



Remedial Construction Work Plan

**Former Silver Cleaners Site #828186
Rochester, New York**

January 12, 2023

Remedial Construction Work Plan

Former Silver Cleaners Site #828186
Rochester, New York

January 12, 2023

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Acronyms and Abbreviations

Arcadis	Arcadis of New York, Inc.
CAMP	Community Air Monitoring Plan
CEPP	Community and Environmental Protection Plan
GES	Groundwater and Environmental Services, Inc.
NYSDEC	New York State Department of Environmental Conservation
ppm	parts per million
RD	Remedial Design
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

1 Introduction

This Remedial Construction Work Plan (Work Plan) has been prepared to support the implementation of remedial construction activities for the Former Silver Cleaners site (Site #828186), located at 245 Andrews Street in the City of Rochester, Monroe County, New York.

This Work Plan (WP) presents the description of the work necessary to complete the remedial construction being completed under a call-out contract mechanism.

1.1 Site Location and Description

The site is located in downtown Rochester, New York (**Figure 1**) and consists of three contiguous parcels totaling 0.30-acres. The site consists of a one-story vacant commercial building (245 Andrews Street) and an asphalt parking lot which is currently used as a permit only parking lot. The site is bordered to the north by Andrews Street, to the east by North Clinton Avenue and a triangle-shaped parcel owned by the City of Rochester. Bordering to the west of the site, 237-241 Andrews Street consists of a basement with utilities and storage, a first floor with businesses, and second and third floors with residential units. Bordering to the south of the site; 113-117 North Clinton Avenue (also known as 113 North Clinton and Elk Place, which is in the Brownfield Cleanup Program BCP Site #C828195), 107 North Clinton, and a parking lot.

113 North Clinton consists of a basement with a utility room and storage, two businesses on the first floor (barber shop and mini mart), and residential apartment units on the second through fifth floors.

107 North Clinton Avenue is owned by the Rochester City School District (RCSD) (RCSD School No. 90) and consists of a basement (utilities and storage) and two floors of classrooms as well as a parking lot (Figure 2). Site topography is generally flat with approximate elevations of 530 to 526.4 feet above mean sea level (AMSL).

1.2 Previous Investigations

In 2012, Ravi Engineering & Land Surveying, P.C. (RE&LS) completed a Phase I ESA of the site for D4 Discovery and the City of Rochester through Rochester's Brownfield Assistance Program (BAP) (RE&LS 2012). The Phase I ESA identified the following recognized environmental conditions (RECs) related to former operations at the site:

- Two 1,000-gallon gasoline USTs and one (or two) 500-gallon USTs were utilized by several former service stations;
- A potential petroleum release to site soils and/or groundwater;
- The site building was occupied by a dry-cleaning business known to have used PCE; and
- A potential PCE release to site soils and/or groundwater.

In 2012, Leader Professional Services Inc. (Leader) and RE&LS completed a Confirmatory Phase II ESA (Leader 2013) to confirm whether contaminants related to the above RECs had impacted the subsurface. The Phase II ESA included performing a geophysical survey to locate former USTs and advancing soil borings to evaluate whether there were impacts to soil and groundwater. The geophysical survey identified electromagnetic anomalies indicative of buried metal objects. A total of five soil borings were advanced to refusal at depths ranging from 2 to 13.8 feet below ground surface (bgs). Four of the locations were advanced in the building and one was advanced east of the building near assumed locations of former USTs (Leader 2013).

Soil sample analytical results from borings advanced below the building slab (SB-1 at 7 feet bgs and SB-4 at 8 feet bgs) were less than unrestricted use soil cleanup objectives (SCOs). Analytical results from soil boring SB-5 at 8 feet bgs indicated that ethylbenzene (1.3 parts per million [ppm]), o-xylene (2.6 ppm), and m,p-xylene (5.9 ppm), near the former UST area exceeded Part 375 unrestricted use SCOs. Soil samples were not collected from SB-2 or SB-3 for laboratory analysis. Analytical results for PCE concentrations in groundwater samples GW-1, collected from SB-1 at 7.5 feet bgs (7,890 micrograms/L [$\mu\text{g/L}$]) and GW-2, collected from SB-4 at 13.2 feet bgs (88,500 $\mu\text{g/L}$), exceeded the New York State Class GA Groundwater Standard (Class GA Standard) of 5 $\mu\text{g/L}$ listed in the New York State Division of Water Technical and Operation Guidance Series (TOGS) version No. 1.1.1. Analytical results from groundwater sample GW-5 at 13.3 feet bgs collected in soil boring SB-5 exceeded the respective Class GA Standards for ethylbenzene (1,040 $\mu\text{g/L}$), methylcyclohexane (826 $\mu\text{g/L}$), toluene (309 $\mu\text{g/L}$), naphthalene (699 $\mu\text{g/L}$), 1,2,4-trimethylbenzene (1,650 $\mu\text{g/L}$), 1,3,5-trimethylbenzene (630 $\mu\text{g/L}$), o-xylene (1,250 $\mu\text{g/L}$), and m,p-xylene (3,450 $\mu\text{g/L}$). Based on the concentration of PCE in groundwater noted above, SB-4 is considered a potential PCE source area and further investigations were conducted during the RI (as detailed below) to delineate PCE groundwater concentrations.

A Remedial Investigation (RI) was completed in 2020, a summary of which is provided in the following subsection.

1.3 Remedial Investigation Activities and Conclusions

The scope of work for the RI was designed to further evaluate the nature and extent of PCE and petroleum related compounds in soil and groundwater at the site; and the potential for soil vapor intrusion into adjacent properties as a result of former site operations. The scope of work included the following:

- Preliminary review of historical documents and an initial site walk;
- Asbestos containing material (ACM) survey;
- Geophysical survey;
- Soil boring advancement and soil sampling;
- Test pit excavation;
- Underground storage tank removal;
- Overburden piezometer and monitoring well and bedrock monitoring well installation;
- Well development and hydraulic conductivity testing;
- Groundwater and sump water sampling; and
- Offsite soil vapor sampling.

Through the completion of the above activities, the nature and extent of constituents of potential concern (COPCs) were identified during the RI, with the exception of COPC in the deep overburden and bedrock groundwater downgradient of the site. However, the source and migration of COPCs, and exposure pathways have been identified through the development of a CSM and, given the data gaps mentioned below, the results from the RI investigation provide sufficient data to evaluate potential site (i.e., source area) remedies. Results of the RI conducted at the site are described below.

- The data indicates that there was a historical release of chlorinated solvents (PCE and TCE) into the sand and fill material either beneath the site building slab, near the south edge of the site building, and/or just outside the site building's south wall. Data also indicates a historical release of petroleum related constituents

(BTEX, 1,2,4-trimethylbenzene, and naphthalene) to the shallow overburden in the vicinity of the former service station.

- Concentrations of primary COPCs are greatest near the south side of the site building in the deep and shallow overburden groundwater and are shown to decrease hydraulically downgradient of the PCE source area. PCE and TCE appear to have migrated through the silty sand and dense till and into bedrock.
- Concentrations of BTEX, 1,2,4-trimethylbenzene, and naphthalene are greatest in shallow overburden groundwater beneath and adjacent to the former service station area. Low concentrations of BTEX are present in the deep overburden indicating that the dense till is acting as a semi-confining layer.
- Overburden materials are generally composed of urban fill overlying glacial outwash sediments (sand and silt) (9-16' bgs) which overlies a dense glacial till (densely packed sand, silt, and gravel), followed by a thin layer of silty sand (between 26-34' bgs), and then bedrock (dolomite). The top of bedrock ranges from 27 to 34.3 feet bgs.
- Concentrations of PCE in shallow and deep overburden groundwater indicate that residual separate-phase product is likely present, although it was not observed in groundwater or soil during the RI or previous investigations.
- VOCs in shallow and deep overburden have migrated north following groundwater flow.
- The vertical and horizontal extent of PCE and TCE in the bedrock is not fully delineated as analytical results from groundwater collected in bedrock well (BRW-2) showed PCE concentrations greater than the respective Class GA Standard.
- The extent of dissolved-phase COPCs in the overburden is not fully delineated as groundwater from the farthest sample locations downgradient (north of) and to the west of the site contain chlorinated solvent COPCs at concentrations greater than Class GA Standards. However, PCE was detected at lower concentrations compared to the onsite concentrations. Other sources of VOCs in the groundwater from historical use (historical gas station) and other nearby contaminated sites could also be contributing to these concentrations.
- PCBs and pesticides were not detected and no metals of concern were detected above respective soil and groundwater standards during the RI. Only three soil samples contained SVOCs detected at concentrations greater than applicable SCOs. There were no detections of PFAS greater than the USEPA health-based criteria for drinking water. As such, SVOCs, PCBs, pesticides, PFAS, and metals are not considered COPCs for soil or groundwater.
- VOCs are present in the indoor air and sub-slab vapor at the properties adjacent to the site (237-241 Andrews Street and 113 North Clinton Avenue).

Potential exposure pathways at the site primarily exist for those who could come in contact with groundwater, sump water, and or subsurface soil. Construction and utility workers could be exposed to subsurface soils during excavations via dermal contact, incidental ingestion, and inhalation of vapors and soil particulates. Complete groundwater and sump water exposure pathways for construction and utility workers include dermal contact, incidental ingestion, and inhalation of vapors. There is a complete exposure pathway via soil vapor intrusion and inhalation of indoor air in the adjacent properties in the absence of engineering controls.

1.4 Record of Decision

The NYSDEC issued a Record of Decision (ROD) in June 2020 that presents the remedy for the site. The elements of the selected remedy are as follows:

- Demolition of the on-site building;
- Excavation and off-site disposal of contaminant source areas, with soil concentrations greater than the protection of groundwater soil cleanup objectives (PGWSCOs);
- Implementation of in-situ chemical treatment, whereby a chemical oxidant is injected into the subsurface to destroy site-related contaminant;
- Installation of site cover where the upper two feet of exposed surface soil exceeds the respective PGWSCOs;
- Mitigation of soil vapor intrusion in any future site buildings;
- Imposition of an institutional control in the form of an environmental easement;
- Preparation and implementation of a Site Management Plan.

This Remedy will achieve the remediation goals for the site by excavation of source area soil and the treatment of groundwater and soil below the groundwater table using in-situ chemical treatment.

1.5 Remedial Design

A Basis of Design Report was developed to summarize historical information, collected data, and previously completed work related to residual environmental contamination to develop the proposed remedial design for the Former Silver Cleaners Site and is included in **Appendix A**.

This work plan has been prepared to cover the proposed remedial construction activities involving the source excavation and disposal. The specific scope of work is further defined in Section 2 of this Work Plan.

In addition, the Limited Site Specific Data (LSSD) supported the preparation of the remedial design. The LSSD is included in **Appendix B**.

1.6 Project Responsibilities

Responsibilities of the Owner (NYSDEC or Department) and the Contractor (Groundwater and Environmental Services, Inc. [GES] or their subcontractor(s)). The Engineer (Arcadis of New York, Inc. [Arcadis]) is the entity that prepared this Work Plan and Remedial Design. Department's Representative (Arcadis) will act as an agent to the Department. The responsibilities as they relate to the implementation of this Work Plan, are summaries as follows:

- Owner – Primary responsibility is to coordinate with the GES and Department's Representative (as necessary) to implement the required work activities in conformance with this Work Plan. Department is responsible for contracting with the GES.
- Engineer – Primary responsibility is to prepare this work plan and the remedial design. During the remedial design implementation, Arcadis will review all submittals prepared by GES and will oversee the remedial construction for compliance with the remedial design requirements.
- NYSDEC/Department's Representative (or Representative) – Responsibility is to provide staff to observe and monitor implementation of the remedial activities.
- Contractor – Primary responsibility is to complete remedial activities as presented in this Work Plan.

2 Remedial Activities

This section presents a summary of the remedial activities that are anticipated to occur under this Work Plan.

2.1 Scope

The Work includes, but is not limited to, the following:

1. Install temporary fence and privacy screen.
2. Install erosion and sediments controls prior to any intrusive work.
3. Furnish specified temporary services and controls.
4. Furnish specified H&S controls as further defined in Specification 01 35 29, Contractor's Health and Safety Plan in Appendix D.
5. Prepare and Implement the Community Air Monitoring Plan (CAMP) as further outlined in Appendix E.
6. Prepare and Implement the Geotechnical Monitoring Plan prior to any intrusive work as further defined in Specification 31 09 13, Geotechnical Instrumentation and Monitoring in Appendix D. The geotechnical monitoring plan will be prepared and implemented by GES to protect the adjacent structures from vibrational damage during remedial construction activities.
7. Furnish decontamination pad and supporting systems prior to intrusive work in accordance with the design drawings and design specifications. GES will provide water treatment system, obtain discharge approval, and pay any characterization and discharge fees.
8. Furnish Water Treatment System prior to intrusive work as further defined in Specification 44 00 05, Water Treatment in Appendix D.
9. Furnish stockpile pad(s) as required for staging of contaminated soils if not being direct loaded in accordance with the design drawings and design specifications.
10. Pre excavation survey per the design specifications.
11. Abandon wells and piezometers that fall within the source excavation area.
12. Demo building foundation and asphalt as required for source excavation.
13. Install excavation support system.
14. Complete source excavation, characterization, manage, transport and disposal of contaminated soils in accordance with design specifications. Manage groundwater and stormwater collected within the excavation area during the source excavation activities until excavation area is excavated.
15. Collect five documentation samples from the bottom of the excavation utilizing the excavator for sampling of the dense till soil layer.
16. Post excavation survey to define the final limits of excavation and the location of the documentation samples per the design specifications.

17. Install passive ISCO injection header system as shown in the design drawings.
18. Install source excavation backfill as shown and specified.
19. Remove excavation support system.
20. Install drainage improvements.
21. Install asphalt at disturbed areas.
22. Remove decontamination pad, stockpile pad(s), and Water Treatment System.
23. Removal of Items 1 to 6.
24. As-built survey per the design specifications.

The work shall be conducted in accordance with the remedial design which consists of the design drawings and the design specifications included as **Appendix C and Appendix D**, respectively.

2.2 Site Controls

GES and its subcontractor(s) shall prepare and submit a project Operations Plan which provides a detailed description of the planned means and methods to be implemented to control the site during the work. This Operational Plan shall also include other necessary plans and submissions required and/or specified in the design specifications. Following approval of the Operations Plan, GES shall mobilize to the site and establish all site controls required. These include providing for health and safety and security for the personnel, and protection of completed work, equipment, and materials of the project. Also access controls, storm water controls, community health and safety elements, and any engineering controls necessary shall be implemented. Actions which are intrusive into the ground shall not be initiated until these controls are in place.

2.3 Access Controls

GES shall confine the work to within the Limits of Work as shown on the attached drawings. The site abuts other building structures. GES is required to coordinate with the owners and property tenants during the work.

Access to the site shall be through the existing site curb cuts as shown on the drawings.

2.4 Storm Water Controls

GES shall utilize storm water controls to prevent the release of materials, including contaminated soil and water, to local storm water during the work. At a minimum, GES shall install sediment controls as shown on the drawings at the perimeter of the excavation areas and around all stockpiles, laydown and work areas. Controls to prevent the discharge of storm water, snow, or melted snow collected during the work in lined storage areas, excavations and decontamination facilities shall be implemented by GES. All such controlled and collected materials shall be contained, characterized and disposed of in accordance with all governing laws and regulations. Collected waters may be disposed either:

- After treatment, to the municipal sewer system; after attaining the pretreatment requirements and discharge approval by Monroe County Pure Waters as further specified in Section 44 00 05, Water Treatment in Appendix D.

- At an off-site treatment or disposal facility after meeting the discharge requirements of the receiving facility.

In no case shall collected waters be discharged to the ground surface at the Site.

2.5 Air Monitoring

The soil contaminants at the site include Volatile Organic Compounds. During the remedial work, GES shall monitor air quality as part of a CAMP to ensure the safety of personnel and the public. Air monitoring shall be conducted in accordance with the requirements of the Community Air Monitoring Plan/Community and Environmental Protection Plan (CAMP/CEPP) included in **Appendix E** of this Work Plan.

2.6 Health and Safety

Health and safety documents to be kept on site during the work activities and updated as conditions change include a site-specific Health and Safety Plan (HASP) and CAMP/CEPP.

2.6.1 Site Worker HASP

Prior to mobilization to the site, GES shall prepare a site-specific HASP for use during the work to cover Contractor's activities and the activities of their subcontractors and vendors. This HASP shall supplement the existing Health and Safety Plan prepared for the callout Contractor's standby construction contract, and shall address any subcontractors, suppliers and possible vendors associated with the project. The HASP shall address provisions for protecting the health and safety of Contractor's personnel and the public, including on-site personnel not associated with the work, from harm related to the work.

The HASP shall be prepared in accordance with the requirements in Section 01 35 29, Contractor's Health and Safety Plan (See Appendix D). The HASP shall be submitted to the Department in advance of the start of work to allow resourcing and planning for full implementation during the work.

2.6.2 Community Air Monitoring Plan

In conjunction with the HASP, the standby callout Contractor shall implement the Community Air Monitoring Plan/Community and Environmental Protection Plan. The CAMP shall provide provisions to protect the public in the area of the work from exposure to particulates, dust and contaminants that could be released during demolition.

Air monitoring shall be conducted in accordance with the requirements of the Community Air Monitoring Plan/Community and Environmental Protection Plan included in Appendix E of this Work Plan.

2.7 Staging Areas

As shown on the drawings, GES shall utilize the identified open site area to construct a staging, storage, stockpiling and lay down area for equipment and materials. GES shall use only areas within the Limit of Work shown for these activities. The area shall be protected from contamination as shown on drawings.

2.8 Utility Summary

The approximate locations of known underground, surface and overhead utilities have been shown on the drawings. Prior to any intrusive work, GES shall confirm these locations and shall utilize an underground utility search service to mark out all utilities within the Limit of Work. Any modified or newly-identified utilities shall be identified to the Department prior to the initiation of intrusive activities. If required, GES shall coordinate with the individual utility companies and the service users to temporarily relocate, interrupt service from, or modify the utilities.

3 Contaminated Soil Excavation And Disposal

During excavation, GES shall excavate soil from the areas shown on the design drawings included in Appendix C. All of the soil contained within the horizontal and vertical limits identified shall be removed from the excavation by GES, staged appropriately on-site, characterized, and ultimately disposed at an approved off-site facility licensed to accept soils of this type. The proposed source excavation limits and excavation activities are discussed more fully in the Basis of Design Report included in Appendix A and shown in the design drawings included in Appendix C.

3.1 Sampling and Characterization

Representative samples of excavated soil shall be collected and analyzed by GES. GES will characterize the material for disposal acceptance in accordance with Specification Section 02 51 41, Off-Site Transportation and Disposal, and the requirements of the off-site disposal facility or facilities receiving the contaminated soil. Specification Section 02 51 41, Off-Site Transportation and Disposal is included in Appendix D.

All analytical results shall be submitted to the Department promptly upon receipt by GES. GES shall be solely responsible for coordinating excavation activities with excavation area access and laboratory testing to minimize the period between excavating and backfilling/restoration.

Arcadis is preparing a contained-in determination request for submission and approval. Based on the existing data it can be assumed that some of the soils will be characterized as F-listed waste and a portion of the soils will be disposed of as non-hazardous waste.

3.2 Excavation Dewatering

GES shall provide on-site water collection, containment, treatment and discharge permits and fees as required to manage excavation dewatering in accordance with the requirements of the remedial design. Any groundwater and runoff that enters the excavation area shall be collected and treated in accordance with Section 44 00 05, Water Treatment in Appendix D and as more fully described in Section 2.4.

3.3 Supplemental Excavation

GES shall not be required to remove supplemental soil from the excavation areas beyond the established Limits of Excavation. At the conclusion of soil removal activities, GES shall conduct a topographical survey of the area. The survey shall include the excavation “sidewalls” and bottom, and shall be submitted to the Department. This volume shall be determined by comparing the pre- and post-excavation topography using a suitable electronic earthworks program.

3.4 Contaminated Soil Handling and Stockpiling

All soil removed from the excavation areas shall be assumed to be contaminated and shall be handled and managed as such. At a minimum, the excavated soil shall be placed either in secure roll-off containers or on lined stockpiles as shown on the drawings located within the Limit of Work. Air and particulate dust discharges from the storage areas shall be managed by GES in accordance with the project HASP and Community Air Monitoring Plan/Community and Environmental Protection Plan included in Appendix E.

3.5 Loading and Hauling

During all soil excavation activities, debris shall be separated from contaminated soil by GES and stored in a segregated manner based upon disposal requirements. All material shall be transported off-site in accordance with Specification Section 02 51 41, Off-Site Transportation and Disposal, and all New York State Laws and Regulations. Hauling vehicles shall be appropriately licensed to carry the materials of the type and nature to be encountered, and also approved to transport and dispose of materials at the facilities selected by GES to receive the wastes. All transport vehicles shall be decontaminated in accordance with GES's HASP prior to exiting the site, and all loads shall be covered. Bills of lading or manifests for the materials to be transported shall be prepared by GES, and copies of these documents, along with weight receipts from the disposal facilities shall be submitted to the Department. Measurement and payment for all transport of disposed solid materials will be on a per-ton basis.

3.6 Off-Site Disposal

GES shall remove from the site all excavated soil and foundation debris resulting from remedial operations. The location(s) for disposal shall be based upon data received from sampling and characterization of the materials to be conducted by GES. All material shall be disposed of off-site by GES in accordance with Specification Section 02 51 41, all New York State Laws and Regulations, and the specific disposal requirements of the receiving facilities. Measurement and payment for the disposal of excavated soil and other foundation debris will be on a per ton basis for the material as measured by truck weight receipts for each load obtained from a certified truck scale at the disposal facilities.

4 Restoration

Upon completion of the excavation and removal of contaminated soil, disturbed areas of the site shall be restored in accordance with the design drawings and design specifications. The general objective of the restoration is returning the remediated site to pre-excavation grades and providing an asphalt surface that is in keeping with the existing surface and will also provide an engineering controlled cover system.

4.1 Post Excavation Backfill

Following confirmation that the post-excavation subgrade survey has been completed, the Department will notify GES that the excavation is acceptable to be backfilled. A demarcation material shall be placed in the excavation to differentiate between material left in-place and fill material to be imported and used as backfill.

A passive ISCO header system will be installed within the backfill material as shown on the design drawings (See Appendix C)

All fill material brought to the site shall meet the physical and analytical requirements as specified in Section 31 23 05, Excavation and Fill (See Appendix D).

4.2 Compaction

Backfill shall be placed in accordance with Section 31 23 05, Excavation and Fill, attached in Appendix D. As necessary, backfill may be hand or manually-placed around utilities that remain.

4.3 Surface Restoration

The surface of the excavated areas must be restored due to disturbance from the work of this project. The proposed restoration is an asphalt engineering control cover system. GES shall install asphalt in accordance with Section 32 12 00, Flexible Pavement, attached in Appendix D.

4.4 Site Drainage

To facilitate site drainage at the final restored conditions, a catch basin and storm sewer will be installed as further shown on the design drawings (See Appendix C).

4.5 Fencing

A segment of chain link fence will be installed as further shown on the design drawings (See Appendix C).

5 Reporting

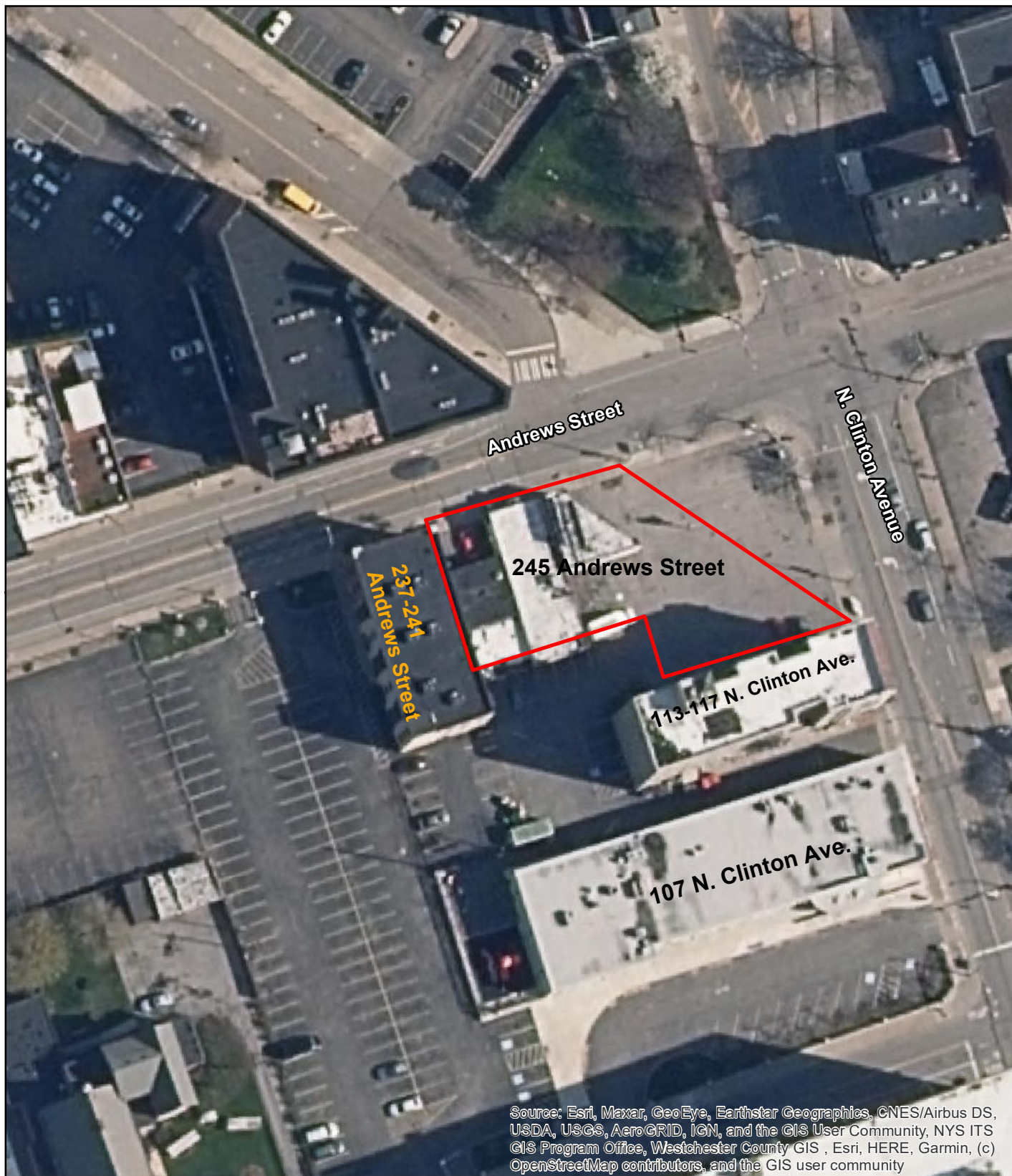
At the conclusion of the work, GES shall participate in a substantial completion inspection of the work with the representatives of the Department. The Department will prepare a punch list of items requiring completion based upon this inspection. GES shall subsequently complete the items on the punch list. GES shall then notify Arcadis that the work is complete and shall participate in a final inspection of the project. Residual work to be completed, if any, shall subsequently be finished by GES within one week of the final inspection.

Following final completion, GES will prepare and submit to the Department a summary report documenting the remedial activities. Appended to the report will be compiled field data, including information collected by GES and provided to the Department. Prior to final completion, GES shall submit to Arcadis the following for use in preparation of the report:

- Daily reports with CAMP data included for all work days indicating the work accomplished and the labor, equipment, materials and other resources utilized;
- Progress photos depicting the work on a daily basis;
- Records of contacts, decisions, conversations and discussions conducted with the Site owners or tenants, representatives of the businesses on the adjacent properties, utility representatives, regulatory staff and personnel from municipal and special districts having jurisdiction at the Site;
- Laboratory analytical data for all samples;
- Bills of lading, manifests and disposal documentation for all hazardous and non-hazardous materials;
- Weight slips from disposal of all materials;
- Survey data, indicating the excavation subgrade and the as-completed horizontal and vertical location of all project features;
- Compiled survey data, including, but not limited to, surfaces defining the areas of excavation following excavation and following backfill and restoration;
- All other survey data and field measurements obtained during the execution of the work;
- A final comprehensive ACSM/ALTA site survey map, prepared, signed and sealed by a land surveyor licensed by the State of New York, depicting the conditions at the conclusion of the work and the Easement(s) identified by the Department;
- Annotated Work Plan figures and specifications, with any necessary supplementary supporting sketches, details or descriptions, indicating changes or modifications made to the work during the project; and
- Documentation of any pre- and post-project measurements, photos and other information obtained by GES.

