary to ensure proper protection is maintained. For the RWP, TRC personnel will clean and disinfect their respirators using warm solution of cleaner and water. The respirators will be air dry prior to storage.

8.4 Storage

After cleaning and drying the APR, it should be placed in a clean resealable plastic bag and stored in a designated cabinet away from heat, sunlight, cold, dust, and damaging chemicals. The respirators should be stored in a manner to prevent distortion of the face piece and should have the straps fully extended.

8.5 Inspection and Maintenance

Prior to using an APR, the personnel will inspect the unit for signs of wear and contamination. The following items will be inspected:

- Face piece will be checked for excessive dirt, cracks, tears, holes; distortion; and cracked, scratched, or loose-fitting lenses.
- Head straps will be checked for breaks, tears; loss of elasticity; and broken or malfunctioning buckles or attachments.
- Inhalation valve and exhalation valve will be checked for detergent residue, dust particles, or dirt on valve or valve seat; cracks, tears, or distortion in the valve material or valve seat; and missing or defective valve cover.
- Filter elements will be checked for proper filter for the hazard, approval designation, missing or worn gaskets.

8.6 Cartridge Selection and Replacement

For the RWP, TRC personnel will use only cartridges that are approved by NIOSH/MSHA and will effectively filter asbestos fibers with the respirators. Cartridges will be replaced with new ones on a daily basis.

9.0 LEVEL OF PROTECTION

Levels of protection to be utilized by on-site personnel will be continually evaluated by the HSO. The levels of protection may be downgraded or upgraded, as necessary, with approval by the HSO. Any change in the level of protection must be documented on the HASP Amendment Form.

For the initial mobilization and monitoring activities outside of containment, the level of protection to be used is anticipated to be Levels D. For the purposes of this plan, **PPE is required in all work areas**. TRC field personnel will utilize Level C for all monitoring activities inside containment.

The following table details the levels of protection and PPE for Level C and D.

<i>Level of Protection</i>	Required PPE	PPE as Needed
Level C	<ul style="list-style-type: none">▪ North 7700 Series half-face APR, or equivalent▪ North P100 filter cartridges, or equivalent▪ Safety vest▪ Steel-toe boots▪ Hard hat▪ Safety glasses/goggles (Vessels/Construction Sites)	<ul style="list-style-type: none">▪ Hearing protection▪ Safety glasses/goggles▪ Nitrile gloves▪ Neoprene, Butyl, or Viton gloves (> 8 hour Breakthrough for PCBs)▪ Work gloves
Level D	<ul style="list-style-type: none">▪ Safety vest▪ Steel-toe boots▪ Hard hat▪ Safety glasses/goggles (Vessels/Construction Sites)	<ul style="list-style-type: none">▪ Hearing protection▪ Safety glasses/goggles▪ Nitrile gloves▪ Neoprene, Butyl, or Viton gloves (> 8 hour Breakthrough for PCBs)▪ Work gloves

TRC shall provide basic PPE to each employee exposed to a hazard at no cost to the employee. A selection of PPE shall be maintained in the TRC Project Offices.

Employees shall periodically inspect personally assigned PPE for serviceability and defects. PPE shall be cared for and stored in a manner that will maintain it in good condition.

All PPE shall be of a safe design and construction for the work to be performed. When employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance and sanitation of such equipment.

PPE devices alone shall not be relied on to provide protection against hazards, but should be used in conjunction with guards, administrative and engineering controls, and sound manufacturing practices.

Defective or damaged PPE shall not be used at any time.

All personal protective equipment used during the course of this project must meet the following OSHA standards:

<u>Type of Protection</u>	<u>Regulation</u>	<u>Source</u>
Eye and Face	29 CFR 1910.133	ANSI/ISEA Z87.1-2015
Respiratory	29 CFR 1910.134	ANSI/ASSE Z88.2-2015
Head	29 CFR 1910.135	ANSI/ISEA Z89.1-2014
Foot	29 CFR 1910.136	ASTM F 2412 and F 2413
Hand	29 CFR 1910.138	
Hearing	29 CFR 1910.95	
Protective Clothing	29 CFR 1910.132	

ANSI = American National Standards Institute
ASSE = American Society of Safety Engineers
ASTM = ASTM International
ISEA = International Safety Equipment Association

10.0 AIR MONITORING

Air monitoring will be conducted during the implementation of the RWP, or in any confined space within the facility, in order to characterize personnel exposures to certain potential site contaminants. The target compounds selected for air monitoring purposes within confined spaces includes oxygen, carbon monoxide, hydrogen sulfide, and LEL. Results of air monitoring will be used to protect on-site personnel from exposure to unacceptable levels of potential site contaminants. Descriptions of air monitoring strategies, procedures and equipment are provided below. Modification of this HASP, including additional monitoring, may be considered as judged necessary by the HSO in conjunction with the Project Manager.

Work area air monitoring will include direct reading methods following the frequency as required in the approved RWP. Monitoring equipment will be calibrated as per manufacturer's recommendation prior to starting work activities. A summary of air monitoring information to be conducted during the initial reconnaissance at the facility is provided in the table below. Procedures for air monitoring to be conducted during confined space entry are provided in Section 7.0 – Confined Space Entry Plan.

Monitoring Device	Monitoring Location	Monitoring Frequency	Action Level	Action
Multi-gas personal protection monitor	Stagnant areas, sumps, lower building areas, tunnels	2 readings <u>Staffed structure:</u> 1 from an occupied area and 1 from unoccupied area <u>Unstaffed structure:</u> 2 from two different unoccupied areas.	CO readings less than 35 ppm	Level D for field inspection
			CO readings more than 35 ppm	Stop work and notify HSO.
			H ₂ S readings less than 5 PPM	Level D for field inspection
			H ₂ S readings more than 10 PPM	Stop work and notify HSO
			LEL readings less than 5 %	Level D for field inspection
			LEL readings more than 10 %	Stop work and notify HSO
			O ₂ readings greater than 19.5% or less than 23.5%	Level D for field inspection
			O ₂ readings less than 19.5% or greater than 23.5%	Stop work and notify HSO

Notes:

ppm parts per million

mg/m³ milligram per cubic meter

10.1 Personal Exposure Monitoring

Personal exposure monitoring may be performed for TRC employees if the potential for exposure to a contaminant above a trigger level is possible. A trigger level is described as 50 percent of the Permissible Exposure Limit (PEL) or Threshold Limit Value (TLV), whichever is the most conservative. PELs and TLVs for contaminants of concern are presented in Table 5-1.

Exposure monitoring strategies for dust, fumes, noise, or organic vapors will be based on the current activities, type of work being performed, environmental conditions, and the hazards present. Personal exposure monitoring will be conducted in accordance with all applicable regulations and standards.

Personal exposure monitoring for asbestos is anticipated to be performed during this project.

11.0 PERSONNEL AND EQUIPMENT DECONTAMINATION

11.1 Personnel Decontamination

Decontamination procedures minimize the potential spread of contaminants that workers may have contacted in the work areas to themselves and clean areas of the Site. This sequence describes the general decontamination procedures for Level C and D. The HSO will ensure that the decontamination procedures are adequate.

Level D Decontamination

1. Remove inner gloves and discard
2. Wash face and hands

Level C Decontamination

1. Remove gloves and deposit in waste container.
2. Remove boot covers and deposit in waste container.
3. Remove disposable coveralls and deposit in waste container.
4. Remove respirator.
5. Shower.
6. Put on clean street clothes.
7. Clean respirator in accordance with Section 8.0 – Respiratory Protection.

11.1.1 Suspected Contamination

Any employee suspected of sustaining skin contact with chemical materials will first use the emergency shower. Following a thorough drenching, the worker will proceed to the contamination reduction zone outside the work area. The worker will remove clothing and don clean clothing. Medical attention will be provided as determined by the HSO based on degree of injury.

11.1.2 Personal Hygiene

Personnel will wash hands, arms, neck and face, following decontamination and before any eating, smoking, or drinking.

11.2 Heavy Equipment and Vehicle Decontamination

No heavy equipment or vehicles are expected to be in contact with on-site contaminants. Therefore, procedures for heavy equipment decontamination are not required.

11.3 Waste Disposal

All waste generated from personnel and equipment decontamination will be treated as contaminated waste unless determined otherwise by accepted testing methods. Wastes will be disposed of in accordance with the federal, state and local regulations and OMH policy, as appropriate.

12.0 WORK PRACTICES AND ENGINEERING CONTROLS

The following work practices will be performed during the implementation of the RWP within the facility:

1. Before beginning work, the following items will be inspected for compliance with the OSHA Standards:
 - Fire extinguishers located in each mobile office trailer and in each field vehicle will be inspected and tagged within the past year.
 - Fire extinguishers will be appropriate for the type of fire.
2. The following PPE will be inspected, if used, prior to use:
 - Gloves will be inspected prior to use.
 - Gloves will be chosen with assistance from the HSO according to the chemical hazards present.
 - Neoprene, Butyl, or Viton gloves (> 8 hour Breakthrough for PCBs) shall be always used when handling PCB samples.
3. Respiratory Equipment:
 - Respiratory equipment will be inspected in accordance with Section 8.0, Respiratory Protection of this HASP.
 - Selection of respiratory protection will be reviewed with the TRC HSO prior to commencing monitoring activities.
4. Required Miscellaneous PPE:
 - Hearing Protection: Hearing protection will be worn by all personnel working in areas with where allowable noise limits, 90 dBA, are exceeded.
 - Safety Boots: Steel-toe safety boots will be worn by all personnel during the project.
 - Eye Protection: Eye protection will be worn by personnel who may be exposed to flying debris, chemical vapors or particulates. Safety glasses will be worn for protection against flying objects. All safety glasses, goggles, and face shields shall comply with ANSI Z87.1-2015.
 - Hard Hats: Appropriately rated hard hats will be worn by personnel working with or near heavy equipment for protection against overhead hazards, including electrical hazards and overhead objects. All hardhats must meet ANSI Z89-1986.
5. To avoid falling objects:
 - Be aware of falling objects in the work area.
 - Secure overhead objects.
6. When using hand tools:
 - Hand tools will meet the manufacturer's safety standards.
 - Hand tools will not be altered in any way.
 - Makeshift tools will not be used.
 - At a minimum, eye protection must be worn when working with hand tools.
 - Wrenches, including adjustable, pipe, end, and socket wrenches, will not be used when jaws are sprung to the point that slippage occurs.
 - Impact tools, such as drift pins, wedges, and chisels, will be kept free of mushroom heads.
 - Wooden handles will be free of splinters or cracks and secured tightly to the tool.
7. Housekeeping:
 - The work area will be kept neat and orderly.

- Walking surfaces will be kept free of debris or loose objects.
 - Aisles, doorways and walkways will be kept clear at all times.
 - Clean, store, and maintain tools and machinery.
 - Use portable light sources when working within buildings.
 - Paint chips and other work debris will not be disposed in common trash.
8. Use of Power Tools:
- All power tools will be inspected regularly and used in accordance with the manufacturer's instructions and its capabilities.
 - Electrical tools will not be used in areas where flammable solids, gases, vapors or liquids are present, unless they are approved for that purpose.
 - Portable electric tools will be used only with a GFCI.
 - Proper eye and hearing protection will be used when working with power tools.
 - Personnel will be trained in the proper use of the specific tool.
 - Any defective power tools will be immediately tagged and removed from service.
 - Tools will be stored properly after use.
 - Power tools cannot be used in certain NFPA class zones. In addition, only intrinsically safe equipment can be used in NFPA class zones.
9. Slips, Trips, and Falls:
- Proper lighting will be maintained at all times.
 - Walkways will remain clear and unobstructed at all times.
 - When possible, cords, hose lines, etc., will be raised to reduce or eliminate trip hazards.
 - Use appropriate climbing equipment.
10. Ground Fault Circuit Interrupters (GFCI) and Electrical Cords:
- GFCIs will be used on all 120 volt, single phase, 15 and 20 ampere receptacle outlets when electrical equipment is used on-site.
 - Electrical cords will be inspected for cracks, tears, or general wear to the outer protective casing. If the wiring of the cord is exposed, the cord will be repaired, if possible, or discarded.
 - All extension cords will contain a grounding prong. If the grounding prong is missing or if the cord was designed to contain only two prongs, the cord will not be allowed for use. These cords are dangerous and cannot be grounded through the use of a GFCI.
11. Personal Hygiene
- Eating, drinking, smoking, chewing gum or tobacco, and other practices that increase the probability of hand-to-mouth transfer and ingestion of material is prohibited in any work area.
 - Hands and face will be thoroughly washed upon leaving the work area and before eating, drinking, urinating, or other activities.
 - Certain medicines can increase the effects of exposure to toxic chemicals. Therefore, site workers utilizing medicines will notify the HSO who will either clear them for work or refer them to a physician for clearing.
 - Beards or other facial hair that interferes with respirator fit will preclude admission to the work area. Contact lenses will not be worn in the work area or if the worker may be expected to enter the work area under routine or emergency situations.
 - Personnel who take over-the-counter drugs within a day before work on a site must consult their physician regarding the warnings listed on the drug's container

(the part of the label that says, for example, "Do not take this medication if you are operating a motor vehicle") to verify that they will be allowed to work without suffering any ill effects.

- Alcoholic beverages intake will be prohibited during project operations. Personnel under the influence of alcohol or recreational or illegal drugs will not be allowed on site.

13.0 KEY PERSONNEL AND EMERGENCY SERVICES

Contact information for key personnel and emergency numbers for this project are listed in the following tables.

Key Personnel

Title	Name	Work/Cell No.	Email Address
Program Director	Josh Cupriks	212.221.7822 646.484.0889 (c)	jcupriks@trccompanies.com
Project Manager	Anthony Sigona	212.221.7822 646.483.3348 (c)	asigona@trccompanies.com
HSO	Daren Bryant	949.727.9336/ 949.697.7418(c)	dbryant@trccompanies.com
Field Team Leader	Nancy Guevara	212.221.7822 347.573.3747(c)	nguevara@trccompanies.com

Local Emergency Service

Organization	Telephone Number
Ambulance	911
Fire Department	911
Police Department	911
National Response Center Desk	800.424.8802
Poison Control Center	800.222.1222
Chemtec	(800) 222-2177
NYSDEC (Spills Hotline):	518.457.7362

Nearest Hospitals to Bronx Psychiatric Center:

Nearest Hospital	Hospital Address	Hospital Phone Number
Montefiore Hospital (226 feet)	1510 Waters Pl, Bronx, NY 10461	718-829-3440
Cavalry Hospital (0.70 miles)	1740 Eastchester Rd, Bronx, NY 10461	718-518-2000
New York City Children's Center (0.4 miles)	1000 Waters Pl, Bronx, NY 10461	718-239-3639
Jack D. Weiler Hospital (0.6 miles)	1825 Eastchester Rd, Bronx, NY 10461	718-904-2000
Montefiore Weiler Hospital (Einstein Campus) (0.6)	1825 Eastchester Rd, Bronx, NY 10461	718-904-2000
NYC Health + Hospitals/Jacobi (1.2 miles)	1400 Pelham Pkwy S, Bronx, NY 10461	718-918-5000
NYC Health + Hospitals/North Central Bronx (4.8 miles)	3424 Kossuth Ave, Bronx, NY 10467	718-519-5000
St. Barnabas Hospital (3.9 miles)	4422 Third Ave, Bronx, NY 10457	718-960-9000
BronxCare Health System (4.6 miles)	1650 Grand Concourse, Bronx, NY 10457	718-590-1800
NYC Health + Hospitals/Lincoln (7.6 miles)	234 E 149th St, Bronx, NY 10451	718-579-5000

Maps and Directions from the Facility to the two closest Hospitals are presented in Appendix G.

14.0 CONTINGENCY PLAN

Site personnel must be prepared in the event of an emergency. Emergencies can include illness, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital will be carried by the field team. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment.

14.1 Emergency Equipment

The following emergency equipment will be kept at the Site during the entire duration of the project:

- Private Telephones: with the field team.
- First Aid Kits: with the field team.
- Fire Extinguisher: On-site, in the mobile office trailer and job vehicle.
- Horns: Air horns will be supplied to personnel at the discretion of the HSO.

14.2 Personal Injury in the Work Area

In the event of an injury in the facility, the victim will be removed from the area and all remaining site personnel will exit the building. The HSO should evaluate the nature of the injury, and the affected person should be decontaminated to the extent practical prior to movement from the work area. At this point, the certified first aid practitioner on site will take control. Appropriate first aid should be initiated, and an immediate request should be made for an ambulance (if necessary), and the designated nearest hospital will be notified (if necessary). No persons should re-enter the work area until the cause of injury or symptoms is determined.

14.3 Personal Injury within the Facility

In the event an injury occurs on the job, the HSO must be notified immediately and the certified first aid practitioner on-site will take control. Appropriate first aid will be administered and, if necessary, the injured individual will be sent to the nearest hospital. First aid should be administered while awaiting an ambulance or paramedic. If injury does not affect the performance of site personnel, operations may continue. **Any person transporting an injured/exposed person to a clinic or hospital for treatment should take with them directions to the hospital and information on the chemical(s) to which they may have been exposed.**

14.4 Personnel Responsibilities During Emergency

The HSO is primarily responsible for responding to and correcting emergency situations. However, during any planned, unplanned, or emergency absences of the HSO, the Project Manager will act as the HSO, such that the following responsibilities are continuously provided for:

- Take appropriate measures to protect personnel including withdrawal from the work area, total evacuation and securing of the Site, or upgrading or downgrading the level of protective clothing;
- Ensure that appropriate federal, state, and local agencies are informed, and emergency response plans are coordinated; In the event of fire or explosion, the local Fire Department should be summoned immediately. If toxic materials are released into the air, the local authorities should be informed in order to assess the need for evacuation;

- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;
- Determine the cause of the incident and make recommendations to prevent recurrence; and,
- Ensure that all required reports have been prepared.

14.5 PPE Failure

If any site worker experiences a failure or alteration of protective equipment that affects the protection factor that person and his/her buddy shall immediately leave the work area. Re-entry will not be permitted until the equipment has been repaired or replaced.

14.6 Emergency Phone Numbers and Hospital Information

Emergency phone numbers, directions and contact information for the nearest medical facility are shown in Section 13.0. This information must be carried by the field teams at the Site.

14.7 Fire or Explosion

In the event of a fire or explosion, the local Fire Department will be summoned immediately. The HSO or designated alternate will call 911 and advise the fire commander of the location, nature and identification of the hazardous materials on-site. Only if it is safe to do so, site personnel may:

- Use firefighting equipment available on site; or,
- Remove or isolate flammable or other hazardous materials that may contribute to the fire.

14.8 Evacuation Routes

TRC will use evacuation routes provided by the OMH for the facility, which will be included in each HASP addendum and periodically reviewed during the daily safety meetings. As the work areas change, the evacuation route and map will be altered accordingly, and the new route will be reviewed during the daily safety meetings.

Under extreme emergency conditions, evacuations should be conducted immediately, without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication. When evacuating the site, personnel will:

- Keep upwind of smoke, vapors, or spill location.
- Exit through the decontamination corridor if possible.
- If evacuation is not possible through the decontamination corridor, site personnel should remove contaminated clothing once they are in a safe location and leave it near the work area or in a safe place.
- HSO, or designated alternate, will conduct a head count to ensure that all personnel have been evacuated safely.
- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

14.9 Spill Control

In the event of a leak or release, field personnel will:

- Inform the HSO and Project Manager immediately, who would then notify OMH and its on-site representatives;
- Determine the nature of the materials that have spilled, identify the potential hazards;

- Locate the source of the spillage and stop the flow if it can be done safely;
- Wait for assistance from on-site OMH representatives and/or remediation contractor.

14.10 Accident/Incident Reporting

If an accident, incident, near miss, an explosion or fire, or a release of toxic materials occurs during the course of the project, the HSO will immediately record the incident. Within 24 hours of any reported accident, the Accident/Incident Report included in Appendix E will be completed and submitted to the OMH. A copy of this report will be available in the job vehicle for immediate use, if required.

APPENDICES

APPENDIX A
HEALTH AND SAFETY PLAN AMENDMENT FORM

HEALTH AND SAFETY PLAN AMENDMENT FORM

Project Name: _____ Project No.: _____

Amendment No.: _____ Date: _____

Amendment Revises: Page: _____ Section: _____

Task(s) Amendment Affects:*

*(Attach new/revised Job Safety Analyses)

Reason For Amendment:

Amendment: (Attach separate sheet(s) as necessary)

Completed by: _____

Approved by: _____

APPENDIX B
HASP REVIEW ACKNOWLEDGEMENT FORM

HEALTH AND SAFETY PLAN REVIEW ACKNOWLEDGEMENT FORM

By signing this document, I am stating that I have read and understand the health and safety plan for TRC personnel, subcontractors and visitors entering the Site.

Name	Company	Signature	Date

APPENDIX C
CONFINED SPACE PERMIT

NON-PERMIT Required Confined Space Entry Air Monitoring Log							
Location:			Confined Space #				
Description:							
Start Date/Time: / / : AM/PM			Finish Date/Time: : / / : AM/PM				
Nature of work (i.e. inspection, repair, maintenance):							
Attendant:							
Entrant (s):							
Required Air Monitoring – O₂, LEL, CO, H₂S							
Location dependent required air monitoring (circle applicable) Cl₂, Hg, Other:							
Acceptable Air Levels							
Oxygen 19.5 to 25.5%, LEL<10%, Hydrogen Sulfide <10 ppm, Carbon Monoxide <35 ppm,							
Hg <0.025 mg/m ³ , Other: _____							
Initial air monitoring must be performed prior to entry. Monitor all items listed in order listed and record time of readings. Use “other” column for an additional parameter.							
Time	Location	O₂	LEL	H₂S	CO	Other	Initials
	Opening						
	Halfway						
	Bottom						
Note problems or issues encountered during entry operations:							

HEALTH AND SAFETY PLAN
Bronx Psychiatric Center
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Confined Space Entry Permit				Permit #	
Section A:					
General Information					
Instructions: Follow procedures carefully. Leave no blank space on this permit.					
Location:				Confined Space #:	
Description:					
Start Date/Time: / / : AM/PM			Finish Date/Time: / / : AM/PM		
Nature of work (i.e. inspection, repair, maintenance):					
Entry Supervisor:					
Authorized Attendant (s):			Authorized Entrants		
Sections B, C, D, E, F and G to be filled out by qualified Entry Supervisor. Answer Yes, No or NR (Not Required)					
Section B:					
Activities that may produce hazardous conditions					
Circle		Circle		Circle	
Yes/No	Welding	Yes/No	Solvent Use	Yes/No	Painting or Coating
Yes/No	Open Flame	Yes/No	Electrical Tool	Yes/No	Disassembly Process
Yes/No	Brazing	Yes/No	Electrical Work	Yes/No	Equipment or Piping
Yes/NR	Other				
Section C:					
Special Requirements					
Circle		Circle		Circle	
Yes/No	Secure Area	Yes/No	Purge, Flush, Vent	Yes/No	Lines Capped or blanked
Yes/No	Lock out/De-Energize	Yes/No	Ventilation	Yes/No	Other:
Section D:					
Equipment Checklist					
Circle		Circle		Circle	
Yes/No	Tripod and winch	Yes/No	Hard Hats	Yes/No	Explosive Proof Lighting
Yes/No	Harness	Yes/No	First Aid Kit	Yes/No	Ventilation fans & flex hoses
Yes/No	Ladder	Yes/No	Fire Extinguisher	Yes/No	Barriers
Yes/No	Scott Pak	Yes/No	Escape Pack	Yes/No	Traffic Cones
Yes/No	"People Working Signs"	Yes/No	Air Monitor	Air Monitor Calibration Date:	
Yes/NR	Other Personal Protective Equipment:				
Yes/No	Radio or other means of outside communication:				
Emergency response procedures to be followed:					
Emergency Rescue Service and Phone # (if not 911):					

Date:

Location dependent required air monitoring (circle applicable) Cl₂, Hg, Other:

Oxygen 19.5 to 25.5%, LEL<10%, Hydrogen Sulfide <10 ppm, Carbon Monoxide <35 ppm, Hg <0.025 mg/m³, Other:_____

Initial air monitoring must be performed prior to entry. Monitor all items listed in order listed and record time of readings. Use "other" column for an additional parameter.

[illegible]

Permit #
Date:

Section F: Reclassified Space Determination/Certification (Check only one):		
<input type="checkbox"/> Alternate Entry Procedure Space: I certify that all non-atmospheric hazards within this space have been eliminated and, as our monitoring and inspection data demonstrate, forced air ventilation along will control any atmospheric hazard within this space.		
<input type="checkbox"/> Non-Permit Space – Temporary Reclassification: I certify that hazard elimination Procedures (referenced above or attached) have been followed and all hazards within this space have been eliminated. This space is now temporarily reclassified as a non-permit space and is considered safe for work (until hazard elimination measures are removed).		
Certify below only if the space is reclassified		
Entry Supervisor Name	Signature	Date
Entrant (s) will monitor continuously with gas detection device set at audio alarm for the duration of confined space work. If any atmospheric testing result is outside the Permissible Exposure Limits (PEL) and cannot be reduced /controlled by ventilation, entry is not permitted under Alternate Entry. If the air monitoring alarm sounds while in the space, exit immediately .		
Section G: PRCS Entry Authorization and Close-out (Note: If space reclassified above, skip Section G)		
Entry Authorization:		
Entry Supervisor Name	Signature	Date
The above signature is required after initial air monitoring test and certifies that all provisions for safe entry into a confined space are completed and all persons in the work crew are trained, equipped, and physically capable of performing the assigned work. Entrant (s) will monitor continuously with gas detection device set at audio alarm for the duration of confined space work.		
Entry Close-Out If work is completed or there is a change in atmospheric conditions that is unacceptable or a new hazard becomes apparent, this permit is no longer valid and immediately exit the space		
Entry Cancelled by:	Time:	Date:
Reason:		
Note all problems encountered during entry operations.		

Permit #
Date:

Section H:
Entry/Exit Log
(Post at Entry)

Re-enter name below for each entry and exit into confined space

[illegible]

APPENDIX D
NOTIFICATION OF IMMEDIATE RISK

Notification of Immediate Health Risk

Attention: OMH Facility Responsible Manager,

Facility Initials:

Facility Name:

Facility Address:

Building Number:

Functional Area:

Date and time of IDL Health discovery:

**Name, date, and time of verbal notification to the following OMH personnel:
OMH escort:**

Contractor's Project Manager:

Description of Material and Condition:

Recommended Corrective Action:

Contractor's Surveyor Name and contact info:

APPENDIX E
ACCIDENT/INCIDENT REPORT

ACCIDENT/INCIDENT REPORT FORM

Date of Report: _____

Injured: _____

Employer: _____

Site: _____ **Site Location:** _____

Report Prepared By: _____

Signature

Title

ACCIDENT/INCIDENT CATEGORY (circle all that applies)

Injury

Illness

Near Miss

Property Damage

Fire

Spill

On-site Equipment

Motor Vehicle

Electrical

Mechanical

Chemical Exposure

Other_____

DATE AND TIME OF ACCIDENT/INCIDENT: Narrative report of Accident/Incident: Identify: 1) actions leading to or contributing to the accident/incident; 2) the accident/incident occurrence; and 3) actions following the accident/incident.

WITNESS TO ACCIDENT/INCIDENT:

Name: _____ **Company:** _____

Address: _____

Phone No.: _____

Name: _____ **Company:** _____

Address: _____

Phone No.: _____

HEALTH AND SAFETY PLAN
Bronx Psychiatric Center
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INJURED:

Name: _____ **SSN:** _____
Address: _____ **Age:** _____

Length of Service: _____ **Time on Present Job:** _____
Time/Classification: _____

SEVERITY OF INJURY OR ILLNESS (circle the appropriate answer):

Disabling	Non-disabling	Fatality
Medical Treatment	First Aid Only	

ESTIMATED NUMBER OF DAYS AWAY FROM JOB: _____

NATURE OF INJURY OR ILLNESS:

CLASSIFICATION OF INJURY (circle the appropriate answer):

Abrasions	Dislocations	Punctures
Bites	Faint/Dizziness	Radiation Burns
Blisters	Fractures	Respiratory Allergy
Bruises	Frostbite	Sprains
Chemical Burns	Heat Burns	Toxic Resp. Exposure Toxic
Cold Exposure	Heat Exhaustion	Ingestion
Concussion	Heat Stroke	Dermal Allergy
Lacerations		

Part of Body Affected: _____

Degree of Disability: _____

Date Medical Care was Received: _____

Where Medical Care was Received: _____

Address (if off-site): _____

(If two or more injuries, record on separate sheets)

PROPERTY DAMAGE:

Description of Damage: _____

Cost of Damage: _____

ACCIDENT/INCIDENT LOCATION: _____

ACCIDENT/INCIDENT ANALYSIS: Causative agent most directly related to accident/incident (Object, substance, material, machinery, equipment, conditions)

Was weather a factor?: _____

Unsafe mechanical/physical/environmental condition at time of accident/incident (Be specific):

Personal factors (Attitude, knowledge or skill, reaction time, fatigue):

ON-SITE ACCIDENTS/INCIDENTS:

Level of personal protection equipment required in Site Safety Plan: _____

Modifications: _____

Was injured using required equipment?:

If not, how did actual equipment use differ from plan?:

ACTION TAKEN TO PREVENT RECURRENCE: (Be specific. What has or will be done? When will it be done? Who is the responsible party to insure that the correction is made?)

HEALTH AND SAFETY PLAN
Bronx Psychiatric Center
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ACCIDENT/INCIDENT REPORT REVIEWED BY:

SSO Name Printed: _____ **SSO Signature:** _____

OTHERS PARTICIPATING IN INVESTIGATION:

Signature: _____ **Title:** _____

Signature: _____ **Title:** _____

Signature: _____ **Title:** _____

ACCIDENT/INCIDENT FOLLOW-UP: Date: Outcome of accident/incident:

Physician's recommendations:

Date injured returned to work: _____

Follow-up performed by: _____

Signature: _____ **Title:** _____

ATTACH ANY ADDITIONAL INFORMATION TO THIS FORM

APPENDIX F
SAFETY DATA SHEETS

SAFETY DATA SHEETS
SDS Index

Carbon Dioxide
Carbon Monoxide
Epoxy/Urethane (Paint)
Hydrogen Sulfide
Methane
Nitrogen
Oxygen
Polychlorinated Biphenyls (PCBs)



Material Safety Data Sheet

1. Product and Company Identification

Product name : **Carbon Dioxide, Gas**

Chemical formula : CO₂

Synonyms : Carbonic Acid Gas, Carbon Dioxide, Carbon Oxide, Carbonic Anhydride

Company : SpecAir Specialty Gases
22 Albiston Way
Auburn, Maine 04210 USA

Telephone : 207-777-6218

Emergency : 800-535-5053

2. Composition/Information on Ingredients

Components	CAS Number	% Volume
Carbon Dioxide, Gas	124-38-9	100%

3. Hazards Identification

Emergency Overview

Containers may rupture or explode if exposed to heat.
May cause difficulty breathing.

Potential Health Effects

Inhalation : Changes in blood pressure, ringing in the ears, nausea, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, tingling sensation, tremors, weakness, visual disturbances, suffocation, convulsions, unconsciousness, coma.

Eye contact : Blurred vision, frostbite.

Skin contact : Blisters, frostbite.

Ingestion : Ingestion of a gas is unlikely.

Chronic Health Hazard : Not applicable.

4. First Aid Measures

General advice : None.

Eye contact : Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Skin contact : If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blanket. Get immediate medical attention.

Ingestion : If a large amount is swallowed, get medical attention.

Inhalation : If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be

administered by qualified personnel. Get immediate medical attention.

5. Fire-Fighting Measures

- Suitable extinguishing media : Use extinguishing agents appropriate for surrounding fire.
- Specific hazards : Negligible fire hazard. Containers may rupture or explode if exposed to heat.
- Fire fighting : Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Do not get water directly on material. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

6. Accidental Release Measures

- Personal precautions : None.
- Environmental precautions : None.
- Methods for cleaning up : Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away. Isolate hazard area and deny entry. Ventilate closed spaces before entering.
- Additional advice : None.

7. Handling and Storage

Handling

Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders.

Storage

Store in accordance with all current regulations and standards. Protect from physical damage. Store in a well-ventilated area. Subject to storage regulation: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

8. Exposure Controls / Personal Protection

Exposure limits

5000 ppm (9000 mg/m³) OSHA TWA
10000 ppm (18000 mg/m³) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
30000 ppm (54000 mg/m³) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
5000 ppm ACGIH TWA
30000 ppm ACGIH STEL
5000 ppm (9000 mg/m³) NIOSH recommended TWA 10 hour(s)
30000 ppm (54000 mg/m³) NIOSH recommended STEL

Engineering measures

Not available.

Personal protective equipment

Respiratory protection : The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.
40000 ppm – Any supplied-air respirator. Any self-contained breathing apparatus with a full facepiece.
Escape – Any appropriate escape-type, self-contained breathing apparatus.
For unknown concentrations or immediately dangerous to life or death – Any

	supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
Hand protection	: Wear insulated gloves.
Eye protection	: For the gas: Eye protection is not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
Skin and body protection	: For the gas, Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.
Ventilation	: Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

9. Physical and Chemical Properties

Form	: Gas.
Color	: Colorless.
Odor	: Odorless.
Taste	: Acid taste.
Molecular weight	: 44.01
Vapor pressure	: 43700 mmHg @ 21 C
Vapor density	: 1.5 (air = 1)
Specific gravity	: 1.527 @ 21 C (water = 1)
Boiling point	: -109.3 to -79 F (-78.50 to -61.7 C) (liquid)
Freezing point	: -71 F (-57 C) @ 4000 mmHg
Water solubility	: Soluble.

10. Stability and Reactivity

Stability	: Stable at normal temperatures and conditions.
Conditions to avoid	: Protect from physical damage and heat. Containers may rupture or explode if exposed to heat. Avoid contact with water or moisture.
Materials to avoid	: Combustible materials, oxidizing materials, metal salts, reducing agents, metal carbide, metals, bases, potassium, sodium, ethyleneimine.
Hazardous decomposition products	: Thermal decomposition products: oxides of carbon.

11. Toxicological Information

Acute Health Hazard

Ingestion	: Not available.
Inhalation	: Not available.
Skin	: Not available.
Medical conditions aggravated by exposure	: Heart or cardiovascular disorders, respiratory disorders.

12. Ecological Information

Ecotoxicity Data

Fish toxicity	: 150000 ug/L 48 day(s) (Mortality) Brown trout (Salmo trutta)
---------------	----------------------------------------------------------------

13. Disposal Considerations

Waste from residues : Dispose in accordance with all applicable regulations.
/ unused products
Contaminated : Return cylinder to supplier.
packaging

14. Transport Information

DOT (US only)

Proper shipping : Carbon Dioxide
name
Class : 2.2
UN/ID No. : UN1013
Labeling : Non-Flammable Gas

Further information

Cylinders should be transported in a secure upright position in a well ventilated truck.

15. Regulatory Information

OSHA Process Safety (29 CFR 1910.119) Hazard Class(es)

Not regulated.

TCSA

Material is listed in TSCA inventory.

SARA Title III Section 302 Extremely Hazardous Substances (40 CFR 355.30)

Not regulated.

SARA Title III Section 304 Extremely Hazardous Substances (40 CFR 355.40)

Not regulated.

SARA Title III SARA Sections 311/312 Hazardous Categories (40 CFR 370.21)

Acute: Yes
Chronic: No
Fire: No
Reactive: No
Sudden Release: Yes

SARA Title III Section 313 (40 CFR 372.65)

Not regulated.



Material Safety Data Sheet

1. Product and Company Identification

Product name : **Carbon Monoxide**

Chemical formula : CO

Synonyms : Carbon Oxide; Carbon Oxide (CO);

Company : SpecAir Specialty Gases
22 Albiston Way
Auburn, Maine 04210 USA

Telephone : 207-777-6218

Emergency : 800-535-5053

2. Composition/Information on Ingredients

Components	CAS Number	% Volume
Carbon Monoxide	630-08-0	100%

3. Hazards Identification

Emergency Overview

Flammable gas. May cause flash fire. Flash back hazard.
May cause blood damage, suffocation.

Potential Health Effects

Inhalation : Changes in body temperature, changes in blood pressure, nausea, vomiting, chest pain, difficulty breathing, irregular heartbeat, headache, drowsiness, dizziness, disorientation, hallucination, pain in extremities, tremors, loss of coordination, hearing loss, visual disturbances, eye damage, suffocation, blood disorders, convulsion, coma. May cause loss of appetite, heart damage, nerve damage, birth defects, brain damage in long term exposure.

Eye contact : No information on significant adverse effects.

Skin contact : No information on significant adverse effects.

Ingestion : Ingestion of a gas is unlikely.

Chronic Health Hazard : Not applicable.

4. First Aid Measures

General advice : None.

Eye contact : Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

Skin contact : Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Ingestion : If a large amount is swallowed, get medical attention.

Inhalation : If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

5. Fire-Fighting Measures

Suitable extinguishing media : Carbon dioxide, regular dry chemical. Large fires: Use regular foam or flood with fine water spray.

Specific hazards : Severe explosion hazard. Vapor/air mixtures are explosive. Pressurized containers may rupture or explode if exposed to sufficient heat. Vapors or gases may ignite at distant ignition sources and flash back.

Fire fighting : Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Cool containers with water. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Stop flow of gas.

6. Accidental Release Measures

Personal precautions : None.

Environmental precautions : Water release – Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

Methods for cleaning up : Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away. Isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering.

Additional advice : None.

7. Handling and Storage

Handling

Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders.

Storage

Store in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulation: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

8. Exposure Controls / Personal Protection

Exposure limits

50 ppm (55 mg/m³) OSHA TWA
35 ppm (40 mg/m³) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
200 ppm (229 mg/m³) OSHA ceiling (vacated by 58 FR 35338, June 30, 1993)
25 ppm ACGIH TWA
35 ppm (40 mg/m³) NIOSH recommended TWA 10 hour(s)
200 ppm (229 mg/m³) NIOSH recommended ceiling

Engineering measures

Not available.

Personal protective equipment

Respiratory protection	:	The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA. 350 ppm – Any supplied-air respirator. 875 ppm – Any supplied-air respirator operated in a continuous flow mode. 1200 ppm – Any air-purifying respirator with a full facepiece and a canister providing protection against this substance. End of service life indicator required (ESLI). Any self-contained breathing apparatus with a full facepiece. Any supplied-air respirator with a full facepiece. Escape – Any air-purifying respirator with a full facepiece and a canister providing protection against this substance. End of service life indicator required (ESLI). Any appropriate escape-type, self-contained breathing apparatus. For unknown concentrations or immediately dangerous to life or death – Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
Hand protection	:	Wear appropriate chemical resistant gloves.
Eye protection	:	Eye protection is not required, but recommended.
Skin and body protection	:	Protective clothing is not required.
Ventilation	:	Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

9. Physical and Chemical Properties

Form	:	Gas.
Color	:	Colorless.
Odor	:	Odorless.
Taste	:	Tasteless.
Molecular weight	:	28.01
Vapor pressure	:	760 mmHg @ -191 C
Vapor density	:	0.968 (air = 1)
Specific gravity	:	Not applicable.
Boiling point	:	-314 F (-192 C)
Freezing point	:	-326 F (-199 C)
Water solubility	:	2.3% @ 20 C

10. Stability and Reactivity

Stability	:	Stable at normal temperatures and conditions.
Conditions to avoid	:	Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.
Materials to avoid	:	Combustible materials, oxidizing materials, halogens, metal oxides, metals, lithium.
Hazardous decomposition products	:	Thermal decomposition products: oxides of carbon.

11. Toxicological Information

Toxicity Data

1807 ppm/4 hour(s) inhalation-rat LC50.

Acute Health Hazard

Ingestion : Not available.
Inhalation : Toxic.
Skin : Not available.
Target organs : Blood.
Medical conditions aggravated by exposure : Blood system disorders, heart or cardiovascular disorders, hormonal disorders, respiratory disorders.

12. Ecological Information

Ecotoxicity Data

Fish toxicity : 75000 ug/L 1 day(s) LC100 (Mortality) Orangespotted sunfish (*Lepomis humilis*).

Fate and Transport

KOW : 1479.11 (log = 3.17) (estimated from water solubility).
KOC : 2760.58 (log = 3.44) (estimated from water solubility).
Henry's Law Constant : 1.2×10^{-3} atm-m³/mol.
Bioconcentration : 2.13 (estimated from water solubility).
Aquatic Processes : 1.3766993 hour(s) (River Model: 1 m deep, 1 m/s flow, 3 m/s wind).
Environmental summary : Relatively non-persistent in the environment. Not expected to leach through the soil or the sediment. Accumulates very little in the body of living organisms. Highly volatile from water.

13. Disposal Considerations

Waste from residues / unused products : Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Contaminated packaging : Return cylinder to supplier.

14. Transport Information

DOT (US only)

Proper shipping name : Carbon Monoxide, Compressed
Class : 2.3
UN/ID No. : UN1016
Labeling : 2.3; 2.1
Additional shipping description : Toxic-Inhalation Hazard Zone D

Further information

Cylinders should be transported in a secure upright position in a well ventilated truck.

15. Regulatory Information

OSHA Process Safety (29 CFR 1910.119) Hazard Class(es)

Not regulated.

TCSA

Material is listed in TSCA inventory.

SARA Title III Section 302 Extremely Hazardous Substances (40 CFR 355.30)

Not regulated.

SARA Title III Section 304 Extremely Hazardous Substances (40 CFR 355.40)

Not regulated.

SARA Title III SARA Sections 311/312 Hazardous Categories (40 CFR 370.21)

Acute: Yes

Chronic: No

Fire: Yes

Reactive: No

Sudden Release: Yes

SARA Title III Section 313 (40 CFR 372.65)

Not regulated.



Protective & Marine Coatings

GENERAL POLYMERS® 3579 STANDARD EPOXY PRIMER/ BINDER

PART A
PART B

GP3579
GP3579B01

SERIES
STANDARD HARDENER

Revised April 06, 2016

PRODUCT INFORMATION

PRODUCT DESCRIPTION

GENERAL POLYMERS 3579 STANDARD PRIMER / BINDER is a high solids, clear or pigmented epoxy primer and binder resin. GENERAL POLYMERS 3579 STANDARD PRIMER / BINDER is available in clear, red, white and gray, has good blush resistance and is low in viscosity to promote penetration of the concrete substrate and excellent wetting of mortar aggregate.

ADVANTAGES

- Good blush resistance at room temperature
- Low modulus of elasticity, stress relieving
- Acceptable for use in USDA inspected facilities

TYPICAL USES

GENERAL POLYMERS 3579 STANDARD PRIMER / BINDER is an epoxy primer for coatings, slurries, mortar overlays, and patches. It can be also used as a binder resin. For slurries, mortar and patching systems. Suitable for use in the Mining & Minerals Industry.

LIMITATIONS

- Slab on grade requires vapor/moisture barrier.
- Surface must be clean and dry.
- Cool damp conditions may cause surface blushing.
- Substrate must be structurally sound and free of bond inhibiting contaminants.
- During installation and initial cure cycle substrate and ambient air temperature must be at a minimum of 50°F (10°C). Substrate temperature must be at least 5°F (3°C) above the dew point (for lower temperature installation contact your local representative).
- When required, adequate ventilation shall be provided and proper clothing and respirators worn.
- **Strictly adhere to published coverage rates.**

SURFACE PREPARATION

Proper inspection and preparation of the substrate to receive resinous material is critical. Read and follow the "Instructions for Concrete Surface Preparation" (Form G-1) for complete details.

PRODUCT CHARACTERISTICS

Color:	Clear, Red, Gray, White
Mix Ratio:	2:1
Volume Solids:	96% ± 2%, mixed
Weight Solids:	96% ± 2%, mixed
VOC (EPA Method 24):	<50 g/L mixed: 0.41 lbs/gal
Viscosity, mixed:	2,100 cps

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns):	6 (150)	30 (750)
~Coverage sq ft/gal (m²/L):	varies according to usage	

Drying Schedule @ 6 mils (150 microns) wet:

@ 73°F (23°C)

To touch: 6-8 hours

To recoat: 10-20 hours

If maximum recoat time is exceeded, abrade surface before recoating.

Drying time is temperature, humidity, and film thickness dependent.

Pot Life: gallon mass 25-30 minutes @ 73°F (23°C)

Shelf Life: Part A: 36 months, unopened
Part B (Standard): 36 months, unopened

Store indoors at 50°F (10°C) to 90°F (32°C)

Flash Point: >230°F (>110°C), ASTM D 93, mixed

PERFORMANCE CHARACTERISTICS

Test Name	Test Method	Results
Adhesion	ACI 503R	300 psi concrete failure
Compressive Strength	ASTM D 695	9,000 psi
Flammability		Self-extinguishing over concrete
Flexural Strength	ASTM D 790	6,000 psi
Hardness, Shore D	ASTM D 2240	75/65
Tensile Strength	ASTM D 638	3,000 psi

continued on back



Protective & Marine Coatings

GENERAL POLYMERS® 3579 STANDARD EPOXY PRIMER/ BINDER

PART A
PART B

GP3579
GP3579B01

SERIES
STANDARD HARDENER

Revised April 06, 2016

PRODUCT INFORMATION

APPLICATION

• APPLICATION INSTRUCTIONS

1. Add 2 parts 3579A (resin) to 1 part 3579B (hardener) by volume. Mix with low speed drill and Jiffy blade for three minutes and until uniform. To insure proper system cure and performance, strictly follow mix ratio recommendations.

2. 3579 may be applied via spray, roller or brush. Apply evenly, with no puddles. Coverage will vary depending upon porosity of the substrate and surface texture.

3. 3579 application varies upon usage.

NOTE: Epoxy materials may tend to blush at the surface especially in humid environments. After the surface is primed and before installation of each subsequent coat, surface must be examined for blush (a whitish greasy film and/or low gloss). The blush must be completely removed prior to recoating using warm detergent water or through solvent wipe.

Epoxy materials will appear to be cured and dry to touch prior to full chemical cross linking. Allow epoxy to cure for 2-3 days prior to exposure to water or other chemicals for best performance.

CLEANUP

Clean up mixing and application equipment immediately after use. Use toluene or xylene. Observe all fire and health precautions when handling or storing solvents.

SAFETY

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

MAINTENANCE

Occasional inspection of the installed material and spot repair can prolong system life. For specific information, Contact your Sherwin-Williams representative.

SHIPPING

• Destinations East of the Rocky Mountains are shipped F.O.B. Cincinnati, Ohio.

• Destinations West of the Rocky Mountains are shipped F.O.B. Victorville, California.

For specific information relating to international shipments, contact your local sales representative.

ORDERING INFORMATION

Packaging:

Part A: 1 gallon (3.8L) and
5 gallon (18.9L) containers
Part B: 1 gallon (3.8L) and
5 gallon (18.9L) containers

Weight: 9.4 ± 0.2 lb/gal; 1.13 Kg/L
mixed, may vary by color

DISCLAIMER

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

WARRANTY

The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

PART A GP4660A01
PART B GP4660B01

CLEAR
HARDENER

Revised: November 28, 2022

PRODUCT INFORMATION

PRODUCT DESCRIPTION

RESUTILE MC 100 is an economical, light stable, high gloss standard traffic system. It provides outstanding gloss retention and superior hardness as well as exceptional abrasion resistance. Resutile MC 100 is resistant to many chemicals and solvents. It prevents concrete dusting, furnishing a surface that is easy to maintain. Resutile MC 100 may be field-tinted with Sherwin-Williams colorants.

Advantages:

- Excellent abrasion and wear resistance
- Outstanding chemical resistance
- High gloss, light stable, aliphatic, non-ambering
- Good thermal shock properties
- Resistant to Skydrol®, jet fuels and other vehicle maintenance fluids
- USDA compliant
- Tintable with Sherwin-Williams colorants

TYPICAL USES

Resutile MC 100 is an ideal high gloss topcoat over a variety of Sherwin-Williams Systems in busy industrial, commercial and institutional settings where additional durability and excellent abrasion-resistance is desired, such as:

- Hospitals, clinics, laboratories
- Food processing plants
- Schools and universities
- Detention and public safety buildings
- Warehouses and logistics operations
- Manufacturing plants, research departments
- Hangars, aerospace and transportation facilities
- Hospitality and restaurants
- Grocery stores and retail establishments

SURFACE PREPARATION

New concrete must have a 28 day cure, and preferably a broom swept finish, prior to coating. In the case of older concrete flooring, remove all surface oils, paint, dust and debris. Prior to coating, ensure the surface is clean, passes the MVT test and the water drop test and that all surface defects have been repaired.

APPLICATION CONDITIONS

Resutile MC 100 should not be applied when the floor temperature is above 90°F (32°C) or below 50°F (10°C), or when within 5°F (2.8°C) of the dew point.

PRODUCT CHARACTERISTICS

Color:	Clear
Sheen:	Gloss
Mix Ratio:	10:1 by volume
Weight Solids:	91%, mixed (ASTM D2369)
Viscosity, A+B:	324 cps (ASTM D2196)
VOC (ASTM D3960):	106 g/L ; 0.88 lb/gal

Recommended Spreading Rate per coat:

	Minimum	Maximum
Dry mils (microns)	2.9 (73)	2.9 (73)
~Coverage sq ft/gal (m²/L):	500 (12.3)	525 (12.9)

Drying Schedule:

	@ 50°F (10°C)	@ 77°F (25°C)	@ 100°F (38°C)
	50% RH	50% RH	50% RH
Dry Touch:	4 hours	4 hours	105 minutes
Dry Tack:	13 hours	6 hours	3.5 hours
Dry Hard:	18.5 hours	7 hours	4.25 hours
To Recoat:			
minimum:		8 hours	
maximum:		24 hours	

NOTE: The cure time will vary with cooler temperatures. Allow a minimum of 2 hours and a maximum of 24 hours between each step.

Shelf Life:	12 months, unopened Store indoors at 40°F (4.5°C) to 95°F (35°C)
Flash Point:	185°F (85°C)

PERFORMANCE CHARACTERISTICS

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060, CS-17 wheel, 1000gm load, 1000 cycles	26.4 mg loss
Adhesion	ASTM D7234	617 psi ; 100% concrete failure
Coefficient of Friction	ASTM D2047	0.53
Elongation	ASTM D2370	9%
Gloss, 60°	ASTM E97	90+
Heat Resistance	MIL-D-3134J	Pass
Pencil Hardness	ASTM D3363	4H+
Surface Burning	ASTM E84	TBD
Tensile Strength	ASTM D2370	6,400 psi

ORDERING INFORMATION

Packaging:	Part A: 2.5 gallons (9.45L) in a 5 gallon pail Part B: 0.25 gallon (0.95L) quart container
Weight:	9.14 lb/gal ; 1.1 Kg/L, mixed

PART A
PART B**GP4660A01**
GP4660B01**CLEAR**
HARDENER

Revised: November 28, 2022

PRODUCT INFORMATION**APPLICATION INSTRUCTIONS**

Primer Application: Once surface preparation is complete, apply selected Sherwin-Williams primer and basecoat(s) to the concrete floor in accordance with system technical data sheet instructions. Note: The cure time will vary with conditions and primer selection.

Topcoat Application:

1. Abrade application surface with 100 grit sandpaper or screens to provide proper surface tension for the Resutile MC 100. Vacuum thoroughly and wipe with clean tack rags until no dust is evident.
2. Combine and blend parts A & B for 3 minutes using a Jiffy mixer blade with slow speed drill. For a pigmented coating, add 2-4 pints of Sherwin-Williams Colorant into blended container of parts A & B and remix.
3. Apply at 500-525 sq. ft. per gallon using a 3/8-inch nap roller, taking great care to apply at recommended spread rate. Excess material could result in blisters; insufficient material could result in an uneven appearance.
4. For a second topcoat of Resutile MC 100, allow first topcoat to cure until no longer tacky. Repeat steps 1-3 above.
5. Allow final topcoat to cure for 24 hours before opening floor to light foot traffic.

Instructions for Use Over Existing Coatings:

1. Examine the existing coating to ensure that it is well bonded to the concrete. Any loose coating must be completely removed and edges should be sanded to a feathered edge.
2. Clean the entire floor thoroughly with detergent cleaner. The surface must be free of all dirt, oils, or other contaminants.
3. After the floor has completely dried, sand the existing coating until a powdery residue is evident and all gloss is removed. Sweep or vacuum clean, and wipe with xylene to ensure good adhesion of the new system. Any bare concrete should be mechanically prepared and primed with appropriate Sherwin-Williams primer.

TINTING

Only tint with HPF Universal Colorants. Do not tint with GIS colorants.

CHEMICAL RESISTANCE

For comprehensive chemical resistance information, consult the Chemical Resistant Guide and contact your Sherwin-Williams representative.

CLEANUP

Clean up mixing and application equipment immediately after use with Xylene. Observe all fire and health precautions when handling or storing solvents.

SAFETY

Refer to the SDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

MAINTENANCE

Occasional inspection of the installed material and spot repair can prolong system life. For specific information, contact your Sherwin-Williams representative.

DISCLAIMER

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Material Safety Data Sheet

1. Product and Company Identification

Product name : **Hydrogen Sulfide**

Chemical formula : H₂S

Synonyms : Hydrogen Sulfide (H₂S); Dihydrogen Monosulfide; Dihydrogen Sulfide; Hydrosulfuric acid; Sulfur Dihydride; Sulfureted Hydrogen; Sulfur Hydride; Stink Damp; Sewer gas

Company : SpecAir Specialty Gases
22 Albiston Way
Auburn, Maine 04210 USA

Telephone : 207-777-6218

Emergency : 800-535-5053

2. Composition/Information on Ingredients

Components	CAS Number	% Volume
Hydrogen Sulfide	7783-06-4	100%

3. Hazards Identification

Emergency Overview

Harmful if inhaled.

May cause respiratory tract irritation, skin irritation, eye irritation, blood damage.

Flammable gas. May cause flash fire. Flash back hazard. Electrostatic charges may be generated by flow, agitation, etc.