Arcadis will utilize these documents in the preparation of a Final Engineering Report (FER) to document the Remedial Construction Activities.

Figures



0 20 40 80 120 160 Feet



Legend

 Approximate Site Boundary

New York State Department of Environmental Conservation
Former Silver Cleaners Site # 828186
Rochester, New York
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

SITE MAP



FIGURE

1

Appendix A

Basis of Design Report



**Department of
Environmental
Conservation**

Basis of Design Report

**Former Silver Cleaners Site (Site No.828186)
245 Andrews Street
Rochester, New York**

December 2022

Basis of Design Report

Former Silver Cleaners Site
245 Andrews Street
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December 2022

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Appendices

- A Pre-Demolition Hazardous Building Materials Survey Report
- B Sodium Permanganate Safety Data Sheet

1 Introduction

This Basis of Design (BOD) Report has been developed to summarize historical information, collected data, and previously completed work related to residual environmental contamination to develop the proposed remedial design for the Former Silver Cleaners Site (NYSDEC Site No. 828816; **Figure 1**).

1.1 Objective

The New York State Department of Environmental Conservation (NYSDEC) issued a Record of Decision (ROD) in June 2020 to address the remediation of residual concentrations of tetrachloroethylene (PCE) and other volatile organic compounds (VOCs) in groundwater. Two Interim Remedial Measures (IRMs) were implemented at the site. These IRMs included the following:

- A Sub Slab Depressurization System (SSDS) was installed in March 2019 at the adjacent property to the west of the Site and a second SSDS system was installed under the Brownfield Cleanup Program (ref. Site No. C828195) at an adjacent property to the south of the Site.
- A 500-gallon UST was removed from the site in August 2015.

In addition to administrative controls, the ROD identified source soil excavation and in-situ chemical oxidation (ISCO) injection as the selected remedial alternative to treat the dissolved-phase chlorinated VOC (CVOC) plume at the Site.

2 Site Description

2.1 Historic Site Usage

The 245 Andrews Street parcel was used as a dry cleaner from 1949 to 2011. The 151 and 159-169 Pleasant Street parcels were utilized as a gas station from 1935 to 1955.

The site is currently being used as a surface parking lot and is zoned Center City District (CCD). The CCD is intended to foster a vibrant, safe, twenty-four-hour Center City by encouraging residential development while retaining and further developing a broad range of commercial, office, institutional, public, cultural and entertainment uses and activities.

2.2 Physical Description

2.2.1 Characteristics of Site and Vicinity

The Site (**Figure 1**) is located in downtown Rochester, Monroe County. The site is comprised of three contiguous parcels totaling 0.30 acres located at the corner of Andrews Street and North Clinton Avenue. The addresses for the three contiguous parcels are 245 Andrews Street, 151 and 159-169 Pleasant Street. The site is bounded by Andrews Street to the north, North Clinton Avenue to the east and commercial properties to the west and south.

The on-site soils consist of miscellaneous fill material that is underlain with fine sand with trace silt and gravel. The miscellaneous fill material consists of soil, concrete, and brick. The Genesee River is located approximately 0.2 miles west of the site. The local groundwater flow direction is to the north. The depth to groundwater in the area is approximately 6 to 9 feet below ground surface.

2.2.2 Built Features

2.2.2.1 Structures

The main site feature is the one-story vacant on-site building with a paved parking area on the east side of the property. The building has been abated of friable Asbestos Containing Materials (ACM). The building will be demolished as a controlled demolition (to address the non-friable ACM) as part of a call-out contract prior to completion of the remedial construction activities.

2.2.2.2 Utilities

A site utility survey was completed as part of remedial Investigation activities. While the conditions that are reported herein in the following section were representative of observations made at the time of the review, due to the on-going construction and redevelopment activities the conditions noted herein may have changed since the site visits were completed. It should be noted that formal disconnection of the building utilities will be completed prior to the demolition of the building that will occur prior to the remedial construction.

2.2.2.2.1 Electric

Electric service was supplied to site buildings via overhead lines. Some underground electric has also been noted below the building slab. The electric service provider is Rochester Electric and Gas and has been confirmed to be disconnected.

2.2.2.2.2 Natural Gas

Based on pavement markings observed on the driveway pavement at the site, a natural gas line enters the site from the northwest corner of the site and into the building at the northwest portion of the building. The natural gas service provider is Rochester gas and Electric and has been confirmed to be disconnected.

2.2.2.2.3 Water

A water line is assumed to be connected to the building. Its location has not been identified to date. Water is provided by the City of Rochester. Disconnection is pending.

2.2.2.2.4 Wastewater

A sewer line is vault is assumed to be connected to the building. Its location has not been identified to date. Sewer service is provided by Monroe County Pure Waters. Disconnection is pending.

2.2.2.2.5 Communications

Overhead communications lines are present and enter the building at the northeast corner. Disconnection is pending.

2.2.2.2.6 Stormwater

Stormwater drainage is present on the City of Rochester parcel east of the site.

3 Site Contamination

As presented in the ROD, contaminants of concern were identified during the Remedial Investigation. A "contaminant of concern" may be a hazardous waste if it is sufficiently present in frequency and concentration in the environment to require evaluation for remedial action. Not all contaminants identified on the property are contaminants of concern. The primary contaminants of concern identified within the proposed source area at the Site are:

- tetrachloroethene (PCE),
- trichloroethene (TCE), and
- cis-1,2-dichloroethene.

As illustrated in the ROD, the contaminants of concern exceed the applicable Standards, Criteria and Guidance (SCGs) for:

Groundwater

- Remedial Action Objectives (RAOs) for Public Health Protection
 - Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
 - Prevent contact with, or inhalation of volatiles, from contaminated groundwater.
- RAOs for Environmental Protection
 - Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
 - Prevent the discharge of contaminants to surface water.
 - Remove the source of ground or surface water contamination.

Soil

- RAOs for Public Health Protection
 - Prevent ingestion/direct contact with contaminated soil.
 - Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.
- RAOs for Environmental Protection
 - Prevent migration of contaminants that would result in groundwater or surface water contamination.
 - Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or

impacts from bioaccumulation through the terrestrial food chain.

Soil Vapor Intrusion

- RAOs for Public Health Protection
 - Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings at a site.

3.1 Groundwater Contamination

PCE and its associated degradation products are found in groundwater on and off- site, substantially exceeding groundwater standard of 5 parts per billion (ppb), with a maximum concentration of 130,000 ppb of PCE. Concentrations of trichloroethene found on and off-site, substantially exceed groundwater standard of 5 ppb, with a maximum concentration of 2,500 ppb. Concentrations of cis-1,2-dichloroethene found on and off-site, substantially exceed groundwater standard of 5 ppb with a maximum concentration of 150 ppb.

3.2 Soil Contamination

PCE is found in shallow and deeper soil, predominantly under and to the south of the on- site building extending off-site. Concentrations of PCE found on-site at levels, up to 670 parts per million (ppm), significantly exceed the soil cleanup objectives for the protection of groundwater (1.3 ppm) and for restricted residential use (19 ppm). Concentrations of trichloroethene and cis-1,2-dichloroethene were not found at levels that exceed the soil cleanup objectives for the protection of groundwater (1.3 ppm) or for restricted residential use (21 and 100 ppm, respectively).

3.3 Soil Vapor

To determine whether actions are needed to address exposure related to soil vapor intrusion, sub-slab vapor, indoor air, and outdoor air samples were collected at three buildings (237-241 Andrews Street, 113 North Clinton Avenue, and 107 North Clinton Avenue) from 2014-2016. Soil vapor intrusion sampling was offered to four additional properties, but access was not granted. The maximum concentrations of PCE and TCE in sub- slab vapor samples were as follows: 400,000 micrograms per cubic meter (ug/m³) and 8,200 ug/m³, respectively. Similarly, PCE and TCE were found in indoor air samples at maximum levels of 72 ug/m³ and 1.4 ug/m³, respectively. The DOH air guidelines for indoor air samples are, 30 ug/m³ for PCE and 2 ug/m³ for TCE. The concentrations of these VOCs in outdoor air samples were found to be consistent with background ranges.

3.4 PFAS

Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) were reported in groundwater at concentrations of up to 19 and 25 parts per trillion (ppt), respectively. These levels exceed their respective screening levels of 10 ppt. No other individual PFAS exceeded the 100 ppt screening level. The total concentration of PFAS, including PFOA and PFOS, were reported at concentrations of up to 64.6 ppt. The highest concentrations are found on-site under the southern part of the building slab.

3.5 Bulk Storage and Potential Associated Contamination

A focused IRM was completed in August 2015 to identify whether underground storage tanks (USTs) existed on the site. One 500-gallon UST was removed from the site. At the completion of the IRM, a Construction Completion Report, dated December 2019, was prepared.

4 Remedial History of Site

4.1 Initial Site Investigations and Soil IRM

A Remedial Investigation (RI) has been conducted. The purpose of the RI was to define the nature and extent of any contamination resulting from previous activities at the site. The field activities and findings of the investigation are described in the RI Report.

The following general activities are conducted during an RI:

- Research of historical information,
- Geophysical survey to identify subsurface utilities and tanks and, in some situations, determine the lateral extent of wastes,
- Test pits, soil borings, and monitoring well installations,
- Sampling of waste, surface and subsurface soils, groundwater, and soil vapor,
- Sampling of surface water and sediment,
- Ecological and Human Health Exposure Assessments.

The analytical data collected on this site includes data for:

- Groundwater
- Soil
- Indoor air
- Sub-slab vapor

4.2 Record of Decision

Based on the results of the RI/FS, the NYSDEC issued a Record of Decision (ROD) in June 2020 requiring source soil excavation and in-situ chemical oxidation (ISCO) of the source area with the highest concentrations of chlorinated volatile organic compounds (VOCs).

4.3 Pre-Design Testing and Pilot Studies

Remedial Design investigations (RDIs) were conducted during the Remedial Design phase. Detailed descriptions of the work activities completed and ongoing in the development of the Remedial Design are presented in this section. The RDI limit referred to in the scope of work is the area within and adjacent to the former Silver Cleaners building footprint. RDI activities included:

- RDI Task 1 – Geoprobe Boring Investigation - Direct-push drilling methods were used to advance 18 soil borings to refusal at a depth of approximately 12 to 16 feet (depth range of refusal at top of dense till with direct-push drilling methods). The objective of the Geoprobe boring investigation was to further delineate the extent of soil with concentrations greater than the protection of groundwater Soil Cleanup Objectives (SCOs) and provide data to support the decision to determine whether confirmation samples during remedial construction or documentation samples post-remedy are needed.
- RDI Task 2 – Geotechnical Boring Investigation - Geotechnical borings were advanced with a hollow stem auger (HSA) equipped with a 2-foot-long split spoon. Borings were completed to support the preparation of a geotechnical investigation report that will be provided as Limited Supplemental Site Data (LSSD) information to support the excavation design to be specified as required of the remedial contractor. Standard Penetration Testing were conducted at soil borings to assess the relative density of in-place soils in accordance with American Society for Testing and Materials (ASTM) D1586. Four borings were completed to bedrock at an approximate depth of 35 feet, or refusal, if encountered before 35 feet. Geotechnical information was collected in the field by recording blow counts and collecting continuous split spoon samples for soil characterization. Soil samples from select intervals have been sent to a Geotechnical laboratory for the following tests (soil classifications, moisture content, and gradations).
- RDI Task 3 – Groundwater Sampling - Groundwater samples were collected in June 2022 from 20 existing monitoring wells associated with the site to provide pre-remedy baseline groundwater quality data. Groundwater will not be collected from monitoring wells that were destroyed during the building demolition. Samples were collected via low-flow methodology with a peristaltic pump. Sampling results will provide the analytical data necessary to assist in determining the extent of contamination, if any, in the shallow groundwater at the site.

A round of gauging will be conducted at all site monitoring wells to measure static water levels, confirm groundwater flow at the site, and provide data for excavation dewatering during the remedy.

- Investigation Derived Waste (IDW) characterization and removal - IDW generated during the PDI will be containerized on site. Soil cuttings, personal protective equipment, spent disposable sampling materials, and water generated during sampling and decontamination activities will be segregated by waste type and placed in DOT-approved 55-gallon steel drums. Each drum/container will be appropriately labeled (i.e., with the contents, generator, location, and date).

Drums/containers will be staged on site in a secure area. The secure location will be within locked site fencing, or within a locked site storage area. The analytical results for waste characterization samples collected during the PDI will be used to prepare waste profiles for IDW. After completion of PDI activities, a NYSDEC approved vendor will transport the IDW for off-site treatment/disposal in accordance with state and federal guidelines.

- RDI Summary Report- The results of the PDI will be documented in a PDI Summary Report. The results, along with existing site information, will support the design for the remedy. The PDI Summary Report will include:
 - A summary of the PDI work activities and results, including field observations, sampling results, deviations in response to field conditions, issues encountered and resolved, the proposed limits (vertical and horizontal) of the source area excavation.

- Updated figures showing the surveyed locations of aboveground and underground utilities in and around the proposed remedial areas and soil boring and soil sampling locations completed as part of the PDI.
- Figures and tables that define the extent of the proposed source area excavation based on an initial evaluation of the PDI data.
- A summary of sampling locations and corresponding laboratory analyses.
- Soil boring logs.
- Laboratory analytical data reports.

Figure 2 shows the geoprobe and geotechnical boring locations.

5 Remedial Components

5.1 Building Demolition

As identified in the ROD, remedial construction at the Site requires source removal and treatment within the footprint of the existing on-site structure. As such, building demolition is required to allow the implementation of the remedial construction design.

5.1.1 Pre-Demolition Investigation and Reporting

Arcadis performed a Pre-Demolition Hazardous Building Materials (HBM) Survey and completed in a report, dated December 2017, summarizing the effort and analytical results. The objective of the HBM Survey was to ascertain the general presence, quantity, and location of asbestos-containing materials (ACM), lead paint, and potentially regulated materials and universal waste. The Pre-Demolition HBM Survey report is attached to this document as Appendix A which details methodologies, existing building conditions, and analytical findings of associated building material samples.

5.1.2 Demolition Design

The demolition of the on-site structure will be completed prior to the remedial construction by a NYSDEC call-out contractor. The demolition will be conducted in accordance with applicable state and local regulations. The demolition activities will address the contaminants of concern and include applicable abatement procedures to be implemented prior to the demolition of the building structure.

5.1.3 ACM Abatement

The friable ACM present in and on the Site building was abated during the school summer recess in the summer of 2022. Due to the deteriorated condition of the roof the non-friable ACM will be abated as part of the building demolition as part of a controlled demolition variance. This controlled demolition will require the condemnation of the building. The NYSDEC is coordinating the formal condemnation of the building by the City of Rochester.

5.1.4 Demolition

Demolition of the on-site structure will be conducted in coordination with applicable environmental abatement procedures. The on-site structure will be demolished using minimally disruptive methodologies to prevent the obstruction or damage to Andrews Street or other adjacent properties. Demolition of the on-site structure will be progressed to the existing concrete slab foundation. The building slab will be removed with footing and frost walls as required to be removed for excavation of contaminated soils as part of the remedial construction.

A pre-demo and post-demolition photo survey and vibration monitoring will be employed during the demolition activities to document pre-and post-demolition conditions of adjacent structures as well as photo documentation during demolition activities to verify that activities did not adversely impact adjacent properties and structures.

5.1.5 Characterization of Debris

Non-Asbestos Containing Materials listed in the Pre-Demolition HBM Survey report have been characterized and shall be abated and disposed of separately at an approved off-site facility prior to the overall building demolition. Sorted and piled debris from building demolition activities at the Site shall be characterized by the remedial contractor prior to disposal. The characterization samples will be analyzed by an ELAP-approved laboratory and analytical results will be submitted to Arcadis for review and approval. Characterization samples will be used to further determine the classification, fate and transport of the demolition debris material. Building slabs, footings and frost walls in the source area will be broom-cleaned or pressure washed to remove source area soil that may be attached to them before removing them from the source area.

5.1.6 Transport and Disposal of Debris

The Contractor shall obtain approval from approved off-site disposal facility(s) for the anticipated hazardous and non-hazardous materials. Characterized debris approved for disposal shall be transported off-site using New York State Department of Transportation approved environmental hauling trucks. Disposal trucks shall adhere to applicable local and state regulations regarding loading and transport.

5.2 Utility Disconnection, Abandonment or Removal

No formal utility survey was completed during the site visits, and observations were qualitative only. The conditions that are reported in the following section are current to at the time of the review. Conditions and current state of utilities may have changed since the site visits were completed.

Prior to the implementation of demolition activities utility disconnection, abandonment or removal is required. There are multiple utilities servicing the building owned by both the municipality and private service providers. These utility providers will be notified prior to the commencement of demolition activities, the service provider will recommend the best applicable practice for terminating the service, including disconnecting, abandoning or removing the specific utility. Should the service require specific termination measures not able to be carried out by the on-site contractor, the utility provider will be asked to provide termination services. The Contractor shall coordinate whether utilities are to be isolated at existing shutoffs or at the property line. Buried utility piping remaining will be flushed and abandoned in place and overhead utilities shall be removed.

Based on the current assessment, the following is the know status of the utilities:

- Rochester Gas and Electric has disconnected the electrical service.
- Rochester Gas and Electric has disconnected the gas service.
- The sewer is still connected.
- The water is still connected.
- The communications are still connected.

5.3 Source Area Contaminant Removal

Excavated contaminated soil from the Source Area and groundwater associated with dewatering activities associated with the excavation process will be managed as F-002 listed hazardous wastes unless a contained-in determination approval has been received from NYSDEC.

5.3.1 Permit Equivalencies and Approvals

5.3.1.1 Water Discharge

A discharge permit and approval will need to be obtained from Monroe County Pure Waters for discharge to the sewer. It is specified that this permit and associated fees will be the responsibility of the remedial contractor.

5.3.1.2 Soil Disposal

As an F-listed waste, select soil excavated from within Source Area will be managed and disposed of as a F-listed Hazardous waste. However, management of soil unassociated with dry-cleaning activities or that meet the requirements of the approved contained-in determination, may be disposed of as non-hazardous waste.

5.3.2 Site Preparation

Upon mobilization to the Site, the Contractor shall erect temporary perimeter fencing along the site limits and City of Rochester parcel (to provide additional work area).

In addition, an Area of Contamination (AOC) will be established onsite within which soils may be excavated and managed.

5.3.3 Dewatering

During source removal excavation activities, it is anticipated that the Contractor will excavate into the groundwater table and encounter contaminated water. To progress with the desired remedy, dewatering of the excavation will be necessary.

5.3.3.1 Water Management

During excavation of source area contaminated soils, excavation will occur beneath the existing ground water table and the presence of groundwater will have to be managed. The Contractor shall be required to drive sheet piling or some alternate shoring method(s) around the proposed limits of excavation due to excavation depths. With shoring system in place, the Contractor will excavate soil and pump water that contains site contaminants

from the excavation area using submersible pumps or other perimeter pumping systems to the on-site water management system.

As stated above, water generated as part of dewatering will be discharged to the sewer as further discussed in Section 5.3.3.3.

5.3.3.2 Water Containment

Waters encountered during the excavation of contaminated soils at the Site will be pumped from the excavation area and into an on-site water management system. The water management system may contain water in on-site frac-tanks. The frac-tanks will serve as a settling area for solids and particulates in the contaminated waters prior to treatment.

5.3.3.3 Water Treatment

Groundwater and precipitation that is encountered in the excavation becomes a waste when it enters the excavation and an F-002 waste when it is removed from the excavation. In this circumstance, the federal RCRA regulations provide the following exclusion for the wastewater treatment unit:

Wastewater treatment unit means a device which:

- Is part of a wastewater treatment facility that is subject to regulation under either the Federal Water Pollution Control Act (Clean Water Act [CWA]), 33 United States Code, §§ et seq., §402 or §307(b), as amended; and
- Receives and processes or stores an influent wastewater which is a hazardous or industrial solid waste, or generates and accumulates a wastewater treatment sludge which is a hazardous or industrial solid waste, or processes or stores a wastewater treatment sludge which is a hazardous or industrial solid waste.

An on-site water management system will be constructed to treat contaminated waters generated or encountered at the Site. The system will consist of frac-tanks, possibly air strippers, and bag and GAC filter systems. Containerized waters present in the on-site frac-tanks will be treated using a series of pumps, treatment processes and filters. Waters may subsequently be pumped to an additional frac-tank to hold treated water. Prior to discharging, the treated waters will be sampled by the Contractor. The analytical results of these samples will be compared to the allowable discharge standards set forth by the municipality.

5.3.3.4 NAPL Management

Based on current understanding and assumptions, NAPL won't be managed in situ. However, the treatment system will include frac tanks and an oil-water separator, as necessary, to remove NAPL encountered.

5.3.3.5 Water Discharge

Analytical results of the post-treatment waters of the water treatment system will be reviewed by Monroe County Pure Waters prior to discharge. Contractor will be required to attain required discharge standards prior to discharge to the municipal sanitary sewer system.

5.3.4 Source Soil Excavation

As stated in Section 3.2 of this document, contaminated soils are present under the majority of the on-site structure. It is estimated that approximately 50 percent of the soil will be characterized as hazardous and 50 percent of the soil will be characterized as non-hazardous.

Contamination has been observed between the existing ground surface and approximately twenty-two (22) feet below ground surface (bgs). As such, the Contractor will be required to install the shoring system at the limits of the proposed soil excavation area to confine the excavation laterally and serve as excavation wall stabilization. Soils will be excavated to a maximum depth of 22 feet bgs, based on observed contamination at the time of excavation.

Existing monitoring wells existing located within the footprint of the source soil excavation area will be formally decommissioned, if they extend below the excavation depth, prior to the completion of the excavation activities. If the well terminates above the excavation depth, the well will be removed during the source excavation activities. The excavation limits were estimated based on best judgement using the available site soil analytical data, considering the site geology and hydrology, and physical site constraints.

5.3.4.1 Soil Management

Contaminated soils excavated from the source soil excavation area will be direct loaded into environmental hauling trucks. Should direct loading prove unapplicable at the Site, the Contractor shall stockpile excavated soils on-site and must be within the AOC. The soil stockpile(s) shall be underlain with minimum 40-millimeter high-density polyethylene (HDPE) sheeting with a haybale perimeter around each stockpile of excavated soils. The stockpile(s) will also be encompassed by silt fencing. Stockpiles remaining after on-site working hours will be covered with polyvinyl sheeting and secured overnight, until load out procedures resume.

5.3.4.2 Soil Transport and Disposal

Excavated source area soils will be classified as hazardous (F-Listed) waste or non-hazardous waste as further characterized and will be managed accordingly. A contained-in determination is being sought for the non-hazardous wastes. Additional representative soil samples may need to be collected to verify that they are suitable for land disposal prior to off-site transport and disposal. The Contractor shall obtain approval for transport of characterized soils to an approved off-site disposal facility(s) at which the Source Area soils will be accepted for disposal. Characterized soils approved for disposal shall be transported off-site using New York State Department of Transportation-approved environmental hauling trucks. Disposal trucks shall adhere to applicable local and state regulations regarding loading and transport.

5.3.5 Confirmation Sampling

No confirmation sampling is proposed at the completion of the source area excavation since the excavation limits are not being progressed to a target cleanup limit. The source excavation limits are limited by the proximity to existing structures at the north and west property lines. To the east and south the limits were established by sampling to define a target extent to excavation. The Remedial Design Investigation (RDI) and historical sampling have defined the residual contamination that would remain in place post source excavation. This residual contamination will be addressed by future in-situ chemical oxidation injections.

5.3.6 Backfill and Compaction

Following the review and acceptance of collected confirmation samples representative of the excavation limits, and determination that the excavation process has been completed, the source excavation area shall be backfilled. The source excavation area shall be backfilled with quarried gravel, for which source testing data for physical properties shall be submitted for approval prior to importation to the Site. Environmental source testing data is assumed not to be required for quarried materials. Approved backfill material shall be placed in the excavation area in lifts no greater than 12-inches in depth, as necessary. Lifts shall subsequently be compacted using mechanical methods (i.e. tamped in with bucket, vibratory plate, etc.). Lifts will be advanced and compacted using this method until the excavation has been backfilled to pre-excavation elevations to match the surrounding grades. Upon completion of the backfill the shoring system will be removed to avoid any future hydraulic barrier to future ISCO.

5.4 In Situ Chemical Oxidation

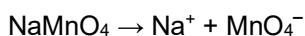
5.4.1 Injection Infrastructure

Infrastructure for application of a chemical oxidant will consist of an injection header installed within the Source Area soil excavation, and four (4) injection wells. In addition, 5 shallow/deep clusters will be installed to assist in the monitoring of the reagent and monitor effectiveness of the program. It should be noted that, although the ISCO effort is proposed as part of the overall remedial design, it is not part of the current remedial design construction scope. It is assumed this ISCO program will be implemented by the DEC as part of a call out program.

5.4.2 Chemical Oxidant Selection

Past experience has indicated that sodium permanganate (NaMnO_4) has been effectively used to treat dissolved-phase CVOCs. In addition, sodium permanganate is not a controlled material under homeland security. Potassium Permanganate could also be utilized but does fall under the homeland security as a controlled material, as such Potassium Permanganate was not further considered. As such, it has been selected to be implemented in the full-scale remedy. A safety data sheet (SDS) is provided in Appendix B.

Sodium permanganate is a soluble ionic compound and in solution is fully dissociated to sodium (Na^+) and permanganate (MnO_4^-) ions:



The active oxidant is MnO_4^- , which is a strong and persistent oxidant in the subsurface. Permanganate diffuses into fine-grained soil matrices, which inhibits back-diffusion of CVOCs from less transmissive zones within the treatment area. The permanganate oxidation pathway for alkenes such as CVOCs begins with electrophilic attack on the carbon-carbon double bond, producing a cyclic hypomanganate diester as a reaction intermediate. There are two potential oxidation pathways for the diester intermediate; via either hydrolysis to glycol aldehyde or bond cleavage to formaldehyde. Both compounds continue to degrade to carboxylic acids. No hazardous intermediates or final products are generated. Unreacted permanganate may be consumed by the natural oxidant demand within the subsurface.

5.4.3 Injection Solution and Volume

Injection Well

The injection wells will be constructed with 28 feet of 2-inch-diameter schedule 40 PVC riser pipe and 5 feet of 0.010-inch wire wrapped stainless steel screen. The annular space around the well screen will be backfilled with #1 filter pack to 2 feet above top of screen, followed by two feet of #00 choker sand, and neat Portland cement to the surface. The wells will be completed with riser fitted with a 2" female camlock and male plug centered in a 12-inch dia. flush-mount well covers set inside three-foot-by-three-foot concrete pad.

The injected volume is determined by approximating an idealized cylindrical distribution around the injection well with a height equal to the injection interval. The following equation was used to determine the necessary per well injection volume:

$$V_{inj} = \pi \times ROI^2 \times h_{injection} \times \theta_m \times 7.48$$

Where: V_{inj} is the injected volume in gallons, Radius of Influence (ROI) in feet, $h_{injection}$ is the injection interval in feet, θ_m is the mobile portion (as a percentage) of the aquifer porosity controlling subsurface migration, and 7.48 is a conversion from cubic feet to gallons.

The target ROI is over 15 feet (ft) and assumed mobile portion is approximately 10% and screen interval of 5 ft between 28 and 32 ft bgs. The target injection volume per injection well is approximately 5,000 pounds of 40% sodium permanganate will be needed. The reagent will be diluted to 2% sodium permanganate concentration before injection. The ROI was assumed based on past experience with project having similar hydrology.

Injection Header at the Source Area

Following excavation, perforated pipe will be installed in the excavation area. At middle of each of the three east-west arm of the perforated pipes a riser will be installed (total three riser). The riser will be completed at the ground surface centered inside an 18-inch manhole in a three-foot by three-foot concrete pad. Assuming 22 ft deep and 50 ft by 85 ft excavation area, water table at approximately 10 ft bgs, and 10% effective mobile porosity, approximately 38,000 gallons need to be injected to cover the saturated portion of the entire excavation area.

For one round of injection using both injection header at the source area and injection wells, approximately 24,000 pounds 40% sodium permanganate will be needed. The reagent will be diluted to 2% sodium permanganate concentration before injection.

5.4.4 Injection Flow Rates and Injection Pressure

Previous pilot studies and site investigation activities have shown that both high and lower permeability zones are present in the lithology under the site. To minimize the risk of solution surfacing around the injection area, injection will be performed via a low-pressure feed (2 psi maximum wellhead pressure), with an assumed injection flow rate of 0.25 gallons per minute. Based on the potential for breakout, the injection pressure and flow rate may need to be reduced. A Spill Prevention, Control and Containment (SPCC) Plan will be prepared to address the handling the chemical oxidant; including, but not limited to, receiving, storing, mixing, placement, and disposal. All spilled material shall be contained and, if possible, reused. Spilled material shall be handled and treated in accordance with the manufacturer's recommendations. The ISCO Contractor will also provide necessary spill materials and neutralizing agents in accordance with the SPCC Plan.