Potential Health Effects

Inhalation : Irritation, lack of sense of smell, sensitivity to light, nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, disorientation, tremors, visual disturbances, suffocation, lung congestion, internal bleeding, heart damage, nerve damage, brain damage, coma, death. May cause allergic reactions, nausea, vomiting, loss of appetite, weight loss, irregular heartbeat, headache, sleep disturbances, emotional disturbances, lung congestion, nerve damage in long term exposure.

Eye contact : Irritation, sensitivity to light, visual disturbances. May cause eye damage in long term exposure.

Skin contact : Irritation. May cause skin disorders in long term exposure.

Ingestion : Ingestion of harmful amounts is unlikely.

Chronic Health Hazard : None known.

4. First Aid Measures

General advice : None.

Eye contact : Immediately flush eyes with plenty of water for at least 15 minutes. Then get

	immediate medical attention.
Skin contact	: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.
Ingestion	: If a large amount is swallowed, get immediate medical attention.
Inhalation	: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.
Antidote	: Amyl nitrite, inhalation; sodium nitrite, intravenous; pyridoxine, intravenous; urea, intravenous. CAUTION! Get medical attention immediately.
Note to physician	: For inhalation, consider oxygen.

5. Fire-Fighting Measures

Suitable extinguishing media	: Let burn unless leak can be stopped immediately. Large fires: Use regular foam or flood with fine water spray.
Specific hazards	: Severe fire hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Pressurized containers may rupture or explode if exposed to sufficient heat. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.
Fire fighting	: Move container from fire area if it can be done without risk. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Cool containers with water spray until well after fire is out. Keep unnecessary people away, isolate hazard area and deny entry. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Stop flow of gas.

6. Accidental Release Measures

Personal precautions	: None.
Environmental precautions	: Air release – Reduce vapors with water spray. Collect runoff for disposal as potential hazardous waste. Soil release – Dike for later disposal. Absorb with sand or other non-combustible material. Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash). Water release – Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash).
Methods for cleaning up	: Do not touch spilled material. Stop leak if possible without personal risk. Avoid heat, flames, sparks and other sources of ignition. Remove sources of ignition. Reduce vapors with water spray. Do not get water directly on material. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Ventilate closed spaces before entering. Evacuation radius: 150 feet. For tank, rail car or tank truck: 800 meters(1/2 mile). Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).
Additional advice	: None.

7. Handling and Storage

Handling

Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders. Subject to handling regulations: U.S. OSHA 29 CFR 1910.119.

Storage

Store in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Store in a cool, dry place. Store in a well-ventilated area. Avoid contact with light. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30). Keep separated from incompatible substances.

8. Exposure Controls / Personal Protection

Exposure limits

20 ppm OSHA ceiling
50 ppm OSHA peak 10 minute(s) (once if no other measurable exposure occurs)
10 ppm (14 mg/m³) OSHA TWA (vacated by 58 FR 35338, June 30, 1993)
15 ppm (21 mg/m³) OSHA STEL (vacated by 58 FR 35338, June 30, 1993)
10 ppm ACGIH TWA
15 ppm ACGIH STEL
10 ppm (15 mg/m³) NIOSH recommended ceiling 10 minute(s)

Engineering measures

Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal protective equipment

Respiratory protection	:	The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA. 100 ppm – Any powered, air-purifying respirator with cartridge(s) providing protection against this substance. Any air-purifying respirator with a full facepiece and a canister providing protection against this substance. Any supplied-air respirator. Any self-contained breathing apparatus with a full facepiece. Escape – Any air-purifying respirator with a full facepiece and a canister providing protection against this substance. Any appropriate escape-type, self-contained breathing apparatus. For unknown concentrations or immediately dangerous to life or health – Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
Hand protection	:	Wear appropriate chemical resistant gloves.
Eye protection	:	Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
Skin and body protection	:	Wear appropriate chemical resistant clothing.

9. Physical and Chemical Properties

Form	:	Gas.
Color	:	Colorless.
Odor	:	Rotten egg odor.
Molecular weight	:	34.08

Vapor pressure	: 15200 mmHg @ 25 C
Vapor density	: 1.2 (air = 1)
Specific gravity	: 1.192 (water = 1)
Boiling point	: -78 to -77 F (-61 to -60.3 C)
Freezing point	: -123 F (-86 C)
Water solubility	: 2.58 – 2.9% @ 20 C
Evaporation rate	: Not applicable.

10. Stability and Reactivity

Stability	: Stable at normal temperatures and pressure.
Conditions to avoid	: Avoid heat, sparks, flames or other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.
Materials to avoid	: Combustible materials, halogens, metals, oxidizing materials, metal salts, bases, metal oxides.
Hazardous decomposition products	: Thermal decomposition products: oxides of sulfur.

11. Toxicological Information

Toxicity Data

444 ppm inhalation-rat LC50

Acute Health Hazard

Ingestion	: None known.
Inhalation	: Toxic.
Skin	: None known.
Medical conditions aggravated by exposure	: Eye disorders, respiratory disorders, nervous system disorders.

12. Ecological Information

Ecotoxicity Data

Fish toxicity	: 14.9 ug/L 96 hour(s) LC50 (Mortality) Fathead minnow (<i>Pimephales promelas</i>).
Invertebrate toxicity	: 9730 ug/L 1.5 hour(s) (Mortality) Mediterranean mussel (<i>Mytilus galloprovincialis</i>).
Environmental summary	: Highly toxic to aquatic life.

13. Disposal Considerations

Waste from residues / unused products	: Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U135.
Contaminated packaging	: Return cylinder to supplier.

14. Transport Information

DOT (US only)

Proper shipping name	: Hydrogen sulfide
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Class : 2.3
UN/ID No. : UN1053
Labeling : Flammable Gas; Poison
Additional shipping description : Toxic-Inhalation Hazard Zone B

Further information

Cylinders should be transported in a secure upright position in a well ventilated truck.

15. Regulatory Information

OSHA Process Safety (29 CFR 1910.119) Hazard Class(es)

Hydrogen Sulfide: 1500 LBS TQ

TCSA

Material is listed in TSCA inventory.

SARA Title III Section 302 Extremely Hazardous Substances (40 CFR 355.30)

Hydrogen Sulfide: 500 LBS TPQ

SARA Title III Section 304 Extremely Hazardous Substances (40 CFR 355.40)

Hydrogen Sulfide: 100 LBS RQ

SARA Title III SARA Sections 311/312 Hazardous Categories (40 CFR 370.21)

Acute: Yes

Chronic: No

Fire: Yes

Reactive: No

Sudden Release: Yes

SARA Title III Section 313 (40 CFR 372.65)

Hydrogen Sulfide: Administrative stay issued Aug. 22, 1994



Material Safety Data Sheet

1. Product and Company Identification

Product name : **Methane, Compressed Gas**

Chemical formula : C-H₄

Synonyms : Fire Damp; Marsh Gas; Methyl Hydride; Natural Gas; Methane

Company : SpecAir Specialty Gases
22 Albiston Way
Auburn, Maine 04210 USA

Telephone : 207-777-6218

Emergency : 800-535-5053

2. Composition/Information on Ingredients

Components	CAS Number	% Volume
Methane	74-82-8	100%

3. Hazards Identification

Emergency Overview

Flammable gas. May cause flash fire. Flash back hazard. Electrostatic charges may be generated by flow, agitation, etc.
May cause difficulty breathing.

Potential Health Effects

Inhalation : Nausea, vomiting, difficulty breathing, irregular heartbeat, headache, drowsiness, fatigue, dizziness, disorientation, mood swing, tingling sensation, loss of coordination, suffocation, convulsions, unconsciousness, coma.

Eye contact : No information on significant adverse effects.

Skin contact : No information on significant adverse effects.

Ingestion : Ingestion of a gas is unlikely.

Chronic Health Hazard : None known.

4. First Aid Measures

General advice : None.

Eye contact : Flush eyes with plenty of water.

Skin contact : Wash exposed skin with soap and water.

Ingestion : If a large amount is swallowed, get immediate medical attention.

Inhalation : If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Note to physician : For inhalation, consider oxygen.

5. Fire-Fighting Measures

- Suitable extinguishing media : Carbon dioxide, regular dry chemical.
Large fires: Use regular foam or flood with fine water spray.
- Specific hazards : Severe fire hazard. Severe explosion hazard. Pressurized containers may rupture or explode if exposed to sufficient heat. Vapor/air mixtures are explosive above flash point. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.
- Fire fighting : Move container from fire area if it can be done without risk. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzle until well after fire is out. If this is impossible, take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables. Evacuation radius: 800 meters (1/2 mile). Stop flow of gas.

6. Accidental Release Measures

- Personal precautions : None.
- Environmental precautions : None.
- Methods for cleaning up : Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition. Ventilate closed spaces before entering.
- Additional advice : None.

7. Handling and Storage

Handling

Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders.

Storage

Store in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

8. Exposure Controls / Personal Protection

Exposure limits

1000 ppm ACGIH TWA

Engineering measures

Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal protective equipment

- Respiratory protection : Under conditions of frequent use or heavy exposure, respiratory protection may be needed.
For unknown concentrations or immediately dangerous to life or health – Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive pressure mode in combination with a separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

Hand protection	: Wear appropriate chemical resistant gloves.
Eye protection	: Eye protection not required, but recommended.
Skin and body protection	: Protective clothing is not required.

9. Physical and Chemical Properties

Form	: Gas.
Color	: Colorless.
Odor	: Odorless.
Molecular weight	: 16.04
Vapor pressure	: 760 mmHg @ -161 C
Vapor density	: 0.555 (air = 1)
Specific gravity	: Not applicable.
Boiling point	: -260 F (-162 C)
Freezing point	: -297 F (-183 C)
Water solubility	: 3.5% @ 17 C
Evaporation rate	: Not applicable.

10. Stability and Reactivity

Stability	: Stable at normal temperatures and pressure.
Conditions to avoid	: Avoid heat, sparks, flames or other sources of ignition. Containers may rupture or explode if exposed to heat.
Materials to avoid	: Halogens, oxidizing materials, combustible materials.
Hazardous decomposition products	: Thermal decomposition products: oxides of carbon.

11. Toxicological Information

Toxicity Data

50 ppb/2 hour(s) inhalation-mouse LC50

Acute Health Hazard

Ingestion	: None known.
Inhalation	: Relatively non-toxic.
Skin	: None known.
Medical conditions aggravated by exposure	: None known.

12. Ecological Information

Fate and Transport

KOW	: 724.44 (log = 2.87) (estimated from water solubility).
KOC	: 2192.80 (log = 3.34) (estimated from water solubility).
Henry's Law constant	: 4.6 E -4 atm-m3/mol.
Bioconcentration	: 1.68 (estimated from water solubility).
Aquatic processes	: 1.0416679 hours (Rover Model: 1 m deep, 1 m/s flow, 3 m/s wind).
Environmental summary	: Relatively non-persistent in the environment. Not expected to leach through the soil or the sediment. Accumulates very little in the bodies of living organisms. Moderately volatile from water.

13. Disposal Considerations

Waste from residues : Dispose in accordance with all applicable regulations. Subject to disposal
/ unused products regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Contaminated : Return cylinder to supplier.
packaging

14. Transport Information

DOT (US only)

Proper shipping : Methane, Compressed
name
Class : 2.1
UN/ID No. : UN1971
Labeling : Flammable Gas

Further information

Cylinders should be transported in a secure upright position in a well ventilated truck.

15. Regulatory Information

OSHA Process Safety (29 CFR 1910.119) Hazard Class(es)

Not regulated.

TCSA

Material is listed in TSCA inventory.

SARA Title III Section 302 Extremely Hazardous Substances (40 CFR 355.30)

Not regulated.

SARA Title III Section 304 Extremely Hazardous Substances (40 CFR 355.40)

Not regulated.

SARA Title III SARA Sections 311/312 Hazardous Categories (40 CFR 370.21)

Acute: Yes
Chronic: No
Fire: Yes
Reactive: No
Sudden Release: Yes

SARA Title III Section 313 (40 CFR 372.65)

Not regulated.



Material Safety Data Sheet

1. Product and Company Identification

Product name : **Nitrogen, Compressed Gas**

Chemical formula : N₂

Synonyms : Diatomic Nitrogen; Dinitrogen; Nitrogen; Nitrogen-14; Nitrogen Gas

Company : SpecAir Specialty Gases
22 Albiston Way
Auburn, Maine 04210 USA

Telephone : 207-777-6218

Emergency : 800-535-5053

2. Composition/Information on Ingredients

Components	CAS Number	% Volume
Nitrogen, Compressed Gas	7727-37-9	100%

3. Hazards Identification

Emergency Overview

May cause difficulty breathing.
Containers may rupture or explode if exposed to heat.

Potential Health Effects

Inhalation : Nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma.

Eye contact : Irritation.

Skin contact : No information on significant adverse effects.

Ingestion : Ingestion of a gas is unlikely.

Chronic Health Hazard : None known.

4. First Aid Measures

General advice : None.

Eye contact : Flush eyes with plenty of water.

Skin contact : Wash exposed skin with soap and water.

Ingestion : If a large amount is swallowed, get immediate medical attention.

Inhalation : If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

5. Fire-Fighting Measures

Suitable : Carbon dioxide, regular dry chemical.

extinguishing media	Large fires: Use regular foam or flood with fine water spray.
Specific hazards	: Negligible fire hazard. Pressurized containers may rupture or explode if exposed to sufficient heat.
Fire fighting	: Move container from fire area if it can be done without risk. Cool containers with water spray until well after fire is out. Stay away from ends of tanks. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Use extinguishing agents appropriate for surrounding fire. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Do not get water directly on material. Reduce vapors with water spray. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Consider downwind evacuation if material is leaking.

6. Accidental Release Measures

Personal precautions	: None.
Environmental precautions	: None.
Methods for cleaning up	: Stop leak if possible without personal risk. Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.
Additional advice	: None.

7. Handling and Storage

Handling

Secure cylinder when using to protect from falling. Use suitable hand truck to move cylinders.

Storage

Store in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

8. Exposure Controls / Personal Protection

Exposure limits

ACGIH (simple asphyxiant)

Engineering measures

Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal protective equipment

Respiratory protection	: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. For unknown concentrations or immediately dangerous to life or health – Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.
Hand protection	: Wear appropriate chemical resistant gloves.
Eye protection	: Wear splash resistant safety goggles. Provide and emergency eye wash fountain and quick drench shower in the immediate work area.
Skin and body protection	: Wear appropriate chemical resistant clothing.

9. Physical and Chemical Properties

Form	: Gas.
Color	: Colorless.
Odor	: Odorless.
Molecular weight	: 28.0134
Vapor pressure	: 760 mmHg @ -196 C
Vapor density	: 0.967 (air = 1)
Specific gravity	: Not applicable.
Boiling point	: -321 F (-196 C)
Freezing point	: -346 F (-210 C)
Water solubility	: 1.6% @ 20 C
Evaporation rate	: Not applicable.

10. Stability and Reactivity

Stability	: Stable at normal temperatures and pressure.
Conditions to avoid	: Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.
Materials to avoid	: Metals, oxidizing materials.
Hazardous decomposition products	: Thermal decomposition products: oxides of nitrogen.

11. Toxicological Information

Acute Health Hazard

Ingestion	: None known.
Inhalation	: None known.
Skin	: None known.

12. Ecological Information

Not available.

13. Disposal Considerations

Waste from residues / unused products	: Dispose in accordance with all applicable regulations.
Contaminated packaging	: Return cylinder to supplier.

14. Transport Information

DOT (US only)

Proper shipping name	: Nitrogen, Compressed
Class	: 2.2
UN/ID No.	: UN1066
Labeling	: Non-Flammable Gas

Further information

Cylinders should be transported in a secure upright position in a well ventilated truck.

15. Regulatory Information

OSHA Process Safety (29 CFR 1910.119) Hazard Class(es)

Not regulated.

TCSA

Material is listed in TSCA inventory.

SARA Title III Section 302 Extremely Hazardous Substances (40 CFR 355.30)

Not regulated.

SARA Title III Section 304 Extremely Hazardous Substances (40 CFR 355.40)

Not regulated.

SARA Title III SARA Sections 311/312 Hazardous Categories (40 CFR 370.21)

Acute: Yes

Chronic: No

Fire: No

Reactive: No

Sudden Release: Yes

SARA Title III Section 313 (40 CFR 372.65)

Not regulated.

SAFETY DATA SHEET


Oxygen

Airgas
an Air Liquide company

Section 1. Identification

GHS product identifier	: Oxygen
Chemical name	: oxygen
Other means of identification	: Molecular oxygen; Oxygen molecule; Pure oxygen; O ₂ ; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)
Product type	: Gas.
Product use	: Synthetic/Analytical chemistry.
Synonym	: Molecular oxygen; Oxygen molecule; Pure oxygen; O ₂ ; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)
SDS #	: 001043
Supplier's details	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253 Inside the US: 1-800-424-9300 (Chemtrec, 24 hours) Outside the US: 1-703-527-3887 (Chemtrec, 24 hours)
24-hour telephone	: Airgas Emergency Response Center 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture	: OXIDIZING GASES - Category 1 GASES UNDER PRESSURE - Compressed gas
GHS label elements	
Hazard pictograms	: 
Signal word	: Danger
Hazard statements	: H270 - May cause or intensify fire; oxidizer. H280 - Contains gas under pressure; may explode if heated.
Precautionary statements	
General	: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Open valve slowly. Use only with equipment cleaned for Oxygen service.
Prevention	: P220 - Keep away from clothing and other combustible materials. P244 - Keep reduction valves, valves and fittings free from oil and grease.
Response	: P370 + P376 - In case of fire: Stop leak if safe to do so.
Storage	: P410 + P403 - Protect from sunlight. Store in a well-ventilated place.
Disposal	: Not applicable.
Hazards not otherwise classified	: None known.

Section 3. Composition/information on ingredients

Substance/mixture	: Substance
Chemical name	: oxygen
Other means of identification	: Molecular oxygen; Oxygen molecule; Pure oxygen; O ₂ ; UN 1072; Dioxygen; Oxygen USP, Aviator's Breathing Oxygen (ABO)
Product code	: 001043

Ingredient name	%	CAS number
Oxygen	100	7782-44-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention.
Inhalation	: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Skin contact	: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Ingestion	: As this product is a gas, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	: Contact with rapidly expanding gas may cause burns or frostbite.
Inhalation	: No known significant effects or critical hazards.
Skin contact	: Contact with rapidly expanding gas may cause burns or frostbite.
Frostbite	: Try to warm up the frozen tissues and seek medical attention.
Ingestion	: As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact	: No specific data.
Inhalation	: No specific data.
Skin contact	: No specific data.
Ingestion	: No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician	: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: No specific treatment.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : Contains gas under pressure. Oxidizing material. This material increases the risk of fire and may aid combustion. Contact with combustible material may cause fire. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Hazardous thermal decomposition products : No specific data.

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid breathing gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous. Keep away from clothing, incompatible materials and combustible materials. Keep reduction valves free from grease and oil.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Separate from reducing agents and combustible materials. Store away from grease and oil. Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
oxygen	None.

Biological exposure indices

No exposure indices known.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance

Physical state	: Gas. [Compressed gas.]
Color	: Colorless. Blue.
Odor	: Odorless.
Odor threshold	: Not available.
pH	: Not applicable.
Melting point/freezing point	: -218.4°C (-361.1°F)
Boiling point or initial boiling point and boiling range	: -183°C (-297.4°F)
Flash point	: [Product does not sustain combustion.]
Evaporation rate	: Not available.
Flammability (solid, gas)	: Extremely flammable in the presence of the following materials or conditions: reducing materials, combustible materials and organic materials.
Lower and upper explosive (flammable) limits	: Not available.
Vapor pressure	: Not available.
Relative vapor density	: 1.1 [Air = 1]
Specific Volume (ft ³ /lb)	: 12.0482
Gas Density (lb/ft ³)	: 0.083
Relative density	: Not applicable.
Solubility in water	: Not available.
Partition coefficient: n-octanol/water	: 0.65
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
Flow time (ISO 2431)	: Not available.
Molecular weight	: 32 g/mole

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Hazardous reactions or instability may occur under certain conditions of storage or use. Conditions may include the following: contact with combustible materials Reactions may include the following: risk of causing fire
Conditions to avoid	: No specific data.
Incompatible materials	: Highly reactive or incompatible with the following materials: combustible materials reducing materials grease oil
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 10. Stability and reactivity

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Conclusion/Summary [Product] : Not available.

Skin corrosion/irritation

Not available.

Conclusion/Summary [Product] : Not available.

Serious eye damage/eye irritation

Not available.

Conclusion/Summary [Product] : Not available.

Respiratory corrosion/irritation

Not available.

Conclusion/Summary [Product] : Not available.

Respiratory or skin sensitization

Not available.

Skin

Conclusion/Summary [Product] : Not available.

Respiratory

Conclusion/Summary [Product] : Not available.

Germ cell mutagenicity

Not available.

Conclusion/Summary [Product] : Not available.

Carcinogenicity

Not available.

Conclusion/Summary [Product] : Not available.

Reproductive toxicity

Not available.

Conclusion/Summary [Product] : Not available.

Section 11. Toxicological information

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure

Not available.

Potential acute health effects

- Eye contact** : Contact with rapidly expanding gas may cause burns or frostbite.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Contact with rapidly expanding gas may cause burns or frostbite.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : No specific data.
- Ingestion** : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Potential chronic health effects

Not available.

Conclusion/Summary [Product] : Not available.

- General** : No known significant effects or critical hazards.
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity** : No known significant effects or critical hazards.
- Reproductive toxicity** : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

N/A

Section 12. Ecological information

Toxicity

Not available.

Conclusion/Summary [Product] : Not available.

Persistence and degradability

Not available.

Conclusion/Summary [Product] : Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
oxygen	0.65	-	Low

Mobility in soil

Soil/Water partition coefficient : Not available.






Other adverse effects

No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1072	UN1072	UN1072	UN1072	UN1072
UN proper shipping name	Oxygen, compressed	OXYGEN, COMPRESSED	OXIGENO COMPRIMIDO	OXYGEN, COMPRESSED	Oxygen, compressed
Transport hazard class(es)	2.2 (5.1) 	2.2 (5.1) 	2.2 (5.1) 	2.2 (5.1) 	2.2 (5.1) 
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

Section 14. Transport information

Additional information

- DOT Classification** : **Limited quantity** Yes.
Packaging instruction Exceptions: 306. Non-bulk: 302. Bulk: 314, 315.
Quantity limitation Passenger aircraft/rail: 75 kg. Cargo aircraft: 150 kg.
Special provisions 110, A14
- TDG Classification** : Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2), 2.23-2.25 (Class 5).
Explosive Limit and Limited Quantity Index 0.125
ERAP Index 3000
Passenger Carrying Road or Rail Index 75
- Mexico Classification** : **Special provisions** 355
- IMDG** : **Emergency schedules** _F-C_, _S-W_
Special provisions 355
- IATA** : **Quantity limitation** Passenger and Cargo Aircraft: 75 kg. Packaging instructions: 200. Cargo Aircraft Only: 150 kg. Packaging instructions: 200. Limited Quantities - Passenger Aircraft: Forbidden. Packaging instructions: Forbidden.
Special provisions A175, A302
- Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption:** This material is listed or exempted.

TSCA 12(b) - Chemical export notification

Not applicable.

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Refer to Section 2: Hazards Identification of this SDS for classification of substance.

State regulations

Massachusetts : This material is listed.

New York : This material is not listed.

Section 15. Regulatory information

New Jersey : This material is listed.

Pennsylvania : This material is listed.

California Prop. 65

This product does not require a Safe Harbor warning under California Prop. 65.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia	: This material is listed or exempted.
Canada	: This material is listed or exempted.
China	: This material is listed or exempted.
Eurasian Economic Union	: Russian Federation inventory : Not determined.
Japan	: Japan inventory (CSCL) : Not determined. Japan inventory (ISHL) : Not determined.
New Zealand	: This material is listed or exempted.
Philippines	: This material is listed or exempted.
Republic of Korea	: This material is listed or exempted.
Taiwan	: This material is listed or exempted.
Thailand	: This material is listed or exempted.
Turkey	: Not determined.
United States	: This material is active or exempted.
Viet Nam	: This material is listed or exempted.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	/	0
Flammability		0
Physical hazards		3

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

National Fire Protection Association (U.S.A.)

Section 16. Other information



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Procedure used to derive the classification

Classification	Justification
OXIDIZING GASES - Category 1 GASES UNDER PRESSURE - Compressed gas	Expert judgment According to package

History

Date of printing : 3/28/2025

Date of issue/Date of revision : 3/28/2025

Date of previous issue : 2/20/2024

Version : 5.06

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Monsanto

Material Safety Data

POLYCHLORINATED BIPHENYLS (PCBs)

Emergency Phone No.
(Call Collect)
314-694-1000

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **POLYCHLORINATED BIPHENYLS (PCBs)**
Aroclor® Series 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268
Therminol® FR Series

MSDS Number: M00018515

Date: 12/95

Chemical Family: Chlorinated Hydrocarbons
Chemical Name: Polychlorinated biphenyls
Synonyms: PCBs, Chlorodiphenyls, Chlorinated biphenyls

Trade Names/Common Names:

PYRANOL® and INERTEEN® are trade names for commonly used dielectric fluids that may have contained varying amounts of PCBs as well as other components including chlorinated benzenes.

ASKAREL is the generic name for a broad class of fire resistant synthetic chlorinated hydrocarbons and mixtures used as dielectric fluids that commonly contained about 30 - 70% PCBs. Some ASKAREL fluids contained 99% or greater PCBs and some contained no PCBs.

PYDRAUL® is the trade name for hydraulic fluids that, prior to 1972, may have contained varying amounts of PCBs and other components including phosphate esters.

The product names/trade names are representative of several commonly used Monsanto products (or products formulated with Monsanto products). Other trademarked PCB products were marketed by Monsanto and other manufacturers. PCBs were also manufactured and sold by several European and Japanese companies. Contact the manufacturer of the trademarked product, if not in this listing, to determine if the formulation contained PCBs.

In 1972, Monsanto restricted sales of PCBs to applications involving only closed electrical systems, (transformers and capacitors). In 1977, all manufacturing and sales were voluntarily terminated. In 1979, EPA restricted the manufacture, processing, use, and distribution of PCBs to specifically exempted and authorized activities.

MONSANTO COMPANY, 800 N. LINDBERGH BLVD., ST. LOUIS, MO 63167

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE, OR ACCIDENT
Call CHEMTREC - Day or Night - 1-800-424-9300 Toll free in the continental U.S., Hawaii, Puerto Rico, Canada, Alaska, or Virgin Islands. For calls originating elsewhere: 202-483-7616 (collect calls accepted)

For additional nonemergency information, call: 314-694-3344.

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemically, commercial PCBs are defined as a series of technical mixtures, consisting of many isomers and compounds that vary from mobile, oily liquids to white crystalline solids and hard noncrystalline resins. Technical products vary in composition, in the degree of chlorination, and possibly according to batch.

The mixtures generally used contain an average of 3 atoms of chlorine per molecule (42% chlorine) to 5 atoms of chlorine per molecule (54% chlorine). They were used as components of dielectric fluids in transformers and capacitors. Prior to 1972, PCB applications included heat transfer media, hydraulic, and other industrial fluids, plasticizers, carbonless copy paper, paints, inks, and adhesives.

<u>Component</u>	<u>CAS No.</u>
chlorinated biphenyl	1336-36-3
Aroclor 1016	12674-11-2
Aroclor 1221	11104-28-2
Aroclor 1232	11141-16-5
Aroclor 1242	53469-21-9
Aroclor 1248	12672-29-6
Aroclor 1254	11097-69-1
Aroclor 1260	11096-82-5
Aroclor 1262	37324-23-5
Aroclor 1268	11100-14-4

There are also CAS Numbers for individual PCB congeners and for mixtures of Aroclor® products.

PCBs are identified as hazardous chemicals under criteria of the OSHA Hazard Communication Standard (29 CFR Part 1910.1200). PCBs have been listed in the International Agency for Research on Cancer (IARC) Monographs (1987)-Group 2A and in the National Toxicology Program (NTP) Annual Report on Carcinogens (Seventh).

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Appearance and Odor: PCB mixtures range in form and color from clear to amber liquids to white crystalline solids. They have a mild, distinctive odor and are not volatile at room temperature. Refer to Section 9 for details.

WARNING!
CAUSES EYE IRRITATION
MAY CAUSE SKIN IRRITATION

PROCESSING AT ELEVATED TEMPERATURES MAY RELEASE VAPORS OR FUMES WHICH MAY CAUSE RESPIRATORY TRACT IRRITATION

POTENTIAL HEALTH EFFECTS

Likely Routes

of Exposure: Skin contact and inhalation of heated vapors

Eye Contact: Causes moderate irritation based on worker experience.

Skin Contact: Prolonged or repeated contact may result in redness, dry skin and defatting based on human experience. A potential exists for developing chloracne. PCBs can be absorbed through intact skin.

Inhalation: Due to the low volatility of PCBs, exposure to this material in ambient conditions is not expected to produce adverse health effects. However, at elevated processing temperatures, PCBs may produce a vapor that may cause respiratory tract irritation if inhaled based on human experience.

Ingestion: No more than slightly toxic based on acute animal toxicity studies. Coughing, choking and shortness of breath may occur if liquid material is accidentally drawn into the lungs during swallowing or vomiting.

Other: Numerous epidemiological studies of humans, both occupationally exposed and nonworker environmentally exposed populations, have not demonstrated any causal relationship between PCB exposure and chronic human illnesses such as cancer or neurological or cardiovascular effects. PCBs at high dosage can cause skin symptoms; however, these subside upon removal of the exposure source.

Refer to Section 11 for toxicological information.

4. FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. If easy to do, remove any contact lenses. Get medical attention. Remove material from skin and clothing.

IF ON SKIN, immediately flush the area with plenty of water. Wash skin gently with soap as soon as it is available. Get medical attention if irritation persists.

IF INHALED, remove person to fresh air. If breathing is difficult, get medical attention.

IF SWALLOWED, do NOT induce vomiting. Rinse mouth with water. Get medical attention. Contact a Poison Control Center. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

NOTE TO PHYSICIANS: Hot PCBs may cause thermal burn. If electrical equipment arcs between conductors, PCBs or other chlorinated hydrocarbon dielectric fluids may decompose to produce hydrochloric acid (HCl), a respiratory irritant. If large amounts are swallowed, gastric lavage may be considered.

5. FIRE FIGHTING MEASURES

Flash Point: 284 degrees F (140 degrees C) or higher depending on the chlorination level of the Aroclor product

Fire Point: 349 degrees F (176 degrees C) or higher depending on the chlorination level of the Aroclor product

NOTE: Refer to Section 9 for individual flash points and fire points.

Extinguishing

Media: Extinguish fire using agent suitable for surrounding fire. Use dry chemical, foam, carbon dioxide or water spray. Water may be ineffective. Use water spray to keep fire-exposed containers or transformer cool.

PCBs are fire-resistant compounds. They may decompose to form CO, CO₂, HCl, phenolics, aldehydes, and other toxic combustion products under severe conditions such as exposure to flame or hot surfaces.

Dielectric fluids having PCBs and chlorinated benzenes as components have been reported to produce polychlorinated dibenzo-p-dioxins (PCDDs) and furans (PCDFs) during fire situations involving electrical equipment. At temperatures in the range of 600-650 degrees C in the presence of excess oxygen, PCBs may form polychlorinated dibenzofurans (PCDFs). Laboratory studies under similar conditions have demonstrated that PCBs do not produce polychlorinated dibenzo-p-dioxins (PCDDs).

Federal regulations require all PCB transformers to be registered with fire response personnel.

If a PCB transformer is involved in a fire-related incident, the owner of the transformer may be required to report the incident. Consult and follow appropriate federal, state and local regulations.

Fire Fighting Equipment: Fire fighters and others exposed to products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Cleanup and disposal of liquid PCBs and other PCB items are strictly regulated by the federal government. The regulations are found at 40 CFR Part 761. Consult these regulations as well as applicable state and local regulations prior to any cleanup or disposal of PCBs, PCB items, or PCB contaminated items.

If PCBs leak or are spilled, the following steps should be taken immediately:

All nonessential personnel should leave the leak or spill area.

The area should be adequately ventilated to prevent the accumulation of vapors.

The spill/leak should be contained. Loss to sewer systems, navigable waterways, and streams should be prevented. Spills/leaks should be removed promptly by means of absorptive material, such as sawdust, vermiculite, dry sand, clay, dirt or other similar materials, or trapped and removed by pumping or other suitable means (traps, drip-pans, trays, etc.).

Personnel entering the spill or leak area should be furnished with appropriate personal protective equipment and clothing as needed. Refer to Section 8 for personal protection equipment and clothing.

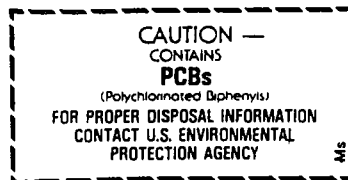
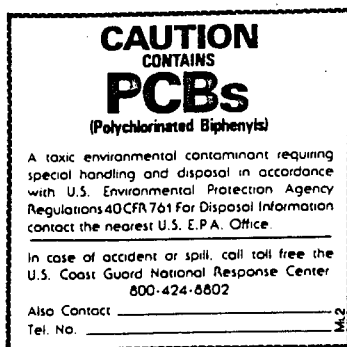
Personnel trained in emergency procedures and protected against attendant hazards should shut off sources of PCBs, clean up spills, control and repair leaks, and fight fires in PCB areas.

Refer to Section 13 for disposal information and Sections 14 and 15 for information regarding reportable quantity, and Section 7 for marking information.

7. HANDLING AND STORAGE

Care should be taken to prevent entry into the environment through spills, leakage, use vaporization, or disposal of liquid or containers. Avoid prolonged breathing of vapors or mists. Avoid contact with eyes or prolonged contact with skin. If skin contact occurs, remove by washing with soap and water. Following eye contact, flush with water. In case of spillage onto clothing, the clothing should be removed as soon as practical, skin washed, and clothing laundered. Comply with all federal, state, and local regulations.

Federal regulations under the Toxic Substances Control Act require PCBs, PCB items, storage areas, transformer vaults, and transport vehicles to be marked (check regulations, 40 CFR 761, for details).



Storage: The storage of PCB items or equipment (those containing 50 ppm or greater PCBs) and PCB waste is strictly regulated by 40 CFR Part 761. The storage time is limited, the storage area must meet physical requirements, and the area must be labeled.

Avoid contact with eyes.
Wash thoroughly after handling.
Avoid breathing processing fumes or vapors.
Process using adequate ventilation.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection: Wear chemical splash goggles and have eye baths available where there is significant potential for eye contact.

Skin Protection: Wear appropriate protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine the appropriate type glove for a given application. Wear chemical goggles, face shield, and chemical resistant clothing such as a rubber apron when splashing is likely. Wash immediately if skin is contacted. Remove contaminated clothing promptly and launder before reuse. Clean protective equipment before reuse. Provide a safety shower at any location where skin contact can occur. Wash thoroughly after handling.

ATTENTION! Repeated or prolonged skin contact may cause chloracne in some people.

Respiratory Protection: Avoid breathing vapor, mist, or dust. Use NIOSH/MSHA approved equipment when airborne exposure limits are exceeded. Full facepiece equipment is recommended when airborne exposure limits are exceeded and, if used, replaces the need for face shield and/or chemical splash goggles. Consult respirator manufacturer to determine the type of equipment for a given application. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed. High airborne concentrations may require use of self-contained breathing apparatus or supplied air respirator. Respiratory protection programs must be in compliance with 29 CFR Part 1910.134.

ATTENTION! Repeated or prolonged inhalation may cause chloracne in some people.

Ventilation: Provide natural or mechanical ventilation to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of vapor or mist, such as open process equipment.

Airborne Exposure Limits:

Product: Chlorodiphenyl (42% chlorine)

OSHA PEL: 1 mg/m³ 8-hour time-weighted average - Skin*
ACGIH TLV: 1 mg/m³ 8-hour time-weighted average - Skin*

Product: Chlorodiphenyl (54% chlorine)

OSHA PEL: 0.5 mg/m³ 8-hour time-weighted average - Skin*
ACGIH TLV: 0.5 mg/m³ 8-hour time-weighted average - Skin*

*For Skin notation see Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Government Industrial Hygienists, 1995-1996.

9. PHYSICAL AND CHEMICAL PROPERTIES

PROPERTIES OF SELECTED AROCLORS [®]							
PROPERTY	1016	1221	1232	1242	1248	1254	1260
Color (APHA)	40	100	100	100	100	100	150
Physical state	mobile oil	mobile oil	mobile oil	mobile oil	mobile oil	viscous liquid	sticky resin
Stability	inert	inert	inert	inert	inert	inert	inert
Density (lb/gal 25°C)	11.40	9.85	10.55	11.50	12.04	12.82	13.50
Specific gravity x/15.5°C	1.36-1.37 x-25°	1.18-1.19 x-25°	1.27-1.28 x-25°	1.30-1.39 x-25°	1.40-1.41 x-65°	1.49-1.50 x-65°	1.55-1.56 x-90°
Distillation range (°C)	323-356	275-320	290-325	325-366	340-375	365-390	385-420
Acidity mg KOH/g, maximum	.010	.014	.014	.015	.010	.010	.014
Fire point (°C)	none to boiling point	176	238	none to boiling point	none to boiling point	none to boiling point	none to boiling point
Flash point (°C)	170	141-150	152-154	176-180	193-196	none	none
Vapor pressure (mm Hg @ 100°F)	NA	NA	0.005	0.001	0.00037	0.00006	NA
Viscosity (Saybolt Univ. Sec. @ 100°F) (centistokes)	71-81 13-16	38-41 3.6-4.6	44-51 5.5-7.7	82-92 16-19	185-240 42-52	1800-2500 390-540	— —

NA—Not Available

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specifications for the product.

10. STABILITY AND REACTIVITY

Stability: PCBs are very stable, fire-resistant compounds.

Materials to Avoid: None

Hazardous Decomposition

Products: PCBs may decompose to form CO, CO₂, HCl, phenolics, aldehydes, and other toxic combustion products under severe conditions such as exposure to flame or hot surface.

Hazardous Polymerization: Does not occur.

11. TOXICOLOGICAL INFORMATION

Data from laboratory studies conducted by Monsanto and from the available scientific literature are summarized below.

Single exposure (acute) studies indicate:

Oral - Slightly Toxic (Rat LD50 - 8.65 g/kg for 42% chlorinated; 11.9 g/kg for 54% chlorinated)

The liquid products and their vapors are moderately irritating to eye tissues. Animal experiments of varying duration and at different air concentrations show that for similar exposure conditions, the 54% chlorinated material produces more liver injury than the 42% chlorinated material.

There are literature reports that PCBs can impair reproductive functions in monkeys. The National Cancer Institute (NCI) performed a study in 1977 using Aroclor 1254 with both sexes of rats. NCI stated that the PCB, Aroclor 1254, was not carcinogenic under the conditions of their bioassay. There is sufficient evidence in the scientific literature to conclude that Aroclor 1260 can cause liver cancer when fed to rodents at high doses. Similar experiments with less chlorinated PCB products have produced negative or equivocal results.

The consistent finding in animal studies is that PCBs produce liver injury following prolonged and repeated exposure by any route, if the exposure is of sufficient degree and duration. Liver injury is produced first, and by exposures that are less than those reported to cause cancer in rodents. Therefore, exposure by all routes should be kept sufficiently low to prevent liver injury.

Numerous epidemiological studies of humans, both occupationally exposed and nonworker environmentally exposed population, have not demonstrated any causal relationship between PCB exposure and chronic human illnesses such as cancer or neurological or cardiovascular effects. PCBs at high dosage can cause skin symptoms; however, these subside upon removal of the exposure source.

PCBs have been listed in the International Agency for Research on Cancer (IARC) Monographs (1987)-Group 2A and in the National Toxicology Program (NTP) Seventh Annual Report on Carcinogens.

12. ECOLOGICAL INFORMATION

Care should be taken to prevent entry of PCBs into the environment through spills, leakage, use, vaporization or disposal of liquid or solids. PCBs can accumulate in the environment and can adversely affect some animals and aquatic life. In general, PCBs have low solubility in water, are strongly bound to soils and sediments, and are slowly degraded by natural processes in the environment.

13. DISPOSAL CONSIDERATIONS

The disposal of PCB items or equipment (those containing 50 ppm or greater PCBs) and PCB wastes is strictly regulated by 40 CFR Part 761. For example, all wastes and residues containing PCBs (wiping cloths, absorbent material, used disposable protective gloves and clothing, etc.) should be collected, placed in proper containers, marked and disposed of in the manner prescribed by EPA regulations (40 CFR Part 761) and applicable state and local regulations.

14. TRANSPORT INFORMATION

The data provided in this section are for information only. Please apply the appropriate regulations to properly classify a shipment for transportation.

DOT Classification:	IF WEIGHT OF PCBs TO BE SHIPPED IS OVER ONE POUND, THE FOLLOWING CLASSIFICATION AND LABEL APPLY.
DOT Label:	LIQUID: Environmentally Hazardous Substance, liquid, n.o.s. (Contains PCB), 9, UN 3082, III
	SOLID: Environmentally Hazardous Substance, solid, n.o.s. (Contains PCB), 9, UN 3077, III
DOT Label:	Class: 9
DOT Reportable Quantity:	One Pound
IMO Classification:	Polychlorinated Biphenyls, IMO Class 9, UN 2315, II
	IMO Page 9034, EMS 6.1-02
IATA/ICAO Classification:	Polychlorinated Biphenyls, 9, UN2315, II

15. REGULATORY INFORMATION

For regulatory purposes, under the Toxic Substances Control Act, the term "PCBs" refers to a chemical substance limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contain such a substance (40 CFR Part 761).

TSCA Inventory: not listed.

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370): Immediate, Delayed.
SARA Section 313 Toxic Chemical(s): Listed-1993 (De Minimis concentration 0.1%).

Reportable Quantity (RQ) under DOT (49 CFR) and CERCLA Regulations: 1 lb. (polychlorinated biphenyls) PCBs.

Release of more than 1 (one) pound of PCBs to the environment requires notification to the National Response Center (800-424-8802 or 202-426-2675).

Various state and local regulations may require immediate reporting of PCB spills and may also define spill cleanup levels. Consult your attorney or appropriate regulatory officials for information relating to spill reporting and spill cleanup.

16. OTHER INFORMATION

Reason for revision: Conversion to the 16 section format. Supersedes MSDS dated 10/88.

Therminol®, Aroclor® and Pydraul® are registered trademarks of Monsanto Company
Pyranol® is a registered trademark of General Electric Company
Inerteen® is a registered trademark of Westinghouse Electric Corporation

FOR ADDITIONAL NONEMERGENCY INFORMATION, CONTACT:

Gary W. Mappes
Manager, Product & Environmental Safety

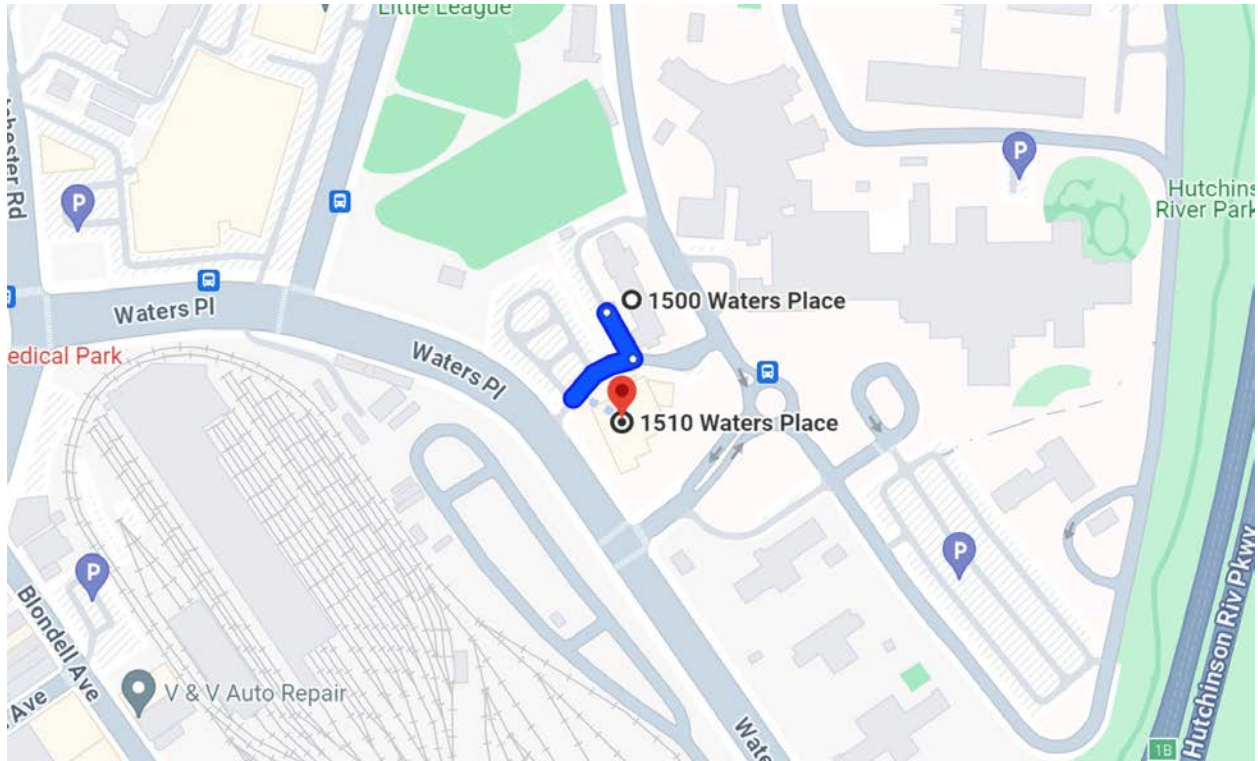
Robert G. Kaley, II
Director, Environmental Affairs

Monsanto Company
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St. Louis, MO 63167
(314) 694-3344

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APPENDIX G
MAPS AND DIRECTIONS TO THE CLOSEST HOSPITALS

CLOSEST HOSPITAL AND DIRECTIONS: MONTEFIORE HOSPITAL



1 min (226 ft)

Fastest route to 1500 Waters Place Bronx, New York 10461

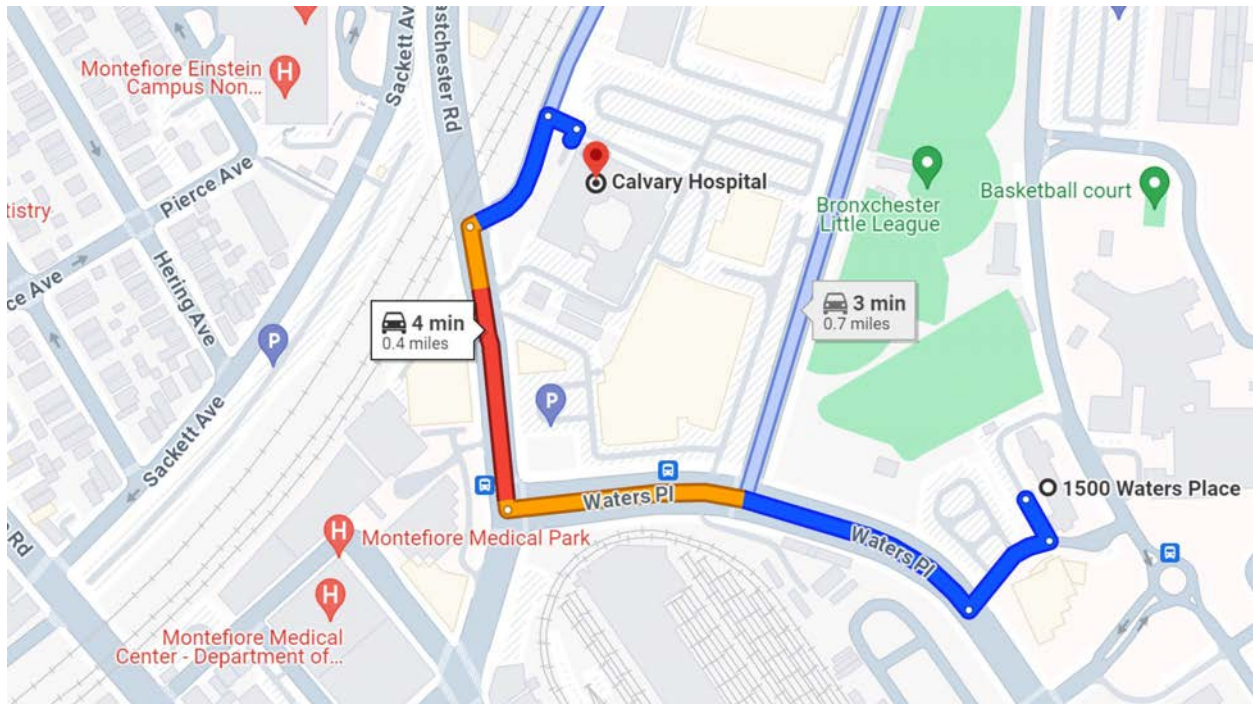
Head southeast 95 feet

Turn right

Destination will be 131 feet ahead on the left

1510 Waters Place Bronx, New York 10461

SECOND CLOSEST HOSPITAL AND DIRECTIONS: CAVALRY HOSPITAL



4 min (0.4 mile)

Fastest Route via Waters Place and Eastchester Road to 1500 Waters Place Bronx, New York 10461

Head southeast toward Waters Place 95 feet

Turn right toward Waters Place 217 feet

Turn right onto Waters Place 0.2 miles

Turn right onto Eastchester Road 0.1 miles

Turn right onto Bassett Avenue 282 feet

Turn right 62 feet

Turn right 23 feet

Calvary Hospital

1740 Eastchester Road, Bronx, New York 10461

APPENDIX 5

COMMUNITY AIR MONITORING PLAN

COMMUNITY AIR MONITORING PLAN
FOR

TRANSFORMER ROOMS NOS. 1 & 2 – BLDG. 1
BRONX PSYCHIATRIC CENTER
1500 WATERS PLACE, BRONX, NY 10461
DASNY PROJECT NUMBER 3816609999

Prepared For:



New York State Office of Mental Health
75 New Scotland Avenue
Albany, NY 12208

Prepared by:
TRC Engineers, Inc.
1407 Broadway, 33rd Floor
New York, New York 10018
Phone: (212) 221-7822
TRC Project No. 411323.0000.0022

January 2026



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3.0	AIR MONITORING PROTOCOL	3
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4.0	REPORTING.....	5

1.0 INTRODUCTION

In accordance with the Remedial Work Plan, this Community Air Monitoring Plan (CAMP) is developed for utilization during ground intrusive work activities at Transformer Room No. 1 and Transformer Room No. 2 located inside Building No. 1 (Medical Surgical Building 101 (Thomson Building), located at the Bronx Psychiatric Center located at 1500 Waters Place in Bronx County of New York City, tax block 4226, lot 30. (referred to as the “Site”).

TRC Engineers, Inc. (TRC) developed this CAMP to describe the procedures for real-time air monitoring for particulate levels, which will be completed during slab removal, excavation, material handling, and off-site transport. Continuous monitoring and observations will be required during ground intrusive activities. This CAMP was developed based on the requirements of the New York State Department of Health (NYSDOH) Generic CAMP, Appendix 1A and Fugitive Dust and Particulate Monitoring, Appendix 1B, of the New York State Department of Environmental Conservation (NYSDEC) DER-10.

2.0 PURPOSE

The Community Air Monitoring Plan (CAMP) requires real-time monitoring for particulates (i.e., dust) at the downwind perimeter of the work area at the Site.

Transformer Rooms 1 and 2 are located in the basement of an unoccupied building and are secluded from the public. Each Transformer Room has an egress on the basement level with dedicated exterior stairs from the basement level directly to the ground level, which is the primary pathway for remedial work and waste removal for basement Transformer Rooms 1 and 2. During the intrusive remedial activities, the front primary pathway entrance to the basement will be isolated (e.g. polyvinyl plastic sheeting (curtain wall) to prevent dust from leaving the work area). Polyvinyl plastic sheeting (curtain wall) will be installed at each exterior doorway during intrusive work. Soil and concrete will be transported to roll-off containers on the ground level via the exterior stairwells, and bins utilized to transport soil and concrete will be covered during transport to the roll-off.

There is a potential for dust emissions to impact the community during the transport of soil and concrete into roll-off containers or during off-site transport. Therefore, as a precautionary measure, an exterior dust monitor will be positioned at a downwind location at the exterior doorway nearest to the work during the transport of soil or concrete outside of the building.

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 businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of ground intrusive 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 do not spread contamination off-site through the air.

3.0 AIR MONITORING PROTOCOL

A qualified environmental monitor with “stop work authority” will be responsible for air monitoring and daily calibration and maintenance of the equipment in accordance with the manufacturer’s specifications. All instrumentation and equipment will be maintained at all times in proper operating condition. The qualified environmental monitor will be responsible for documenting in the dedicated project log book each calibration event, any equipment and instrument malfunctions, unusual conditions, air monitoring station locations, and any exceedances of action levels and countermeasures implemented. Copies of the manufacturers’ owner’s manuals for monitoring instrumentation to be used are included as *Appendix A*.

3.1 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind locations of the perimeter of the Site 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 (i.e., TSI DustTrak Model 8530). 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 ($\mu\text{g}/\text{m}^3$) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed $150 \mu\text{g}/\text{m}^3$ above the upwind level and provided that no visible dust is migrating from the work area. Note that dust complaints from any owner of an adjacent or nearby property will be managed by the Contractor in a manner equivalent to an exceedance of an action level in the CAMP.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than $150 \mu\text{g}/\text{m}^3$ above the upwind level, work will be stopped, and a re-evaluation of activities will be initiated. Work will be able to be resumed provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within $150 \mu\text{g}/\text{m}^3$ of the upwind level and in preventing visible dust migration.