5.4.5 Injection Monitoring

Prior to application of chemical oxidant, a baseline monitoring event will be completed at the site and downgradient monitoring wells. Groundwater will be collected from 10 locations. Samples will be analyzed for VOCs, metals (total sodium, iron, and manganese, dissolved iron and manganese), and PFAS to characterize the groundwater at the site. Dissolved metals will be field-filtered, if possible, or laboratory-filtered. Samples will be analyzed in accordance with the following:

<i>Analyses</i>	<i>Total number of samples</i>
<i>Volatile Organic Compounds (Method 8260)</i>	10
<i>Metals - total sodium, total and dissolved iron, manganese (Method 6010)</i>	10
<i>PFAS (Method 8327)</i>	10

Prior to groundwater sampling, water levels will be recorded at each well location. Samples will be collected in accordance with the USEPA 2017 low flow guidance document (EPA, 2017).

Field parameters will be recorded and monitored until the following stabilization criteria are achieved:

- Turbidity (10% for values greater than 5 NTU; if three Turbidity values are less than 5 NTU, consider the values as stabilized)
- Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized)
- Specific Conductance (3%)
- Temperature (3%), pH (± 0.1 unit)
- Oxidation/Reduction Potential (± 10 millivolts).

Quality Assurance/Quality Control samples will be collected at a frequency of one per 20 samples and a trip blank will be included in each shipment of analytes for analysis of VOCs. Due to collection of PFAS, no Teflon-containing materials (e.g. Teflon tape) will be used during sampling activities.

5.5 Restoration

5.5.1 Exterior Surfaces

Following completion of backfill activities, the surface of the Site at the areas of the removed building slab, source soil excavation, and other areas disturbed by remedial construction activities will be graded to prevent ponding or accumulation of precipitation and asphalt will be installed in disturbed areas. Existing asphalt and concrete surfaces damaged by remedial construction activities will be restored with asphalt.

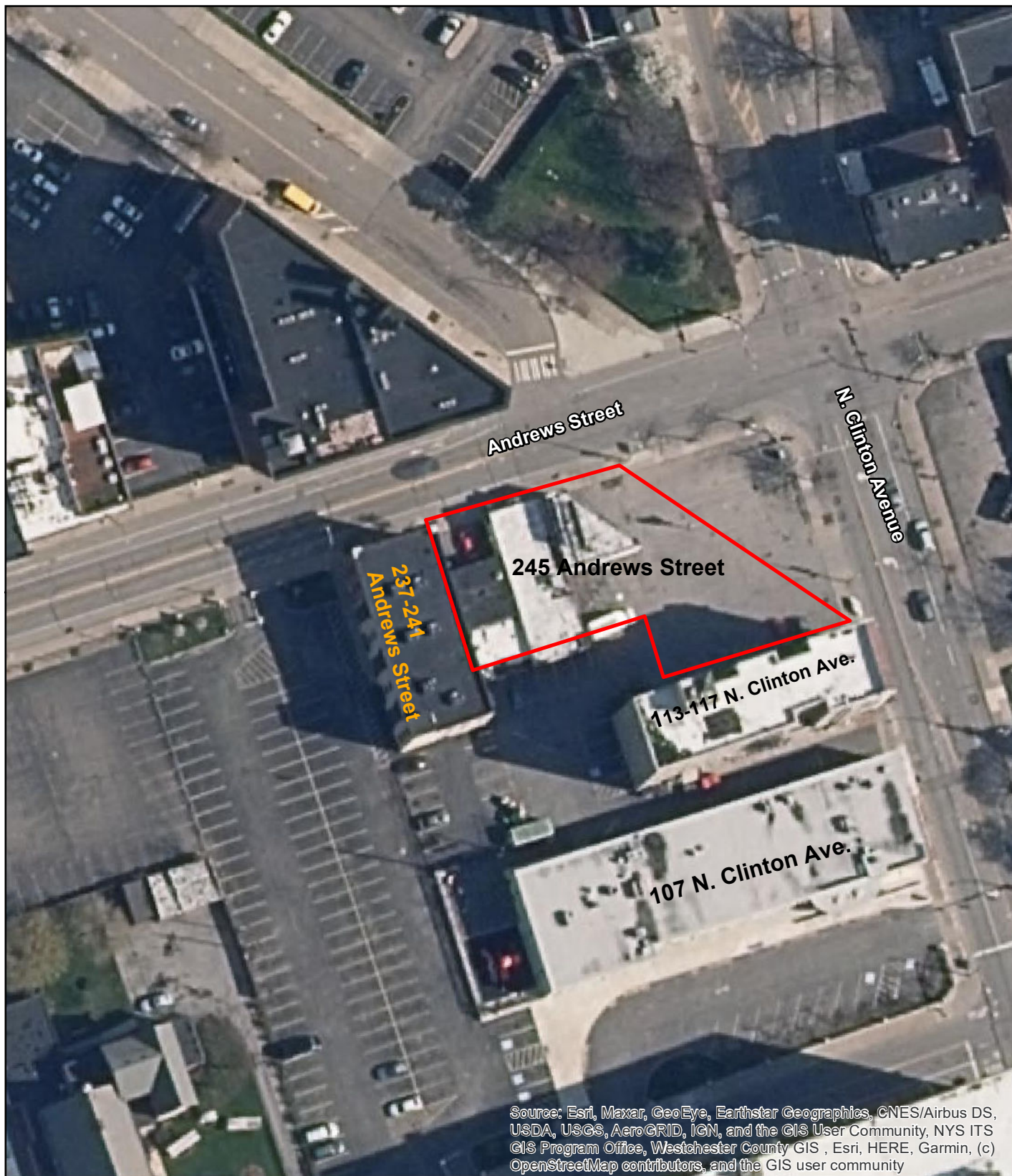
5.5.2 Fencing

A chain link fence will be installed along the south side of the site at the school property to limit access to the school property.

5.5.3 Storm Drainage

A new catch basin and storm water drainage piping will be installed to drain runoff from the Northwest corner of the site back to an existing catch basin that is located at the east side of the site.

Figures



0 20 40 80 120 160 Feet



Legend

 Approximate Site Boundary

New York State Department of Environmental Conservation
Former Silver Cleaners Site # 828186
Rochester, New York
REMEDIAL INVESTIGATION/FEASIBILITY STUDY

SITE MAP



FIGURE

1

[illegible]

Appendix A

Pre-Demolition Hazardous Building Materials Survey Report



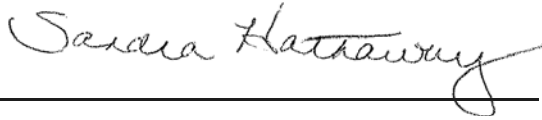
Department of
Environmental
Conservation

PRE-DEMOLITION ASSESSMENT REPORT

Former Silver Cleaners Site
245 Andrews Street
Rochester, New York

December 2017





Sandy Hathaway
Project Environmental Engineer



Mark Flusche
Project Manager

PRE-DEMOLITION ASSESSMENT REPORT

Former Silver Cleaners Site
Rochester, New York

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APPENDICES

A	Pre-Demolition Asbestos Survey
B	Analytical Data Reports
C	Photographic Log – General Site Conditions

1 INTRODUCTION

This *Pre-Demolition Assessment Report* summarizes the building material characterization and environmental assessment activities conducted in August 2017 by Arcadis CE, Inc. (Arcadis) at the Former Silver Cleaners Site located at 245 Andrews Street in Rochester, New York (the Site) (Figure 1).

The pre-demolition assessment was performed to 1) identify building materials and/or equipment that may require decommissioning, decontamination or special disposal during demolition and 2) provide information for contractors to provide comparable quotations on the demolition work. A summary of the activities performed is presented in the following sections, including an evaluation of observations and sampling data.

1.1 Background Information

The Former Silver Cleaners Site (New York State Department of Environmental Conservation (NYSDEC) Site #828186) is located in the City of Rochester, Monroe County, New York. The Site is comprised of three parcels totaling 0.3 acres and is located at the corner of Andrews Street and North Clinton Avenue. The addresses for the parcels are 245 Andrews Street, 151 and 159-169 Pleasant Street. The main site feature is a vacant retail building that was formerly used as a dry cleaner, from 1955 to 2011.

1.2 Site Description

The Site building is a single story, is constructed on a concrete foundation and is approximately 5200 square feet. Building height is approximately 11 feet in garage and press rooms; the height of remaining area of the building is approximately 14 feet. A partial, approximately 45-square-foot basement can be accessed through a floor hatch in northwestern portion of the Site. Some plumbing can be accessed from basement but subgrade plumbing is located beneath the concrete slab throughout the building. Exterior building walls are brick and concrete masonry units (CMUs). Roof framing is wood joists and steel beams with a wood deck. Interior floor finishes consist of concrete, vinyl tile and carpet. Interior wall finishes include CMU, wood wall paneling, plaster, and gypsum wallboard. Ceiling finishes are comprised of plaster and suspended and glued-on acoustical tile. The roof system is constructed of rolled asphalt, built-up roofing, rubber, styrofoam insulation, repair caulk and tar.

Various debris remains onsite associated with the former dry-cleaning business including steam presses, air compressors, laundry carts, clothing and various chemicals. Subsequent to the business closing, the Site was left unsecured and has been vandalized. Some minor damage to the building and fixtures was incurred. As a result, various refuse has accumulated onsite including clothing, food and human waste and drug paraphernalia.

2 SUMMARY OF ACTIVITIES PERFORMED

Pre-demolition assessment activities were conducted on August 28 and 29, 2017. The scope of activities conducted onsite included:

- Universal Waste/Regulated Materials Inventory
- Asbestos-Containing Materials (ACM) Survey
- Building Material Characterization Sampling and Analysis

A description of the completed activities associated with each task is presented in the following sections.

2.1 Universal Waste/Regulated Materials Inventory

Arcadis conducted a visual reconnaissance to identify universal waste and other potentially hazardous and/or regulated materials. Universal waste and potentially regulated materials were identified and categorized according to waste type. A summary of universal wastes/regulated materials identified is presented in Table 1.

2.2 ACM Survey

Arcadis performed a pre-demolition survey of the Site to identify the presence of ACM. The survey was conducted in general accordance with ASTM E2356 Standard Practice for Comprehensive Building Asbestos Surveys.

The Pre-DEMOLITION Asbestos Survey which details the ACM survey and summarizes results is provided as Appendix A to this report.

2.3 Building Material Sampling and Analysis

Arcadis performed building material sampling and analysis to assess current building conditions and support future preparation of Request for Proposals for demolition.

2.3.1 Sampling Rationale

The following rationale was used to determine sample locations:

- 1) Spatial – Samples collected at spatially distributed locations along interior walls and from above-grade and at-grade floors in the interest of providing uniform coverage.
- 2) Biased – Samples collected at selected locations based on one or more of the following considerations:
 - Historic use of an area or former equipment location suggested the potential presence of constituents of concern
 - Visible stains or spills were observed

2.3.2 Building Material Sampling

The following building material samples were collected. Sample locations are presented on Figure 2.

PRE-DEMOLITION ASSESSMENT REPORT

- 1) Concrete and Brick – Core samples were collected from porous media (e.g., brick and concrete). Three concrete slab samples and two brick wall samples were collected and analyzed for toxicity characteristic leaching procedure (TCLP) volatile organic compounds (VOCs), TCLP semi-volatile organic compounds (SVOCs), and TCLP inorganics (consisting of analyses of metals listed under the Resource Conservation and Recovery Act [RCRA]), polychlorinated biphenyls (PCBs), reactivity, ignitability and corrosivity.
- 2) Paint Chip – Three paint chip samples were collected from loose paint on interior walls. Samples were analyzed for total lead or PCBs.
- 3) Caulk and Glazing – Bulk samples were collected from miscellaneous media (i.e., caulk and glazing) for analysis for PCBs. Three bulk samples of caulk and glaze were collected from interior and exterior windows and doors.
- 4) Dust – Two dust samples were collected: One from dust in and around air ducts was analyzed for VOCs and the other was collected from dust accumulated on equipment and analyzed for PCBs.
- 5) Residuals – Two samples were collected from accumulated sludge in interior sumps and drains. One sample was analyzed for TCLP VOCs, TCLP SVOCs TCLP inorganics, PCBs, reactivity, corrosivity and ignitability. The other sample was analyzed for PCBs and Target Compound List VOCs.
- 6) Fluids – Two samples were collected from fluids drained from equipment and analyzed for PCBs.

Samples were shipped to Con-Test Analytical Laboratory in East Longmeadow, MA for analysis.

3 RESULTS

3.1 Evaluation Criteria

Select analytical results were compared to applicable criteria to assess potential disposition options. The following criteria were applied:

- PCBs – For off-site disposition purposes, the PCB criteria considered was 50 parts per million (ppm). For PCBs, 50 ppm is used as a screening criterion in evaluating whether PCB analytical data indicate that a given media is subject to Toxic Substance Control Act (TSCA) disposal regulations.
- 20 Times Rule for TCLP (20X TCLP) – This criterion indicates the potential of a constituent to be classified as a characteristic hazardous waste by comparing the total concentrations of detected constituents to twenty-times the TCLP regulatory limit. This criterion was used as a screening tool in spatial and biased core samples in order to determine the potential for a particular sample to pass or fail TCLP analyses. For example, if a given constituent has a total concentration below the 20X TCLP criteria, then it can be confirmed that there is not enough constituent present in the sample to exceed the corresponding TCLP regulatory criterion following analysis via TCLP. Alternatively, if a given constituent has a total concentration exceeding the 20X TCLP criteria, then it is possible that there is enough constituent present in the sample to *potentially* exceed the corresponding TCLP regulatory criterion following analysis via TCLP.

Based on the sampling approach implemented at the Site, if the 20X TCLP criteria was exceeded by an initial sample, then a TCLP sample may be collected at that location during the supplemental sampling and analyzed for that criteria.

- Maximum concentration of contaminants for characteristics of TCLP toxicity – These criteria were applied only to TCLP analyses and indicate if a material is considered a RCRA characteristic hazardous waste and therefore requires disposition at a hazardous waste disposal facility.

3.2 Sample Analytical Results

Sample analytical results are summarized in Tables 2 through 5. The laboratory data reports are provided in Appendix B. A photographic log of overall general site conditions and sample locations is included in Appendix C.

3.3 Evaluation of Observations and Sampling Data

Key observations from the building material sampling data review are as follows:

- Concrete and Brick – None of the analytical results for the three concrete slab and two brick wall samples exceeded the screening criteria.
- Paint Chip – Analytical results for the sample (P-01) analyzed for lead indicate that the paint is lead containing and would potentially fail TCLP. The analytical results for the two paint samples analyzed for PCBs do not exceed the screening criterion. Due to the age of the facility and the lead results for the one paint sample, all paint is assumed to be lead-containing.

PRE-DEMOLITION ASSESSMENT REPORT

- Caulk and Glazing – None of the analytical results for the caulk/glazing samples exceeded the screening criterion.
- Dust – Analytical results for the dust samples indicate the presence of low level VOCs in one sample. No PCBs were detected in the sample analyzed for PCBs.
- Residuals – None of the analytical results for residual samples exceeded the screening criteria.
- Fluid - Analytical results for fluid samples indicate that PCBs were not detected in the samples.
- Asbestos – As detailed in the Pre-Demolition Asbestos Survey (Attachment A), 16 homogenous areas were confirmed or assumed to be asbestos-containing.

4 RECOMMENDATIONS

Based on the results of the pre-demolition assessment, Arcadis recommends that prior to building demolition, the following pre-demolition activities be conducted:

- Universal wastes and regulated materials should be removed, handled and disposed off-site in accordance with applicable regulations. An inventory of items observed onsite is presented in Table 1 and includes, but is not limited to:
 - o Fluorescent and HID lamps – Spent lamps must be managed as a universal waste.
 - o Batteries – Batteries must be managed as a universal waste.
 - o Electronic waste – Electronic waste such as computers, computer peripherals, televisions, small scale servers, and small electronic equipment must be recycled in accordance with NYS Electronic Equipment Recycling and Reuse Act regulations.
 - o Chlorofluorocarbon- (CFC-) containing waste -Equipment such as air conditions may contain CFCs. Prior to disposal, units must be inspected and CFCs must be evacuated by a licensed technician in accordance with applicable regulations.
 - o Fire extinguishers – Fire extinguishers are not regulated as hazardous waste but they may be pressurized and will require special handling prior to disposal.
 - o Oil-containing equipment – Oil containing equipment should be drained prior to disposal. Collected oil must be managed in accordance with applicable regulations.
 - o Containerized chemicals – Containerized chemicals should be collected, containerized and subsequently disposed of off-site. Materials that cannot be profiled based on available information should be characterized for disposal.
- Abatement of asbestos-containing materials should be conducted.
- Due to disturbance of painted surfaces during demolition activities, all loose or flaking paint should be removed. Collected paint chips should be characterized as a separate waste stream from other building materials.

TABLES



Table 1
Universal Waste and Regulated Materials Inventory

Pre-Demolition Assessment Report
Former Silver Cleaners
Rochester, NY

Material/Description	Container Type	Container Size	Approximate Quantity	Location	Notes
Fire Extinguisher	Metal	Various	8	Throughout	
Halogen Bulbs	Glass	--	146	Throughout	
Incandescent Bulbs	Glass	--	52	Throughout	
Exit Sign	--	--	1	Throughout	
Circuit Breaker Box	--	--	8	Throughout	
Thermostat	--	--	6	Throughout	
Electrical Switch	--	--	8	Throughout	
Air Compressor	--	--	3	Southern Corner	(2) 200 PSI Tanks; (1) Unknown
Fuse Breaker Box	--	--	5	Throughout	
Cash Register	--	--	2	Throughout	
Gas Fired Space Heater	--	--	5	Throughout	
Computer Monitor	--	--	1	Counter Area	
9-Pin Printer	--	--	2	Counter Area	
Datamark Desktop Calculator	--	--	2	Counter Area	
Telephone	--	--	4	Throughout	
Window-Mounted Air Conditioner	--	--	2	Throughout	
Electric Heater	--	--	2	Throughout	
Security Camera	--	--	3	Throughout	
Box Fan w/ Motor	--	--	4	Western Wall	
Dial Timer Switch	--	--	1	Northwestern Portion	
Credit Card Machine	--	--	5	Northwestern Portion	
Computer Hard Drive Tower	--	--	1	Northwestern Portion	
Computer Printer	--	--	2	Northwestern Portion	
Steam Press	--	--	6	Throughout	
20 Gallon Vacuum Unit	--	--	1	Southern Portion	
Window-Mounted Louver with Motor	--	--	1	Southern Corner	
Transformers	--	--	2	Southwestern Wall	
Security Alarm Battery	--	--	1	Northern Portion	
Chemicals					
Arkema Forane 22	Metal Tank	30 lb	2	Central/Southern Portion	Not Full
Paint	Metal	1 Gallon	4	Central/Southern Portion	
Wet Patch Roof Cement	Metal	1 Gallon	1	Central/Southern Portion	
Motor Oil	Plastic Bottle	1 Quart	3	Central/Southern Portion	
Rail Wiz	Plastic Bottle	1 Gallon	<1	Central/Southern Portion	
Pre-Cooked Laundry Starch	Plastic Bag	30 lb	1	Central/Southern Portion	
Dye Stripper	Plastic Bottle	1 Gallon	0.5	Central/Southern Portion	Corrosive
APOG Solvent	Plastic Bottle	1 Gallon	<1	Central/Southern Portion	CAS #64742-95-6
Antifreeze	Plastic Bottle	1 Gallon	1.5	Central/Southern Portion	
Caled Plasticizer	--	1 Gallon	1	Central/Southern Portion	
Dry Cleaning Fluid	Plastic Bottle	1 Gallon	<1	Central/Southern Portion	CAS #8052-41-3
Knock Out Ink Remover	Plastic Bottle	1 Gallon	1	Central/Southern Portion	
Laidlaw Swan Cote (Aerosol)	Metal Can	16 oz	2	Central/Southern Portion	Contains PCE, methylene chloride
Paint Thinner	Metal Can	1 Gallon	1	Central/Southern Portion	
Ink	Plastic Bottle	1 Gallon	<1	Central/Southern Portion	Contains isopropyl acetate
Erusticator Neutralizer	--	Ounces	48	Central/Southern Portion	
Dry Sodium Perborate	--	Ounces	4	Central/Southern Portion	
DSR Digestive Agent	Plastic Bottle	16 oz	4	Central/Southern Portion	
Unkown	Various	Gallon	10	Central/Southern Portion	
Laidlaw Crystal Soft-Cote	Plastic Bottle	Gallon	1	Central/Southern Portion	
Unmarked Soil/Product	Poly-Lined Plastic Drums	10 Gallon	6	Central/Southern Portion	Southeast Corner of Building Interior
PVC Glue/Cleaner	Metal Container	1 Quart	2	Basement	

NOTE: Universal waste is regulated under the Resource Conservation and Recovery Act (RCRA) Universal Waste Rule (UWR) (40 CFR part 273) and Subtitle C hazardous waste regulations.

Table 2
Brick/Concrete (Wall and Slab) Analytical Results

Pre-Demolition Assessment Report
Former Silver Cleaners
Rochester, NY

Location ID: Date Collected:	Criteria (bold)	Units	BW-01 08/29/17	BW-02 08/29/17	CS-01 08/29/17	CS-02 08/29/17	CS-03 08/29/17
PCBs							
Total PCBs	50	mg/kg	ND	ND	ND	ND	ND
Misc							
Ignitability	--	Present/Absent	Absent	Absent	Absent	Absent	Absent
pH @ 23.5°C	--	pH Units	8.6	8.6	12	12	12
Reactive Cyanide	--	mg/Kg	ND	ND	ND	ND	ND
Reactive Sulfide	--	mg/Kg	ND	ND	ND	ND	ND
TCLP Volatile Organics							
Benzene	0.50	mg/L	ND	ND	ND	ND	ND
2-Butanone (MEK)	200.00	mg/L	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.50	mg/L	ND	ND	ND	ND	ND
Chlorobenzene	100.00	mg/L	ND	ND	ND	ND	ND
Chloroform	6.00	mg/L	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	7.50	mg/L	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.50	mg/L	ND	ND	ND	ND	ND
1,1-Dichloroethylene	0.70	mg/L	ND	ND	ND	ND	ND
Tetrachloroethylene	0.70	mg/L	0.030	ND	ND	0.013	ND
Trichloroethylene	0.50	mg/L	ND	ND	ND	ND	ND
Vinyl Chloride	0.20	mg/L	ND	ND	ND	ND	ND
TCLP Semi-Volatile Organics							
2,4-Dinitrotoluene	0.13	mg/L	ND	ND	ND	ND	ND
Hexachlorobenzene	0.13	mg/L	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.50	mg/L	ND	ND	ND	ND	ND
Hexachloroethane	3.00	mg/L	ND	ND	ND	ND	ND
2-Methylphenol	200.00	mg/L	ND	ND	ND	ND	ND
3/4-Methylphenol	200.00	mg/L	ND	ND	ND	ND	ND
Nitrobenzene	2.00	mg/L	ND	ND	ND	ND	ND
Pentachlorophenol	100.00	mg/L	ND	ND	ND	ND	ND
Pyridine	5.00	mg/L	ND	ND	ND	ND	ND
2,4,5-Trichlorophenol	400.00	mg/L	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	2.00	mg/L	ND	ND	ND	ND	ND
TCLP Metals							
Arsenic	5.00	mg/L	ND	ND	ND	ND	ND
Mercury	0.20	mg/L	ND	ND	ND	0.000035	ND
Barium	100.00	mg/L	0.40	0.15	0.29	0.14	0.34
Cadmium	1.00	mg/L	0.0019	0.0013	0.0013	0.002	0.0044
Chromium	5.00	mg/L	ND	ND	3.2	0.012	ND
Lead	5.00	mg/L	ND	ND	ND	ND	ND
Selenium	1.00	mg/L	ND	ND	ND	ND	ND
Silver	5.00	mg/L	ND	ND	ND	ND	ND

Notes:

1. mg/Kg = milligrams per kilogram
2. mg/L = milligrams per liter
3. ND = Not Detected
4. 50 parts per million (ppm) (equivalent to mg/Kg) is the screening criteria for PCBs. Results >50 ppm are subject to Toxic Substances Control Act (TSCA) regulations.
5. For TCLP results, RCRA maximum concentrations of contaminants for characteristics of TCLP toxicity were used as screening criteria.

Table 3
Caulk/Glazing and Paint Chip Analytical Results

Pre-Demolition Assessment Report
Former Silver Cleaners
Rochester, NY

Location ID: Date Collected:	Criteria (bold)	Units	C-01 8/28/2017	C-02 8/28/2017	C-03 8/28/2017	P-01 8/28/2017	P-02 8/28/2017	P-03 8/28/17
PCBs								
Aroclor-1016	--	mg/kg	ND	ND	ND	--	ND	ND
Aroclor-1221	--	mg/kg	ND	ND	ND	--	ND	ND
Aroclor-1232	--	mg/kg	ND	ND	ND	--	ND	ND
Aroclor-1242	--	mg/kg	ND	ND	ND	--	ND	ND
Aroclor-1248	--	mg/kg	ND	ND	ND	--	ND	1.9
Aroclor-1254	--	mg/kg	0.21	0.22	ND	--	1.8	2.7
Aroclor-1260	--	mg/kg	0.15	0.15	ND	--	0.73	1.4
Aroclor-1262	--	mg/kg	ND	ND	ND	--	ND	ND
Aroclor-1268	--	mg/kg	ND	ND	ND	--	ND	ND
Total PCBs	50	mg/kg	0.36	0.37	ND	--	2.53	6
Inorganics								
Total Lead	100	mg/kg	--	--	--	1500	--	--

Notes:

1. mg/Kg = milligrams per kilogram
2. ND = Not Detected
3. 50 parts per million (ppm) (equivalent to mg/Kg) is the screening criteria for PCBs. Results >50 ppm are subject to Toxic Substances Control Act (TSCA) regulations.
4. For lead results, 20 times the TCLP toxicity concentration was used as the screening criteria. This is applied to totals results to determine the potential to pass or fail TCLP.

Table 4
Dust and Sumps/Drain Analytical Results

Pre-Demolition Assessment Report
Former Silver Cleaners
Rochester, NY

Location ID: Date Collected:	Criteria (bold)	Units	D-01 8/28/2017	D-02 8/28/2017	SD-01 8/29/2017	SD-02 8/29/2017
PCBs						
Aroclor-1016	--	mg/kg	--	ND	ND	ND
Aroclor-1221	--	mg/kg	--	ND	ND	ND
Aroclor-1232	--	mg/kg	--	ND	ND	ND
Aroclor-1242	--	mg/kg	--	ND	ND	ND
Aroclor-1248	--	mg/kg	--	ND	ND	ND
Aroclor-1254	--	mg/kg	--	ND	0.13	0.37
Aroclor-1260	--	mg/kg	--	ND	ND	0.066
Aroclor-1262	--	mg/kg	--	ND	ND	ND
Aroclor-1268	--	mg/kg	--	ND	ND	ND
Total PCBs	50	mg/kg	--	ND	0.13	0.436
Misc						
Ignitability		Present/Absent	--	--	Absent	--
pH @ 23.5°C	--	pH Units	--	--	8.5	--
Reactive Cyanide	--	mg/Kg	--	--	ND	--
Reactive Sulfide	--	mg/Kg	--	--	ND	--
TCLP Volatile Organics						
Benzene	0.50	mg/L	--	--	ND	--
2-Butanone (MEK)	200.00	mg/L	--	--	ND	--
Carbon Tetrachloride	0.50	mg/L	--	--	ND	--
Chlorobenzene	100.00	mg/L	--	--	ND	--
Chloroform	6.00	mg/L	--	--	ND	--
1,4-Dichlorobenzene	7.50	mg/L	--	--	ND	--
1,2-Dichloroethane	0.50	mg/L	--	--	ND	--
1,1-Dichloroethylene	0.70	mg/L	--	--	ND	--
Tetrachloroethylene	0.70	mg/L	--	--	0.046	--
Trichloroethylene	0.50	mg/L	--	--	ND	--
Vinyl Chloride	0.20	mg/L	--	--	ND	--
TCLP Semi-Volatile Organics						
2,4-Dinitrotoluene	0.13	mg/L	--	--	ND	--
Hexachlorobenzene	0.13	mg/L	--	--	ND	--
Hexachlorobutadiene	0.50	mg/L	--	--	ND	--
Hexachloroethane	3.00	mg/L	--	--	ND	--
2-Methylphenol	200.00	mg/L	--	--	ND	--
3/4-Methylphenol	200.00	mg/L	--	--	ND	--
Nitrobenzene	2.00	mg/L	--	--	ND	--
Pentachlorophenol	100.00	mg/L	--	--	ND	--
Pyridine	5.00	mg/L	--	--	ND	--
2,4,5-Trichlorophenol	400.00	mg/L	--	--	ND	--
2,4,6-Trichlorophenol	2.00	mg/L	--	--	ND	--

Table 4
Dust and Sumps/Drain Analytical Results

Pre-Demolition Assessment Report
Former Silver Cleaners
Rochester, NY

Location ID: Date Collected:	Criteria (bold)	Units	D-01 8/28/2017	D-02 8/28/2017	SD-01 8/29/2017	SD-02 8/29/2017
TCLP Metals						
Arsenic	5.00	mg/L	--	--	ND	--
Mercury	0.20	mg/L	--	--	0.000049	--
Barium	100.00	mg/L	--	--	0.29	--
Cadmium	1.00	mg/L	--	--	0.010	--
Chromium	5.00	mg/L	--	--	ND	--
Lead	5.00	mg/L	--	--	ND	--
Selenium	1.00	mg/L	--	--	ND	--
Silver	5.00	mg/L	--	--	ND	--
Detected Volatile Organic Compounds						
Acetone	--	mg/kg	ND	--	--	0.084
Bromomethane	--	mg/kg	6.2	--	--	ND
Methyl Acetate	--	mg/kg	4.1	--	--	ND
Tetrachloroethylene	14	mg/kg	ND	--	--	0.013

Notes:

1. mg/Kg = milligrams per kilogram

2. mg/L = milligrams per liter

3. ND = Not Detected

4. Criteria:

-50 parts per million (ppm) (equivalent to mg/Kg) is the screening criteria for PCBs. Results >50 ppm are subject to Toxic Substances Control Act (TSCA) regulations.