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

4.0 REPORTING

Any exceedance of a CAMP threshold or action level will be reported to the NYS Office of Mental Health, NYSDEC, and NYSDOH immediately and additionally via email within 4 hours of the time it is recorded. The report will include the instrument readings; location of the monitoring station where the exceedance was recorded; readings at upwind locations; date, time, and duration of elevated readings (i.e., number of 15 minute time-weighted exceedances); activities being performed at the time of the exceedances; and descriptions of countermeasures implemented to control the exceedance and prevent future occurrences.

At the completion of each workday, the data recorded from each air monitoring station will be downloaded onto a dedicated field computer and evaluated by the qualified environmental monitor. All readings will be recorded and will be available for State (NYSDEC and NYSDOH) personnel to review.

APPENDIX A
MANUFACTURERS' OWNER'S MANUALS

DustTrak™ II Aerosol Monitor



Model 8530/8530EP/8532

Operation and Service Manual

P/N 6001893, Revision W
April 2023



DustTrak™ II 8530 Desktop and 8532 Handheld Monitors



DustTrak™ II 8530EP Monitor

Start Seeing the Benefits of Registering Today!

Thank you for your TSI® instrument purchase. Occasionally, TSI® releases information on software updates, product enhancements and new products. By registering your instrument, TSI® will be able to send this important information to you.

<http://register.tsi.com>

As part of the registration process, you will be asked for your comments on TSI products and services. TSI's customer feedback program gives customers like you a way to tell us how we are doing.

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Address

TSI Incorporated / 500 Cardigan Road / Shoreview, MN 55126 / USA

Fax No.

(651) 490-3824

Limitation of Warranty and Liability (effective April 2014)

(For country-specific terms and conditions outside of the USA, please visit www.tsi.com.)

Seller warrants the goods, excluding software sold hereunder, under normal use and service as described in the operator's manual, shall be free from defects in workmanship and material for twenty-four (24) months, or if less, the length of time specified in the operator's manual, from the date of shipment to the customer. This warranty period is inclusive of any statutory warranty. This limited warranty is subject to the following exclusions and exceptions:

- a. Hot-wire or hot-film sensors used with research anemometers, and certain other components when indicated in specifications, are warranted for 90 days from the date of shipment;
- b. DustTrak internal pump for Models 8530 and 8533 is warranted for two (2) years or 4000 hours, whichever comes first;
- c. DustTrak external pump for Models 8530EP and 8533EP is warranted for two (2) years or 8760 hours, whichever comes first;
- d. DustTrak internal pump for Models 8530 and 8533 is warranted for operation within ambient temperatures between 5–45°C. Warranty is void when the internal pump is operating outside of this temperature range;
- e. Parts repaired or replaced as a result of repair services are warranted to be free from defects in workmanship and material, under normal use, for 90 days from the date of shipment;
- f. Seller does not provide any warranty on finished goods manufactured by others or on any fuses, batteries or other consumable materials. Only the original manufacturer's warranty applies;
- g. This warranty does not cover calibration requirements, and seller warrants only that the instrument or product is properly calibrated at the time of its manufacture. Instruments returned for calibration are not covered by this warranty;
- h. This warranty is **VOID** if the instrument is opened by anyone other than a factory authorized service center with the one exception where requirements set forth in the manual allow an operator to replace consumables or perform recommended cleaning;
- i. This warranty is **VOID** if the product has been misused, neglected, subjected to accidental or intentional damage, or is not properly installed, maintained, or cleaned according to the requirements of the manual. Unless specifically authorized in a separate writing by Seller, Seller makes no warranty with respect to, and shall have no liability in connection with, goods which are incorporated into other products or equipment, or which are modified by any person other than Seller.

The foregoing is **IN LIEU OF** all other warranties and is subject to the **LIMITATIONS** stated herein. **NO OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. WITH RESPECT TO SELLER'S BREACH OF THE IMPLIED WARRANTY AGAINST INFRINGEMENT, SAID WARRANTY IS LIMITED TO CLAIMS OF DIRECT INFRINGEMENT AND EXCLUDES CLAIMS OF CONTRIBUTORY OR INDUCED INFRINGEMENTS. BUYER'S EXCLUSIVE REMEDY SHALL BE THE RETURN OF THE PURCHASE PRICE DISCOUNTED FOR REASONABLE WEAR AND TEAR OR AT SELLER'S OPTION REPLACEMENT OF THE GOODS WITH NON-INFRINGEMENTS GOODS.**

TO THE EXTENT PERMITTED BY LAW, THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF SELLER'S LIABILITY FOR ANY AND ALL LOSSES, INJURIES, OR DAMAGES CONCERNING THE GOODS (INCLUDING CLAIMS BASED ON CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) SHALL BE THE RETURN OF GOODS TO SELLER AND THE REFUND OF THE PURCHASE PRICE, OR, AT THE OPTION OF SELLER, THE REPAIR OR REPLACEMENT OF THE GOODS. IN THE CASE OF SOFTWARE, SELLER WILL REPAIR OR REPLACE DEFECTIVE SOFTWARE OR IF UNABLE TO DO SO, WILL REFUND THE PURCHASE PRICE OF THE SOFTWARE. IN NO EVENT SHALL SELLER BE LIABLE FOR LOST PROFITS, BUSINESS INTERRUPTION OR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR INCIDENTAL DAMAGES. SELLER SHALL NOT BE RESPONSIBLE FOR INSTALLATION, DISMANTLING OR REINSTALLATION COSTS OR CHARGES. No Action, regardless of form, may be brought against Seller more than 12 months after a cause of action has accrued. The goods returned under warranty to Seller's factory shall be at Buyer's risk of loss, and will be returned, if at all, at Seller's risk of loss.

Buyer and all users are deemed to have accepted this LIMITATION OF WARRANTY AND LIABILITY, which contains the complete and exclusive limited warranty of Seller. This LIMITATION OF WARRANTY AND LIABILITY may not be amended, modified or its terms waived, except by writing signed by an Officer of Seller.

Service Policy

Knowing that inoperative or defective instruments are as detrimental to TSI as they are to our customers, our service policy is designed to give prompt attention to any problems. If any malfunction is discovered, please contact your nearest sales office or representative, or call TSI's Customer Service department at (800) 680-1220 (USA) or (001 651) 490-2860 (International) or visit www.tsi.com.

Trademarks

TSI and TSI logo are registered trademarks of TSI Incorporated in the United States and may be protected under other country's trademark registrations. DustTrak and TrakPro are trademarks of TSI Incorporated. Microsoft, Excel, and Windows are registered trademarks of Microsoft Corporation.

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These Application Notes can also be found on TSI® Incorporated's web site:
<https://www.tsi.com>

[*EXPMN-001 DustTrak II Theory of Operation.pdf*](#)
[*EXPMN-003 DustTrak II Impactor.pdf*](#)

Safety Information

IMPORTANT NOTICE

There are no user serviceable parts inside the instrument. Refer all repair and maintenance to a qualified factory-authorized technician. All maintenance and repair information in this manual is included for use by a qualified factory-authorized technician.

Laser Safety

- The Model 8530/8532 DustTrak™ II monitor is a Class I laser-based instrument.
- During normal operation, you will **not** be exposed to laser radiation.
- Precaution should be taken to avoid exposure to hazardous radiation in the form of intense, focused, visible light.
- Exposure to this light may cause blindness.

Take these precautions:

- **DO NOT** remove any parts from the DustTrak™ II monitor unless you are specifically told to do so in this manual
- **DO NOT** remove the housing or covers. There are no serviceable components inside the housing.



WARNING

The use of controls, adjustments, or procedures other than those specified in this manual may result in exposure to hazardous optical radiation.



WARNING

There are no user-serviceable parts inside this instrument. The instrument should only be opened by TSI® or a TSI® approved service technician.



WARNING

If the DustTrak™ monitor is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

When operated according to the manufacturer's instruction, this device is a Class I laser product as defined by U.S. Department of Health and Human Services standards under the Radiation Control for Health and Safety Act of 1968. A certification and identification label like the one shown below is affixed to each instrument.

Labels

Advisory labels and identification labels are attached to the instrument.

<p>1. Serial Number Label (bottom)</p>	
<p>2. Laser Radiation Label (internal)</p>	<p>DANGER! VISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM WARNING: NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL</p>
<p>3. Battery label</p>	<p>!!WARNING!! THIS INSTRUMENT WAS DESIGNED TO USE ONLY TSI SUPPLIED BATTERIES, PN 801680 or !!WARNING!! THIS INSTRUMENT WAS DESIGNED TO USE ONLY TSI SUPPLIED BATTERIES, PN 801680</p>
<p>4. European symbol for non-disposable item. Item must be recycled.</p>	

Description of Caution/Warning Symbols

Appropriate caution/warning statements are used throughout the manual and on the instrument that require you to take cautionary measures when working with the instrument.

Caution



CAUTION
Failure to follow the procedures prescribed in this manual might result in irreparable equipment damage. Important information about the operation and maintenance of this instrument is included in this manual.

Warning



WARNING
Warning means that unsafe use of the instrument could result in serious injury to you or cause damage to the instrument. Follow the procedures prescribed.

Caution and Warning Symbols



The following symbols may accompany cautions and warnings to indicate the nature and consequences of hazards:

	Warns that the instrument contains a laser and that important information about its safe operation and maintenance is included in the manual.
	Warns that the instrument is susceptible to electro-static discharge (ESD) and ESD protection should be followed to avoid damage.
	Indicates the connector is connected to earth ground and cabinet ground.

Reusing and Recycling



As part of TSI® Incorporated's effort to have a minimal negative impact on the communities in which its products are manufactured and used:

-  **DO NOT** dispose of used batteries in the trash. Follow local environmental requirements for battery recycling.
-  If instrument becomes obsolete, return to TSI for disassembly and recycling.

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Chapter 1

Unpacking and Parts Identification

Carefully unpack the Model 8530/8532 DustTrak™ II Aerosol Monitor from the shipping container. Use the tables and illustrations below to make certain that there are no missing components. Contact [TSI®](#) immediately if anything is missing or damaged.

NOTICE

If you purchased a DustTrak™ II Model 8530-NA (no accessories) Aerosol Monitor, it only comes with the following items:






- DustTrak™ II Model 8530 Aerosol Monitor
- Operations manual
- TrakPro™ Data Analysis Software CD
- One-year calibration certificate
- Service paperwork
- 2-year warranty

All accessories for the DustTrak™ II Model 8530 Aerosol Monitor are sold separately. Contact TSI® at (800) 680-1220 for information on accessories and how to purchase them through a TSI® sales representative.

(continued on next page)








Unpacking the DustTrak™ II Aerosol Monitor




Compare all the components you received with those listed in the table below. If any parts are missing, contact [TSI®](https://tsi.com).

Item	Qty	Part Number	Description
 or 	1	8530	Desktop II
		8532	Handheld II
	1	801670	Desktop II Carrying Case
		801669	Handheld II Carrying Case
	1	1090014	Data Analysis Software CD-ROM
		(Software is also available for download from the TSI® website at https://tsi.com/software .)	
	1	800663	Zero Filter

Item	Qty	Part Number	Description
	1	801680	7800 mAh Lithium Ion Rechargeable Battery (Desktop)
<p>or</p>		801681	Rechargeable lithium ion battery (Handheld)
	1	1303740	USB cable
	1	801652	Analog/alarm output cable (Desktop models only)
	1	6001893	Operation and Service Manual
	1	N/A	Calibration Certificate

Item	Qty	Part Number	Description
	1	801688	Conductive Tubing
	1	801668	Filter removal tool (Spanner Driver)
	4	801673	Spare Internal Filter Elements Desktop Model Only
	2		37-mm filter includes: Filter body top Filter body bottom Mesh screen
	1		Comes with 37-mm cartridge opening tool
	8	801666	Spare Internal Filters Handheld Model Only
	1	801667	Impactor Kit PM _{2.5} assembled Top Bottom Impactation Plate PM _{1.0} Top PM _{4.0} Top PM ₁₀ Top Extra Impactation Plate
	1	801691	Dorr-Oliver Cyclone

Item	Qty	Part Number	Description
	1	801684	Power Supply – Desktop
		801694	Power Supply – Handheld
	2	N/A	Stylus
		When shipped, one stylus will be in the accessory bag, the second stylus attached to instrument.	
	1	3012094	Screwdriver, dual ended. (For Handheld Models only)
	1	801674	Impactor Oil
	2	801698	Inlet cap
		When shipped, one inlet will be in the accessory bag, the second inlet attached to instrument.	
	1	801675	External Pump Kit for 8530EP only

Item	Qty	Part Number	Description
	1	801797	External Pump Power Cable (to DustTrak™ monitor) <i>for 8530EP only</i>
	1	801798	External Pump Flow Tube (to DustTrak™ monitor) <i>for 8530EP only</i>
	1		Exhaust Adapter, DustTrak™ monitor <i>for 8530EP only</i>

Optional Accessories

The following photos and table list optional accessories. If you ordered optional accessories, make certain they have been received and are in working order.

Accessories	Qty	Part Number	Description
	1	801675	External Pump Kit
	2	801795	DustTrak™ II/DRX External Pump Service Kit for 8530EP only. Contains two filters for External Pump
	1	801685	Battery Charger, 2-Bay, Battery 801680 for Desktop DustTrak™ monitor
	1	801686	Battery Charger, Battery 801681 for Handheld DustTrak™ monitor

Parts Identification for the DustTrak™ II Desktop Aerosol Monitor Models 8530

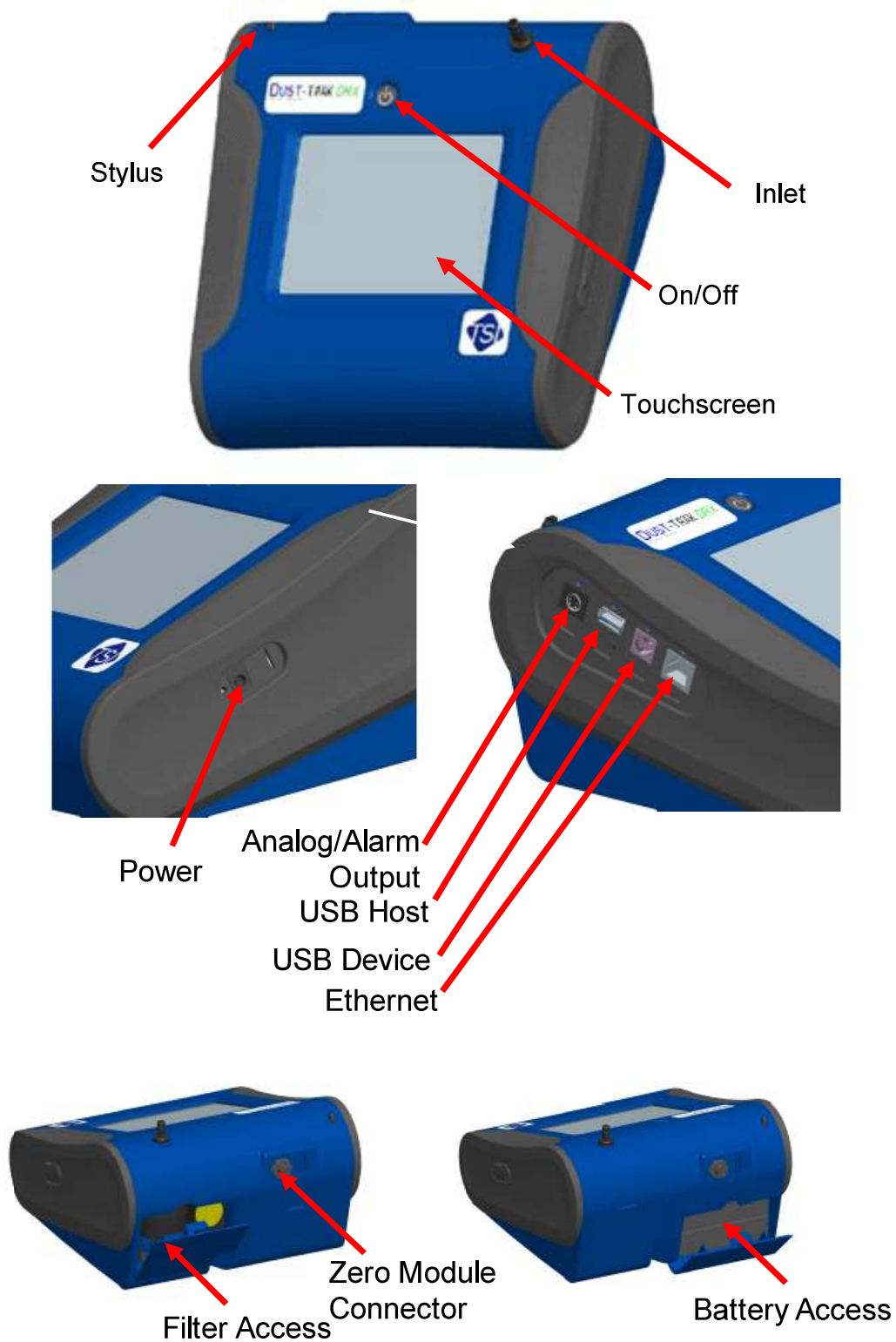
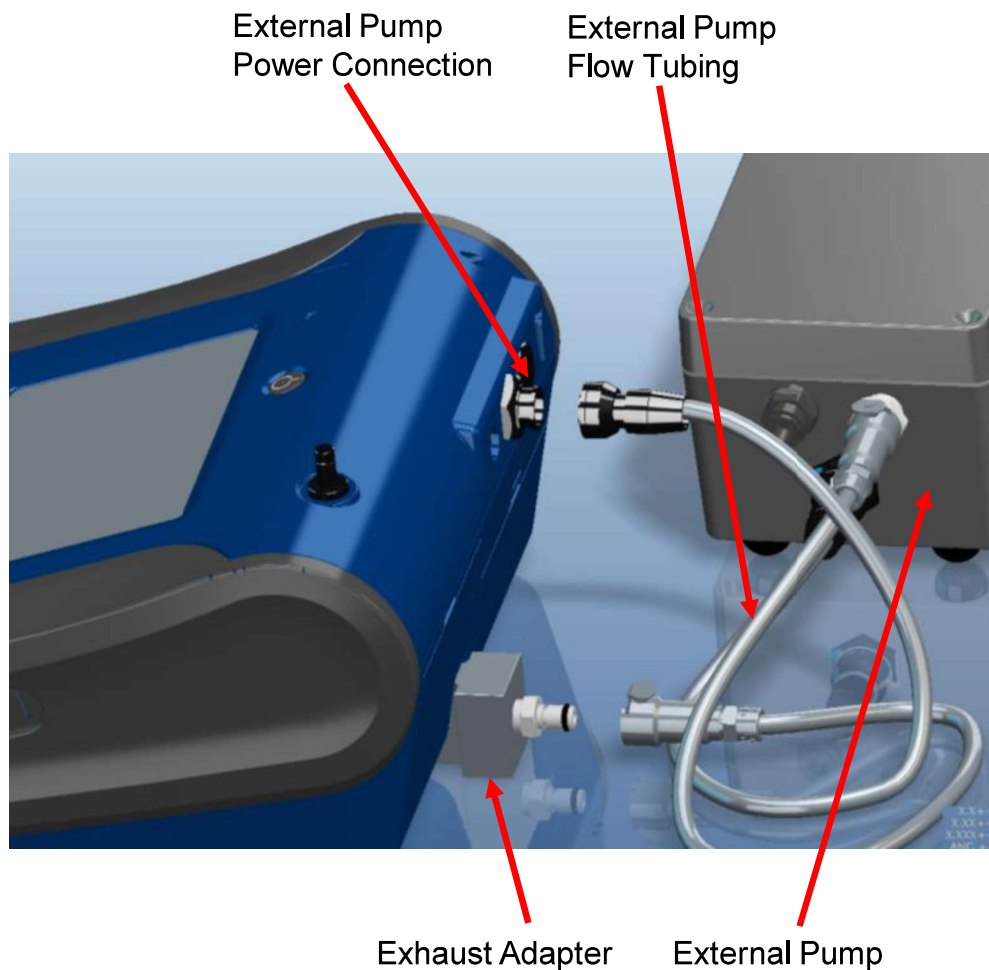


Figure 1-1: Features on Desktop Model 8530

Parts Identification for the DustTrak™ II Desktop Aerosol Monitor Model 8530EP



External Pump Module (8530EP only)

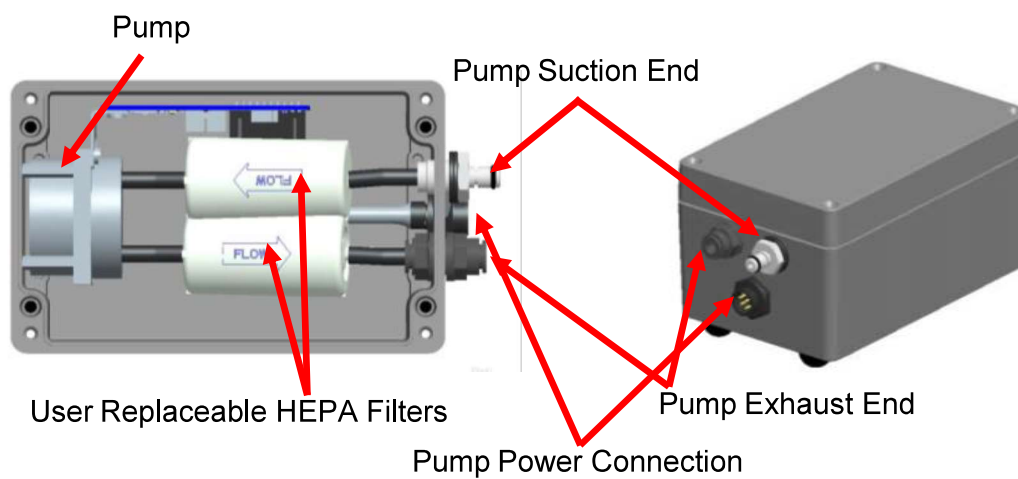


Figure 1-2: Features on Desktop Model 8530EP

Parts Identification for the DustTrak™ II Handheld Aerosol Monitor Model 8532

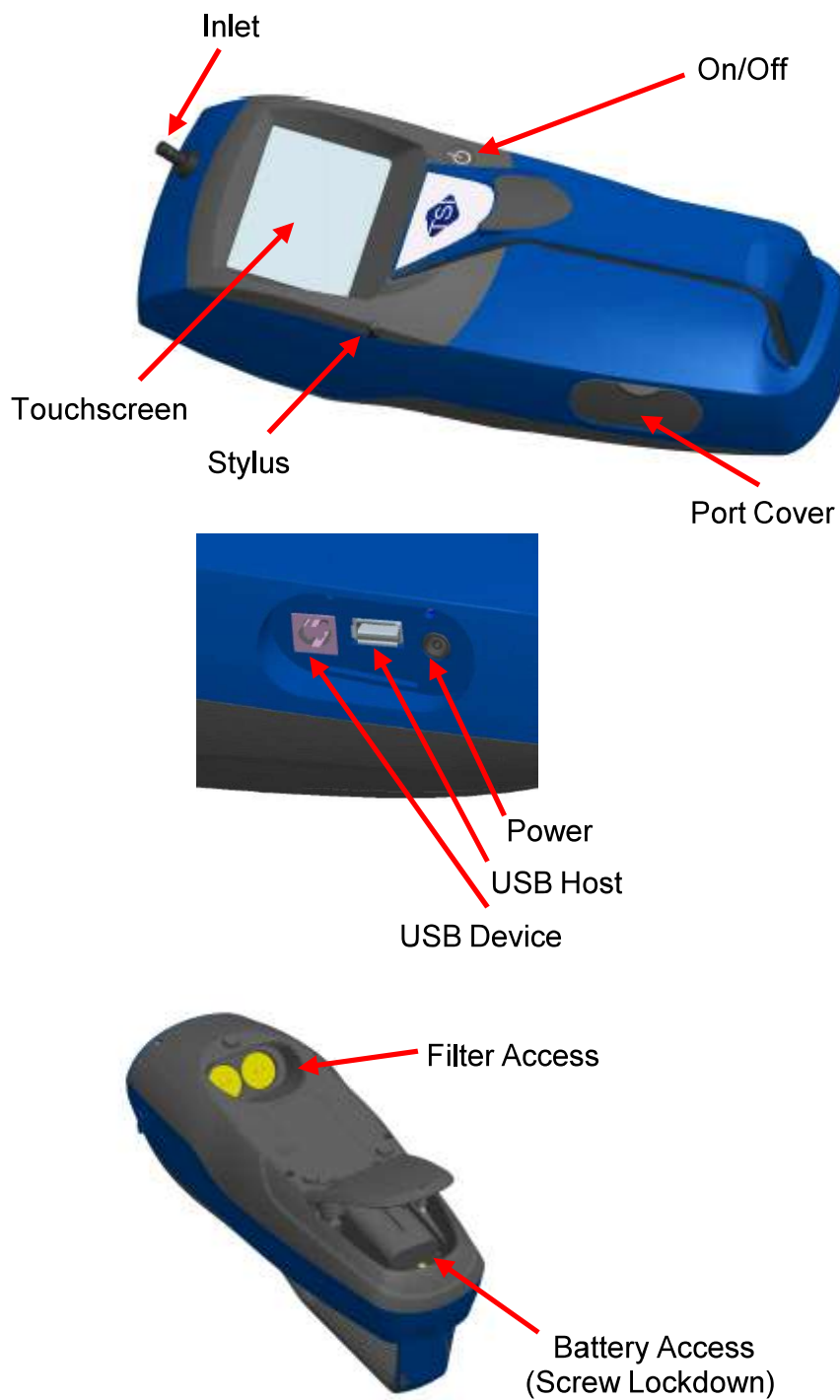


Figure 1-3: Features on Handheld Model

Chapter 2

Setting Up

Supplying Power to the DustTrak™ II Aerosol Monitor

The DustTrak™ II Aerosol Monitor must be powered by either batteries or using the external AC adapter.



WARNING

The instrument has been design to be used with batteries supplied by TSI®. **DO NOT** use a substitute.

Disposing of old batteries must be recycled in accordance with the local environmental regulations.



WARNING

DO NOT use non-rechargeable batteries in this instrument. Fire, explosions, or other hazards may result.

Installing the Batteries in Model 8530/8530EP Desktop

Remove the battery cover and slide one or two batteries into the battery slots. A single battery can be put into either slot. Orient the batteries with the label side facing up (see Figure 2-1).



Figure 2-1: Batteries into Desktop Unit

Installing the Batteries in Model 8532 Handheld

Remove the battery cover by loosening captured screw on the bottom of the unit. Orient battery with brass connectors facing forward. Insert battery into cavity and slide forward to engage into pins. Replace the battery cover and secure by tightening screw (see Figure 2-2).



Figure 2-2: Batteries into Handheld Unit

Connecting the External Pump to DustTrak™ Model 8530EP

The Model 8530EP is a Desktop DustTrak™ monitor with an external pump. This DustTrak™ monitor has no internal pump and will not work with any other external pump other than the one provided by TSI® (P/N 801675). The Model 8530EP is intended for applications where the DustTrak monitor is operated continuously over extended periods (several days to months) under wide temperature fluctuations (0 to 50°C). The external pump is designed to be more robust for 24/7 operation of the DustTrak monitor and is warranted to operate continuously for one full year or 8760 hours. The Model 8530EP is ideal for fugitive dust monitoring.