-For TCLP results, RCRA maximum concentrations of contaminants for characteristics of TCLP toxicity were used as the screening criteria

-For total volatile organic compounds, 20 times the TCLP toxicity concentration was used the screening criteria (where available). This is applied to totals results to determine the potential to pass or fail TCLP

5. As a result of jar breakage during shipment, only PCB and VOC analysis were run for sample SD-02.

Table 5
Equipment Fluid Analytical Results

Pre-Demolition Assessment Report
Former Silver Cleaners
Rochester, NY

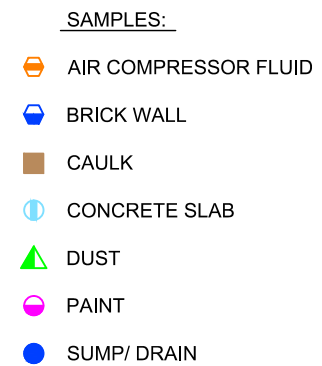
Location ID: Date Collected:	Criteria (bold)	Units	ACF-01	ACF-02
PCBs				
Aroclor-1016	--	mg/kg	ND	ND
Aroclor-1221	--	mg/kg	ND	ND
Aroclor-1232	--	mg/kg	ND	ND
Aroclor-1242	--	mg/kg	ND	ND
Aroclor-1248	--	mg/kg	ND	ND
Aroclor-1254	--	mg/kg	ND	ND
Aroclor-1260	--	mg/kg	ND	ND
Aroclor-1262	--	mg/kg	ND	ND
Aroclor-1268	--	mg/kg	ND	ND
Total PCBs	50	mg/kg	ND	ND

Notes:

1. mg/Kg= milligrams per kilogram
2. ND= Not Detected
3. 50 parts per million (ppm) (equivalent to mg/Kg) is the screening criteria for PCBs. Results >50 ppm are subject to Toxic Substances Control Act (TSCA) regulations.

FIGURES





<u>SAMPLE ID NOMENCLATURE:</u>	
ACF	AIR COMPRESSOR FLUID
BW	BRICK WALL
C	CAULK
CS	CONCRETE SLAB
D	DUST
P	PAINT
SD	SUMP/ DRAIN
01	SAMPLE NUMBER

1. SAMPLES COLLECTED 8/28/17- 08/29/17 BY ARCADIS
2. ALL LOCATIONS ARE APPROXIMATE

APPENDIX A

Pre-Demolition Asbestos Survey



**NEW YORK STATE DEPARTMENT
OF ENVIRONMENTAL CONSERVATION**

**PRE-DEMOLITION ASBESTOS
SURVEY**

**Former Silver Cleaners Site
245 Andrews Street
Rochester, New York 14604**

December 11, 2017

A large, solid orange geometric shape, resembling a stylized triangle or a section of a larger triangle, is positioned in the bottom right corner of the page. It is composed of two overlapping triangles, creating a complex, angular form that extends from the bottom edge towards the top right corner.

PRE-DEMOLITION ASBESTOS SURVEY

PRE-DEMOLITION ASBESTOS SURVEY

Former Silver Cleaners Site
245 Andrews Street
Rochester, New York 14604

Report Prepared By:



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Our Ref.:

00266426.0000

Date:

December 11, 2017

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2	Building Description	1
3	Survey Methodology	1
4	Analytical Methods	2
5	Findings.....	2
6	Recommendations	3
7	Additional Survey Limitations.....	4

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Table 1	Homogeneous Areas

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Figure 1	Asbestos Sample Locations – Basement
Figure 2	Asbestos Sample Locations – First Floor
Figure 3	Asbestos Sample Locations – Exterior
Figure 4	Asbestos Sample Locations – Roof

APPENDICES

Appendix A	Limitations and Service Constraints
Appendix B	Accreditations
Appendix C	Laboratory Reports – Asbestos
Appendix D	Photograph Log

1 INTRODUCTION

Arcadis of New York, Inc. (Arcadis) conducted a Pre-Demolition Asbestos Survey (survey) of the Former Silver Cleaners Site (Site) building located at 245 Andrews Street in Rochester, New York. The objective of the survey was to ascertain the general presence, quantity, and location of asbestos-containing materials (ACMs) prior to demolition activities.

The survey was conducted on August 28, 2017 and August 29, 2017 by Mr. Joseph Ashman of Arcadis. Our survey and report is subject to the Limitations and Service Constraints provided in Appendix A.

Mr. Ashman is New York State Department of Labor Accredited Asbestos Building Inspector. A copy of his asbestos accreditations is provided in Appendix B.

2 BUILDING DESCRIPTION

The single-story Site building encompasses approximately 4,910 square feet of area, is constructed on a concrete foundation and includes a partial basement. Exterior building walls are brick and concrete masonry units (CMUs). Roof framing is wood joists and steel beams with a wood deck. Interior floor finishes consist of vinyl tile and carpet. Interior wall finishes include CMU, wood wall paneling, plaster, and gypsum wallboard. Ceiling finishes are comprised of plaster and suspended and glued-on acoustical tile. The roof system is constructed of rolled asphalt, built-up roofing, rubber, styrofoam insulation, repair caulk and tar.

3 SURVEY METHODOLOGY

Arcadis conducted the Pre-Demolition Asbestos Survey in accordance with the National Emissions Standards for Hazardous Air Pollutants (NESHAP) and Part 56 of Title 12 of the Official Compilation of Codes, Rules and Regulations of the State of New York (cited as 12 NYCRR Part 56).

The survey was accomplished by initially conducting a visual inspection of the structure and then collecting samples of suspect ACM based on observations. Arcadis conducted the asbestos survey in general accordance with the American Society for Testing and Materials International (ASTM) E2356 Standard Practice for Comprehensive Building Asbestos Surveys. ASTM E2356 meets the applicable requirements of current United States Environmental Protection Agency (USEPA) NESHAP Standard 40 Code of Federal Regulations (CFR) 61, Subpart M (Asbestos), USEPA Asbestos Hazard Emergency Response Act (AHERA) 40 CFR 763, Subpart E, and Occupational Safety and Health Administration (OSHA) asbestos survey and/or sampling regulations.

The survey included a facility-wide inspection providing a general sense of the overall location, type, quantity, and condition of potential ACMs present. It was thorough in that most accessible functional spaces were inspected and bulk samples taken of suspect materials observed.

The survey included destructive, intrusive, and/or exploratory testing. The sampling areas requiring destructive sampling were left in an orderly manner. Arcadis endeavored to observe normally inaccessible areas, such as, but not limited to, pipe chases, wall cavities, inside mechanical systems, above ceilings, under primary flooring surfaces, and roofing materials for suspect ACMs. In addition, the

PRE-DEMOLITION ASBESTOS SURVEY

survey included accessing, surveying, and/or sampling accessible roofing systems and exterior building materials.

The asbestos survey included a visual and physical assessment of each accessible space to locate suspect ACMs. Suspect materials were divided into "Homogeneous Areas" (HAs) (i.e., building materials that were determined by the inspector to be homogeneous based on their color, texture, and assumed date of installation). A representative number of samples were collected from each HA.

Bulk material samples were collected in zip-lock plastic bags, and tightly sealed for transport under documented chain of custody to EMSL Analytical, Inc. (EMSL) located in Cinnaminson, New Jersey. Each sample collected by Arcadis was assigned its own unique coded number.

4 ANALYTICAL METHODS

Material identification was performed following the New York State (NYS) Department of Health Environmental Laboratory Accreditation Program protocol methods 198.1 and 198.6 (depending on material), and 198.4, which require the analysis of friable materials utilizing Polarized Light Microscopy (PLM) with Dispersion Staining and PLM Stratified Point Counting. Non-Friable Organically Bound (NOB) materials were analyzed using PLM and Transmission Electron Microscopy for NOB matrices.

EMSL is a NYS-approved laboratory as well as a member of the American Industrial Hygiene Association, National Voluntary Laboratory Accreditation Program (NVLAP). EMSL's NVLAP format laboratory analysis results and bulk sample summary reports are provided in Appendix C.

5 FINDINGS

Arcadis identified 49 HAs, of which 111 suspect ACM bulk samples were collected and submitted for laboratory analysis. A listing of the identified HAs, including each HA material description, location, condition, asbestos content, and estimated quantity, is presented in Table 1. Approximate sampling locations are shown in Figures 1 - 4.

Sixteen HAs have been confirmed or assumed to contain asbestos at concentrations above one percent asbestos. (NYSDOL defines ACM as any material containing greater than one percent of asbestos). Four HAs have been confirmed to contain asbestos at concentrations below one percent.

The following HAs are confirmed ACMs:

- HA-1: 12" x 12" Orange Mottled Floor Tile
- HA-5: 9" x 9" Black with White Streaks Floor Tile
- HA-6: 9" x 9" Brown with White Streaks Floor Tile
- HA-7: Black Mastic from HA-5 and HA-6
- HA-17: 9" x 9" Red with White Streaks Floor Tile
- HA-18: 9" x 9" White with Brown Specks Floor Tile
- HA-19: Black Mastic from HA-17 and HA-18
- HA-20: 12" x 12" Yellow with Brown Splotches Floor Tile
- HA-21: Black Mastic from HA-20

PRE-DEMOLITION ASBESTOS SURVEY

- HA-24: White Window Glazing
- HA-25: Composite: Black Mastic and Vapor Barrier
- HA-26: Black Electrical Switch
- HA-33: Exterior Top-Coat Plaster
- HA-41: Bottom Layer: Reinforced Felts and Mopping (Main Field)
- HA-43: Bottom Layer: Felts and Mopping (Flashing)
- HA-44: Repair Tar

The following HAs have been determined to contain trace amounts of asbestos, i.e. one percent or less (1% or <1%) by laboratory analysis and their disturbance is still regulated by OSHA:

- HA-2: Yellow Mastic from HA-1
- HA-4: Black/Tan Mastic from HA-3
- HA-40: Top Layer: Silver-Coated Rolled Roofing (Main Field)
- HA-42: Top Layer: Silver-Coated Rolled Roofing (Flashing)

The remaining bulk samples collected by Arcadis as part of the survey were reported by the laboratory as “None Detected” for asbestos. Representative photographs are provided Appendix D.

6 RECOMMENDATIONS

As presented in Table 1 and the laboratory data provided in Appendix C, results of the asbestos survey identified confirmed ACMs at the Site.

In accordance with current USEPA NESHAP regulations, certain types of ACM must be removed prior to being disturbed by demolition activities. Current USEPA NESHAP and New York State Code Rule Part 56 regulations require that all Regulated ACMs (RACM) be removed prior to being disturbed. RACMs are defined as:

- Friable ACM
- Category I non-friable ACM that has become friable
- Category I non-friable ACM that has been or will be subjected to sanding, abrading, grinding, or cutting.
- Category II non-friable ACM that has a high probability of becoming friable or crumbled, pulverized, or otherwise reduced to powder by demolition or renovation activities

ACMs that may be disturbed during demolition activities, must be removed by a licensed asbestos abatement contractor utilizing industry standard work procedures in accordance with all federal, state, and local regulations governing asbestos. HA's shown in bold in Table 1 require removal prior to being disturbed by demolition activities.

Due to the inability to effectively separate some types of multi-layered ACMs (e.g., floor tile/mastic, and gypsum board/joint compound) from non-ACMs, these materials are considered “asbestos-contaminated” for the purposes of removal, and should be managed as ACM. In addition, carpet was observed adhered to asbestos-containing floor tiles and should be managed as ACM.

PRE-DEMOLITION ASBESTOS SURVEY

If other suspect materials, not referenced in this survey report, are identified at the Site, Arcadis recommends that these materials be considered ACM until they are inspected by an appropriately licensed asbestos inspector and proven otherwise.

Asbestos waste removed from the Site must be disposed at an asbestos waste receiving facility that is duly permitted by the state and/or local municipality in which it resides.

The OSHA Construction Standard for Asbestos (29 CFR 1926.1101) procedures and guidelines must be followed for personnel conducting activities that may disturb materials that contain asbestos during abatement, construction, demolition, renovation, and other similar activities, whether they are considered ACM because they contain greater than 1% asbestos or if they contain 1% or less asbestos. Materials that are confirmed to contain trace amounts of asbestos (less than one percent) by either point counting or Transmission Electron Microscopy (TEM) are not currently subject to the USEPA regulations. These materials, however, may still be subject to federal OSHA regulations when their disturbance may elevate, or potentially elevate, the concentration of airborne fibers above the eight-hour time weighted average (TWA) permissible exposure limit (PEL) of 0.1 fibers per cubic centimeter of air (f/cc) or the 30-minute short term excursion limit (STEL) of 1.0 f/cc. It should be noted, despite these limits established by OSHA, that no "safe" level of asbestos exposure has been determined.

OSHA considers disturbance of building materials containing equal to or less than 1% asbestos as "unclassified asbestos operations". Unclassified asbestos operations cover employees likely to be exposed in excess of the PELs and who are performing asbestos operations that are not covered by Class I through IV asbestos operations (e.g., renovation/restoration activities). Employees must have appropriate training meeting OSHA Standard 29 CFR 1926.1101 (k)(9)(viii). In addition, the employer still must follow the requirements in 29 CFR 1926.1101 paragraphs (g)(1) [except (g)(1)(i)], (g)(2) and (g)(3) that describe engineering and work practice controls operation.

Arcadis recommends that engineering controls and work practices be utilized and that personal exposure assessment (air monitoring) be conducted on contractors performing work in areas where materials have been identified to contain equal to or less than 1% asbestos in accordance with OSHA Standard 29 CFR 1926.1101 (f) Exposure Assessments and Monitoring. Arcadis also recommends that contractors wear applicable personal protective equipment (PPE) as defined in 29 CFR 1926.1101, while performing work activities in these areas, and utilize appropriate engineering and work practice controls to minimize the potential fiber release.

7 ADDITIONAL SURVEY LIMITATIONS

Arcadis' survey is subject to the following limitations in addition to those presented in Appendix A:

- The survey did not include access or inspection of confined spaces, underground piping, conduits, building footings or subsurface soil.

TABLES



Table 1
Homogeneous Areas

Former Silver Cleaners
425 Andrews Street
Rochester, New York 14604

HA No.	Material Description	Material Location	Sample Number	Condition	Friability	Asbestos Content	Estimated Quantity	Unit	Notes
HA-1	12" x 12" Orange Mottled Floor Tile	Lobby	SC-001 SC-002	Good	Non-Friable	3.2% Chrysotile	155	SF	
HA-2	Yellow Mastic from HA-1	Lobby	SC-003 SC-004	Good	Non-Friable	<1% Chrysotile	155	SF	
HA-3	12" x 12" Tan Stone Print Floor Tile	Lobby	SC-005 SC-006	Good	Non-Friable	NAD	155	SF	
HA-4	Black/Tan Mastic from HA-3	Lobby	SC-007 SC-008	Good	Non-Friable	<1% Chrysotile	155	SF	
HA-5	9" x 9" Black with White Streaks Floor Tile	Rack Room, Office, Restrooms, Sewing Room	SC-009 SC-010	Good	Non-Friable	6.4% Chrysotile	265	SF	
HA-6	9" x 9" Brown with White Streaks Floor Tile	Rack Room, Office, Restrooms, Sewing Room	SC-011 SC-012	Good	Non-Friable	10.8% Chrysotile	265	SF	
HA-7	Black Mastic from HA-5 and HA-6	Rack Room, Office, Restrooms, Sewing Room	SC-013 SC-014	Good	Non-Friable	1.5% Chrysotile	530	SF	
HA-8	Tan Mastic from Gray Carpet	Lobby, Office, Customer Service, Sewing Room	SC-015 SC-016	Good	Non-Friable	NAD	630	SF	
HA-9	1' x 1' Mechanically Adhered Ceiling Tile	Rack Room, Office, Sewing Room	SC-017 SC-018	Good	Friable	NAD	680	SF	
HA-10	2' x 4' Suspended Fissured Ceiling Tile	Office, Sewing Room	SC-019 SC-020	Good	Friable	NAD	280	SF	
HA-11	Top Coat Plaster	Office, Lobby, Restrooms, Rack Room, Press Room, Customer Service, Sewing Room	SC-021 SC-022 SC-023 SC-024 SC-025 SC-026 SC-027	Damaged	Friable	NAD	10,000	SF	

Table 1
Homogeneous Areas
Former Silver Cleaners
425 Andrews Street
Rochester, New York 14604

HA No.	Material Description	Material Location	Sample Number	Condition	Friability	Asbestos Content	Estimated Quantity	Unit	Notes
HA-12	Base Coat Plaster	Office, Lobby, Restrooms, Rack Room, Press Room, Customer Service, Sewing Room	SC-028 SC-029 SC-030 SC-031 SC-032 SC-033 SC-034	Damaged	Friable	NAD	10,000	SF	
HA-13	Gypsum Board	Rack Room, Customer Service, Basement	SC-035 SC-036	Good	Friable	NAD	500	SF	
HA-14	Joint Compound	Rack Room, Customer Service, Basement	SC-037 SC-038	Good	Friable	NAD	500	SF	
HA-15	Cloth Wire Insulation	Throughout	SC-039 SC-040	Good	Non-Friable	NAD	1,500	LF	
HA-16	Tan Adhesive from 4" Blue Cove Base	Customer Service	SC-041 SC-042	Good	Non-Friable	NAD	100	LF	
HA-17	9" x 9" Red with White Streaks Floor Tile	Customer Service, Sewing Room	SC-043 SC-044	Good	Non-Friable	5.6% Chrysotile	250	SF	
HA-18	9" x 9" White with Brown Specks Floor Tile	Customer Service, Sewing Room	SC-045 SC-046	Good	Non-Friable	11.4% Chrysotile	250	SF	
HA-19	Black Mastic from HA-17 and HA-18	Customer Service, Sewing Room	SC-047 SC-048	Good	Non-Friable	1.8% Chrysotile	500	SF	
HA-20	12" x 12" Yellow with Brown Splotches Floor Tile	Press Room, Sewing Room, Customer Service	SC-049 SC-050	Good	Non-Friable	1.6% Chrysotile	1,000	SF	
HA-21	Black Mastic from HA-20	Press Room, Sewing Room, Customer Service	SC-051 SC-052	Good	Non-Friable	1.8% Chrysotile	1,000	SF	
HA-22	White Floor Leveler	Press Room, Sewing Room, Customer Service	SC-053 SC-054	Good	Friable	NAD	1,000	SF	

Table 1
Homogeneous Areas

Former Silver Cleaners
425 Andrews Street
Rochester, New York 14604

HA No.	Material Description	Material Location	Sample Number	Condition	Friability	Asbestos Content	Estimated Quantity	Unit	Notes
HA-23	Brick Mortar	Office, Lobby, Rack Room, Basement	SC-055 SC-056	Good	Friable	NAD	5,000	SF	
HA-24	White Window Glazing	Press Room	SC-057 SC-058	Good	Non-Friable	11.7% Chrysotile	200	LF	
HA-25	Composite: Black Mastic and Vapor Barrier	Press Room	SC-059 SC-060	Good	Non-Friable	3.7% Chrysotile	1,000	SF	Material located under 9" x 9" Multi-Colored Rubber Floor Tiles
HA-26	Black Electrical Switch	Press Room	SC-061 SC-062	Good	Non-Friable	4.2% Chrysotile	20	EA	
HA-27	Gray Electrical Switch	Press Room	SC-063 SC-064	Good	Non-Friable	NAD	5	EA	
HA-28	Cloth Iron Pad	Press Room	SC-065 SC-066	Good	Non-Friable	NAD	250	SF	
HA-29	Black Iron Cover (Housing)	Press Room	SC-067 SC-068	Good	Non-Friable	NAD	5	EA	
HA-30	Tan Paneling Adhesive	Sewing Room	SC-069 SC-070	Good	Non-Friable	NAD	200	SF	
HA-31	Newer Concrete Block Mortar	Garage	SC-071 SC-072	Good	Friable	NAD	15,000	SF	
HA-32	Exterior Parge Coat	Building Exterior	SC-073 SC-074 SC-075	Good	Friable	NAD	500	SF	
HA-33	Exterior Top-Coat Plaster	Building Exterior	SC-076 SC-077 SC-078	Good	Friable	1.70% Chrysotile	300	SF	

Table 1
Homogeneous Areas

Former Silver Cleaners
425 Andrews Street
Rochester, New York 14604

HA No.	Material Description	Material Location	Sample Number	Condition	Friability	Asbestos Content	Estimated Quantity	Unit	Notes
HA-34	Exterior Base-Coat Plaster	Building Exterior	SC-079 SC-080 SC-081	Good	Friable	NAD	300	SF	Due to the inability to effectively separate the base coat plaster (HA-34) from the asbestos-containing top coat (HA-33), the base coat plaster should be managed as ACM.
HA-35	Older Concrete Block Mortar	Press Room, Building Exterior	SC-082 SC-083	Good	Friable	NAD	18,000	SF	
HA-36	Black Window/Door Frame Caulk	Building Exterior	SC-084 SC-085	Good	Non-Friable	NAD	500	LF	
HA-37	White Louver Caulk	Building Exterior	SC-086 SC-087	Good	Non-Friable	NAD	50	LF	
HA-38	Sheet Goods on Table-Top	Rack Room	SC-088 SC-089	Good	Non-Friable	NAD	40	SF	
HA-39	Tan Adhesive from HA-38	Rack Room	SC-090 SC-091	Good	Non-Friable	NAD	40	SF	
HA-40	Top Layer: Silver-Coated Rolled Roofing (Main Field)	Roof 1, 2, 4	SC-092 SC-093	Damaged	Non-Friable	<1% Chrysotile	3,950	SF	Roof 4 is damaged, structurally unsound, and was not safely accessible at the time of the survey.
HA-41	Bottom Layer: Reinforced Felts and Mopping (Main Field)	Roof 1, 2, 4	SC-094 SC-095	Damaged	Non-Friable	9.6% Chrysotile	3,950	SF	Roof 4 is damaged, structurally unsound, and was not safely accessible at the time of the survey.
HA-42	Top Layer: Silver-Coated Rolled Roofing (Flashing)	Roof 1, 2, 4	SC-096 SC-097	Good	Non-Friable	<1% Chrysotile	950	SF	
HA-43	Bottom Layer: Felts and Mopping (Flashing)	Roof 1, 2, 4	SC-098 SC-099	Good	Non-Friable	1.2% Chrysotile	950	SF	
HA-44	Repair Tar	Roof 1, 2, 4	SC-100 SC-101	Good	Non-Friable	9.2% Chrysotile	500	SF	
HA-45	Clay Coping Mortar	Roof 1	SC-102 SC-103	Good	Friable	NAD	300	SF	

**Table 1
Homogeneous Areas**

**Former Silver Cleaners
425 Andrews Street
Rochester, New York 14604**

HA No.	Material Description	Material Location	Sample Number	Condition	Friability	Asbestos Content	Estimated Quantity	Unit	Notes
HA-46	Bottom Layer: Vapor Barrier	Roof 3	SC-104 SC-105	Good	Non-Friable	NAD	960	SF	Material is located under rubber roof and foam insulation board.
HA-47	Tan Adhesive from Rubber Roofing System	Roof 3	SC-106 SC-107	Good	Non-Friable	NAD	1,060	SF	
HA-48	Black Repair/Seam Caulk	Roof 3	SC-108 SC-109	Good	Non-Friable	NAD	500	LF	
HA-49	White Repair Caulk	Roof 3	SC-110 SC-111	Good	Non-Friable	NAD	100	LF	

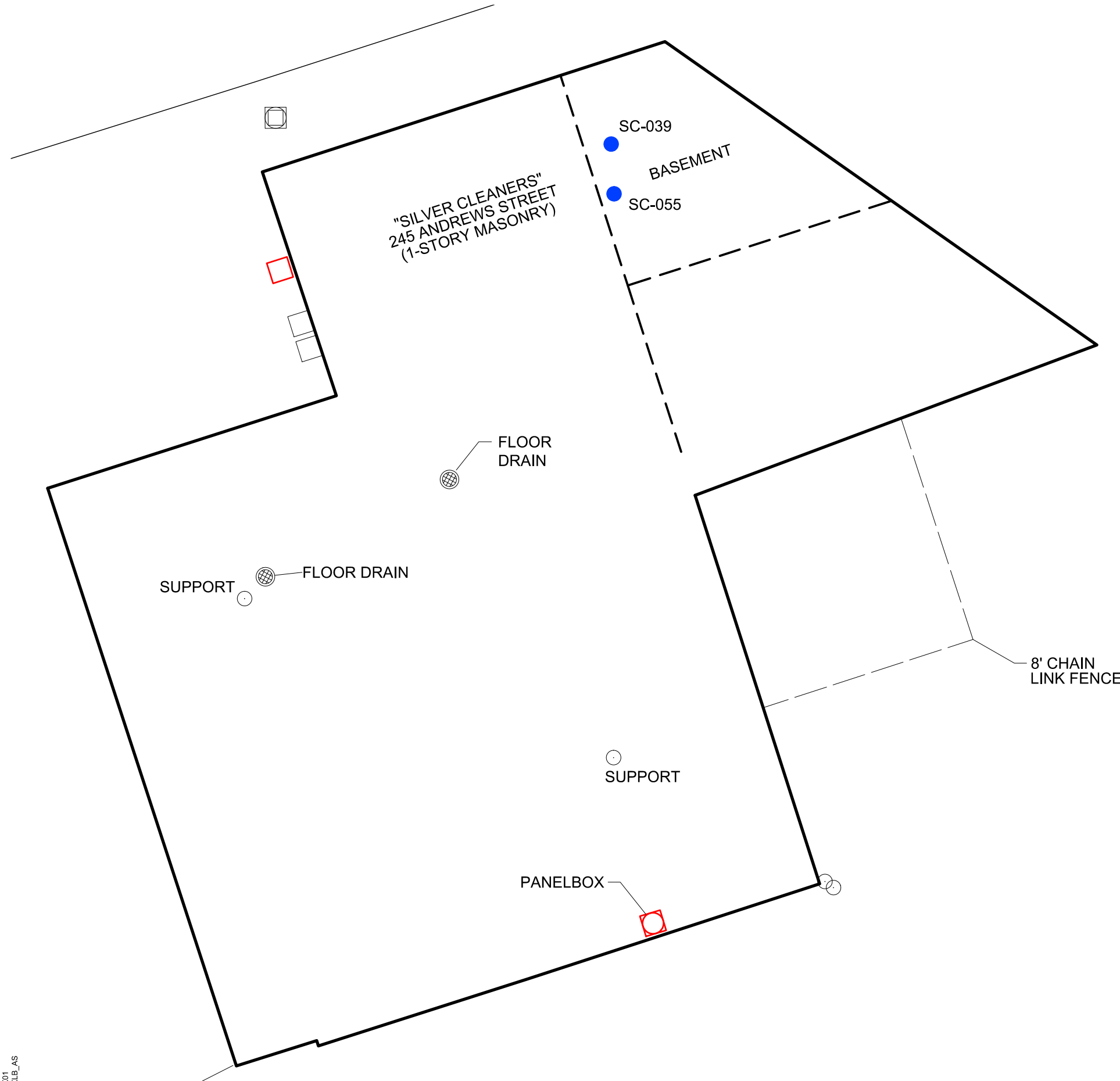
Notes:

1. ACM = Asbestos-Containing Material
2. EA = Each
3. LF = Linear Foot
4. NAD = No Asbestos Detected
5. SF = Square Foot

FIGURES



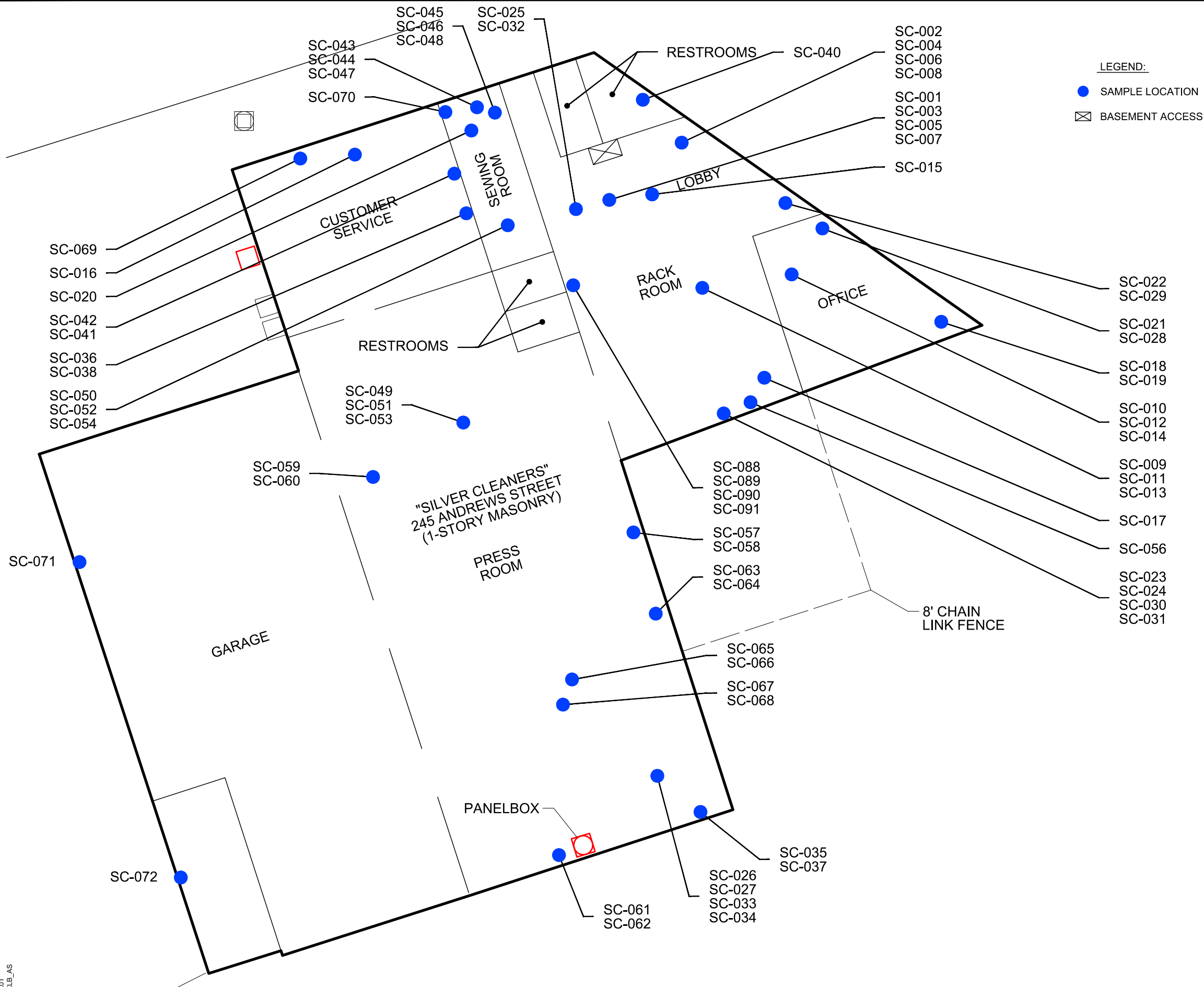
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LEGEND:
● SAMPLE LOCATION

NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION FORMER SILVER CLEANERS SITE #828186 ROCHESTER, NEW YORK PRE-DEMOLITION ASBESTOS SURVEY	
BASEMENT SAMPLE LOCATIONS	
 Design & Consultancy for natural and built assets	FIGURE 1

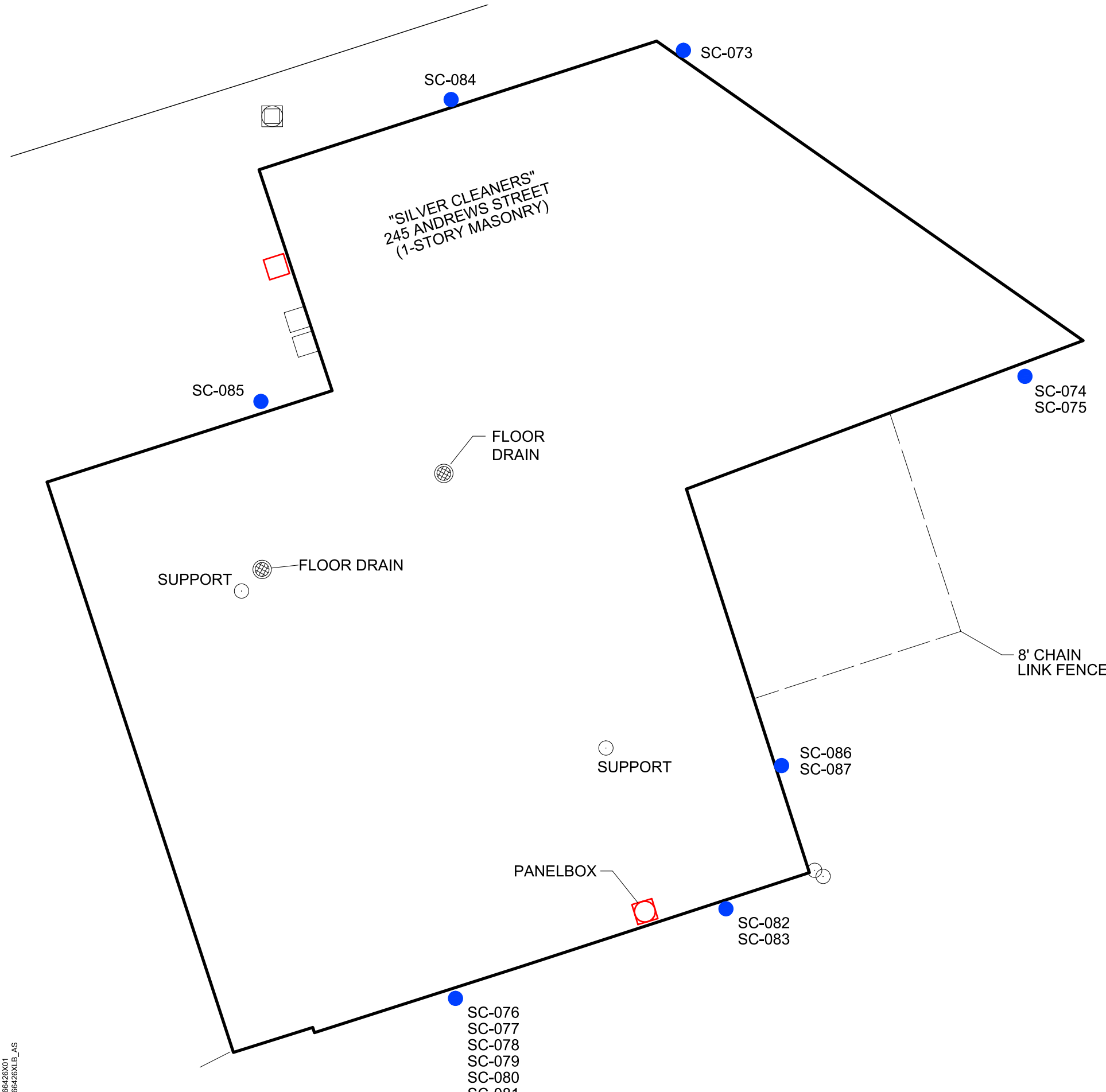
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NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
FORMER SILVER CLEANERS SITE #828186
ROCHESTER, NEW YORK
PRE-DEMOLITION ASBESTOS SURVEY

**FIRST FLOOR
SAMPLE LOCATIONS**

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66426X01
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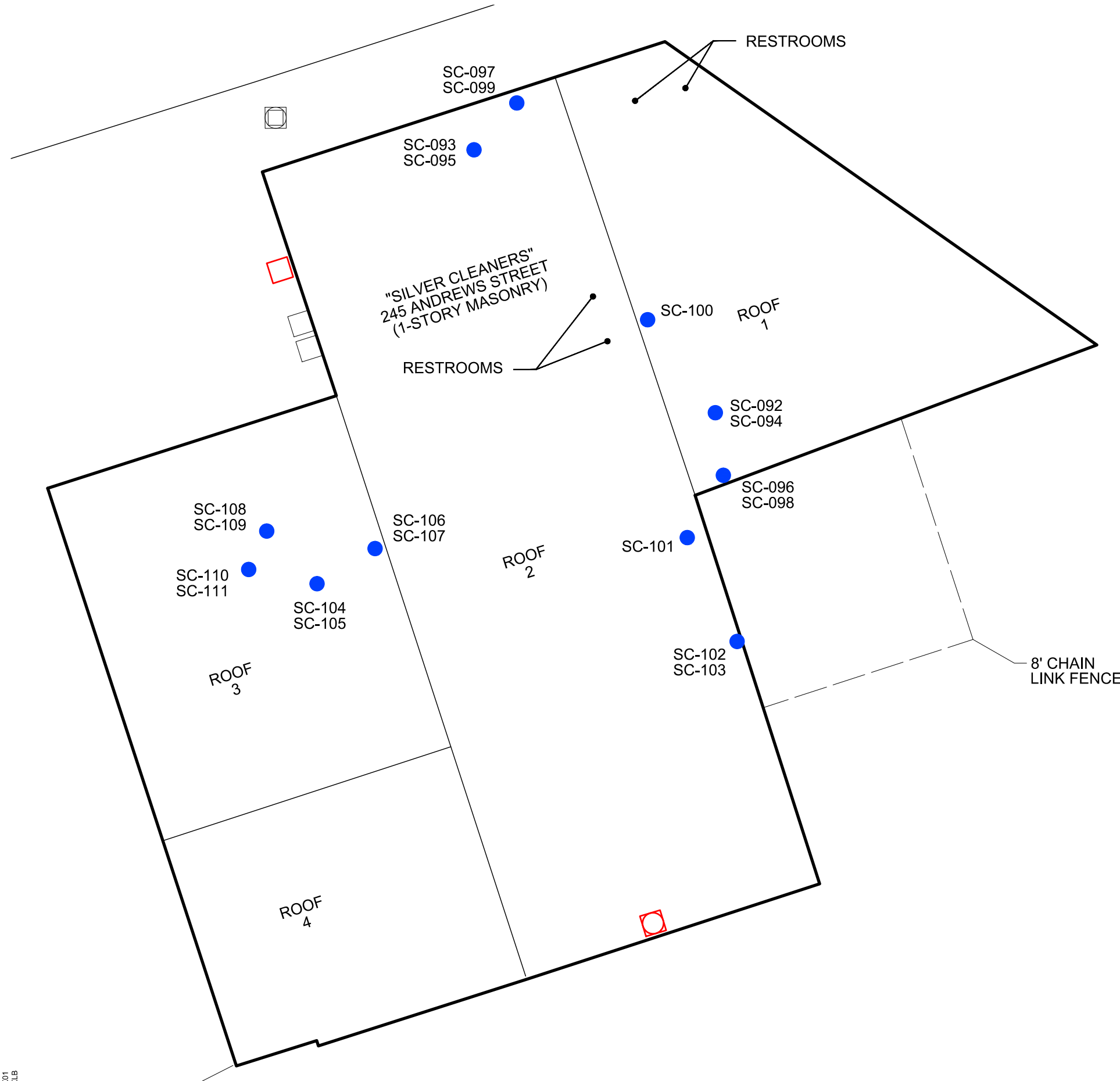
LEGEND:
● SAMPLE LOCATION

NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
FORMER SILVER CLEANERS SITE #828186
ROCHESTER, NEW YORK
PRE-DEMOLITION ASBESTOS SURVEY

**EXTERIOR
SAMPLE LOCATIONS**



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G:\Projects\00266426\0000\000001\DWG\Figures_Asbestos Survey\66426FIG04.dwg LAYOUT: 4 SAVED: 9/26/2017 10:38 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: -- PLOTSTYLETABLE: PLTFULLCTB PLOTTED: 9/26/2017 10:38 AM BY: WELSHANS, MATTHEW
XREFS: 66426X01 66426XLB
IMAGES: PROJECTNAME: --



LEGEND:
● SAMPLE LOCATION

NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION FORMER SILVER CLEANERS SITE #828186 ROCHESTER, NEW YORK PRE-DEMOLITION ASBESTOS SURVEY	
ROOF PLAN SAMPLE LOCATIONS	
 Design & Consultancy for natural and built assets	FIGURE 4

APPENDIX A

Limitations and Service Constraints



LIMITATIONS AND SERVICE CONSTRAINTS

Asbestos Related Services

All professional opinions presented in this report are based on information made available to us either by review of data provided by others or data gathered by ARCADIS personnel.

ARCADIS affirms that data gathered and presented by ARCADIS in this report was collected in an appropriate manner in accordance with generally accepted methods and practices. ARCADIS cannot be responsible for decisions made by our client solely on the basis of economic factors.

Conditions described in this report are as found at the time of investigation, unless otherwise stated.

ARCADIS analyzed only the substances, conditions and locations described in the report at the time indicated. No inferences regarding other substances, conditions, location or time can be made unless specifically stated in this report.

No recommendations were provided for materials containing less than one- percent asbestos. Materials containing less than one percent asbestos do not meet either the generally accepted industry definition of asbestos-containing material (any material containing greater than one percent asbestos) or the EPA definition of friable ACM (any material friable bulk insulation material contain greater than one percent asbestos by weight as analyzed by Polarized Light Microscopy.) ARCADIS, however, makes no statement, implied or explicit, about the hazards of materials containing less than one percent asbestos.

This report is intended for the use listed in the section of this report described as the Introduction. The use of this report in any manner other than that listed in the Introduction requires the written consent of ARCADIS. This report must be presented in its entirety.

APPENDIX B

Accreditations



STATE OF NEW YORK - DEPARTMENT OF LABOR
ASBESTOS CERTIFICATE



JOSEPH M ASHMAN

CLASS(EXPIRES)

C ATEC(07/17) D INSP(07/18)

H PM (07/17)

CERT# 06-13334
DMV# 795213248

MUST BE CARRIED ON ASBESTOS PROJECTS

01/01/17 10 01 00/01/18 10 01 00

APPENDIX C

Laboratory Reports – Asbestos



**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com>cinnaslab@EMSL.com

EMSL Order: 041726144
 CustomerID: ACAD78J
 CustomerPO: 00266426.0000
 ProjectID:

Attn: **Joe Ashman**
ARCADIS U.S., Inc.
30 Braintree Hill Office Park
Suite 105
Braintree, MA 02184

Phone: (781) 356-7300
 Fax:
 Received: 08/31/17 9:10 AM
 Analysis Date: 9/7/2017
 Collected: 8/29/2017

Project: **ARCADIS; FORMER SILVER CLEANERS 245 ANDREWS STREET, ROCHESTER, NEW YORK - 00266426.0000.00004**

Test Report:Asbestos Analysis of Bulk Material

Test		Analyzed Date	Color	Non Asbestos		Asbestos
				Fibrous	Non-Fibrous	
Sample ID	SC-001		Description	LOBBY - 12'X12' ORANGE MOTTLED FLOOR TILE		
	041726144-0001		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB		9/7/2017	Orange			3.2% Chrysotile 3.2% Total
TEM NYS 198.4 NOB						Not Analyzed
Sample ID	SC-002		Description	LOBBY - 12'X12' ORANGE MOTTLED FLOOR TILE		
	041726144-0002		Homogeneity			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB		9/7/2017				Positive Stop (Not Analyzed)
TEM NYS 198.4 NOB						Not Analyzed
Sample ID	SC-003		Description	LOBBY - YELLOW MASTIC FROM HA1		
	041726144-0003		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB		9/7/2017	Yellow			Inconclusive : <1%Chrysotile Inconclusive - <1% Total
TEM NYS 198.4 NOB		9/8/2017	Yellow			<1% Chrysotile <1% Total
Sample ID	SC-004		Description	LOBBY - YELLOW MASTIC FROM HA1		
	041726144-0004		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB		9/7/2017	Yellow			Inconclusive: None Detected
TEM NYS 198.4 NOB		9/8/2017	Yellow			<1% Chrysotile <1% Total
Sample ID	SC-005		Description	LOBBY - 12"X12" TAN STONE PRINT FLOOR TILE		
	041726144-0005		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB		9/7/2017	Tan			Inconclusive: None Detected
TEM NYS 198.4 NOB		9/8/2017	Tan			None Detected

Initial Report From 09/11/2017 07:29:37

Test Report 198VCM-7.30.0 Printed: 9/11/2017 7:29:37 AM

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**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com>cinnaslab@EMSL.com

EMSL Order: 041726144
 CustomerID: ACAD78J
 CustomerPO: 00266426.0000
 ProjectID:

Test Report: Asbestos Analysis of Bulk Material

		Non Asbestos			
Test		Color	Fibrous	Non-Fibrous	Asbestos
Sample ID	SC-006 041726144-0006	Description Homogeneity	LOBBY - 12"X12" TAN STONE PRINT FLOOR TILE Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Tan	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	Tan	None Detected		
Sample ID	SC-007 041726144-0007	Description Homogeneity	LOBBY - BLACK/TAN MASTIC FROM HA3 Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	Black	<1% Chrysotile <1% Total		
Sample ID	SC-008 041726144-0008	Description Homogeneity	LOBBY - BLACK/TAN MASTIC FROM HA3 Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	Black	<1% Chrysotile <1% Total		
Sample ID	SC-009 041726144-0009	Description Homogeneity	RACK ROOM - 9"X9" BLACK WITH WHITE STREAKS FLOOR TILE Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black	6.4% Chrysotile 6.4% Total		
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-010 041726144-0010	Description Homogeneity	OFFICE - 9"X9" BLACK WITH WHITE STREAKS FLOOR TILE Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017		Positive Stop (Not Analyzed)		
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-011 041726144-0011	Description Homogeneity	RACK ROOM - 9"X9" BROWN WITH WHITE STEAKS FLOOR TILE Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Brown	10.8% Chrysotile 10.8% Total		
TEM NYS 198.4 NOB					Not Analyzed

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Test Report 198VCM-7.30.0 Printed: 9/11/2017 7:29:37 AM

Page 2

**EMSL Analytical, Inc.**

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EMSL Order: 041726144
 CustomerID: ACAD78J
 CustomerPO: 00266426.0000
 ProjectID:

Test Report:Asbestos Analysis of Bulk Material

Test		Color	Fibrous	Non-Fibrous	Asbestos
Sample ID	SC-012 041726144-0012	Description Homogeneity	OFFICE - 9"X9" BROWN WITH WHITE STEAKS FLOOR TILE		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017		Positive Stop (Not Analyzed)		
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-013 041726144-0013	Description Homogeneity	RACK ROOM - BLACK MASTIC FROM HA5 & HA6 Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black	1.5% Chrysotile 1.5% Total		
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-014 041726144-0014	Description Homogeneity	OFFICE - BLACK MASTIC FROM HA5 & HA6		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017		Positive Stop (Not Analyzed)		
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-015 041726144-0015	Description Homogeneity	LOBBY - TAN MASTIC FROM GRAY CARPET Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Tan	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	Tan	None Detected		
Sample ID	SC-016 041726144-0016	Description Homogeneity	CUSTOMER SERVICE - TAN MASTIC FROM GRAY CARPET Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Tan	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	Tan	None Detected		
Sample ID	SC-017 041726144-0017	Description Homogeneity	RACK ROOM - 1'X1' ADHERED CEILING TILE Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Tan/White	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	Tan/White	None Detected		

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EMSL Order: 041726144
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Test Report:Asbestos Analysis of Bulk Material

Test		Color	Non Asbestos			Asbestos
Sample ID	SC-018	Description	Fibrous	Non-Fibrous		
	041726144-0018	Homogeneity	OFFICE - 1'X1' ADHERED CEILING TILE			
			Homogeneous			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Tan/White			Inconclusive: None Detected	
TEM NYS 198.4 NOB	9/8/2017	Tan/White			None Detected	
Sample ID	SC-019	Description	OFFICE - 2'X4' SUSPENDED CEILING TILE			
	041726144-0019	Homogeneity	Homogeneous			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	White			Inconclusive: None Detected	
TEM NYS 198.4 NOB	9/8/2017	White			None Detected	
Sample ID	SC-020	Description	SEWING ROOM - 2'X4' SUSPENDED CEILING TILE			
	041726144-0020	Homogeneity	Homogeneous			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	White			Inconclusive: None Detected	
TEM NYS 198.4 NOB	9/8/2017	White			None Detected	
Sample ID	SC-021	Description	OFFICE WALL - TOP COAT PLASTER			
	041726144-0021	Homogeneity	Homogeneous			
PLM NYS 198.1 Friable	9/7/2017	White	4.00% Cellulose	96.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB						Not Analyzed
TEM NYS 198.4 NOB						Not Analyzed
Sample ID	SC-022	Description	LOBBY WALL - TOP COAT PLASTER			
	041726144-0022	Homogeneity	Homogeneous			
PLM NYS 198.1 Friable	9/7/2017	White	5.00% Cellulose	95.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB						Not Analyzed
TEM NYS 198.4 NOB						Not Analyzed
Sample ID	SC-023	Description	RACK ROOM WALL - TOP COAT PLASTER			
	041726144-0023	Homogeneity	Homogeneous			
PLM NYS 198.1 Friable	9/7/2017	White	3.00% Cellulose	97.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB						Not Analyzed
TEM NYS 198.4 NOB						Not Analyzed

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EMSL Order: 041726144
 CustomerID: ACAD78J
 CustomerPO: 00266426.0000
 ProjectID:

Test Report:Asbestos Analysis of Bulk Material

Test		Color	Fibrous	Non-Fibrous	Asbestos
Sample ID	SC-024 041726144-0024	Description Homogeneity	RACK ROOM WALL - TOP COAT PLASTER Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	White	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-025 041726144-0025	Description Homogeneity	LOBBY CEILING - TOP COAT PLASTER Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	White	3.00% Cellulose	97.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-026 041726144-0026	Description Homogeneity	PRESS ROOM CEILING - TOP COAT PLASTER Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	White	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-027 041726144-0027	Description Homogeneity	PRESS ROOM CEILING - TOP COAT PLASTER Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	White	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-028 041726144-0028	Description Homogeneity	OFFICE WALL - BASE COAT PLASTER Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	Gray	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-029 041726144-0029	Description Homogeneity	LOBBY WALL - BASE COAT PLASTER Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	Gray	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

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EMSL Order: 041726144
 CustomerID: ACAD78J
 CustomerPO: 00266426.0000
 ProjectID:

Test Report:Asbestos Analysis of Bulk Material

Test		Color	Non Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID	SC-030	Description	RACK ROOM WALL - BASE COAT PLASTER		
	041726144-0030	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	Gray	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-031	Description	RACK ROOM WALL - BASE COAT PLASTER		
	041726144-0031	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	Gray	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-032	Description	LOBBY CEILING - BASE COAT PLASTER		
	041726144-0032	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	Gray	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-033	Description	PRESS ROOM CEILING - BASE COAT PLASTER		
	041726144-0033	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	Gray	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-034	Description	PRESS ROOM CEILING - BASE COAT PLASTER		
	041726144-0034	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	Gray	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-035	Description	RACK ROOM - GYPSUM BOARD		
	041726144-0035	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	Gray/White	20.00% Cellulose	80.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

**EMSL Analytical, Inc.**

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EMSL Order: 041726144
 CustomerID: ACAD78J
 CustomerPO: 00266426.0000
 ProjectID:

Test Report: Asbestos Analysis of Bulk Material

		Non Asbestos				Asbestos
Test		Color	Fibrous	Non-Fibrous		
Sample ID	SC-036 041726144-0036	Description Homogeneity	CUSTOMER SERVICE - GYPSUM BOARD Homogeneous			
PLM NYS 198.1 Friable	9/8/2017	Gray/White	20.00% Cellulose	80.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB						Not Analyzed
TEM NYS 198.4 NOB						Not Analyzed
Sample ID	SC-037 041726144-0037	Description Homogeneity	RACK ROOM - JOINT COMPOUND Homogeneous			
PLM NYS 198.1 Friable	9/7/2017	White		100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB						Not Analyzed
TEM NYS 198.4 NOB						Not Analyzed
Sample ID	SC-038 041726144-0038	Description Homogeneity	CUSTOMER SERVICE - JOINT COMPOUND Homogeneous			
PLM NYS 198.1 Friable	9/8/2017	White		100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB						Not Analyzed
TEM NYS 198.4 NOB						Not Analyzed
Sample ID	SC-039 041726144-0039	Description Homogeneity	BASEMENT - CLOTH WIRE INSULATION Homogeneous			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Brown/White/ Black	13.4% Glass			Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	Brown/White/ Black				None Detected
Sample ID	SC-040 041726144-0040	Description Homogeneity	LOBBY RESTROOM - CLOTH WIRE INSULATION Homogeneous			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Brown/White/ Black	22.3% Glass			Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	Brown/White/ Black				None Detected
Sample ID	SC-041 041726144-0041	Description Homogeneity	CUSTOMER SERVICE - TAN ADHESIVE FROM 4" BLUE COVE BASE Homogeneous			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Tan				Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	Tan				None Detected

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EMSL Order: 041726144
 CustomerID: ACAD78J
 CustomerPO: 00266426.0000
 ProjectID:

Test Report:Asbestos Analysis of Bulk Material

		Non Asbestos		
Test		Color	Fibrous	Non-Fibrous
Sample ID		Description		Asbestos
SC-042		CUSTOMER SERVICE - TAN ADHESIVE FROM 4" BLUE COVE BASE		
041726144-0042		Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Tan		Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	Tan		None Detected
Sample ID		Description		
SC-043		SEWING ROOM - 9"X9" RED WITH WHITE STREAKS FLOOR TILE		
041726144-0043		Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Red		5.6% Chrysotile
				5.6% Total
TEM NYS 198.4 NOB				Not Analyzed
Sample ID		Description		
SC-044		SEWING ROOM - 9"X9" RED WITH WHITE STREAKS FLOOR TILE		
041726144-0044		Homogeneity		
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017			Positive Stop (Not Analyzed)
TEM NYS 198.4 NOB				Not Analyzed
Sample ID		Description		
SC-045		SEWING ROOM - 9"X9" WHITE WITH BROWN SPECKS FLOOR TILE		
041726144-0045		Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Brown		11.4% Chrysotile
				11.4% Total
TEM NYS 198.4 NOB				Not Analyzed
Sample ID		Description		
SC-046		SEWING ROOM - 9"X9" WHITE WITH BROWN SPECKS FLOOR TILE		
041726144-0046		Homogeneity		
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017			Positive Stop (Not Analyzed)
TEM NYS 198.4 NOB				Not Analyzed
Sample ID		Description		
SC-047		SEWING ROOM - BLACK MASTIC FROM HA17 & HA18		
041726144-0047		Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black		Inconclusive : <1%Chrysotile
				Inconclusive - <1% Total
TEM NYS 198.4 NOB				Not Analyzed

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EMSL Order: 041726144
CustomerID: ACAD78J
CustomerPO: 00266426.0000
ProjectID:

Test Report:Asbestos Analysis of Bulk Material

Test		Non Asbestos		Asbestos
		Color	Fibrous Non-Fibrous	
Sample ID	SC-048	Description	SEWING ROOM - BLACK MASTIC FROM HA17 & HA18	
	041726144-0048	Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black		1.8% Chrysotile 1.8% Total
TEM NYS 198.4 NOB				Not Analyzed
Sample ID	SC-049	Description	PRESS ROOM - 12"X12" YELLOW BROWN SPLOTCHES FLOOR TILE	
	041726144-0049	Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Brown/Yellow		1.6% Chrysotile 1.6% Total
TEM NYS 198.4 NOB				Not Analyzed
Sample ID	SC-050	Description	SEWING ROOM - 12"X12" YELLOW BROWN SPLOTCHES FLOOR TILE	
	041726144-0050	Homogeneity		
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017			Positive Stop (Not Analyzed)
TEM NYS 198.4 NOB				Not Analyzed
Sample ID	SC-051	Description	PRESS ROOM - BLACK MASTIC FROM HA20	
	041726144-0051	Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black		Inconclusive : <1%Chrysotile Inconclusive - <1% Total
TEM NYS 198.4 NOB				Not Analyzed
Sample ID	SC-052	Description	SEWING ROOM - BLACK MASTIC FROM HA20	
	041726144-0052	Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black		1.8% Chrysotile 1.8% Total
TEM NYS 198.4 NOB				Not Analyzed

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 CustomerID: ACAD78J
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Test Report:Asbestos Analysis of Bulk Material

Test		Color	Fibrous	Non-Fibrous	Asbestos
Sample ID	SC-053 041726144-0053	Description Homogeneity	PRESS ROOM - WHITE FLOOR LEVELER Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	White	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-054 041726144-0054	Description Homogeneity	SEWING ROOM - WHITE FLOOR LEVELER Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	White	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-055 041726144-0055	Description Homogeneity	BASEMENT - BRICK MORTAR Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	Tan	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-056 041726144-0056	Description Homogeneity	RACK ROOM - BRICK MORTAR Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	Tan	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-057 041726144-0057	Description Homogeneity	PRESS ROOM - WHITE WINDOW GLAZING Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	White	Inconclusive : <1%Chrysotile Inconclusive - <1% Total		
TEM NYS 198.4 NOB	9/8/2017	White	11.7% Chrysotile 11.7% Total		
Sample ID	SC-058 041726144-0058	Description Homogeneity	PRESS ROOM - WHITE WINDOW GLAZING Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	White	Inconclusive : <1%Chrysotile Inconclusive - <1% Total		
TEM NYS 198.4 NOB	9/11/2017		Positive Stop (Not Analyzed)		

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Test Report:Asbestos Analysis of Bulk Material

Test		Color	Fibrous	Non-Fibrous	Asbestos
Sample ID	SC-059 041726144-0059	Description Homogeneity	PRESS ROOM - COMPOSITE BLACK MASTIC & VAPOR BARRIER Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black	3.7% Chrysotile 3.7% Total		
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-060 041726144-0060	Description Homogeneity	PRESS ROOM - COMPOSITE BLACK MASTIC & VAPOR BARRIER		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017		Positive Stop (Not Analyzed)		
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-061 041726144-0061	Description Homogeneity	PRESS ROOM - BLACK ELECTRICAL SWITCH Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black	4.2% Chrysotile 4.2% Total		
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-062 041726144-0062	Description Homogeneity	PRESS ROOM - BLACK ELECTRICAL SWITCH		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017		Positive Stop (Not Analyzed)		
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-063 041726144-0063	Description Homogeneity	PRESS ROOM - GRAY ELECTRICAL SWITCH Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Gray	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	Gray	None Detected		
Sample ID	SC-064 041726144-0064	Description Homogeneity	PRESS ROOM - GRAY ELECTRICAL SWITCH Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/8/2017	Gray	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	Gray	None Detected		

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Test Report:Asbestos Analysis of Bulk Material

Test		Color	Non Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID	SC-065	Description	PRESS ROOM - CLOTH IRON PAD		
	041726144-0065	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	Brown/Black	90.00% Synthetic	10.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-066	Description	PRESS ROOM - CLOTH IRON PAD		
	041726144-0066	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	Brown	90.00% Synthetic	10.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-067	Description	PRESS ROOM - BLACK IRON COVER HOUSING		
	041726144-0067	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black	14.8% Glass		Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	Black			None Detected
Sample ID	SC-068	Description	PRESS ROOM - BLACK IRON COVER HOUSING		
	041726144-0068	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/8/2017	Black	16.4% Glass		Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	Black			None Detected
Sample ID	SC-069	Description	CUSTOMER SERVICE - TAN PANELING ADHESIVE		
	041726144-0069	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Tan			Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	Tan			None Detected
Sample ID	SC-070	Description	SEWING ROOM - TAN PANELING ADHESIVE		
	041726144-0070	Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	9/8/2017	Tan			Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	Tan			None Detected

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Test Report:Asbestos Analysis of Bulk Material

		Non Asbestos			
Test		Color	Fibrous	Non-Fibrous	Asbestos
Sample ID	SC-071 041726144-0071	Description Homogeneity	GARAGE - NEWER CMU MORTAR Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	Gray	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-072 041726144-0072	Description Homogeneity	GARAGE - NEWER CMU MORTAR Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	Gray	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-073 041726144-0073	Description Homogeneity	BUILDING EXTERIOR - EXTERIOR PARGING Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	White	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-074 041726144-0074	Description Homogeneity	BUILDING EXTERIOR - EXTERIOR PARGING Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	White	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-075 041726144-0075	Description Homogeneity	BUILDING EXTERIOR - EXTERIOR PARGING Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	White	100.00% Non-fibrous (other)		None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-076 041726144-0076	Description Homogeneity	BUILDING EXTERIOR - EXTERIOR TOP COAT PLASTER Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	White/Green	98.30% Non-fibrous (other)		1.70% Chrysotile
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

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Test Report:Asbestos Analysis of Bulk Material

Test		Color	Fibrous	Non-Fibrous	Asbestos
Sample ID	SC-077 041726144-0077	Description Homogeneity	BUILDING EXTERIOR - EXTERIOR TOP COAT PLASTER		
PLM NYS 198.1 Friable	9/7/2017				Positive Stop (Not Analyzed)
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-078 041726144-0078	Description Homogeneity	BUILDING EXTERIOR - EXTERIOR TOP COAT PLASTER		
PLM NYS 198.1 Friable	9/7/2017				Positive Stop (Not Analyzed)
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-079 041726144-0079	Description Homogeneity	BUILDING EXTERIOR - EXTERIOR BASE COAT PLASTER		
PLM NYS 198.1 Friable	9/7/2017	Gray		100.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-080 041726144-0080	Description Homogeneity	BUILDING EXTERIOR - EXTERIOR BASE COAT PLASTER		
PLM NYS 198.1 Friable	9/7/2017	Gray		100.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-081 041726144-0081	Description Homogeneity	BUILDING EXTERIOR - EXTERIOR BASE COAT PLASTER		
PLM NYS 198.1 Friable	9/8/2017	Gray		100.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID	SC-082 041726144-0082	Description Homogeneity	BUILDING EXTERIOR - OLDER CMU MORTAR		
PLM NYS 198.1 Friable	9/7/2017	Gray		100.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

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Test Report:Asbestos Analysis of Bulk Material

		Non Asbestos			Asbestos
Test		Color	Fibrous	Non-Fibrous	
Sample ID	SC-083 041726144-0083	Description Homogeneity	PRESS ROOM - OLDER CMU MORTAR Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	Gray	100.00% Non-fibrous (other)		
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB					
TEM NYS 198.4 NOB					
Sample ID	SC-084 041726144-0084	Description Homogeneity	FRONT ENTRANCE AREA - BLACK WINDOW/DOOR FRAME CAULK Homogeneous		
PLM NYS 198.1 Friable					
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB	9/7/2017	Black	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	Black	None Detected		
Sample ID	SC-085 041726144-0085	Description Homogeneity	GARAGE ENTRANCE AREA - BLACK WINDOW/DOOR FRAME CAULK Homogeneous		
PLM NYS 198.1 Friable					
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB	9/8/2017	Black	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	Black	None Detected		
Sample ID	SC-086 041726144-0086	Description Homogeneity	EXTERIOR EAST - WHITE LOUVER CAULK Homogeneous		
PLM NYS 198.1 Friable					
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB	9/7/2017	White	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	White	None Detected		
Sample ID	SC-087 041726144-0087	Description Homogeneity	EXTERIOR EAST - WHITE LOUVER CAULK Homogeneous		
PLM NYS 198.1 Friable					
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB	9/8/2017	White	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	White	None Detected		
Sample ID	SC-088 041726144-0088	Description Homogeneity	RACK ROOM - SHEET GOODS ON TABLE TOP Homogeneous		
PLM NYS 198.1 Friable					
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB	9/7/2017	White	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017	White	None Detected		

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 CustomerPO: 00266426.0000
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Test Report:Asbestos Analysis of Bulk Material

		Non Asbestos		
Test		Color	Fibrous	Non-Fibrous
Sample ID		Description		Asbestos
SC-089 041726144-0089		RACK ROOM - SHEET GOODS ON TABLE TOP		
		Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/8/2017	White		Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	White		None Detected
Sample ID		Description		
SC-090 041726144-0090		RACK ROOM - TAN ADHESIVE FROM HA38		
		Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Tan		Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	Tan		None Detected
Sample ID		Description		
SC-091 041726144-0091		RACK ROOM - TAN ADHESIVE FROM HA38		
		Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/8/2017	Tan		Inconclusive: None Detected
TEM NYS 198.4 NOB	9/8/2017	Tan		None Detected
Sample ID		Description		
SC-092 041726144-0092		ROOF 1 MAIN FIELD - TOP LAYER SILVER COATED ROLLED ROOFING		
		Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black/Silver		Inconclusive : <1%Chrysotile Inconclusive - <1% Total
TEM NYS 198.4 NOB	9/8/2017	Black/Silver		None Detected
Sample ID		Description		
SC-093 041726144-0093		ROOF 2 MAIN FIELD - TOP LAYER SILVER COATED ROLLED ROOFING		
		Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/8/2017	Black/Silver		Inconclusive : <1%Chrysotile Inconclusive - <1% Total
TEM NYS 198.4 NOB	9/8/2017	Black/Silver		None Detected
Sample ID		Description		
SC-094 041726144-0094		ROOF 1 MAIN FIELD - BOTTOM LAYER REINFORCED FELTS AND MOPPING		
		Homogeneity	Homogeneous	
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black		9.6% Chrysotile 9.6% Total
TEM NYS 198.4 NOB				Not Analyzed

Initial Report From 09/11/2017 07:29:37

Test Report 198VCM-7.30.0 Printed: 9/11/2017 7:29:37 AM

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Test Report:Asbestos Analysis of Bulk Material

Test		Color	Fibrous	Non Asbestos		Asbestos
Sample ID	SC-095 041726144-0095	Description Homogeneity	ROOF 2 MAIN FIELD - BOTTOM LAYER REINFORCED FELTS AND MOPPING			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/7/2017		Positive Stop (Not Analyzed)			
TEM NYS 198.4 NOB						Not Analyzed
Sample ID	SC-096 041726144-0096	Description Homogeneity	ROOF 1 FLASHING - TOP LAYER SILVER COATED ROLLED ROOFING			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black/Silver	Inconclusive : <1%Chrysotile Inconclusive - <1% Total			
TEM NYS 198.4 NOB	9/8/2017	Black/Silver	<1% Chrysotile <1% Total			
Sample ID	SC-097 041726144-0097	Description Homogeneity	ROOF 2 FLASHING - TOP LAYER SILVER COATED ROLLED ROOFING			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/8/2017	Black/Silver	Inconclusive : <1%Chrysotile Inconclusive - <1% Total			
TEM NYS 198.4 NOB	9/8/2017	Black/Silver	None Detected			
Sample ID	SC-098 041726144-0098	Description Homogeneity	ROOF 1 FLASHING - BOTTOM LAYER FELTS AND MOPPING			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/7/2017	Black	1.2% Chrysotile 1.2% Total			
TEM NYS 198.4 NOB						Not Analyzed
Sample ID	SC-099 041726144-0099	Description Homogeneity	ROOF 2 FLASHING - BOTTOM LAYER FELTS AND MOPPING			
PLM NYS 198.1 Friable						Not Analyzed
PLM NYS 198.6 VCM						Not Analyzed
PLM NYS 198.6 NOB	9/7/2017		Positive Stop (Not Analyzed)			
TEM NYS 198.4 NOB						Not Analyzed

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Test Report:Asbestos Analysis of Bulk Material

Test		Non Asbestos			Asbestos
		Color	Fibrous	Non-Fibrous	
Sample ID	SC-100 041726144-0100	Description Homogeneity	ROOF 1 - REPAIR TAR Homogeneous		
PLM NYS 198.1 Friable					
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB	9/7/2017	Black	9.2% Chrysotile 9.2% Total		
TEM NYS 198.4 NOB					
Sample ID	SC-101 041726144-0101	Description Homogeneity	ROOF 2 - REPAIR TAR		
PLM NYS 198.1 Friable					
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB	9/7/2017	Positive Stop (Not Analyzed)			
TEM NYS 198.4 NOB					
Sample ID	SC-102 041726144-0102	Description Homogeneity	ROOF 1 - CLAY COPING MORTAR Homogeneous		
PLM NYS 198.1 Friable	9/7/2017	Gray	100.00% Non-fibrous (other)	None Detected	
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB					
TEM NYS 198.4 NOB					
Sample ID	SC-103 041726144-0103	Description Homogeneity	ROOF 1 - CLAY COPING MORTAR Homogeneous		
PLM NYS 198.1 Friable	9/8/2017	Gray	100.00% Non-fibrous (other)	None Detected	
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB					
TEM NYS 198.4 NOB					
Sample ID	SC-104 041726144-0104	Description Homogeneity	ROOF 3 - BOTTOM LAYER VAPOR BARRIOER Homogeneous		
PLM NYS 198.1 Friable					
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB	9/7/2017	Black	2.0% Glass	Inconclusive: None Detected	
TEM NYS 198.4 NOB	9/8/2017	Black	None Detected		
Sample ID	SC-105 041726144-0105	Description Homogeneity	ROOF 3 - BOTTOM LAYER VAPOR BARRIOER Homogeneous		
PLM NYS 198.1 Friable					
PLM NYS 198.6 VCM					
PLM NYS 198.6 NOB	9/8/2017	Black	<1% Glass	Inconclusive: None Detected	
TEM NYS 198.4 NOB					

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com>cinnaslab@EMSL.com

EMSL Order: 041726144
 CustomerID: ACAD78J
 CustomerPO: 00266426.0000
 ProjectID:

Test Report:Asbestos Analysis of Bulk Material

		Non Asbestos		
Test		Color	Fibrous Non-Fibrous	Asbestos
Sample ID SC-106 041726144-0106	Description Homogeneity	ROOF 3 - TAN ADHESIVE FROM RUBBER ROOFING SYSTEM Homogeneous		
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017 Tan	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017 Tan	None Detected		
Sample ID SC-107 041726144-0107	Description Homogeneity	ROOF 3 - TAN ADHESIVE FROM RUBBER ROOFING SYSTEM Homogeneous		
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/8/2017 Tan	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017 Tan	None Detected		
Sample ID SC-108 041726144-0108	Description Homogeneity	ROOF 3 - BLACK REPAIR/SEAM CAULK Homogeneous		
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017 Black	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017 Black	None Detected		
Sample ID SC-109 041726144-0109	Description Homogeneity	ROOF 3 - BLACK REPAIR/SEAM CAULK Homogeneous		
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/8/2017 Black	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017 Black	None Detected		
Sample ID SC-110 041726144-0110	Description Homogeneity	ROOF 3 - WHITE REPAIR CAULK Homogeneous		
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/7/2017 White	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017 White	None Detected		
Sample ID SC-111 041726144-0111	Description Homogeneity	ROOF 3 - WHITE REPAIR CAULK Homogeneous		
PLM NYS 198.1 Friable				Not Analyzed
PLM NYS 198.6 VCM				Not Analyzed
PLM NYS 198.6 NOB	9/8/2017 White	Inconclusive: None Detected		
TEM NYS 198.4 NOB	9/8/2017 White	None Detected		



EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077

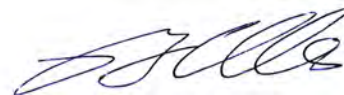
Phone/Fax: (800) 220-3675 / (856) 786-5974

<http://www.EMSL.com>

cinnasblab@EMSL.com

EMSL Order: 041726144
CustomerID: ACAD78J
CustomerPO: 00266426.0000
ProjectID:

Test Report: Asbestos Analysis of Bulk Material

Test	Non Asbestos			Asbestos
	Color	Fibrous	Non-Fibrous	
Analyst(s)				
Andrew Coward	Frank Dicrescenzo	Samantha Rundstorm-Cru		
Debbie Little	Matthew Hermann			
Essie Spencer	Nancy Stalter			
				 Benjamin Ellis, Laboratory Manager or other approved signatory

NOB = Non Friable Organically Bound N/A = Not Applicable VCM = Vermiculite Containing Material

-In New York State, TEM is currently the only method that can be used to determine if NOB materials can be considered or treated as non-asbestos containing.

All samples examined for the presence of vermiculite when analyzed via NYS 198.1.

-NYS Guidelines for Vermiculite containing samples are available at http://www.wadsworth.org/labcert/elapcert/forms/VermiculiteInterimGuidance_Rev070913.pdf

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL.

EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples were received in good condition unless otherwise noted.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. This report may contain data that is not covered by the NVLAP accreditation.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NYS ELAP 10872, PA ID# 68-00367



ASBESTOS CHAIN-OF-CUSTODY FORM

ARCADIS PROJECT NO.: 00266426.0000.00004

PROJECT NAME: FORMER SILVER CLEANERS

Page 1 of 7

041726144

all Results To:			Mail Invoice To:			
Name: <u>Joe Ashman</u>			Name: <u>Accounts Payable</u>			
Company: <u>ARCADIS U. S.</u>			Company: <u>ARCADIS U. S.</u>			
Street: <u>50 Fountain Plaza, Suite 600</u>			Street: <u>630 Plaza Drive, Suite 100</u>			
City, State Zip: <u>Buffalo, NY 14202</u>			City, State Zip: <u>Highlands Ranch, CO 80129</u>			
Phone #: <u>(607) 621-1112</u>			Email: <u>accountspayable.administration@arcadis-us.com</u>			
Fax #: _____						
Email PDF Reports to: <u>joe.ashman@arcadis.com;</u> <u>sandy.hathaway@arcadis.com</u>			Email EDD Reports to: <u>joe.ashman@arcadis.com</u>			
Site Address: Former Silver Cleaners 245 Andrews Street Rochester, New York			Sample Number Sequence: <u>SC-001 thru SC-111</u>			
Samples Collected By: <u>Joe Ashman</u>			Analysis Turnaround Time: <u>5 DAYS</u>			
Date(s) Collected: <u>08/28-29/2017</u>			Date Emailed Results Required: _____			
Sample Type: <u>BULK</u>			Date Typed Results Required: _____			
☐ Analyze All Samples ☒ Positive Stop ☒ Point count if $\leq 3\%$						
	Printed Name	Signature	Affiliation	Date & Time	# Samples	Task for Person Handling COC
Remitted	Joe Ashman		ARCADIS	8/30/17 FedEx	111	Analyze by NY Protocol
Received	L. Ramowski		EMSL	8/31/17 9:10	111	
Remitted						
Received						
					AUG 31 2017	
Comments: Please call the ARCADIS employee named above in the "Mail Result To:" line if the laboratory has <u>ANY</u> questions about the samples, sample analysis, or chain-of-custody.						

Lab: EMSL Analytical Inc., 200 Route 130 North, Cinnaminson, NJ 08077 1 800 220 3675

HA No.	Material Type	Sample ID	Sample Location	Friable	Notes
1	12"x12" Orange Mottled Floor Tile	SC-001	Lobby	N	
		SC-002	Lobby		
2	Yellow Mastic from HA-1	SC-003	Lobby	N	
		SC-004	Lobby		
3	12"x12" Tan Stone Print Floor Tile	SC-005	Lobby	N	
		SC-006	Lobby		
4	Black/Tan Mastic from HA-3	SC-007	Lobby	N	
		SC-008	Lobby		
5	9"x9" Black with White Streaks Floor Tile	SC-009	Rack Room	N	
		SC-010	Office		
6	9"x9" Brown with White Streaks Floor Tile	SC-011	Rack Room	N	
		SC-012	Office		
7	Black Mastic from HAs 5 & 6	SC-013	Rack Room	N	
		SC-014	Office		
8	Tan Mastic from Gray Carpet	SC-015	Lobby	N	
		SC-016	Customer Service		
9	1'x1' Adhered Ceiling Tile	SC-017	Rack Room	Y	
		SC-018	Office		
10	2'x4' Suspended Ceiling Tile	SC-019	Office	Y	
		SC-020	Sewing Room		

HA No.	Material Type	Sample ID	Sample Location	Friable	Notes
11	Top-Coat Plaster	SC-021	Office - Wall	Y	
		SC-022	Lobby - Wall		
		SC-023	Rack Room - Wall		
11	Top-Coat Plaster	SC-024	Rack Room - Wall	Y	
		SC-025	Lobby - Ceiling		
		SC-026	Press Room - Ceiling		
11	Top-Coat Plaster	SC-027	Press Room - Ceiling	Y	
12	Base-Coat Plaster	SC-028	Office - Wall	Y	
		SC-029	Lobby - Wall		
		SC-030	Rack Room - Wall		
12	Base-Coat Plaster	SC-031	Rack Room - Wall	Y	
		SC-032	Lobby - Ceiling		
		SC-033	Press Room - Ceiling		
12	Base-Coat Plaster	SC-034	Press Room - Ceiling	Y	
13	Gypsum Board	SC-035	Rack Room	Y	
		SC-036	Customer Service		
14	Joint Compound	SC-037	Rack Room	Y	
		SC-038	Customer Service		
15	Cloth Wire Insulation	SC-039	Basement	N	
		SC-040	Lobby Restroom		
16	Tan Adhesive from 4" Blue Cove Base	SC-041	Customer Service	N	
		SC-042	Customer Service		

HA No.	Material Type	Sample ID	Sample Location	Friable	Notes
17	9"x9" Red with White Streaks Floor Tile	SC-043	Sewing Room	N	
		SC-044	Sewing Room		
18	9"x9" White with Brown Specks Floor Tile	SC-045	Sewing Room	N	
		SC-046	Sewing Room		
19	Black Mastic from HAs 17 & 18	SC-047	Sewing Room	N	
		SC-048	Sewing Room		
20	12"x12" Yellow with Brown Splotches Floor Tile	SC-049	Press Room	N	
		SC-050	Sewing Room		
21	Black Mastic from HA-20	SC-051	Press Room	N	
		SC-052	Sewing Room		
22	White Floor Leveler	SC-053	Press Room	Y	
		SC-054	Sewing Room		
23	Brick Mortar	SC-055	Basement	Y	
		SC-056	Rack Room		
24	White Window Glazing	SC-057	Press Room	N	
		SC-058	Press Room		
25	Composite, Black Mastic & Vapor Barrier	SC-059	Press Room	N	Under 9"x9" Multi-Colored Rubber Floor Tiles
		SC-060	Press Room		
26	Black Electrical Switch	SC-061	Press Room	N	
		SC-062	Press Room		

HA No.	Material Type	Sample ID	Sample Location	Friable	Notes
27	Gray Electrical Switch	SC-063	Press Room	N	
		SC-064	Press Room		
28	Cloth Iron Pad	SC-065	Press Room	N	
		SC-066	Press Room		
29	Black Iron Cover (Housing)	SC-067	Press Room	N	
		SC-068	Press Room		
30	Tan Paneling Adhesive	SC-069	Customer Service	N	
		SC-070	Sewing Room		
31	Newer CMU Mortar	SC-071	Garage	Y	
		SC-072	Garage		
32	Exterior Parging	SC-073	Building Exterior	Y	
		SC-074	Building Exterior		
		SC-075	Building Exterior		
33	Exterior Top-Coat Plaster	SC-076	Building Exterior	Y	
		SC-077	Building Exterior		
		SC-078	Building Exterior		
34	Exterior Base-Coat Plaster	SC-079	Building Exterior	Y	
		SC-080	Building Exterior		
		SC-081	Building Exterior		
35	Older CMU Mortar	SC-082	Building Exterior	Y	
		SC-083	Press Room		
36	Black Window/Door Frame Caulk	SC-084	Front Entrance Area	N	
		SC-085	Garage Entrance Area		

HA No.	Material Type	Sample ID	Sample Location	Friable	Notes
37	White Louver Caulk	SC-086	Exterior East	N	
		SC-087	Exterior East		
38	Sheet Goods on Table-Top	SC-088	Rack Room	N	
		SC-089	Rack Room		
39	Tan Adhesive from HA-38	SC-090	Rack Room	N	
		SC-091	Rack Room		
40	Top Layer: Silver-Coated Rolled Roofing	SC-092	Roof 1 - Main Field	N	
		SC-093	Roof 2 - Main Field		
41	Bottom Layer: Reinforced Felts and Mopping	SC-094	Roof 1 - Main Field	N	
		SC-095	Roof 2 - Main Field		
42	Top Layer: Silver-Coated Rolled Roofing	SC-096	Roof 1 - Flashing	N	
		SC-097	Roof 2 - Flashing		
43	Bottom Layer: Felts and Mopping	SC-098	Roof 1 - Flashing	N	
		SC-099	Roof 2 - Flashing		
44	Repair Tar	SC-100	Roof 1	N	
		SC-101	Roof 2		
45	Clay Coping Mortar	SC-102	Roof 1	Y	
		SC-103	Roof 1		
46	Bottom Layer: Vapor Barrier	SC-104	Roof 3	N	
		SC-105	Roof 3		

HA No.	Material Type	Sample ID	Sample Location	Friable	Notes
47	Tan Adhesive from Rubber Roofing System	SC-106	Roof 3	N	
		SC-107	Roof 3		
48	Black Repair/Seam Caulk	SC-108	Roof 3	N	
		SC-109	Roof 3		
49	White Repair Caulk	SC-110	Roof 3	N	
		SC-111	Roof 3		

APPENDIX D

Photograph Logs





View of the Front of the Building



**HA-1: 12" x 12" Orange Mottled Floor Tile;
HA-2: Yellow Mastic from HA-1**



**HA-3: 12" x 12" Tan Stone Print Floor Tile;
HA-4: Black/Tan Mastic from HA-3;
HA-8: Tan Mastic from Gray carpet**



**HA-5: 9" x 9" Black with White Streaks
Floor Tile; HA-6: 9" x 9" Brown with White
Streaks Floor Tile; HA-7: Black Mastic
from HA-5 and HA-6**



HA-9: 1' x 1' Mechanically Adhered Ceiling Tile



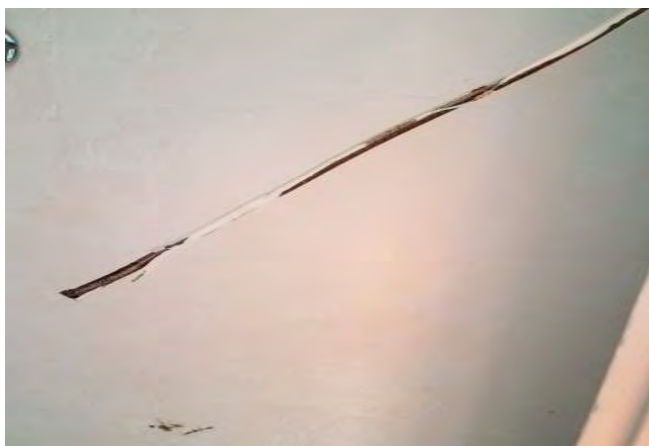
**HA-10: 2' x 4' Suspended Fissured
Ceiling Tile**



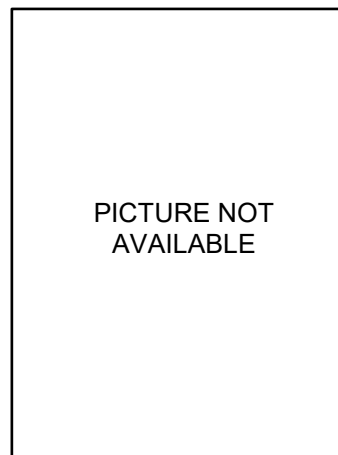
HA-11: Top Coat Plaster; HA-12: Base Coat Plaster



HA-13: Gypsum Board; HA-14: Joint Compound; HA-23: Brick Mortar



HA-15: Cloth Wire Insulation



HA-16: Tan Adhesive from 4" Blue Cove Base



**HA-17: 9" x 9" Red with White Streaks Floor Tile;
HA-18: 9" x 9" White with Brown Specks Floor Tile;
HA-19: Black Mastic from HA-17 and HA-18**



**HA-20: 12" x 12" Yellow with Brown Splotches
Floor Tile; HA-21: Black Mastic from HA-20;
HA-22: White Floor Leveler**



HA-24: White Window Glazing



HA-25: Composite: Black Mastic and Vapor Barrier



HA-26: Black Electrical Switch



HA-27: Gray Electrical Switch



**HA-28: Cloth Iron Pad;
HA-29: Black Iron Cover (Housing)**



HA-30: Tan Paneling Adhesive



HA-31: Newer Concrete Block Mortar



HA-32: Exterior Parge Coat



HA-33: Exterior Top-Coat Plaster;
HA-34: Exterior Base-Coat Plaster



HA-35: Older Concrete Block Mortar



HA-36: Black Window/Door Frame Caulk



HA-37: White Louver Caulk



HA-38: Sheet Goods on Table-Top; HA-39: Tan Adhesive from HA-38



HA-40: Top Layer: Silver-Coated Rolled Roofing (Main Field); HA-41: Bottom Layer: Reinforced Felts and Mopping (Main Field)



HA-42: Top Layer: Silver-Coated Rolled Roofing (Flashing); HA-43: Bottom Layer: Felts and Mopping (Flashing)



**HA-44: Repair Tar;
HA-45: Clay Coping Mortar**



HA-46: Bottom Layer: Vapor Barrier



HA-47: Tan Adhesive from Rubber Roofing System



HA-48: Black Repair/Seam Caulk



HA-49: White Repair Caulk

Arcadis of New York, Inc.