The pump and the DustTrak monitor come separately and require assembly. Follow the steps below to connect the pump with the Model 8530EP DustTrak monitor.



WARNING

Turn the DustTrak monitor OFF before connecting the external pump. Turn the DustTrak monitor ON only after connecting the External Module.

1. Connect the pump end of the quick connect to the pump module (see Figure 2-3).



Figure 2-3: Connect Pump End of Quick Connect to Pump Module

2. Likewise, plug one end of the power connector to the pump module as shown above. Turn the power connector until it clicks and locks in place. This prevents the connector from disconnecting due to vibration or movement.



Figure 2-4: Connect Exhaust Adapter to Exhaust of DustTrak Monitor

3. Connect the exhaust adapter to the exhaust of the DustTrak™ monitor (see Figure 2-4).
4. Connect the other end of the flow tubing to the exhaust adapter of the DustTrak™ monitor.
5. Connect the other end of the power connector to the DustTrak™ monitor (see Figure 2-5).

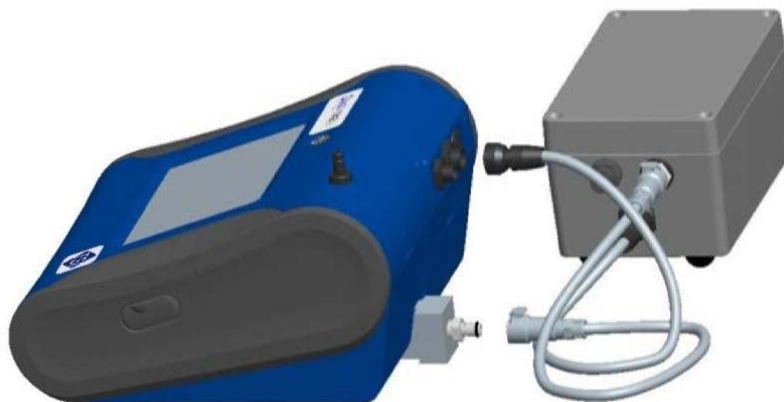


Figure 2-5: Connect Power Connector to DustTrak Monitor



WARNING

The Pump module design does not allow for installation outdoors without any protection from the elements. Always operate it within an enclosure.

The DustTrak™ external pump module **DOES NOT** require an A/C adapter. It is always powered off the DustTrak™ monitor.

NOTICES

1. The power connector and the flow quick connect “click” when securely connected. The power connector must be rotated clockwise past the locking pin.
2. **DO NOT** hot-plug the External Pump Module when the DustTrak™ monitor is turned ON. Always connect the External Pump module first and then turn the DustTrak monitor ON.
3. TSI® recommends that the DustTrak monitor with the external pump be operated in the Model 8535 Environmental Enclosure.
4. TSI® recommends that the pump module be operated when mounted on its feet and avoid operating at other orientations as much as possible.
5. Pump module and the DustTrak monitor should be at the same electrical potential.
6. The additional port on the external pump module is where the pump exhausts the flow. For applications where the DustTrak monitor is sampling from a chamber or a duct at pressures significantly different from the ambient, TSI® recommends plumbing the exhaust of the external pump back in to the chamber/duct.

Using the AC Adapter to Run Instrument

The AC adapter allows you to power the DustTrak monitor from an AC wall outlet. When using the AC adapter, the batteries (if installed) are bypassed.

Battery Charging

This instrument will charge the Lithium Ion battery packs. Insert the batteries into the battery compartment, plug the instrument into AC power, and turn the instrument on. Batteries will charge only when the instrument is on and in stand-by mode. Batteries will not charge if the instrument is turned off or is actively taken measurements. Charging will stop when the batteries are fully charged.



CAUTION

When Charging Battery the ambient temp **MUST NOT** exceed 42°C.

Inlet Cap

When using the DustTrak™ monitor to sample environmental air, the inlet cap should be put over the instrument. This cap will keep large objects from dropping into and plugging the inlet. The cap will also keep direct light from shining into the chamber and skewing the results.

The inlet cap can simply be pressed onto the instruments inlet.



Figure 2-6: Putting on Inlet Cap

Size-Selective Impactors

Size-selective impactors can be attached to the inlet of the DustTrak II instruments. Size-selective impactors can be used to pre-condition the size range of the particles entering the instrument. PM₁, PM_{2.5}, PM₄ (Respirable) and PM₁₀ impactors are available. **The instrument must run at the factory default setting of 3.0 L/min for the impactors to achieve the correct cut points.**

The size-selective impactor is composed of three parts; the cap, impaction plate and bottom. Selection of the cap will determine cut size of the impactor. Each cap is labeled with the particle cut size (1 μ m, 2.5 μ m, 4.0 μ m or 10 μ m). The same impaction plate and bottom are used on all impactor sizes.

The impactor assembly is attached to the instrument in place of the inlet cap. The inlet cap does not need to be used if an impactor is being used. See [Chapter 4, "Maintenance,"](#) for instructions on how to add oil to the impaction plate.

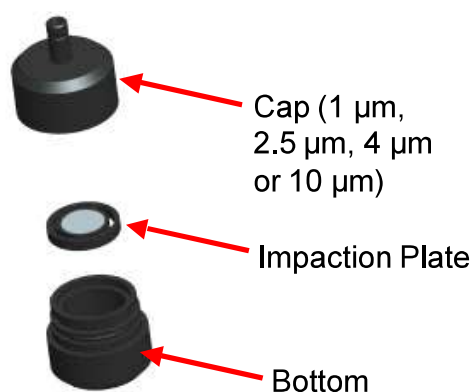


Figure 2-7:
Size-Selective Impactor

Dorr-Oliver Cyclone

A Dorr-Oliver cyclone is shipped with the instrument. The Dorr-Oliver cyclone removes particles over 4.0 μm in size. The Dorr-Oliver cyclone is attached to the instrument by sliding the cyclone clip over the protruding catch. The tube from the Dorr-Oliver cyclone needs to be routed to the inlet of the instrument.



Figure 2-8: Installing Dorr-Oliver Cyclone

DO NOT use Inlet attachments (impactors or inlet cap) when using the Dorr-Oliver Cyclone. **The instrument flow rate must be changed to 1.7 L/min when using the Dorr-Oliver Cyclone in order to achieve a 4 μm (respirable) cut-point.** See the [Flow Cal](#) instructions in the Operations chapter for instructions on how to change the instruments flow rate.

Instrument Setup

The DustTrak™ II monitor can be connected to a computer to download data and upload sampling programs.

Connecting to the Computer

Connect the USB host port of a Microsoft® Windows®-based computer to the USB device port on the side of the DustTrak monitor.

Installing TrakPro™ Data Analysis Software

TrakPro™ software can preprogram the DustTrak™ monitor, download data, view and create raw data and statistical reports, create graphs, and combine graphs with data from other TSI® instruments that use TrakPro™ software. The following sections describe how to install the software and set up the computer.

NOTICE

To use TrakPro software with the DustTrak™ Aerosol Monitor, the PC must be running Microsoft® Windows® and the computer must have an available Universal Serial Bus (USB) port.

®Microsoft and Windows are registered trademarks of Microsoft Corporation.

1. Insert the TrakPro™ Data Analysis Software CD into the CD-ROM drive. The install screen starts automatically.

NOTICE

If the software does not start automatically after a few minutes, manually run the program listed on the label of the CD using the **Run** command on the Windows® Start Menu.

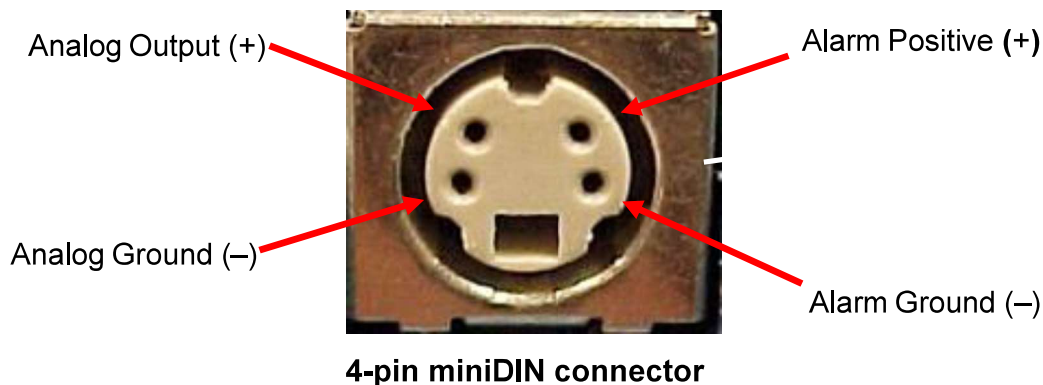
2. Follow the directions to install TrakPro™ software.
 - Software is also available for download from the TSI® website at <https://tsi.com/software>. Follow online instructions to download software.

TrakPro™ software contains a comprehensive installation guide. TSI® recommends printing out this guide prior to starting the TrakPro software installation on your computer, so it may be consulted during the installation. The TrakPro Software manual is located in the “Help” file in TrakPro software. There is no separately printed TrakPro Data Analysis software manual.

Connecting Analog/Alarm Output

The Analog/Alarm Output Cable plugs into the alarm connection on the side of the instrument. This feature is on the desktop model 8530 only.

The cable contains a 4-pin, mini-DIN connector. The pin-outs for the connector and the wiring for the cable are shown below.



Cable Wiring Diagram	
Brown Wire	Analog Ground
Orange Wire	Analog Out
Red Wire	Alarm (+)
White Wire	Alarm (-)
Black Wire	Shield

Figure 2-9: Cable Wiring Diagram

Wiring the Analog Output

System specifications:

- Output voltage: 0 to 5 VDC. With a maximum output of 15 mA.
- Output Current 4 mA to 20 mA with a maximum load impedance of 250 ohms.
- Correct polarity must be observed (see pin-outs above).

The output cable supplied by TSI® (P/N 801652) is labeled with the pin-out wiring diagram. Additional equipment may be needed for making connections to the system that TSI® does not supply. It is your responsibility to specify and supply all additional equipment.

Wiring the Alarm

System specifications:

- Maximum voltage: 15 VDC (**DO NOT USE AC POWER**)
- Maximum current: 1 Amp
- Correct polarity must be observed (see pin-outs above)
- The alarm switch, located inside the DustTrak™ monitor must be located on the ground side of the alarm system.



WARNING

The DustTrak™ monitor Alarm Output function **SHOULD NOT** be used to detect hazardous conditions or to provide an alarm for protecting human life, health or safety.



WARNING

The alarm switch **MUST NOT** be wired to AC power! Failure to install the user alarm properly could damage the DustTrak™ instrument and/or void the instrument warranty! Please read and follow all instructions before wiring or operating the user alarm.



WARNING

When connected to the analog out and alarm out connector, you **MUST** use safety certified equipment and/or power sources.

Chapter 3

Operation

Getting Started

The **START UP** screen is displayed initially when the instrument is turned on, following the initial TSI® logo splash screen.



Use a stylus or fingertip, touch the “buttons” on the screen to activate different menus.

For Model DustTrak™ 8530EP only

NOTICE

Always setup and operate the DustTrak™ monitor with External Pump Module with the External Pump Module connected to the DustTrak™ monitor. Failure to do so will result in communication errors.

Communication errors take place under four different scenarios as follows:

1. When the unit is idle and **IS NOT** connected to the External Pump Module, a warning displays on the Main screen.

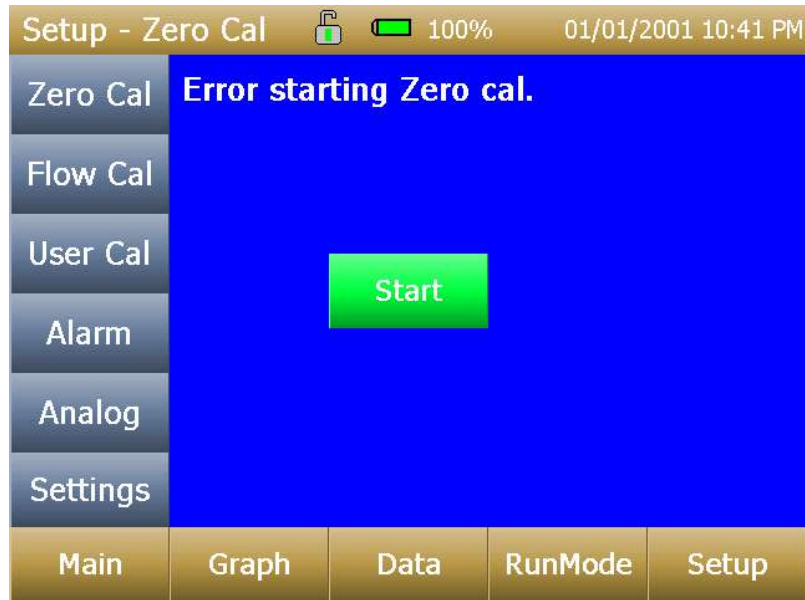


NOTICE
“No Pump is Connected” is a sticky error. Even after the warning message, if the External Pump Module is connected to the DustTrak™ monitor, the error will not disappear until the screen is refreshed. Refresh the screen by going into a different menu and returning to the Main menu.

2. When the unit **IS NOT** connected to the External Pump Module and an attempt is made to start a run by selecting “**Start**”, an error appears on the Main screen.



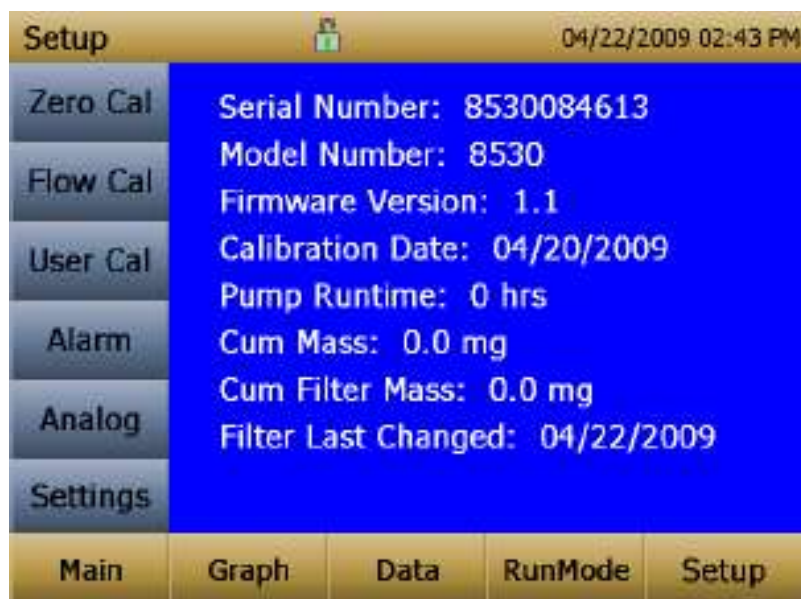
3. If the pump **IS NOT** connected while attempting to perform a Zero Cal, an error appears on the Setup screen.



4. If the pump **IS NOT** connected while attempting to perform a Flow Cal, an error appears on the Setup screen.



Setup Menu

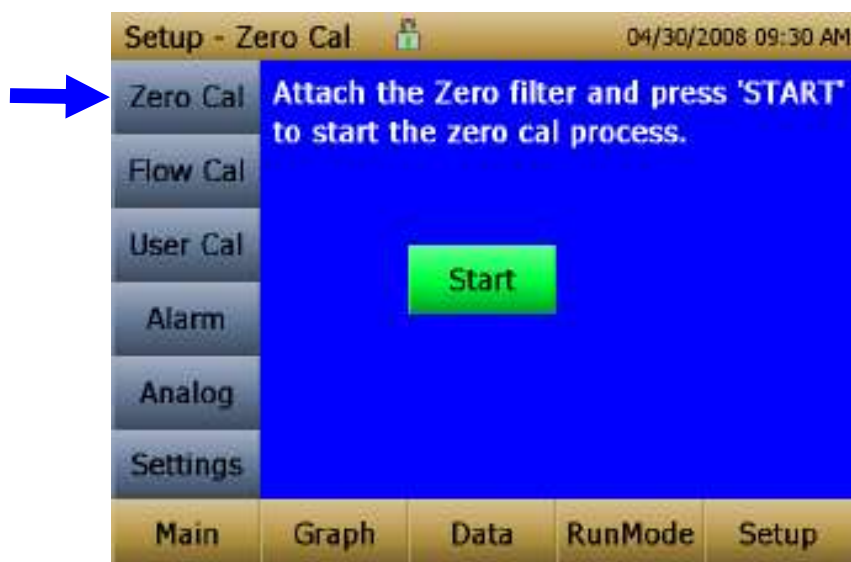


Pressing **Setup** activates the Setup Menu touchscreen buttons along the left edge of the screen. Setup is not accessible when the instrument is sampling.

The main screen of the **Setup** screen displays the following information:

Serial Number	The instruments serial number.
Model Number	The instruments model number.
Firmware Version	Instruments current version of firmware.
Calibration Date	Date of the last factory calibration.
Pump Run Time	Pump running time in hours.
Cum Mass Conc	Amount of mass run through instrument since its last calibration.
Cum Filter Conc	Amount of mass run through instrument since last filter change.
Filter Time	Date of last filter change.

Zero Cal



Run **Zero Cal** the first time the instrument is used and repeat prior to every use. Zero Cal requires that the zero filter be attached prior to running. Zero Cal must also be performed if the unit is reading negative concentrations. It is not possible for the DustTrak to read negative concentrations. Negative concentrations are a symptom of zero drift.

NOTICE

NEVER perform a zero cal without attaching a zero filter.

1. Press **Zero Cal** Button
2. Attach Zero Filter
3. Press the **Start** button to start Zeroing process.
4. A count-down clock will appear indicating the time remaining. The screen will indicate "**Zero Cal Complete**" when done.

Remove filter after zeroing has been completed. The instrument is now zero calibrated and ready for use.

Flow Cal



Run **Flow Cal** to change the flow set point. The flow set point is factory set to 3 L/min total flow. 2 L/min of the total flow is measured aerosol flow. 1 L/min of total flow is split off, filtered, and used for sheath flow. There is an internal ΔP flowmeter in the DustTrak™ II instrument that controls flow rate to $\pm 5\%$ of the factory setpoint. TSI® recommends checking the flow with an external flow reference meter, especially when collecting data. The pump will automatically start when entering the Flow Cal screen.

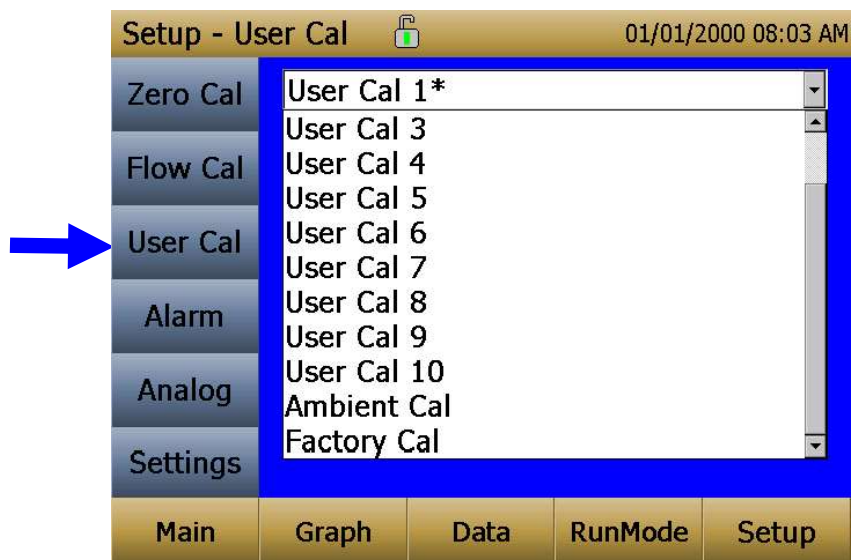
1. Attach a flow calibrator (reference flow meter) to inlet port. You may use a bubble buret, mass flow meter, dry piston or rotameter as flow measurement devices.
2. Move the arrows up or down to achieve desired flow rate on the reference flowmeter. Each up or down arrow will change the flow about 1%. Allow time between button presses to let pump change to the new flow rate.

Select **Save** once the desired flow rate is achieved. Select **Undo** to return to the factory set point.

NOTICE

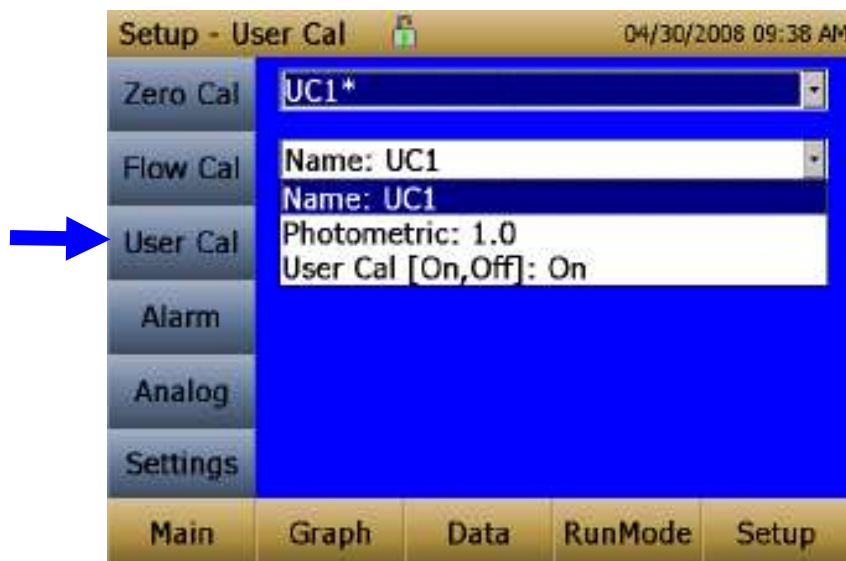
The flow rate can be adjusted from approximately 1.5 to 4.0 L/min. If needed, this feature can be used to adjust the flow rate to a value other than the factory set point, allowing for the use with the provided Dorr-Oliver Cyclone (1.7 L/min required) or 3rd party size selective inlets (cyclones or impactors) that may require a different flow rate.

User Cal



User Cal allows you to store and use 10 different calibration factors. In addition, there are two factory defaults, one is the “Ambient Cal” and the other is the “Factory Cal”. The “Ambient Cal” is appropriate for outdoor ambient dust or fugitive dust monitoring. The “Factory Cal” is the calibration to ISO 12103-1, A1 Arizona test dust for which a calibration certificate is provided with the instrument. The “Factory Cal” is appropriate for most workplace aerosol monitoring. The currently active user calibration is highlighted with an asterisk “*”.

Four variables can be set for each user calibration.



Name	User can rename calibration to a description name.
Photometric	Changes the factory calibration of particle signal, based on Arizona Road Dust, to actual aerosol being measured. See below for sets to set this calibration.
User Cal [on,off]	Selecting On will activate current user calibration and deactivate the previously selected user calibration.

Taking a Gravimetric Sample Using the DustTrak™ Monitor

When sampling with the DustTrak™ monitor, you can simultaneously take a gravimetric sample either for custom calibration of the DustTrak™ monitor or for collecting the sample on to the gravimetric filter downstream of the DustTrak monitor without a need for additional gravimetric sampling pump and filter assembly. To accomplish this, follow the instructions given below:

1. Setup the DustTrak monitor to sample how long you want the sample run time to be. The following example shows a sample for 8 hours.
2. Under RunMode menu, put the instrument in Manual Log (Manual Logging is reviewed later in this section), which will enable you to start and stop the pump at any time you choose.
3. Set the logging interval. One minute (i.e., “01:00”) is a good choice.
4. Make sure you have a preweighed 37-mm gravimetric filter cassette loaded into the DustTrak™ monitor. See Chapter 4, “[Replacing the Internal Filters](#)” on how to access the filter (see [figure 4-8](#)) and replace it.

NOTICE

Use only the conductive plastic filter cassette holder (SKC Part# 225-308).

5. Under the Setup Menu, make sure the DustTrak monitor is set to the desired flow rate. For DustTrak II Model 8530, the flow can be varied from 1.7 to 4 L/min for use with various inlet conditioners. For DustTrak DRX Model 8533, **the flow cannot be changed**. The flows for DustTrak II monitor can be changed by changing the default flow calibration setpoint from 1.0 to any value between 0.5 to 1.5 in the span adjustment. An external flowmeter is needed to measure the total flow. Flow can be changed by clicking on the UP or DOWN arrow keys shown below:



6. Conduct a preflow calibration on the DustTrak™ monitor using the same kind of sample media you will sample with. Now, attach the sample media you intend to sample with and start sampling aerosol for the desired time. After the desired run time, stop the sampling. Remove the filter from the DustTrak™ monitor and follow your laboratory's criteria for filter post weight. Conduct a post-flow calibration with the same sample media done with the pre-flow calibration and determine if these flow calibrations are within $\pm 5\%$ of each other. If they are, use the following to calculate the actual flow rate for the DustTrak™ monitor. The laboratory will need the following information to calculate mass concentration in mg/m^3 :
 - Total sample time in minutes.
 - Flow rate—flow rate of the DustTrak monitor used for gravimetric analysis is only $\frac{2}{3}$ the total flow since $\frac{1}{3}$ of the flow is used as sheath flow.
 - Total liters of air sampled = total sample time x flow rate.
7. Using this information the laboratory can determine the concentration using the following formula:

$$\text{concentration, } \frac{\text{mg}}{\text{m}^3} = \frac{\text{Filter Post Weight (mg)} - \text{Filter Pre Weight (mg)}}{\frac{2}{3} * \frac{\text{DustTrak}^{\text{TM}} \text{ Monitor Flow Rate } (\frac{\text{L}}{\text{min}})}{1000} * \text{Total Sample Time (min)}}$$

NOTICE

The flow rate used for gravimetric analysis is only $\frac{2}{3}$ the total flow since $\frac{1}{3}$ of the flow is used as sheath flow.

8. For instructions on how to calibrate the DustTrak monitor using this data, see section below on [“Determining the Calibration Factor for a Specific Aerosol”](#).

Photometric Calibration Factor

In most situations, the DustTrak™ I mass measurements are dependent upon particle size and material properties, there may be times in which a custom calibration would improve your accuracy for a specific aerosol.

Determining an aerosol specific photometric calibration requires that you determine a true mass concentration (e.g., gravimetric analysis) for the aerosol you want to measure. The true mass concentration is used to calculate the custom calibration factor for that aerosol. Once you have a custom calibration factor, you can reuse it each time you make measurements in the same aerosol environment.

Determining the Calibration Factor for a Specific Aerosol

The DustTrak™ II monitor is factory calibrated to the respirable fraction of standard ISO 12103-1, A1 test dust. The DustTrak™ monitor can be easily calibrated to any arbitrary aerosol by adjusting the custom calibration factor. The DustTrak monitor's custom calibration factor is assigned the value of 1.00 for the factory calibration to standard ISO test dust. This procedure describes how to determine the calibration factor for a specific aerosol. Using the value of 1.00 will always revert back to the factory calibration.

To determine a new calibration factor you need some way of accurately measuring the concentration of aerosol, hereafter referred to as the reference instrument. A gravimetric analysis is often the best choice, though it is limited to nonvolatile aerosols. The internal 37 mm filter cartridge, in the desktop units, can be used to collect the reference gravimetric reference sample.

To make an accurate calibration you must simultaneously measure the aerosol concentration with the DustTrak monitor and your reference instrument.

1. Zero the DustTrak II monitor.
2. Put the instrument in Manual Log (Manual Logging is reviewed later in this section).
3. Set the logging interval. One minute (i.e., "01:00") is often a good choice.
4. Co-locate the DustTrak II monitor and the reference sampler together so that they are measuring from the same area. The 37-mm filter cartridge in the desktop unit can be used to collect the particles to be weighed for the gravimetric reference.
5. Start sampling aerosol with both instruments at the same time.

NOTICE

Greater accuracy will be obtained with longer samples. The time you permit for sampling often depends on the reference instrument and characteristics of the measured aerosol. It may take some time to collect sufficient aerosol onto a filter cassette for accurate gravimetric analysis. Refer to instructions of your reference instrument for sampling times.

6. Stop sampling with both instruments at the same time.
7. Record the DustTrak™ monitor average concentration by viewing the sample average in the Data screen. (Data Screen is reviewed later in this chapter.)
8. Determine the mass concentration in mg/m³ from your reference instrument. For gravimetric sampling this means weighing the gravimetric sample.

NOTICE

If you used the internal gravimetric filter in the DustTrak™ Model 8530, the flow rate used to compute the concentration should be 2 L/min, not 3 L/min since only 2 L/min of aerosol flow reaches the filter.

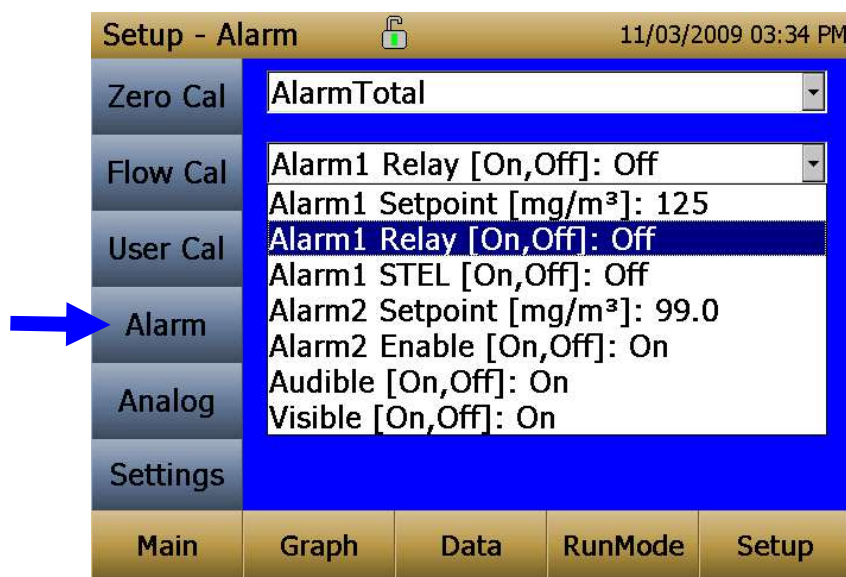
9. Compute the new calibration constant, NewCal, using the following formula:

$$\text{New Cal} = \left(\frac{\text{Reference Concentration}}{\text{DustTrak Concentration}} \right) \cdot \text{CurrentCal}$$

10. Select **Photometric** from the User Cal drop down selection and enter the NewCal factor using the onscreen controls.

Alarm



Alarm allows you to set an alarm level that will be triggered if the instrument's reading goes above the setpoint. However, the alarm functioning is determined by the logging interval. The alarm will turn ON only if the average concentration over the logging interval exceeds the set point. If the logging interval is too long and the concentration exceeds the set point and stays at that level, the alarm will not turn ON until after the logging interval has passed. Likewise, the alarm will not stop until after the concentration has dropped below 5% of the threshold and after the logging interval has passed.



NOTICE


The Alarm is dependent on the logging interval. For the DustTrak™ monitor to alarm as soon as the Alarm Setpoint is exceeded, the logging interval must be set as low as possible (i.e., 1 second or 2 seconds). If a long test duration does not permit setting such a short logging interval, use the STEL alarm instead. The STEL is always based on 1 second concentrations and is independent of the logging interval. For more details on the STEL alarm, see section below on STEL.

In Survey mode, the alarm is dependent on the time constant.

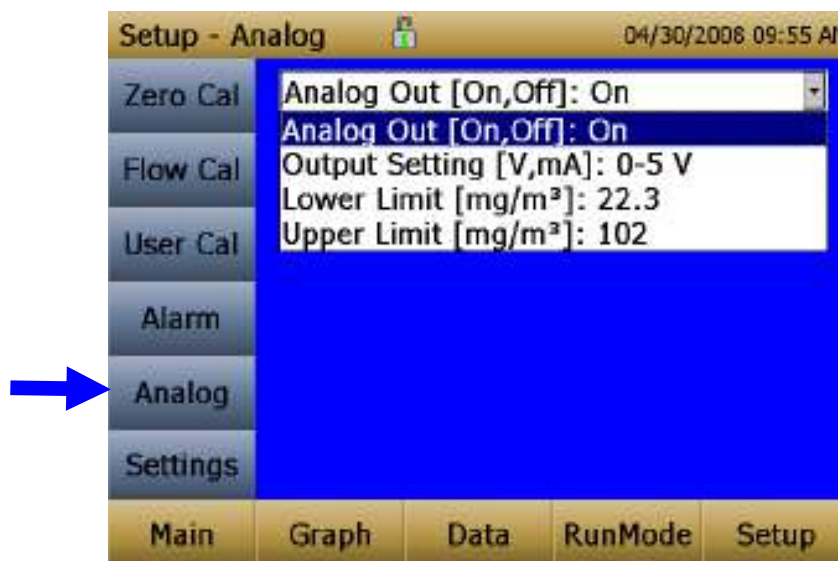
Alarm1 Setpoint [mg/m³]	<p>The alarm1 setpoint is the mass concentration level upon which the alarm1 is triggered.</p> <p>Alarm will trigger if the mass concentration, taken at the logging interval, rises above the setpoint.</p> <div style="background-color: #0070C0; color: white; text-align: center; padding: 2px;">NOTICE</div> <p>Alarm 2 must be lower than Alarm 1 when both alarms are enabled.</p>
Alarm1 Relay [On, Off]	<p>When the relay alarm is turned on, unit will close relay switch when Alarm1 level is surpassed.</p> <p>Relay selection is available on the 8530 desktop model only.</p>
Alarm1 STEL [On, Off]	<p>When the STEL alarm is turned on, STEL data will be collected when Alarm1 level is surpassed.</p> <p>STEL selection is available on the 8530 desktop model only.</p> <p>See STEL Note below.</p>
Alarm2 Setpoint [mg/m³]	<p>The Alarm2 setpoint is the mass concentration level upon which the alarm2 triggers.</p> <p>Alarm triggers if the mass concentration, taken at the logging interval, rises above the setpoint.</p> <div style="background-color: #0070C0; color: white; text-align: center; padding: 2px;">NOTICE</div> <p>Alarm 2 must be lower than Alarm 1 when both alarms are enabled.</p>
Alarm2 Enable [On, Off]	<p>Enables Alarm2 to be logged and will activate the Audible or Visible alarms if they are enabled.</p>
Alarm Audible [On, Off]	<p>When the audible alarm is turned on, the instrument will activate internal beeper when Alarm1 or Alarm2 level is surpassed.</p>
Alarm1 Visible [On, Off]	<p>When the visible alarm is turned on, unit will show the alarm icon (Alarm1 , Alarm 2 ) in title bar when Alarm1 or Alarm2 level is surpassed.</p>

STEL Alarm

STEL stands for **Short Term Exposure Limit**. When a STEL alarm is selected, the instrument will inspect the data on a second by second basis, independent from the selected logging interval. If the mass exceeds the STEL limit, then a STEL event triggers and the following actions will be taken.

STEL indicator	The STEL indicator  STEL will show Red on the main screen.
Data	<p>Data will be taken of the STEL alarm channel at a 1 minute logging interval for 15 minutes.</p> <p>This data will be stored in a separate file named STEL_XXX, where XXX will be matched to the logged data file.</p> <p>The instrument will also continue to log the mass concentration data at the logging interval selected.</p>
STEL Alarm repeat	If the instrument remains over the STEL limit after the 15 minute interval, or if the instrument exceeds the STEL limit later during the sample period, additional STEL files will be generated.

Analog



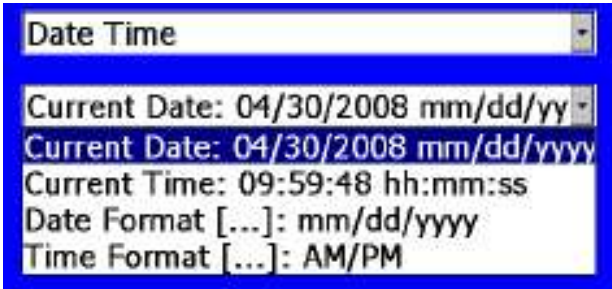
Analog setup screen sets the parameters that will drive the analog out port. Applies to the 8530 Desktop model only.

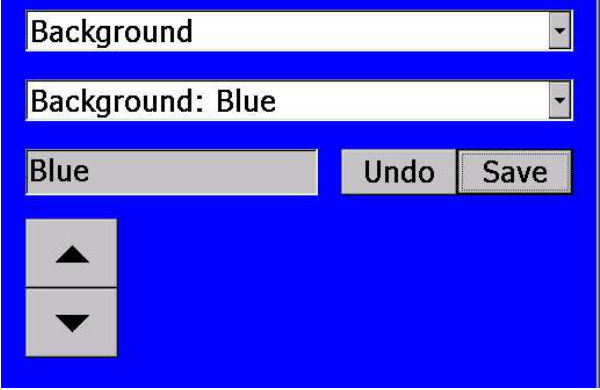

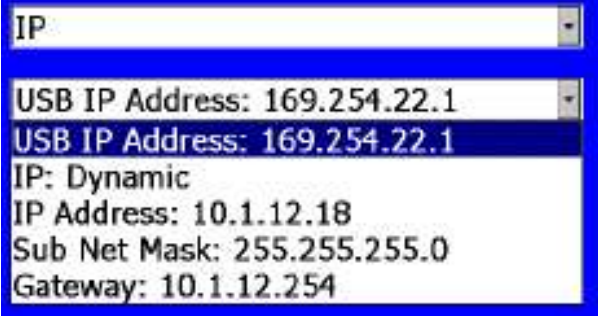
Analog out [On, Off]	Turns analog out port on.
Size Fraction	Selects the size channel that will drive the analog out.
Output Setting [V, mA]	Select between 0 to 5 V and 4 to 20 mA.
Lower Limit [mg/m³]	Mass concentration reading of the selected channel that will correspond to 0 V or 4 mA.
Upper Limit [mg/m³]	Mass concentration reading of the selected channel that will correspond to 5 V or 20 mA.

Settings



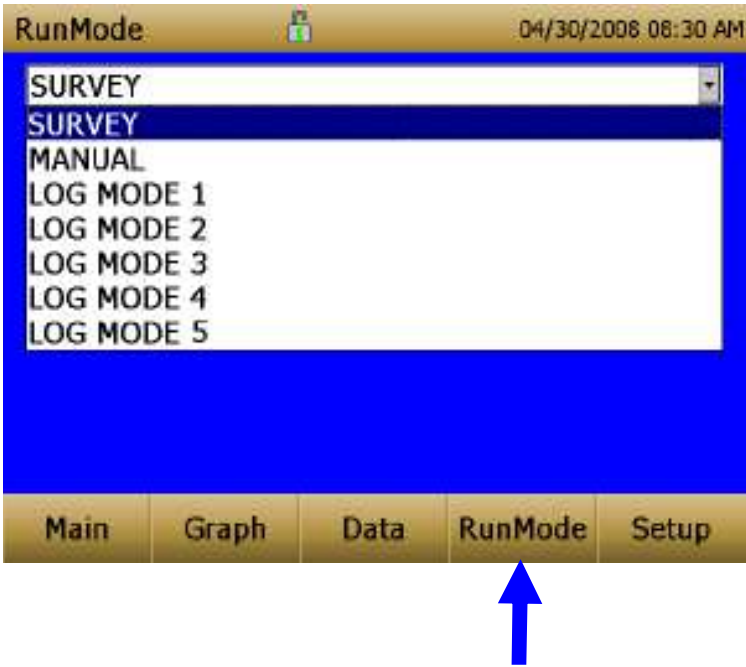
Settings screen sets basic unit parameters.

Date Time	 <p>Sets current date, current time and date/time format. Time can be set in 12 or 24 hour format. Date can be set in yyyy/dd/mm, yyyy/mm/dd or yyyy/dd/mm.</p>
------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Background	 <p>Switches between blue and white backgrounds.</p>
Touch Cal	 <p>Calibrates the touch cal screen.</p>
IP	 <p>USB PORT IP Address: USB IP is the address assigned to the instrument by the NDIS driver. It is shown but cannot be changed.</p> <p>Ethernet Port IP parameters: (Model 8530 Desktop only.)</p> <p>IP method can be set to static or dynamic.</p> <p>For static IP, IP address, default gateway, and subnet mask can be set.</p> <p>For Dynamic, The IP assigned by the network is shown. This cannot be changed.</p> <p>See Note below.</p>

	<div>IP NOTE</div> <p>After changing the instrument to Dynamic or Static, reboot the instrument.</p> <p>In Dynamic Mode, the unit will show the IP to which is assigned (after being rebooted).</p>
Language	<div><div>Language</div><div>Language: English</div><div>EnglishUndoSave</div><div><div>▲</div><div>▼</div><div>Changes to these settings will not take effect until the instrument has been shutdown and restarted.</div></div></div> <p>Switches between display languages. After changing the display language, reboot the instrument.</p>

Run Mode

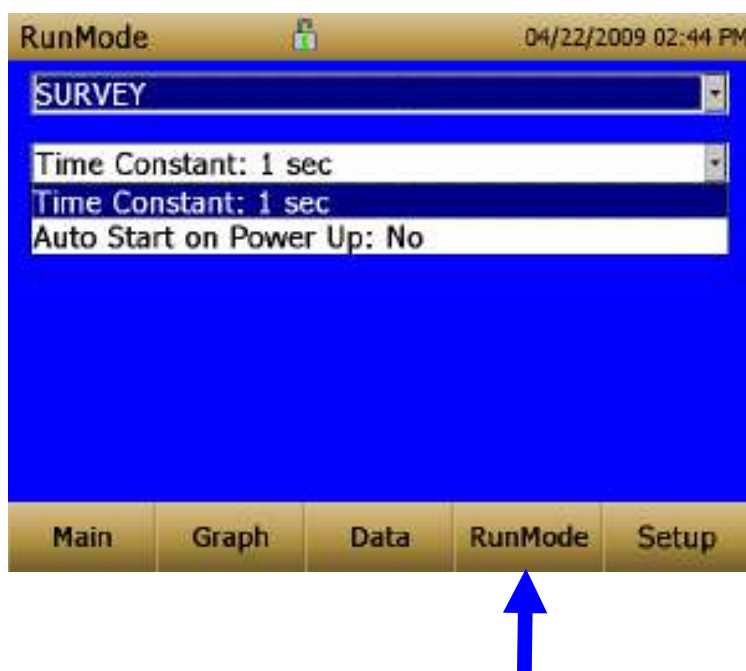


The **RunMode** tab brings up sampling mode options.

Sampling mode options include **Survey Mode**, **Manual Log**, and **Log Mode 1-5**.

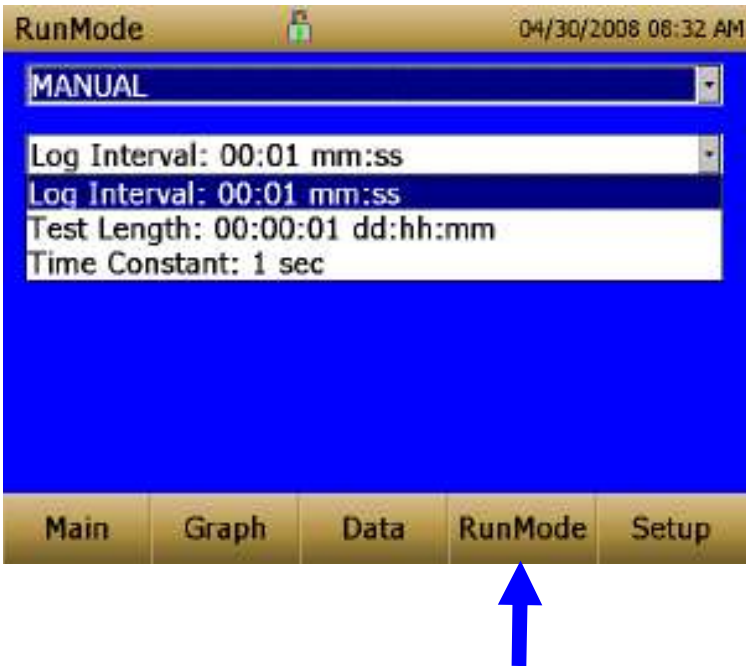
Survey	Survey Mode runs a real time, continuous active sample, but does not log data.
Manual	Manual Log sets the instrument to log data for a specified run time.
Log Modes	Log Mode starts and stops the instrument at specified times, run for a specified test length, and perform multiple tests of the same length with a specified time period between tests.

Survey Mode



Time Constant	Time Constant can be set from 1 to 60 seconds. This will control the update rate of the main screen. It is the rolling average of data displayed on the main screen and is not linked to logged data in either Manual or Program Log modes.
Auto Start on Power Up	When set to "Yes", unit will start a measurement upon being powered on, if the unit was set to "Survey" when it was turned off. When set to "No", the unit will be in idle when it is powered on.

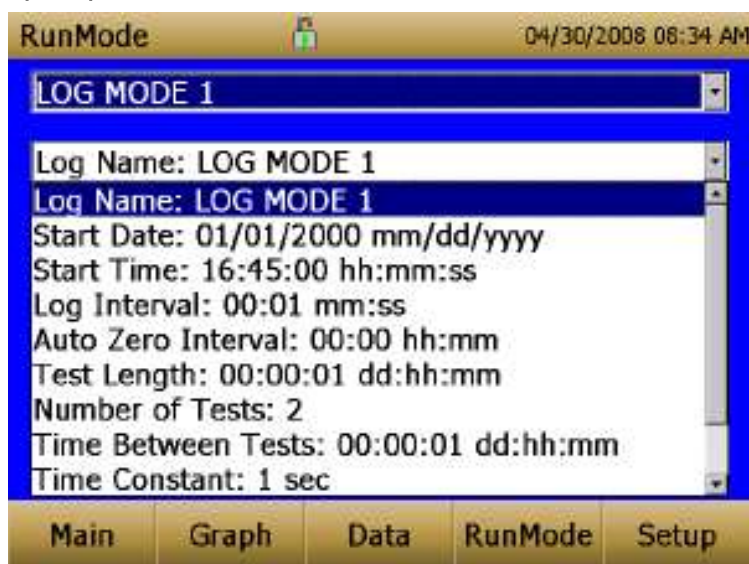
Manual Mode



Log Interval	The log interval can be set from 1 second to 60 minutes. It is the amount of time between logged data points.
Test Length	Test length can be set from 1 minute to the limit of the data storage.
Time Constant	Time Constant can be set from 1 to 60 seconds. This will control the update rate of the main screen. It is the rolling average of data displayed on the main screen and is not linked to logged data in either Manual or Program Log modes.

In Manual mode, data will be stored to a file named “Manual_XYZ” where XYZ is an incrementing integer.

Log Mode (1–5)



Log Name	Log Name, brings up a virtual keypad to name the Logged Data file.
Start Date	Start Date, select the date the test will start.
Start Time	Start Time, select the time the test will start.
Log Interval	The log interval can be set from 1 second to 60 minutes. It is the amount of time between logged data points.
Auto Zero Interval	Interval between re-zeroing the instrument using the Auto-Zero accessory. Model 8530 desktop only.
Test Length	From 1 minute to the limit of the data storage.
Number of Tests	Number of tests, 1 to 999.
Time between Tests	Time between tests, 1 minute to 30 days.
Time Constant	Time Constant can be set from 1 to 60 seconds. This will control the update rate of the main screen. It is the rolling average of data displayed on the main screen and is not linked to logged data in either Manual or Program Log modes.
Use Start Date	Use Start Date, option to use programmed start date or by pass programmed start date.
Use Start Time	Use Start Time, option to use programmed start time or bypass programmed start time.

In Log mode, data will be stored to a file named “LogName_XYZ” where *LogName* is the user entered log name and XYZ is an incrementing integer.

Locking Feature

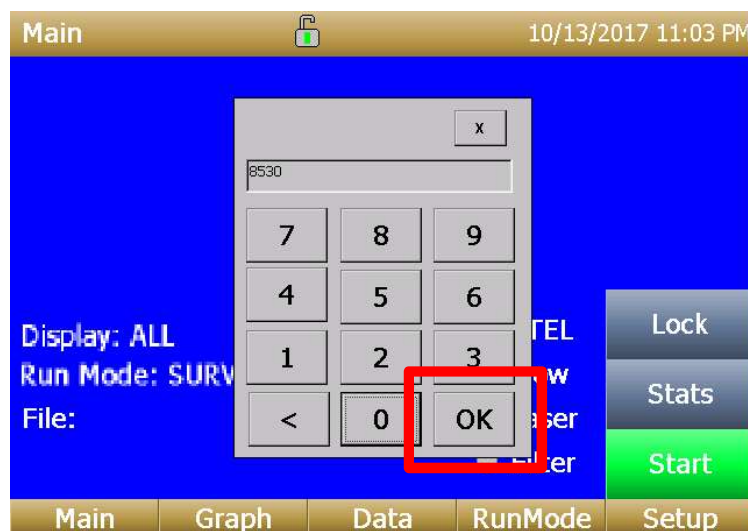
The locking feature allows you to lock the screen at any time. This can be done during mass concentration measurements and while the instrument is idle.

NOTICE
This feature is only available on Desktop models. It is not available on Handheld models.

To enable this feature, touch the **Lock** button on the main screen.



Next enter the model of the instrument. For 8530EP models, 8530 should be used. After entering the model number, touch **OK**.



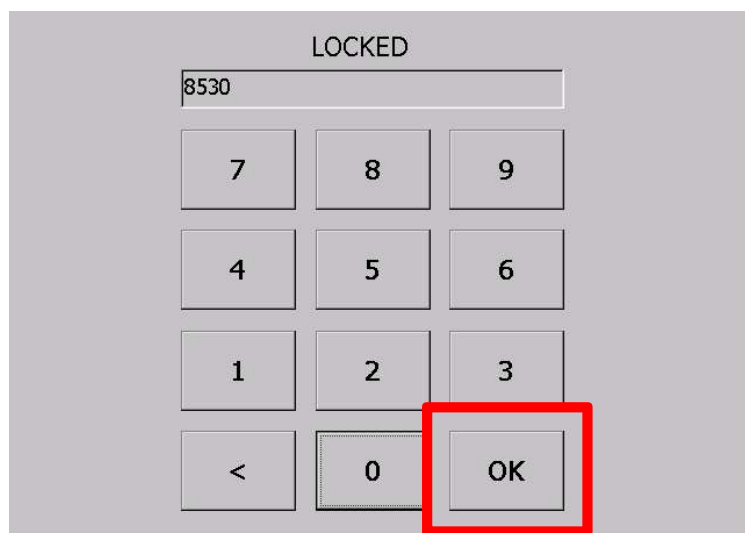
The screen is now locked.



To unlock, touch **UNLOCK** and re-enter the model number. For 8530EP models, 8530 should be used. After entering the model number, touch **OK**.

NOTICE

If you happen to enter the model number incorrectly and touch **OK**, you will be given another chance to enter it correctly. There is no limit to number of chances.



Taking Mass Concentration Measurements

Measurements are started and controlled from the main screen.

Prior to starting a measurement the instrument should be zeroed from the **Setup** screen and the run mode should be configured and selected from the **RunMode** screen.



When the instrument is on, but not taking any mass measurements the start button will be green and instruments pump will not be running. To start taking a measurement, press the green **Start** button.

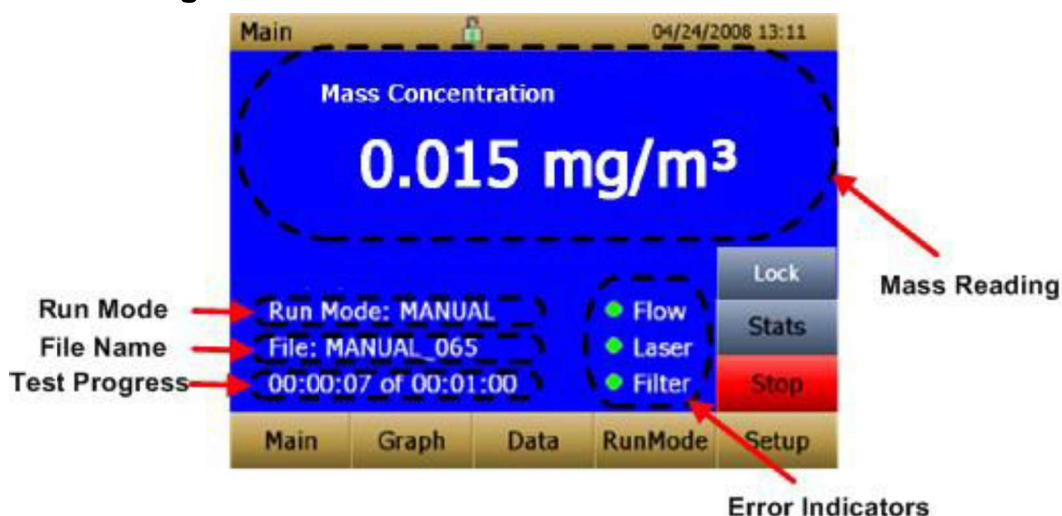
For the Model 8530EP DustTrak™ monitor with external pump, make sure the external pump is connected to the DustTrak™ monitor as described in [Chapter 2](#). If the pump is not connected and the green start button is pressed, the DustTrak™ monitor will identify that the pump is not connected and a warning will be displayed as shown below:



Connect the External Pump Module to the DustTrak™ monitor and then try again. TSI® recommends powering down the DustTrak™ monitor before connecting the External Pump Module to the DustTrak™ monitor. Connect the power cable and the flow tubing between the DustTrak monitor and the External pump module, as applicable.

While taking a measurement the screen will display the current measured mass concentration. The various regions of the screen are shown below.