855 Route 146

Suite 210

Clifton Park, New York 12065

Tel 518.250.7300

Fax 518.371.2757

www.arcadis.com

APPENDIX B

Analytical Data Reports



September 14, 2017

Mark Flusche
Arcadis US, Inc. - Clifton Park-NY
855 Route 146, Suite 210
Clifton Park, NY 12065

Project Location: 245 Andrews St., Rochester, NY
Client Job Number:
Project Number: 00266426.0000
Laboratory Work Order Number: 17H1560

Enclosed are results of analyses for samples received by the laboratory on August 30, 2017. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Aaron L. Benoit", with a horizontal line extending to the right.

Aaron L. Benoit
Project Manager

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39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Arcadis US, Inc. - Clifton Park-NY
855 Route 146, Suite 210
Clifton Park, NY 12065
ATTN: Mark Flusche

REPORT DATE: 9/14/2017

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 00266426.0000

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 17H1560

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: 245 Andrews St., Rochester, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
SD-01	17H1560-01	Soil		SM 2540G	
				SW-846 1030	
				SW-846 6010C-D	
				SW-846 7470A	
				SW-846 8082A	
				SW-846 8260C	
				SW-846 8270D	
				SW-846 9014	
				SW-846 9030A	
				SW-846 9045C	
SD-02	17H1560-02	Soil		SM 2540G	
				SW-846 8082A	
				SW-846 8260C	
BW-01	17H1560-03	Product/Solid		SW-846 1030	
				SW-846 6010C-D	
				SW-846 7470A	
				SW-846 8082A	
				SW-846 8260C	
				SW-846 8270D	
				SW-846 9014	
				SW-846 9030A	
BW-02	17H1560-04	Product/Solid		SW-846 9045C	
				SW-846 1030	
				SW-846 6010C-D	
				SW-846 7470A	
				SW-846 8082A	
				SW-846 8260C	
				SW-846 8270D	
				SW-846 9014	
CS-01	17H1560-05	Product/Solid		SW-846 9030A	
				SW-846 9045C	
				SW-846 1030	
				SW-846 6010C-D	
				SW-846 7470A	
				SW-846 8082A	
				SW-846 8260C	
				SW-846 8270D	
				SW-846 9014	
				SW-846 9030A	
				SW-846 9045C	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Arcadis US, Inc. - Clifton Park-NY
855 Route 146, Suite 210
Clifton Park, NY 12065
ATTN: Mark Flusche

REPORT DATE: 9/14/2017

PURCHASE ORDER NUMBER:

PROJECT NUMBER: 00266426.0000

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 17H1560

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: 245 Andrews St., Rochester, NY

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
CS-02	17H1560-06	Product/Solid		SW-846 1030 SW-846 6010C-D SW-846 7470A SW-846 8082A SW-846 8260C SW-846 8270D SW-846 9014 SW-846 9030A SW-846 9045C	
CS-03	17H1560-07	Product/Solid		SW-846 1030 SW-846 6010C-D SW-846 7470A SW-846 8082A SW-846 8260C SW-846 8270D SW-846 9014 SW-846 9030A SW-846 9045C	
C-01	17H1560-08	Caulk		SW-846 8082A	
C-02	17H1560-09	Caulk		SW-846 8082A	
C-03	17H1560-10	Caulk		SW-846 8082A	
P-01	17H1560-11	Paint		SW-846 6010C Modified	
P-02	17H1560-12	Paint		SW-846 8082A	
P-03	17H1560-13	Paint		SW-846 8082A	
ACF-01	17H1560-14	Oil		EPA 600 4-81-045	
ACF-02	17H1560-15	Oil		EPA 600 4-81-045	
D-01	17H1560-17	Product/Solid		SW-846 8260C	
D-02	17H1560-18	Product/Solid		SW-846 8082A	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

EPA 600 4-81-045

Qualifications:**S-12**

Surrogate recovery is outside of control limits on confirmatory column, but within control limits on primary column. Data validation is not affected.

Analyte & Samples(s) Qualified:**Tetrachloro-m-xylene**

17H1560-14[ACF-01]

SW-846 6010C Modified

Qualifications:**L-10**

The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be bias on the high side.

Analyte & Samples(s) Qualified:**Lead**

17H1560-11[P-01], B185875-MRL1

SW-846 8260C

Qualifications:**B-07**

Data is not affected by elevated level in blank since sample result is >10x level found in the blank.

Analyte & Samples(s) Qualified:**Tetrachloroethylene**

17H1560-01[SD-01], 17H1560-03[BW-01], B185702-BLK1, B185874-BLK1

L-02

Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.

Analyte & Samples(s) Qualified:**2,2-Dichloropropane**

B185296-BS1, B185296-BSD1

L-04

Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.

Analyte & Samples(s) Qualified:**Chloromethane**

17H1560-17[D-01], B185296-BLK1, B185296-BS1, B185296-BSD1

L-07

Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.

Analyte & Samples(s) Qualified:**Chloroethane**

B185318-BS1

trans-1,2-Dichloroethylene

B185318-BS1

PR-15

According to the NY ELAP program, all voa results less than 0.2mg/Kg are estimated and biased low if not collected according to SW-846 5035-L/5035A-L.

Analyte & Samples(s) Qualified:

17H1560-02[SD-02], 17H1560-17[D-01]

V-20

Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

Analyte & Samples(s) Qualified:**1,1,1-Trichloroethane**

B185296-BS1, B185296-BSD1, S015259-CCV1

1,2-Dibromo-3-chloropropane (DB)

B185296-BS1, B185296-BSD1, S015259-CCV1

1,4-Dioxane

B185318-BS1, B185318-BSD1, S015260-CCV1

2,2-Dichloropropane

B185296-BS1, B185296-BSD1, S015259-CCV1

Carbon Tetrachloride

B185296-BS1, B185296-BSD1, B185873-BS1, B185873-BSD1, S015259-CCV1, S015368-CCV1

Chloromethane

B185296-BS1, B185296-BSD1, S015259-CCV1

Cyclohexane

B185318-BS1, B185318-BSD1, S015260-CCV1

Methyl Acetate

B185318-BS1, B185318-BSD1, S015260-CCV1

tert-Butyl Alcohol (TBA)

B185296-BS1, B185296-BSD1, S015259-CCV1

trans-1,2-Dichloroethylene

B185318-BS1, B185318-BSD1, S015260-CCV1

Trichlorofluoromethane (Freon 11)

B185318-BS1, B185318-BSD1, S015260-CCV1

SW-846 8270D**Qualifications:****MS-08**

Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.

Analyte & Samples(s) Qualified:**Pyridine**

17H1560-04RE1[BW-02], B185865-MS1

SW-846 9045C**Qualifications:****H-01**

Recommended sample holding time was exceeded, but analysis was performed before 2X the allowable holding time.

Analyte & Samples(s) Qualified:**pH**

17H1560-03[BW-01], 17H1560-04[BW-02], 17H1560-05[CS-01], 17H1560-06[CS-02], 17H1560-07[CS-03], B185238-DUP1

H-09

Sample received by laboratory with insufficient time remaining to perform analysis within the recommended holding time.

Analyte & Samples(s) Qualified:**pH**

17H1560-01[SD-01]

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

SW-846 6010C/D SW-846 6020A/B

For NC, Metals methods SW-846 6010D and SW-846 6020B are followed, and for all other states methods SW-846 6010C and SW-846 6020A are followed.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "Lisa Worthington", is written over a light gray rectangular background.

Lisa A. Worthington
Project Manager

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: SD-01

Sampled: 8/29/2017 09:15

Sample ID: 17H1560-01

Sample Matrix: Soil

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.024	0.014	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:02	TG
Aroclor-1221 [1]	ND	0.024	0.015	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:02	TG
Aroclor-1232 [1]	ND	0.024	0.011	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:02	TG
Aroclor-1242 [1]	ND	0.024	0.012	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:02	TG
Aroclor-1248 [1]	ND	0.024	0.014	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:02	TG
Aroclor-1254 [2]	0.13	0.024	0.015	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:02	TG
Aroclor-1260 [1]	ND	0.024	0.017	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:02	TG
Aroclor-1262 [1]	ND	0.024	0.012	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:02	TG
Aroclor-1268 [1]	ND	0.024	0.0095	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:02	TG
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	51.6		30-150				9/11/17 14:02			
Decachlorobiphenyl [2]	83.2		30-150				9/11/17 14:02			
Tetrachloro-m-xylene [1]	55.0		30-150				9/11/17 14:02			
Tetrachloro-m-xylene [2]	47.8		30-150				9/11/17 14:02			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: SD-01

Sampled: 8/29/2017 09:15

Sample ID: 17H1560-01

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Ignitability	Absent			present/absent	1		SW-846 1030	8/31/17	8/31/17 18:00	DJM
pH @23°C	8.5			pH Units	1	H-09	SW-846 9045C	8/30/17	8/30/17 12:47	DJM
Reactive Cyanide	ND	3.9	3.9	mg/Kg	1		SW-846 9014	9/5/17	9/6/17 22:35	DJM
Reactive Sulfide	ND	19	19	mg/Kg	1		SW-846 9030A	9/5/17	9/6/17 21:35	DJM
% Solids	84.0			% Wt	1		SM 2540G	8/31/17	8/31/17 11:59	MRL

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: SD-01

Sampled: 8/29/2017 09:15

Sample ID: 17H1560-01

Sample Matrix: Soil

TCLP - Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Benzene	ND	0.010	0.0012	mg/L	10		SW-846 8260C	9/8/17	9/8/17 13:18	LBD
2-Butanone (MEK)	ND	0.20	0.024	mg/L	10		SW-846 8260C	9/8/17	9/8/17 13:18	LBD
Carbon Tetrachloride	ND	0.050	0.0025	mg/L	10		SW-846 8260C	9/8/17	9/8/17 13:18	LBD
Chlorobenzene	ND	0.010	0.0016	mg/L	10		SW-846 8260C	9/8/17	9/8/17 13:18	LBD
Chloroform	ND	0.020	0.0022	mg/L	10		SW-846 8260C	9/8/17	9/8/17 13:18	LBD
1,4-Dichlorobenzene	ND	0.010	0.0015	mg/L	10		SW-846 8260C	9/8/17	9/8/17 13:18	LBD
1,2-Dichloroethane	ND	0.010	0.0019	mg/L	10		SW-846 8260C	9/8/17	9/8/17 13:18	LBD
1,1-Dichloroethylene	ND	0.010	0.0021	mg/L	10		SW-846 8260C	9/8/17	9/8/17 13:18	LBD
Tetrachloroethylene	0.046	0.010	0.0027	mg/L	10	B-07	SW-846 8260C	9/8/17	9/8/17 13:18	LBD
Trichloroethylene	ND	0.010	0.0020	mg/L	10		SW-846 8260C	9/8/17	9/8/17 13:18	LBD
Vinyl Chloride	ND	0.020	0.0013	mg/L	10		SW-846 8260C	9/8/17	9/8/17 13:18	LBD
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
1,2-Dichloroethane-d4	117		70-130				9/8/17 13:18			
Toluene-d8	101		70-130				9/8/17 13:18			
4-Bromofluorobenzene	98.7		70-130				9/8/17 13:18			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: SD-01

Sampled: 8/29/2017 09:15

Sample ID: 17H1560-01

Sample Matrix: Soil

TCLP - Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2,4-Dinitrotoluene	ND	0.050	0.026	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
Hexachlorobenzene	ND	0.050	0.023	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
Hexachlorobutadiene	ND	0.050	0.0092	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
Hexachloroethane	ND	0.050	0.0076	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
2-Methylphenol	ND	0.050	0.013	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
3/4-Methylphenol	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
Nitrobenzene	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
Pentachlorophenol	ND	0.050	0.017	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
Pyridine	ND	0.025	0.024	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
2,4,5-Trichlorophenol	ND	0.050	0.020	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
2,4,6-Trichlorophenol	ND	0.050	0.019	mg/L	1		SW-846 8270D	9/8/17	9/11/17 9:58	BGL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
2-Fluorophenol	65.7		15-110				9/11/17 9:58			
Phenol-d6	61.4		15-110				9/11/17 9:58			
Nitrobenzene-d5	88.8		30-130				9/11/17 9:58			
2-Fluorobiphenyl	84.0		30-130				9/11/17 9:58			
2,4,6-Tribromophenol	105		15-110				9/11/17 9:58			
p-Terphenyl-d14	108		30-130				9/11/17 9:58			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: SD-01

Sampled: 8/29/2017 09:15

Sample ID: 17H1560-01

Sample Matrix: Soil

TCLP - Metals Analyses

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	ND	0.010	0.0080	mg/L	1		SW-846 6010C-D	9/1/17	9/5/17 16:49	QNW
Mercury	0.000049	0.00010	0.000034	mg/L	1	J	SW-846 7470A	9/1/17	9/6/17 9:46	TJK
Barium	0.29	0.050	0.0053	mg/L	1		SW-846 6010C-D	9/1/17	9/5/17 16:49	QNW
Cadmium	0.010	0.0040	0.00090	mg/L	1		SW-846 6010C-D	9/1/17	9/5/17 16:49	QNW
Chromium	ND	0.010	0.0061	mg/L	1		SW-846 6010C-D	9/1/17	9/5/17 16:49	QNW
Lead	ND	0.010	0.0044	mg/L	1		SW-846 6010C-D	9/1/17	9/5/17 16:49	QNW
Selenium	ND	0.050	0.034	mg/L	1		SW-846 6010C-D	9/1/17	9/5/17 16:49	QNW
Silver	ND	0.0050	0.0049	mg/L	1		SW-846 6010C-D	9/1/17	9/5/17 16:49	QNW

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: SD-02

Sampled: 8/29/2017 09:40

Sample ID: 17H1560-02

Sample Matrix: Soil

Sample Flags: PR-15

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	0.084	0.28	0.065	mg/Kg dry	1	J	SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Benzene	ND	0.0055	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Bromochloromethane	ND	0.0055	0.0039	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Bromodichloromethane	ND	0.0055	0.0017	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Bromoform	ND	0.0055	0.0039	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Bromomethane	ND	0.028	0.012	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
2-Butanone (MEK)	ND	0.11	0.049	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Carbon Disulfide	ND	0.017	0.012	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Carbon Tetrachloride	ND	0.0055	0.0022	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Chlorobenzene	ND	0.0055	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Chlorodibromomethane	ND	0.0028	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Chloroethane	ND	0.055	0.0042	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Chloroform	ND	0.011	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Chloromethane	ND	0.028	0.018	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Cyclohexane	ND	0.0055	0.0022	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0055	0.0031	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,2-Dibromoethane (EDB)	ND	0.0028	0.0028	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,2-Dichlorobenzene	ND	0.0055	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,3-Dichlorobenzene	ND	0.0055	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,4-Dichlorobenzene	ND	0.0055	0.0022	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Dichlorodifluoromethane (Freon 12)	ND	0.055	0.0036	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,1-Dichloroethane	ND	0.0055	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,2-Dichloroethane	ND	0.0055	0.0036	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,1-Dichloroethylene	ND	0.011	0.0031	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
cis-1,2-Dichloroethylene	ND	0.0055	0.0022	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
trans-1,2-Dichloroethylene	ND	0.0055	0.0025	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,2-Dichloropropane	ND	0.0055	0.0036	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
cis-1,3-Dichloropropene	ND	0.0028	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
trans-1,3-Dichloropropene	ND	0.0028	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,4-Dioxane	ND	0.28	0.16	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Ethylbenzene	ND	0.0055	0.0022	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
2-Hexanone (MBK)	ND	0.055	0.030	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Isopropylbenzene (Cumene)	ND	0.0055	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Methyl Acetate	ND	0.0055	0.0044	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Methyl tert-Butyl Ether (MTBE)	ND	0.011	0.0025	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Methyl Cyclohexane	ND	0.0055	0.0028	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Methylene Chloride	ND	0.055	0.020	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
4-Methyl-2-pentanone (MIBK)	ND	0.055	0.021	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Styrene	ND	0.0055	0.0017	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,1,2,2-Tetrachloroethane	ND	0.011	0.0025	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Tetrachloroethylene	0.013	0.0055	0.0036	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Toluene	ND	0.0055	0.0022	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,2,3-Trichlorobenzene	ND	0.0055	0.0017	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,2,4-Trichlorobenzene	ND	0.0055	0.0022	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: SD-02

Sampled: 8/29/2017 09:40

Sample ID: 17H1560-02

Sample Matrix: Soil

Sample Flags: PR-15

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
1,1,1-Trichloroethane	ND	0.0055	0.0028	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,1,2-Trichloroethane	ND	0.0055	0.0033	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Trichloroethylene	ND	0.0055	0.0028	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Trichlorofluoromethane (Freon 11)	ND	0.028	0.0031	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.028	0.0025	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Vinyl Chloride	ND	0.028	0.0031	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
m+p Xylene	ND	0.011	0.0047	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
o-Xylene	ND	0.0055	0.0019	mg/Kg dry	1		SW-846 8260C	8/31/17	8/31/17 7:35	MFF
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
1,2-Dichloroethane-d4	106		70-130				8/31/17 7:35			
Toluene-d8	104		70-130				8/31/17 7:35			
4-Bromofluorobenzene	102		70-130				8/31/17 7:35			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: SD-02

Sampled: 8/29/2017 09:40

Sample ID: 17H1560-02

Sample Matrix: Soil

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.036	0.022	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:19	TG
Aroclor-1221 [1]	ND	0.036	0.024	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:19	TG
Aroclor-1232 [1]	ND	0.036	0.016	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:19	TG
Aroclor-1242 [1]	ND	0.036	0.018	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:19	TG
Aroclor-1248 [1]	ND	0.036	0.022	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:19	TG
Aroclor-1254 [2]	0.37	0.036	0.024	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:19	TG
Aroclor-1260 [1]	0.066	0.036	0.025	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:19	TG
Aroclor-1262 [1]	ND	0.036	0.018	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:19	TG
Aroclor-1268 [1]	ND	0.036	0.014	mg/Kg dry	1		SW-846 8082A	9/7/17	9/11/17 14:19	TG
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	59.1		30-150				9/11/17 14:19			
Decachlorobiphenyl [2]	79.4		30-150				9/11/17 14:19			
Tetrachloro-m-xylene [1]	63.5		30-150				9/11/17 14:19			
Tetrachloro-m-xylene [2]	58.5		30-150				9/11/17 14:19			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: SD-02

Sampled: 8/29/2017 09:40

Sample ID: 17H1560-02

Sample Matrix: Soil

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
% Solids	55.3			% Wt	1		SM 2540G	8/31/17	8/31/17 11:59	MRL

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: BW-01

Sampled: 8/29/2017 11:00

Sample ID: 17H1560-03

Sample Matrix: Product/Solid

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.098	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:32	TG
Aroclor-1221 [1]	ND	0.098	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:32	TG
Aroclor-1232 [1]	ND	0.098	0.0088	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:32	TG
Aroclor-1242 [1]	ND	0.098	0.0098	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:32	TG
Aroclor-1248 [1]	ND	0.098	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:32	TG
Aroclor-1254 [1]	ND	0.098	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:32	TG
Aroclor-1260 [1]	ND	0.098	0.014	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:32	TG
Aroclor-1262 [1]	ND	0.098	0.0098	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:32	TG
Aroclor-1268 [1]	ND	0.098	0.0078	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:32	TG
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	98.7		30-150							
Decachlorobiphenyl [2]	94.9		30-150							
Tetrachloro-m-xylene [1]	86.3		30-150							
Tetrachloro-m-xylene [2]	87.5		30-150							

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: BW-01

Sampled: 8/29/2017 11:00

Sample ID: 17H1560-03

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Ignitability	Absent			present/absent	1		SW-846 1030	8/31/17	8/31/17 18:00	DJM
pH @23.5°C	8.6			pH Units	1	H-01	SW-846 9045C	8/30/17	8/30/17 12:47	DJM
Reactive Cyanide	ND	3.9	3.9	mg/Kg	1		SW-846 9014	9/6/17	9/8/17 20:40	DJM
Reactive Sulfide	ND	20	20	mg/Kg	1		SW-846 9030A	9/6/17	9/8/17 17:05	DJM

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: BW-01

Sampled: 8/29/2017 11:00

Sample ID: 17H1560-03

Sample Matrix: Product/Solid

TCLP - Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Benzene	ND	0.010	0.0012	mg/L	10		SW-846 8260C	9/7/17	9/8/17 13:49	LBD
2-Butanone (MEK)	ND	0.20	0.024	mg/L	10		SW-846 8260C	9/7/17	9/8/17 13:49	LBD
Carbon Tetrachloride	ND	0.050	0.0025	mg/L	10		SW-846 8260C	9/7/17	9/8/17 13:49	LBD
Chlorobenzene	ND	0.010	0.0016	mg/L	10		SW-846 8260C	9/7/17	9/8/17 13:49	LBD
Chloroform	ND	0.020	0.0022	mg/L	10		SW-846 8260C	9/7/17	9/8/17 13:49	LBD
1,4-Dichlorobenzene	ND	0.010	0.0015	mg/L	10		SW-846 8260C	9/7/17	9/8/17 13:49	LBD
1,2-Dichloroethane	ND	0.010	0.0019	mg/L	10		SW-846 8260C	9/7/17	9/8/17 13:49	LBD
1,1-Dichloroethylene	ND	0.010	0.0021	mg/L	10		SW-846 8260C	9/7/17	9/8/17 13:49	LBD
Tetrachloroethylene	0.030	0.010	0.0027	mg/L	10	B-07	SW-846 8260C	9/7/17	9/8/17 13:49	LBD
Trichloroethylene	ND	0.010	0.0020	mg/L	10		SW-846 8260C	9/7/17	9/8/17 13:49	LBD
Vinyl Chloride	ND	0.020	0.0013	mg/L	10		SW-846 8260C	9/7/17	9/8/17 13:49	LBD
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
1,2-Dichloroethane-d4	119		70-130				9/8/17 13:49			
Toluene-d8	103		70-130				9/8/17 13:49			
4-Bromofluorobenzene	100		70-130				9/8/17 13:49			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: BW-01

Sampled: 8/29/2017 11:00

Sample ID: 17H1560-03

Sample Matrix: Product/Solid

TCLP - Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2,4-Dinitrotoluene	ND	0.050	0.026	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
Hexachlorobenzene	ND	0.050	0.023	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
Hexachlorobutadiene	ND	0.050	0.0092	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
Hexachloroethane	ND	0.050	0.0076	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
2-Methylphenol	ND	0.050	0.013	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
3/4-Methylphenol	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
Nitrobenzene	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
Pentachlorophenol	ND	0.050	0.017	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
Pyridine	ND	0.025	0.024	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
2,4,5-Trichlorophenol	ND	0.050	0.020	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
2,4,6-Trichlorophenol	ND	0.050	0.019	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:03	BGL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
2-Fluorophenol	56.5		15-110				9/11/17 11:03			
Phenol-d6	51.2		15-110				9/11/17 11:03			
Nitrobenzene-d5	75.3		30-130				9/11/17 11:03			
2-Fluorobiphenyl	67.6		30-130				9/11/17 11:03			
2,4,6-Tribromophenol	84.0		15-110				9/11/17 11:03			
p-Terphenyl-d14	91.1		30-130				9/11/17 11:03			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: BW-01

Sampled: 8/29/2017 11:00

Sample ID: 17H1560-03

Sample Matrix: Product/Solid

TCLP - Metals Analyses

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	ND	0.010	0.0080	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 15:55	QNW
Mercury	ND	0.00010	0.000034	mg/L	1		SW-846 7470A	9/7/17	9/11/17 10:31	TJK
Barium	0.40	0.050	0.0053	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 15:55	QNW
Cadmium	0.0019	0.0040	0.00090	mg/L	1	J	SW-846 6010C-D	9/6/17	9/7/17 15:55	QNW
Chromium	ND	0.010	0.0061	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 15:55	QNW
Lead	ND	0.010	0.0044	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 15:55	QNW
Selenium	ND	0.050	0.034	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 15:55	QNW
Silver	ND	0.0050	0.0049	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 15:55	QNW

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: BW-02

Sampled: 8/29/2017 11:50

Sample ID: 17H1560-04

Sample Matrix: Product/Solid

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:44	TG
Aroclor-1221 [1]	ND	0.10	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:44	TG
Aroclor-1232 [1]	ND	0.10	0.0090	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:44	TG
Aroclor-1242 [1]	ND	0.10	0.010	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:44	TG
Aroclor-1248 [1]	ND	0.10	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:44	TG
Aroclor-1254 [1]	ND	0.10	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:44	TG
Aroclor-1260 [1]	ND	0.10	0.014	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:44	TG
Aroclor-1262 [1]	ND	0.10	0.010	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:44	TG
Aroclor-1268 [1]	ND	0.10	0.0080	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:44	TG
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	93.5		30-150							
Decachlorobiphenyl [2]	89.4		30-150							
Tetrachloro-m-xylene [1]	84.0		30-150							
Tetrachloro-m-xylene [2]	85.8		30-150							

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: BW-02

Sampled: 8/29/2017 11:50

Sample ID: 17H1560-04

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Ignitability	Absent			present/absent	1		SW-846 1030	8/31/17	8/31/17 18:00	DJM
pH @23.4°C	8.6			pH Units	1	H-01	SW-846 9045C	8/30/17	8/30/17 12:47	DJM
Reactive Cyanide	ND	4.0	4.0	mg/Kg	1		SW-846 9014	9/6/17	9/8/17 20:40	DJM
Reactive Sulfide	ND	20	20	mg/Kg	1		SW-846 9030A	9/6/17	9/8/17 17:05	DJM

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: BW-02

Sampled: 8/29/2017 11:50

Sample ID: 17H1560-04

Sample Matrix: Product/Solid

TCLP - Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Benzene	ND	0.010	0.0012	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
2-Butanone (MEK)	ND	0.20	0.024	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
Carbon Tetrachloride	ND	0.050	0.0025	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
Chlorobenzene	ND	0.010	0.0016	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
Chloroform	ND	0.020	0.0022	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
1,4-Dichlorobenzene	ND	0.010	0.0015	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
1,2-Dichloroethane	ND	0.010	0.0019	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
1,1-Dichloroethylene	ND	0.010	0.0021	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
Tetrachloroethylene	ND	0.010	0.0027	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
Trichloroethylene	ND	0.010	0.0020	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
Vinyl Chloride	ND	0.020	0.0013	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:19	LBD
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
1,2-Dichloroethane-d4	121		70-130				9/8/17 14:19			
Toluene-d8	109		70-130				9/8/17 14:19			
4-Bromofluorobenzene	96.1		70-130				9/8/17 14:19			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: BW-02

Sampled: 8/29/2017 11:50

Sample ID: 17H1560-04

Sample Matrix: Product/Solid

TCLP - Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2,4-Dinitrotoluene	ND	0.050	0.026	mg/L	1		SW-846 8270D	9/9/17	9/11/17 13:57	BGL
Hexachlorobenzene	ND	0.050	0.023	mg/L	1		SW-846 8270D	9/9/17	9/11/17 13:57	BGL
Hexachlorobutadiene	ND	0.050	0.0092	mg/L	1		SW-846 8270D	9/9/17	9/11/17 13:57	BGL
Hexachloroethane	ND	0.050	0.0076	mg/L	1		SW-846 8270D	9/9/17	9/11/17 13:57	BGL
2-Methylphenol	ND	0.050	0.013	mg/L	1		SW-846 8270D	9/9/17	9/11/17 13:57	BGL
3/4-Methylphenol	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/9/17	9/11/17 13:57	BGL
Nitrobenzene	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/9/17	9/11/17 13:57	BGL
Pentachlorophenol	ND	0.050	0.017	mg/L	1		SW-846 8270D	9/9/17	9/11/17 13:57	BGL
Pyridine	ND	0.025	0.024	mg/L	1	MS-08	SW-846 8270D	9/9/17	9/11/17 13:57	BGL
2,4,5-Trichlorophenol	ND	0.050	0.020	mg/L	1		SW-846 8270D	9/9/17	9/11/17 13:57	BGL
2,4,6-Trichlorophenol	ND	0.050	0.019	mg/L	1		SW-846 8270D	9/9/17	9/11/17 13:57	BGL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
2-Fluorophenol	67.1		15-110				9/11/17 13:57			
Phenol-d6	65.1		15-110				9/11/17 13:57			
Nitrobenzene-d5	87.9		30-130				9/11/17 13:57			
2-Fluorobiphenyl	84.8		30-130				9/11/17 13:57			
2,4,6-Tribromophenol	105		15-110				9/11/17 13:57			
p-Terphenyl-d14	105		30-130				9/11/17 13:57			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: BW-02