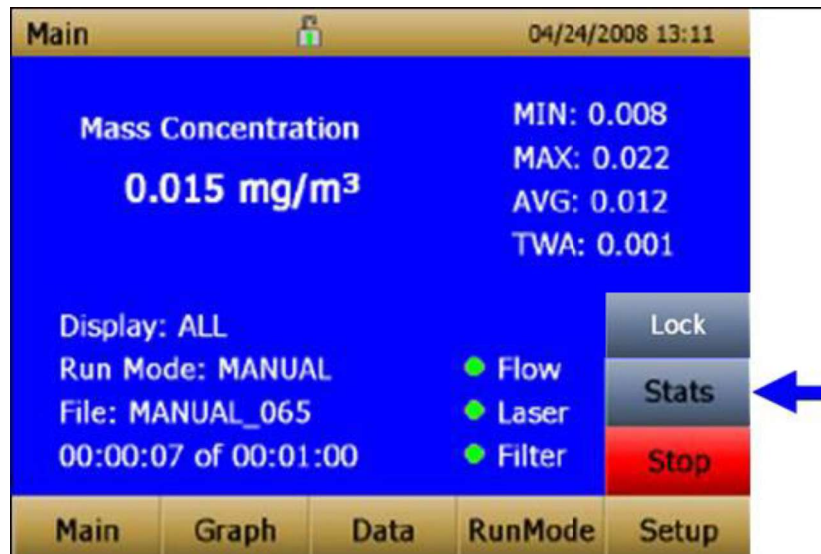
Screen Regions



Mass Reading	Shows the instruments mass measurements.
Run Mode Region	Shows the run mode selected from the RunMode screen.
File Name Region	Displays the file name to which the data is currently being saved.
Test Progress Region	Shows the time-based progress of the test.
Error Indicator Region	<p>Shows the current stats of the instrument</p> <p>STEL: Shows if STEL is in progress (desktop instruments only)</p> <p>Flow: Status of the flow control</p> <p>Laser: Status of the Laser</p> <p>Filter: Status of the Filter</p> <p>See Chapter 5, "Troubleshooting," to resolve any of these error conditions.</p>

Stats

The Stats button shows the statistics of the mass measurement. When the Stats button is pressed, the main mass reading will reduce in font size, and the measurement statistics will show on the right side of the screen.





Graphing

During sampling, pressing the **Graph** button displays current readings in graphical form.

- During Survey Mode, five (5) minutes of running real-time data is displayed graphically.
- During Logging Mode, the entire log test time is displayed on the graph.



Time Display	<p>Pressing the Time x-axis label on the graph screen switches between Time (s), Time (abs), and Time (rel).</p> <p>Time (s): Elapsed time from first logged point (log interval) to the last logged point (test length).</p> <p>Time (rel): Relative time from zero to last logged point (test length – log interval).</p> <p>Time (abs): Absolute time from first logged point (test start + log interval) to last logged point (test stop).</p>
Scale Display	<p>Pressing in the Scale Display area will bring up a dialog that will allow changing between auto scaling and user scaling of the Y-axis.</p>  <p>The Axis Settings dialog box has a title bar 'Axis Settings' with a close button. It contains two input fields: 'Min' with the value '-0.0' and 'Max' with the value '1.0'. Below these is a checkbox labeled 'Auto Scale' which is checked. At the bottom is an 'OK' button.</p>
Data Region	<p>Pressing the data region will bring up a dialog to show TWA or Average lines.</p> <p>TWA: Will show a secondary line on the graph showing the time weighted average of the data. This line will not show if test time is less than 15 minutes.</p> <p>Average: Show a secondary line on the graph of the running average of the data.</p>  <p>The Graph Config dialog box has a title bar 'Graph Config' with a close button. It contains two checkboxes: 'Avg' which is checked and 'TWA' which is unchecked. At the bottom is an 'OK' button.</p>

In Graphing Mode, pressing **Main** returns the instrument to the Main Screen display.

Viewing Data

The **Data** button opens a list of data files for viewing.








Select File	Press the arrows on the right side of the screen to scroll up or down to the data file to be viewed.
Data Statistics	Statistics on the selected file <ul style="list-style-type: none"> ○ File Name ○ Sample Average ○ Sample TWA ○ Sample Maximum Reading ○ Sample Minimum Reading ○ Number of Data Points in the File
Save All Button	Downloads data to a USB thumb drive. The USB thumb drive must be attached to the USB host port. Data is saved as a .csv file that can be viewed in Microsoft® Excel® spreadsheet software.
Delete Button	Deletes the currently highlighted file.
Delete All Button	Deletes all the files stored on the instrument.
Graph Button	Data can also be viewed in graphical form by pressing the Graph button while the data file is highlighted.

Title Bar

The Title Bar shows common instrument information.



Current Screen	Title of the current screen that is being displayed.
Instrument Lock	<p>Icon shows if the instrument touchscreen is in an unlocked or locked condition.</p> <p>Unlocked: </p> <p>Locked: </p> <p>To lock the touchscreen controls, touch the “lock” icon, immediately followed by three (3) quick touches on the current screen (Main) word along the top tool bar.</p> <p>Repeat the process to unlock the screen.</p>
Battery Status	<p>Show the current % life of the battery and show if the battery is currently being charged:</p> <p>Charging:  (unfilled portion of the icon is filled yellow as well as animated to indicate that the charging is in progress)</p> <p>Not Charging:  (unfilled portion of the icon transparent)</p>
Date and Time	Indicates the instruments current date and time.
Alarm	<p>If the instrument is in an alarm status, an alarm icon  will appear in the title bar.</p>

Chapter 4

Maintenance

The DustTrak™ II aerosol monitor can be maintained in the field using the instructions below. Additionally, TSI® recommends that you return your DustTrak™ II monitor to the factory for annual calibration. For a reasonable fee, we will quickly clean and calibrate the unit and return it to you in “as new” working condition, along with a Certificate of Calibration. This “annual checkup” helps ensure that the DustTrak™ II monitor is always in good operating condition.

NOTICE

There are no user-serviceable parts inside this instrument. The instrument should only be opened by TSI® or a TSI® approved service technician.

Maintenance Schedule

The DustTrak II Aerosol Monitor requires maintenance on a regular basis. Table 4–1 lists the factory recommended maintenance schedule.

Some maintenance items are required each time the DustTrak monitor is used or on an annual basis. Other items are scheduled according to how much aerosol is drawn through the instrument. For example, TSI recommends cleaning the inlet sample tube after 350 hours of sampling a 1 mg/m³ concentration of aerosol. This recommendation should be pro-rated according to how the instrument is used. 350 hours at 1 mg/m³ is the same amount of aerosol as 700 hours at 0.5 mg/m³ or 175 hours at 2 mg/m³, etc.

Table 4–1. Recommended Maintenance Schedule

Item	Frequency
Perform zero check	Before each use.
Clean inlet	350 hr. at 1 mg/m ³ *
Clean 2.5 µm calibration impactor	Before every use.
Replace internal filters	350 hr. at 1 mg/m ³ * or when indicated by the main screen filter error indicator.
Return to factory for cleaning and calibration (For 8530EP, TSI recommends that both the DustTrak and the External Pump Module be returned to TSI)	Annually
Replace the internal HEPA filters in the External Pump module	Annually

*Pro-rated, see discussion above.

The DustTrak™ monitor keeps track of the accumulated amount of aerosol drawn through it since its last cleaning. When the internal filter replacement is due, the filter error indicator will turn from green to red.

TSI® recommends you perform a zero check prior to each use for the DustTrak™ monitor and certainly before running any extended tests, and after the instrument experiences a significant environmental change. Examples of significant environmental changes would be ambient temperature changes that exceed 15°F (8°C) or moving from locations with high aerosol concentrations to low concentrations.

Zeroing Instrument

1. Attach the zero filter to the inlet of the instrument.



Figure 4-1: Attach Zero Filter to Inlet

2. Follow zero calibration instructions detailed in the operations section of this manual.

Cleaning the Inlet

The inlet should be cleaned based on the schedule in Table 4–1.

1. Turn the DustTrak™ monitor off.
2. Unscrew the inlet nozzle from the instrument (Figure 4-2).



Figure 4-2: Unscrew Inlet Nozzle

3. Clean the inlet port. Use a cotton swab to clean the outside of the inlet port. You may dampen the swabs with water or a light solvent (e.g., isopropanol). Clean the inside of the sample tube by using a small brush, along with a light solvent. Dry the tube by blowing it out with compressed air, or let it air-dry thoroughly.

NOTICE

Be *careful* NOT to blow particles into the DustTrak™ monitor inlet port.



Figure 4-3: DO NOT Blow into Instrument

4. Screw (hand-tighten) inlet back into instrument.

Cleaning and Oiling Impactors

The calibration impactor should be cleaned prior to every use, using it to perform a Standard Calibration (size correction) on the instrument, as described in the [Operations](#) section.

1. Unscrew Impactor. Check O-ring on the impactor base.
2. Clean outside and inside of Impactor and the impactor plate using a clean brush and a light solvent. Dry impactor parts by blowing it out with compressed air, or let it air-dry thoroughly.
3. Apply 2 drops of oil (included) to the impactor plate. **DO NOT** over-fill impactor plate.
4. Screw (hand-tighten) impactor back together.



Figure 4-4: Apply 2 Drops of Oil to Impactor Plate

Replacing the Internal Filters

Replace the internal filters based on the schedule in Table 4–1 or when the filter indicator on the main screen changes to red.

1. Turn the instrument off.
2. Remove old filters from the instrument.

Handheld Model

- a. Use the enclosed filter removal tool (P/N 801668) tool to unscrew the two filter caps located on the bottom of the instrument.
- b. Pull the old filters out of the two filter wells. If filter wells are visibly dirty, blow out with compressed air.
- c. Put two (2) new filters (P/N 801666) into the filter wells and screw filter caps back into place.



Figure 4-5: Pull Filters Out of Two Filter Wells (Handheld Model)

NOTICE

Replacement filters were shipped with the new instrument. Order additional filters from TSI® under P/N 801666.

Desktop Model

- a. Open filter access door on the back of the instrument.
- b. Use the enclosed filter removal tool (P/N 801668) to unscrew filter cap.
- c. Pull out single cylindrical filter from filter well. If filter well is visibly dirty, blow out with compressed air.
- d. Put new filter (P/N 801673) back into filter well and screw filter cap back into place.



Figure 4-6: Pull out Single Cylindrical Filter from Filter Well (Desktop Model)

- e. Open blue retention clip by pinching ends inward and pushing down.



Figure 4-7: Open Blue Retention Clip

- f. Remove 37-mm filter cassette by pulling downward and outward.

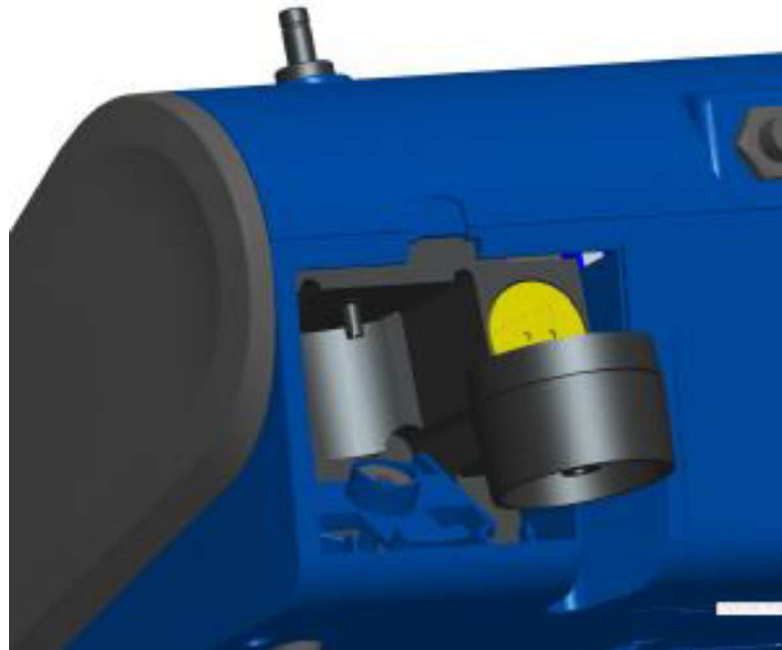


Figure 4-8: Remove 37-mm Filter Cassette

- g. Open filter cassette using enclosed tool P/N 7001303.
- h. Remove screen mesh from filter cassette and blow out using compressed air. Blow in reverse direction to remove captured particulate.
- i. Replace mesh in filter cassette and press halves together. Make sure filter has been fully closed. The filter tool P/N 7001303 can be used to ensure the filter is fully closed.
- j. Place filter cassette back into position and close blue retaining clip. Make sure retaining clip snaps back into place.



Figure 4-9: Open Filter using Enclosed Tool

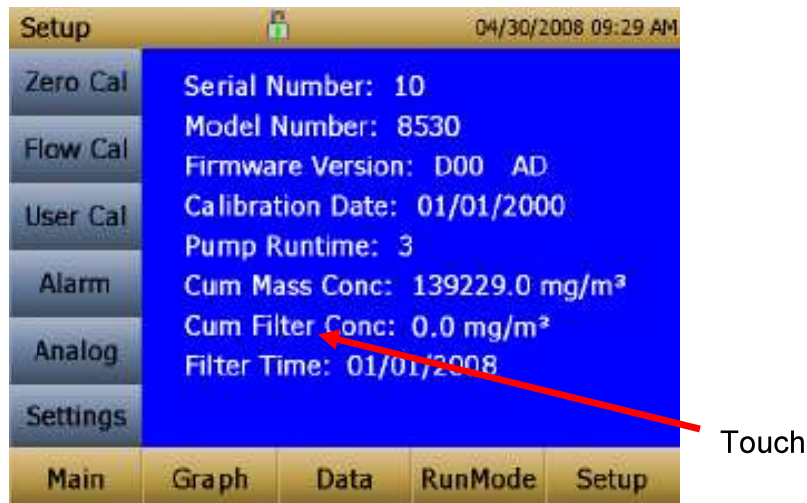


Figure 4-10: Replace Mesh in Filter Holder

NOTICES

- Replacement filters (HEPA and 37-mm Filter Cassette with mesh filter) were shipped with the new instrument. Order additional filters from TSI® under P/N 801673.
- TSI® **DOES NOT** supply any filter media for the filter cassette. Any commercially available 37-mm filter media may be used with the DustTrak™ II or DRX desktop instruments to collect gravimetric reference samples.

3. It is important to reset the instruments filter counter after replacing filters. Resetting the counter will clear the filter error condition shown on the main screen. Reset the counters by the following:
 - a. Turn on the instrument.
 - b. Press the **Setup** button to go into the setup screen.
 - c. Touch the **Cum Filter Conc:** (live key) to reset the aerosol mass.

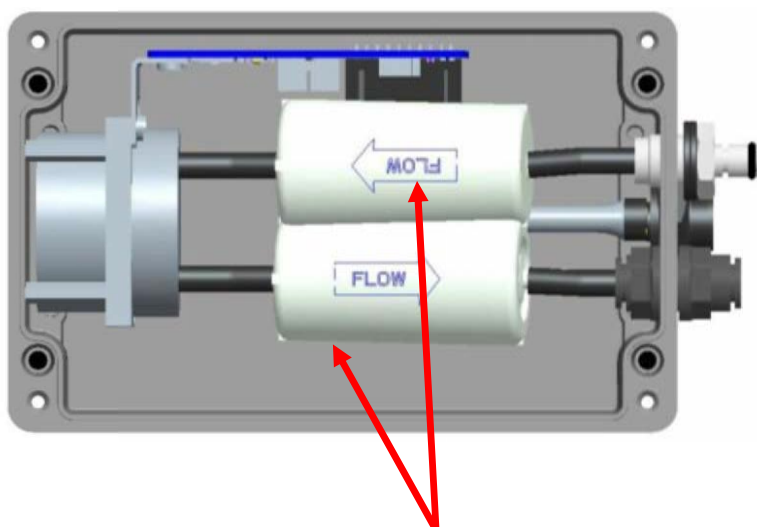


- d. *Replace user serviceable filters?* Dialog will appear. Press **OK**.
- e. *Reset filter concentration?* Dialog will appear. Press **Yes** to reset the cumulative filter concentration to zero.
- f. The Setup screen will now show zero for the **Cum Filter Concentration** and the current date for the **Filter Time**.

Replacing the Filters in the External Pump Module

The external pump module provided with Model 8530EP is designed to run continuously for about a year (8760 hours). There are two HEPA filters that protect the pump from contamination—one on the suction side of the pump and the other on the discharge side of the pump. The discharge side of the pump collects particles shedding from the vanes of the pump and will turn black over time. The HEPA filters will have to be replaced once a year.

To access the filters open the top cover of the pump module. The two HEPA filters are identified in the figure below. The two filters can be replaced by disconnecting the soft tubing between the filters, pump, and the casing connectors.



User Replaceable HEPA Filters

NOTICE

When replacing the HEPA filters, make sure they are oriented in the correction direction as shown in the picture above.

Storage Precautions

When storing the DustTrak™ monitor for more than 30 days, you should charge and remove the batteries. This prevents damage due to battery leakage.

This instrument must be stored in a location where the temperature remains between -20 and 60°C (-4 and 140°F).

Chapter 5

Troubleshooting

The table below lists the symptoms, possible causes, and recommended solutions for common problems encountered with the DustTrak™ II monitor.

Symptom	Possible Cause	Corrective Action
Erratic zero reading.	Leak	Check connections for leaks Replace zero filter
	Dirty inlet port and/or sample tube	Clean inlet port. Clean or replace tubing
	Internal filter(s) not installed properly (leaking)	Inspect internal filter wells to make certain the filters and O-rings are seated properly. Replace internal filters if necessary
DustTrak™ reading negative concentrations	Zero Drift	Perform Zero Cal
	Zero Cal was performed without the Zero Filter in-line	Perform Zero Cal again and make sure the Zero Filter is attached to the DustTrak™ inlet
Error completing Zero Cal	Too much light scatter in the optics chamber due to dust deposits	Clean the inlet nozzle. Attach the zero filter and sample for about 2 minutes. During sampling, pulse the flow going into the DustTrak monitor by intermittently plugging the zero filter. Any dust in the optics chamber will break loose during flow pulsations and will be cleared out by the pump Perform Zero Cal again. If the Zero Cal still cannot be performed, factory service may be required

Symptom	Possible Cause	Corrective Action
Severe/sudden increase or decrease in mass concentration (greater than or equal to $\sim 0.200 \text{ mg/m}^3$)	RF (radio frequency) signal transmitting in the area of the instrument causing electrical interference.	Determine the source and turn off the transmitter. Frequencies between 0.9 GHz to 1.7 GHz are known to interfere with the measurement. This spectrum includes aeronautical navigation aids, satellite communications, radio telescopes, and mobile radios. Relocate the instrument to a location where the interference is not present and normal operation resumes.
Run Mode Error: The start time has passed	The selected Run Mode program has "Use Start Date" selected, but the start date is prior to the current date	Correct or change the run mode program
Run Mode Error: The selected log mode will exceed the allowed number of samples	The selected Run Mode program is programmed to save more samples than is room in memory	Reduce the number of samples by reducing the test length or increasing the logging interval
Instrument runs slow	Large amount of data in memory	Large data files or many small data files will cause instrument to slow, due to need to read and display large amounts of data
No display	Unit not switched on	Switch unit on
	Low or dead batteries	Recharge the batteries or plug in the AC adapter

Symptom	Possible Cause	Corrective Action
No touch - screen response	Instrument currently busy	The instrument will take time to open large data files and save configuration information. During this time, the instrument will not respond to additional touchscreen touches
	Instrument Touchscreen is locked	If the lock in the title bar is red, unlock the instrument following the instructions in the Chapter 3, Operation: Title Bar section of this manual
Analog output does not work	Cable/connector not correctly installed	Make sure cable connector is fully seated
	Output wired with reverse polarity	Make sure analog out (+) and analog ground (-) are wired correctly to data-logger
Analog output is not in proportion to display	Analog output range in DustTrak™ monitor may be set incorrectly	Check analog output setting in the Setup->Analog screen. Make sure the channel of interest is selected. Make sure that the correct output (0 to 5V, 4 to 20 mA) is selected
	Data logger scaling factor may be set incorrectly	Review the scaling factor set in the Setup-Analog screen
Alarm output does not work	Alarm function not turned on	Turn the alarm function on in the Settings->Alarm screen
Alarm does not turn on correctly	Alarm setting incorrect	Check the alarm settings in the Settings->Alarm screen Make sure the logging interval and time constant are set as short as possible (30 seconds or lower)
	Alarm output wired with reverse polarity	Alarm wires are polarized. Voltage input must be wired to alarm input (+)
Instrument does not store new data	Memory is full	Delete or transfer historic data
	Instrument is in Survey mode	The instrument does not store data in survey mode. Can to manual or program log mode

Symptom	Possible Cause	Corrective Action
Flow Error is indicated on front screen	If sampling from a duct, instrument may have problems overcoming pressure differences	Attach both the input and the exhaust port into the duct
	Flow obstruction	Remove obstruction if still present. Press any key to bypass
	Internal pump failing, indicated by inability to adjust flow rate to full range	Factory service may be required
	Filter Cassette clogged or has mass loading	Replace the filter cassette. See the maintenance section of the manual
	External pump module (for Model 8530EP only) is not connected to the DustTrak™ monitor	<p>Make sure both the External Pump cable and the flow tubing connector are connected to the DustTrak™ monitor and the External pump module. Lock the External Pump Cable in place by rotating the connector clockwise until you hear it snap in place</p> <p>Make sure the tubing between the DustTrak™ monitor and the External pump module is not kinked and is free of any sharp bends</p> <p>Make sure the exhaust adapter is connected to the exhaust of the DustTrak monitor</p> <p>Make sure the External Pump module filters are not clogged. If found dirty, replace the two HEPA filters</p>
Laser Error indicated on front screen	Laser background is too high	Remove and clean inlet nozzle. Pay close attention to the tip of the nozzle that is inserted into the instrument to ensure it is clear of any contamination
	Laser is failing	Factory service may be required

Symptom	Possible Cause	Corrective Action
Filter Error indicated on front screen	Filters need to be replaced	<p>Replaced the filters per instructions in the maintenance section of this manual. Make sure to reset the filter mass and date once the filters have been changed</p> <div> <p>NOTICE</p> <p>This is only a warning. The unit will continue to operate normally until the increase in pressure drop across the filter is so high that the pump can no longer maintain the set flow rate.</p> </div>
System Error has Occurred!	The processor did not receive the input it expected. This can also happen if the optics chamber is saturated with light, or the External Pump Cable is accidentally disconnected during the middle of sampling	Reboot the instrument. If the error does not go away, factory service is required

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Appendix A

Specifications

Specifications are subject to change without notice.

Sensor Type	90° light scattering
Range.....	8530 Desktop: 0.001 to 400 mg/m ³ 8532 Handheld: 0.001 to 150 mg/m ³
Resolution	±0.1% of reading or 0.001 mg/m ³ , whichever is greater
Zero Stability	±0.002 mg/m ³ 24 hours at 10 sec time constant
Particle Size Range	Approximately 0.1 to 10 µm
Flow Rate	3.0 L/min set at factory 1.4 to 3.0 L/min adjustable
Flow Accuracy	±5% of factory set point Internal flow controlled
Temperature Coefficient	+0.001 mg/m ³ per °C
Operational Temperature.....	0 to 50°C
Storage Temperature	-20 to 60°C
Operational Humidity	0-95% RH, non-condensing
Time Constant.....	Adjustable 1 to 60 seconds
Data Logging	45 days at 1 minute samples
Log Interval	1 second to 1 hour
Physical Size (HWD)	Handheld: 4.9 x 4.75 x 12.45 in. Desktop: 5.3 x 8.5 x 8.8 in. External Pump: 4.0 x 7.5 x 3.5 in.
Weight	Handheld: 2.9 lb., 3.3 lb. with battery Desktop: 3.45 lb., 4.45 lb. – 1 battery, 5.45 lb. – 2 batteries External Pump: 3.0 lb.
Communications.....	8530: USB (Host and Device) and Ethernet. Stored data accessible using thumb drive 8532: USB (Host and Device). Stored data accessible using thumb drive.

Power—DC	Handheld: 12 VDC at 2A Desktop: 24 VDC at 2.5A
Battery.....	8530: Up to 2 Removable Li-Ion External and Internal charging Life, 1 battery: >6.5 hours (9 hours typical for a new battery) for both internal and external pump Desktop DustTrak monitors Life, 2 battery: >13 hours 8532: 1 Removable Li-Ion External and Internal charging Life: 5 hours typical
Analog out.....	8530: User selectable output 0 to 5 V or 4 to 20 mA User selectable scaling
Alarm Out.....	8530: Relay or sound buzzer Relay No latching MOSFET User selectable set point 5% deadband Connector 4-pin, Mini-DIN connectors 8532: Sound buzzer
Screen.....	8530: 5.7" color touchscreen 8532: 3.5" color touchscreen
Gravimetric Sampling....	8530: Removable 37-mm Cartridge
EMI/RF Immunity	Complies with Emissions Directive Standard: EN50081-1:1992 Complies with Immunity Directive Standard: EN50082-1:1992*

*ESD Shock may require instrument reboot

Appendix B

Zero Module

The Zero Module (P/N 801690) allows for automatic re-zeroing of the DustTrak™ Instrument during long sampling runs. The Zero Module works only with the 8530 desktop models.

Attach the AutoZero module to the main instrument in two steps.

1. Place the Zero module over the instrument's inlet and press down. The Zero module has an O-ring seal that will engage with the instrument's inlet.

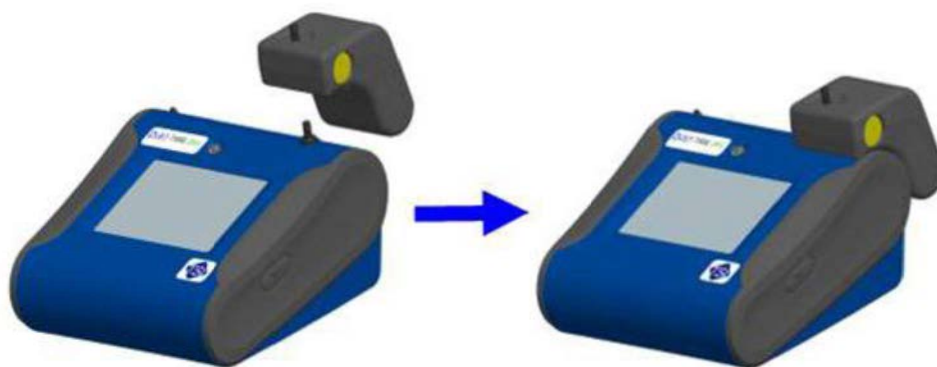


Figure B-1: Place Zero Module Over Inlet and Press Down

2. Attach the cable from the Zero module to the Zero module connector located on the back of the instrument.



Figure B-2: Zero Module Connector

The Zero Module can only be used in a program log mode. The Zero module function is controlled through these two program mode options:

Auto Zero Interval	Interval between re-zeroing the instrument using the Auto-Zero accessory.
Use Auto Zero	Select Yes to use the Zero Module. Select No to not use the Zero Module.

Important points on Zero Module operation:

- The Zero module will take one (1) minute to take a zero reading. The first 45 seconds of that period is used to clear the chamber of particles. Readings from last 15 second of the period, when the chamber is cleared of particles, will be averaged to determine the Zero offset.
- The log interval, when the Zero module is activated, must be two (2) minutes or greater. Data will not be recorded to the log file when the Zero module is activated.



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