Sampled: 8/29/2017 11:50

Sample ID: 17H1560-04

Sample Matrix: Product/Solid

TCLP - Metals Analyses

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	ND	0.010	0.0080	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:18	QNW
Mercury	ND	0.00010	0.000034	mg/L	1		SW-846 7470A	9/7/17	9/11/17 10:33	TJK
Barium	0.15	0.050	0.0053	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:18	QNW
Cadmium	0.0013	0.0040	0.00090	mg/L	1	J	SW-846 6010C-D	9/6/17	9/7/17 16:18	QNW
Chromium	ND	0.010	0.0061	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:18	QNW
Lead	ND	0.010	0.0044	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:18	QNW
Selenium	ND	0.050	0.034	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:18	QNW
Silver	ND	0.0050	0.0049	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:18	QNW

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-01

Sampled: 8/29/2017 10:20

Sample ID: 17H1560-05

Sample Matrix: Product/Solid

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.098	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:57	TG
Aroclor-1221 [1]	ND	0.098	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:57	TG
Aroclor-1232 [1]	ND	0.098	0.0088	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:57	TG
Aroclor-1242 [1]	ND	0.098	0.0098	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:57	TG
Aroclor-1248 [1]	ND	0.098	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:57	TG
Aroclor-1254 [1]	ND	0.098	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:57	TG
Aroclor-1260 [1]	ND	0.098	0.014	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:57	TG
Aroclor-1262 [1]	ND	0.098	0.0098	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:57	TG
Aroclor-1268 [1]	ND	0.098	0.0078	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 20:57	TG
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	78.7		30-150							
Decachlorobiphenyl [2]	75.8		30-150							
Tetrachloro-m-xylene [1]	72.1		30-150							
Tetrachloro-m-xylene [2]	73.1		30-150							

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-01

Sampled: 8/29/2017 10:20

Sample ID: 17H1560-05

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Ignitability	Absent			present/absent	1		SW-846 1030	8/31/17	8/31/17 18:00	DJM
pH @23.6°C	12			pH Units	1	H-01	SW-846 9045C	8/30/17	8/30/17 12:47	DJM
Reactive Cyanide	ND	3.9	3.9	mg/Kg	1		SW-846 9014	9/6/17	9/8/17 20:40	DJM
Reactive Sulfide	ND	20	20	mg/Kg	1		SW-846 9030A	9/6/17	9/8/17 17:05	DJM

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-01

Sampled: 8/29/2017 10:20

Sample ID: 17H1560-05

Sample Matrix: Product/Solid

TCLP - Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Benzene	ND	0.010	0.0012	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
2-Butanone (MEK)	ND	0.20	0.024	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
Carbon Tetrachloride	ND	0.050	0.0025	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
Chlorobenzene	ND	0.010	0.0016	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
Chloroform	ND	0.020	0.0022	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
1,4-Dichlorobenzene	ND	0.010	0.0015	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
1,2-Dichloroethane	ND	0.010	0.0019	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
1,1-Dichloroethylene	ND	0.010	0.0021	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
Tetrachloroethylene	ND	0.010	0.0027	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
Trichloroethylene	ND	0.010	0.0020	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
Vinyl Chloride	ND	0.020	0.0013	mg/L	10		SW-846 8260C	9/7/17	9/8/17 14:50	LBD
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
1,2-Dichloroethane-d4	118		70-130				9/8/17 14:50			
Toluene-d8	105		70-130				9/8/17 14:50			
4-Bromofluorobenzene	98.6		70-130				9/8/17 14:50			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-01

Sampled: 8/29/2017 10:20

Sample ID: 17H1560-05

Sample Matrix: Product/Solid

TCLP - Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2,4-Dinitrotoluene	ND	0.050	0.026	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
Hexachlorobenzene	ND	0.050	0.023	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
Hexachlorobutadiene	ND	0.050	0.0092	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
Hexachloroethane	ND	0.050	0.0076	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
2-Methylphenol	ND	0.050	0.013	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
3/4-Methylphenol	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
Nitrobenzene	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
Pentachlorophenol	ND	0.050	0.017	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
Pyridine	ND	0.025	0.024	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
2,4,5-Trichlorophenol	ND	0.050	0.020	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
2,4,6-Trichlorophenol	ND	0.050	0.019	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:24	BGL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
2-Fluorophenol	58.7		15-110				9/11/17 11:24			
Phenol-d6	50.7		15-110				9/11/17 11:24			
Nitrobenzene-d5	77.0		30-130				9/11/17 11:24			
2-Fluorobiphenyl	75.9		30-130				9/11/17 11:24			
2,4,6-Tribromophenol	93.3		15-110				9/11/17 11:24			
p-Terphenyl-d14	97.1		30-130				9/11/17 11:24			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-01

Sampled: 8/29/2017 10:20

Sample ID: 17H1560-05

Sample Matrix: Product/Solid

TCLP - Metals Analyses

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	ND	0.010	0.0080	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:23	QNW
Mercury	ND	0.00010	0.000034	mg/L	1		SW-846 7470A	9/7/17	9/11/17 10:34	TJK
Barium	0.29	0.050	0.0053	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:23	QNW
Cadmium	0.0013	0.0040	0.00090	mg/L	1	J	SW-846 6010C-D	9/6/17	9/7/17 16:23	QNW
Chromium	3.2	0.010	0.0061	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:23	QNW
Lead	ND	0.010	0.0044	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:23	QNW
Selenium	ND	0.050	0.034	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:23	QNW
Silver	ND	0.0050	0.0049	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:23	QNW

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-02

Sampled: 8/29/2017 10:40

Sample ID: 17H1560-06

Sample Matrix: Product/Solid

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.098	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:09	TG
Aroclor-1221 [1]	ND	0.098	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:09	TG
Aroclor-1232 [1]	ND	0.098	0.0088	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:09	TG
Aroclor-1242 [1]	ND	0.098	0.0098	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:09	TG
Aroclor-1248 [1]	ND	0.098	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:09	TG
Aroclor-1254 [1]	ND	0.098	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:09	TG
Aroclor-1260 [1]	ND	0.098	0.014	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:09	TG
Aroclor-1262 [1]	ND	0.098	0.0098	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:09	TG
Aroclor-1268 [1]	ND	0.098	0.0078	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:09	TG
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	56.9		30-150							
Decachlorobiphenyl [2]	57.2		30-150							
Tetrachloro-m-xylene [1]	61.9		30-150							
Tetrachloro-m-xylene [2]	63.4		30-150							

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-02

Sampled: 8/29/2017 10:40

Sample ID: 17H1560-06

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Ignitability	Absent			present/absent	1		SW-846 1030	8/31/17	8/31/17 18:00	DJM
pH @24.1°C	12			pH Units	1	H-01	SW-846 9045C	8/30/17	8/30/17 12:47	DJM
Reactive Cyanide	ND	4.0	4.0	mg/Kg	1		SW-846 9014	9/6/17	9/8/17 20:40	DJM
Reactive Sulfide	ND	20	20	mg/Kg	1		SW-846 9030A	9/6/17	9/8/17 17:05	DJM

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-02

Sampled: 8/29/2017 10:40

Sample ID: 17H1560-06

Sample Matrix: Product/Solid

TCLP - Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Benzene	ND	0.010	0.0012	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
2-Butanone (MEK)	ND	0.20	0.024	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
Carbon Tetrachloride	ND	0.050	0.0025	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
Chlorobenzene	ND	0.010	0.0016	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
Chloroform	ND	0.020	0.0022	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
1,4-Dichlorobenzene	ND	0.010	0.0015	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
1,2-Dichloroethane	ND	0.010	0.0019	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
1,1-Dichloroethylene	ND	0.010	0.0021	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
Tetrachloroethylene	0.013	0.010	0.0027	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
Trichloroethylene	ND	0.010	0.0020	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
Vinyl Chloride	ND	0.020	0.0013	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:27	MFF
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
1,2-Dichloroethane-d4	117		70-130				9/11/17 12:27			
Toluene-d8	104		70-130				9/11/17 12:27			
4-Bromofluorobenzene	102		70-130				9/11/17 12:27			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-02

Sampled: 8/29/2017 10:40

Sample ID: 17H1560-06

Sample Matrix: Product/Solid

TCLP - Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2,4-Dinitrotoluene	ND	0.050	0.026	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
Hexachlorobenzene	ND	0.050	0.023	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
Hexachlorobutadiene	ND	0.050	0.0092	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
Hexachloroethane	ND	0.050	0.0076	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
2-Methylphenol	ND	0.050	0.013	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
3/4-Methylphenol	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
Nitrobenzene	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
Pentachlorophenol	ND	0.050	0.017	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
Pyridine	ND	0.025	0.024	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
2,4,5-Trichlorophenol	ND	0.050	0.020	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
2,4,6-Trichlorophenol	ND	0.050	0.019	mg/L	1		SW-846 8270D	9/8/17	9/11/17 11:46	BGL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
2-Fluorophenol	60.0		15-110				9/11/17 11:46			
Phenol-d6	55.0		15-110				9/11/17 11:46			
Nitrobenzene-d5	82.4		30-130				9/11/17 11:46			
2-Fluorobiphenyl	71.3		30-130				9/11/17 11:46			
2,4,6-Tribromophenol	88.7		15-110				9/11/17 11:46			
p-Terphenyl-d14	95.8		30-130				9/11/17 11:46			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-02

Sampled: 8/29/2017 10:40

Sample ID: 17H1560-06

Sample Matrix: Product/Solid

TCLP - Metals Analyses

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	ND	0.010	0.0080	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:28	QNW
Mercury	0.000035	0.00010	0.000034	mg/L	1	J	SW-846 7470A	9/7/17	9/11/17 10:40	TJK
Barium	0.14	0.050	0.0053	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:28	QNW
Cadmium	0.0020	0.0040	0.00090	mg/L	1	J	SW-846 6010C-D	9/6/17	9/7/17 16:28	QNW
Chromium	0.012	0.010	0.0061	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:28	QNW
Lead	ND	0.010	0.0044	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:28	QNW
Selenium	ND	0.050	0.034	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:28	QNW
Silver	ND	0.0050	0.0049	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:28	QNW

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-03

Sampled: 8/29/2017 11:30

Sample ID: 17H1560-07

Sample Matrix: Product/Solid

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.097	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:22	TG
Aroclor-1221 [1]	ND	0.097	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:22	TG
Aroclor-1232 [1]	ND	0.097	0.0087	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:22	TG
Aroclor-1242 [1]	ND	0.097	0.0097	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:22	TG
Aroclor-1248 [1]	ND	0.097	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:22	TG
Aroclor-1254 [1]	ND	0.097	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:22	TG
Aroclor-1260 [1]	ND	0.097	0.014	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:22	TG
Aroclor-1262 [1]	ND	0.097	0.0097	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:22	TG
Aroclor-1268 [1]	ND	0.097	0.0078	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:22	TG
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	43.5		30-150							
Decachlorobiphenyl [2]	44.8		30-150							
Tetrachloro-m-xylene [1]	51.0		30-150							
Tetrachloro-m-xylene [2]	53.5		30-150							

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-03

Sampled: 8/29/2017 11:30

Sample ID: 17H1560-07

Sample Matrix: Product/Solid

Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total)

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Ignitability	Absent			present/absent	1		SW-846 1030	8/31/17	8/31/17 18:00	DJM
pH @23.3°C	12			pH Units	1	H-01	SW-846 9045C	8/30/17	8/30/17 12:47	DJM
Reactive Cyanide	ND	3.9	3.9	mg/Kg	1		SW-846 9014	9/6/17	9/8/17 20:40	DJM
Reactive Sulfide	ND	20	20	mg/Kg	1		SW-846 9030A	9/6/17	9/8/17 17:05	DJM

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-03

Sampled: 8/29/2017 11:30

Sample ID: 17H1560-07

Sample Matrix: Product/Solid

TCLP - Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Benzene	ND	0.010	0.0012	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
2-Butanone (MEK)	ND	0.20	0.024	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
Carbon Tetrachloride	ND	0.050	0.0025	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
Chlorobenzene	ND	0.010	0.0016	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
Chloroform	ND	0.020	0.0022	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
1,4-Dichlorobenzene	ND	0.010	0.0015	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
1,2-Dichloroethane	ND	0.010	0.0019	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
1,1-Dichloroethylene	ND	0.010	0.0021	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
Tetrachloroethylene	ND	0.010	0.0027	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
Trichloroethylene	ND	0.010	0.0020	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
Vinyl Chloride	ND	0.020	0.0013	mg/L	10		SW-846 8260C	9/11/17	9/11/17 12:58	MFF
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
1,2-Dichloroethane-d4	115		70-130				9/11/17 12:58			
Toluene-d8	104		70-130				9/11/17 12:58			
4-Bromofluorobenzene	102		70-130				9/11/17 12:58			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-03

Sampled: 8/29/2017 11:30

Sample ID: 17H1560-07

Sample Matrix: Product/Solid

TCLP - Semivolatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
2,4-Dinitrotoluene	ND	0.050	0.026	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
Hexachlorobenzene	ND	0.050	0.023	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
Hexachlorobutadiene	ND	0.050	0.0092	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
Hexachloroethane	ND	0.050	0.0076	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
2-Methylphenol	ND	0.050	0.013	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
3/4-Methylphenol	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
Nitrobenzene	ND	0.050	0.021	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
Pentachlorophenol	ND	0.050	0.017	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
Pyridine	ND	0.025	0.024	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
2,4,5-Trichlorophenol	ND	0.050	0.020	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
2,4,6-Trichlorophenol	ND	0.050	0.019	mg/L	1		SW-846 8270D	9/8/17	9/11/17 12:07	BGL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
2-Fluorophenol	60.9		15-110				9/11/17 12:07			
Phenol-d6	54.1		15-110				9/11/17 12:07			
Nitrobenzene-d5	78.1		30-130				9/11/17 12:07			
2-Fluorobiphenyl	77.6		30-130				9/11/17 12:07			
2,4,6-Tribromophenol	96.4		15-110				9/11/17 12:07			
p-Terphenyl-d14	94.8		30-130				9/11/17 12:07			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: CS-03

Sampled: 8/29/2017 11:30

Sample ID: 17H1560-07

Sample Matrix: Product/Solid

TCLP - Metals Analyses

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Arsenic	ND	0.010	0.0080	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:33	QNW
Mercury	ND	0.00010	0.000034	mg/L	1		SW-846 7470A	9/7/17	9/11/17 10:42	TJK
Barium	0.34	0.050	0.0053	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:33	QNW
Cadmium	0.0044	0.0040	0.00090	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:33	QNW
Chromium	ND	0.010	0.0061	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:33	QNW
Lead	ND	0.010	0.0044	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:33	QNW
Selenium	ND	0.050	0.034	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:33	QNW
Silver	ND	0.0050	0.0049	mg/L	1		SW-846 6010C-D	9/6/17	9/7/17 16:33	QNW

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: C-01

Sampled: 8/28/2017 14:30

Sample ID: 17H1560-08

Sample Matrix: Caulk

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.19	0.012	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:27	KAL
Aroclor-1221 [1]	ND	0.19	0.013	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:27	KAL
Aroclor-1232 [1]	ND	0.19	0.0087	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:27	KAL
Aroclor-1242 [1]	ND	0.19	0.0097	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:27	KAL
Aroclor-1248 [1]	ND	0.19	0.012	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:27	KAL
Aroclor-1254 [2]	0.21	0.19	0.013	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:27	KAL
Aroclor-1260 [2]	0.15	0.19	0.014	mg/Kg	1	J	SW-846 8082A	9/8/17	9/11/17 16:27	KAL
Aroclor-1262 [1]	ND	0.19	0.0097	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:27	KAL
Aroclor-1268 [1]	ND	0.19	0.0077	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:27	KAL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	93.7		30-150				9/11/17 16:27			
Decachlorobiphenyl [2]	90.3		30-150				9/11/17 16:27			
Tetrachloro-m-xylene [1]	93.3		30-150				9/11/17 16:27			
Tetrachloro-m-xylene [2]	92.8		30-150				9/11/17 16:27			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: C-02

Sampled: 8/28/2017 14:35

Sample ID: 17H1560-09

Sample Matrix: Caulk

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	0.012	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:45	KAL
Aroclor-1221 [1]	ND	0.20	0.013	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:45	KAL
Aroclor-1232 [1]	ND	0.20	0.0089	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:45	KAL
Aroclor-1242 [1]	ND	0.20	0.0098	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:45	KAL
Aroclor-1248 [1]	ND	0.20	0.012	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:45	KAL
Aroclor-1254 [1]	0.22	0.20	0.013	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:45	KAL
Aroclor-1260 [1]	0.15	0.20	0.014	mg/Kg	1	J	SW-846 8082A	9/8/17	9/11/17 16:45	KAL
Aroclor-1262 [1]	ND	0.20	0.0098	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:45	KAL
Aroclor-1268 [1]	ND	0.20	0.0079	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:45	KAL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	80.8		30-150							
Decachlorobiphenyl [2]	79.9		30-150							
Tetrachloro-m-xylene [1]	78.8		30-150							
Tetrachloro-m-xylene [2]	81.7		30-150							

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: C-03

Sampled: 8/28/2017 14:40

Sample ID: 17H1560-10

Sample Matrix: Caulk

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.20	0.012	mg/Kg	1		SW-846 8082A	9/8/17	9/12/17 12:38	KAL
Aroclor-1221 [1]	ND	0.20	0.013	mg/Kg	1		SW-846 8082A	9/8/17	9/12/17 12:38	KAL
Aroclor-1232 [1]	ND	0.20	0.0089	mg/Kg	1		SW-846 8082A	9/8/17	9/12/17 12:38	KAL
Aroclor-1242 [1]	ND	0.20	0.0099	mg/Kg	1		SW-846 8082A	9/8/17	9/12/17 12:38	KAL
Aroclor-1248 [1]	ND	0.20	0.012	mg/Kg	1		SW-846 8082A	9/8/17	9/12/17 12:38	KAL
Aroclor-1254 [1]	ND	0.20	0.013	mg/Kg	1		SW-846 8082A	9/8/17	9/12/17 12:38	KAL
Aroclor-1260 [1]	ND	0.20	0.014	mg/Kg	1		SW-846 8082A	9/8/17	9/12/17 12:38	KAL
Aroclor-1262 [1]	ND	0.20	0.0099	mg/Kg	1		SW-846 8082A	9/8/17	9/12/17 12:38	KAL
Aroclor-1268 [1]	ND	0.20	0.0079	mg/Kg	1		SW-846 8082A	9/8/17	9/12/17 12:38	KAL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	103		30-150							
Decachlorobiphenyl [2]	97.9		30-150							
Tetrachloro-m-xylene [1]	81.2		30-150							
Tetrachloro-m-xylene [2]	80.6		30-150							

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: P-01

Sampled: 8/28/2017 14:45

Sample ID: 17H1560-11

Sample Matrix: Paint

Metals Analyses (Total)

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Lead	1500	25	mg/Kg	1	L-10	SW-846 6010C Modified	9/11/17	9/11/17 14:59	QNW

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: P-02

Sampled: 8/28/2017 14:45

Sample ID: 17H1560-12

Sample Matrix: Paint

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.48	0.011	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 15:52	KAL
Aroclor-1221 [1]	ND	0.48	0.012	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 15:52	KAL
Aroclor-1232 [1]	ND	0.48	0.0086	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 15:52	KAL
Aroclor-1242 [1]	ND	0.48	0.0096	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 15:52	KAL
Aroclor-1248 [1]	ND	0.48	0.011	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 15:52	KAL
Aroclor-1254 [2]	1.8	0.48	0.012	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 15:52	KAL
Aroclor-1260 [1]	0.73	0.48	0.013	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 15:52	KAL
Aroclor-1262 [1]	ND	0.48	0.0096	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 15:52	KAL
Aroclor-1268 [1]	ND	0.48	0.0077	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 15:52	KAL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	80.9		30-150							
Decachlorobiphenyl [2]	76.9		30-150							
Tetrachloro-m-xylene [1]	72.6		30-150							
Tetrachloro-m-xylene [2]	72.5		30-150							

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: P-03

Sampled: 8/28/2017 14:50

Sample ID: 17H1560-13

Sample Matrix: Paint

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.49	0.012	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:09	KAL
Aroclor-1221 [1]	ND	0.49	0.013	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:09	KAL
Aroclor-1232 [1]	ND	0.49	0.0087	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:09	KAL
Aroclor-1242 [1]	ND	0.49	0.0097	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:09	KAL
Aroclor-1248 [1]	1.9	0.49	0.012	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:09	KAL
Aroclor-1254 [2]	2.7	0.49	0.013	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:09	KAL
Aroclor-1260 [1]	1.4	0.49	0.014	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:09	KAL
Aroclor-1262 [1]	ND	0.49	0.0097	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:09	KAL
Aroclor-1268 [1]	ND	0.49	0.0078	mg/Kg	1		SW-846 8082A	9/8/17	9/11/17 16:09	KAL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	79.8		30-150							
Decachlorobiphenyl [2]	77.7		30-150							
Tetrachloro-m-xylene [1]	81.6		30-150							
Tetrachloro-m-xylene [2]	79.5		30-150							

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: ACF-01

Sampled: 8/29/2017 12:10

Sample ID: 17H1560-14

Sample Matrix: Oil

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [2]	ND	1.0	0.52	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:19	KAL
Aroclor-1221 [2]	ND	1.0	0.72	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:19	KAL
Aroclor-1232 [2]	ND	1.0	0.60	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:19	KAL
Aroclor-1242 [2]	ND	1.0	0.66	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:19	KAL
Aroclor-1248 [2]	ND	1.0	0.76	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:19	KAL
Aroclor-1254 [2]	ND	1.0	0.50	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:19	KAL
Aroclor-1260 [2]	ND	1.0	0.47	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:19	KAL
Aroclor-1262 [2]	ND	1.0	0.62	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:19	KAL
Aroclor-1268 [2]	ND	1.0	0.48	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:19	KAL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	77.5		30-150						9/7/17 17:19	
Decachlorobiphenyl [2]	77.5		30-150						9/7/17 17:19	
Tetrachloro-m-xylene [1]	154 *		30-150		S-12				9/7/17 17:19	
Tetrachloro-m-xylene [2]	92.9		30-150						9/7/17 17:19	

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: ACF-02

Sampled: 8/29/2017 12:10

Sample ID: 17H1560-15

Sample Matrix: Oil

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.99	0.52	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:37	KAL
Aroclor-1221 [1]	ND	0.99	0.71	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:37	KAL
Aroclor-1232 [1]	ND	0.99	0.60	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:37	KAL
Aroclor-1242 [1]	ND	0.99	0.66	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:37	KAL
Aroclor-1248 [1]	ND	0.99	0.75	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:37	KAL
Aroclor-1254 [1]	ND	0.99	0.50	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:37	KAL
Aroclor-1260 [1]	ND	0.99	0.47	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:37	KAL
Aroclor-1262 [1]	ND	0.99	0.62	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:37	KAL
Aroclor-1268 [1]	ND	0.99	0.48	mg/Kg	1		EPA 600 4-81-045	9/7/17	9/7/17 17:37	KAL
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	89.5		30-150							
Decachlorobiphenyl [2]	81.2		30-150							
Tetrachloro-m-xylene [1]	124		30-150							
Tetrachloro-m-xylene [2]	91.4		30-150							

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: D-01

Sampled: 8/28/2017 13:00

Sample ID: 17H1560-17

Sample Matrix: Product/Solid

Sample Flags: PR-15

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Acetone	ND	160	16	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Acrylonitrile	ND	16	1.9	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
tert-Amyl Methyl Ether (TAME)	ND	1.6	0.35	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Benzene	ND	3.3	0.39	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Bromobenzene	ND	3.3	0.49	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Bromochloromethane	ND	3.3	0.73	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Bromodichloromethane	ND	3.3	0.96	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Bromoform	ND	3.3	0.68	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Bromomethane	6.2	16	3.1	mg/Kg	1	J	SW-846 8260C	8/31/17	9/11/17 11:56	MFF
2-Butanone (MEK)	ND	65	7.7	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
tert-Butyl Alcohol (TBA)	ND	65	7.1	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
n-Butylbenzene	ND	3.3	0.49	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
sec-Butylbenzene	ND	3.3	0.42	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
tert-Butylbenzene	ND	3.3	0.39	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
tert-Butyl Ethyl Ether (TBEE)	ND	1.6	0.31	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Carbon Disulfide	ND	9.8	3.3	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Carbon Tetrachloride	ND	3.3	0.81	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Chlorobenzene	ND	3.3	0.52	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Chlorodibromomethane	ND	1.6	0.34	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Chloroethane	ND	6.5	0.91	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Chloroform	ND	6.5	0.72	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Chloromethane	ND	6.5	1.8	mg/Kg	1	L-04	SW-846 8260C	8/31/17	9/11/17 11:56	MFF
2-Chlorotoluene	ND	3.3	0.39	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
4-Chlorotoluene	ND	3.3	0.46	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,2-Dibromo-3-chloropropane (DBCP)	ND	16	1.2	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,2-Dibromoethane (EDB)	ND	1.6	0.48	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Dibromomethane	ND	3.3	0.52	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,2-Dichlorobenzene	ND	3.3	0.55	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,3-Dichlorobenzene	ND	3.3	0.55	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,4-Dichlorobenzene	ND	3.3	0.49	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
trans-1,4-Dichloro-2-butene	ND	6.5	1.0	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Dichlorodifluoromethane (Freon 12)	ND	6.5	0.93	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,1-Dichloroethane	ND	3.3	0.52	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,2-Dichloroethane	ND	3.3	0.63	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,1-Dichloroethylene	ND	3.3	0.68	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
cis-1,2-Dichloroethylene	ND	3.3	0.48	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
trans-1,2-Dichloroethylene	ND	3.3	0.49	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,2-Dichloropropane	ND	3.3	0.42	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,3-Dichloropropane	ND	1.6	0.42	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
2,2-Dichloropropane	ND	3.3	0.69	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,1-Dichloropropene	ND	6.5	0.42	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
cis-1,3-Dichloropropene	ND	1.6	0.39	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
trans-1,3-Dichloropropene	ND	1.6	0.37	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Diethyl Ether	ND	6.5	0.72	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: D-01

Sampled: 8/28/2017 13:00

Sample ID: 17H1560-17

Sample Matrix: Product/Solid

Sample Flags: PR-15

Volatile Organic Compounds by GC/MS

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Diisopropyl Ether (DIPE)	ND	1.6	0.59	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,4-Dioxane	ND	160	86	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Ethylbenzene	ND	3.3	0.42	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Hexachlorobutadiene	ND	3.3	1.9	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
2-Hexanone (MBK)	ND	33	5.0	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Isopropylbenzene (Cumene)	ND	3.3	0.39	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
p-Isopropyltoluene (p-Cymene)	ND	3.3	0.49	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Methyl Acetate	4.1	33	1.4	mg/Kg	1	J	SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Methyl tert-Butyl Ether (MTBE)	ND	3.3	0.29	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Methyl Cyclohexane	ND	3.3	2.1	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Methylene Chloride	ND	16	10	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
4-Methyl-2-pentanone (MIBK)	ND	33	4.8	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Naphthalene	ND	6.5	0.39	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
n-Propylbenzene	ND	3.3	0.42	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Styrene	ND	3.3	0.49	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,1,1,2-Tetrachloroethane	ND	3.3	0.39	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,1,2,2-Tetrachloroethane	ND	1.6	0.52	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Tetrachloroethylene	ND	3.3	0.89	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Tetrahydrofuran	ND	33	3.5	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Toluene	ND	3.3	0.55	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,2,3-Trichlorobenzene	ND	16	0.46	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,2,4-Trichlorobenzene	ND	3.3	0.62	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,3,5-Trichlorobenzene	ND	3.3	0.55	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,1,1-Trichloroethane	ND	3.3	0.43	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,1,2-Trichloroethane	ND	3.3	0.77	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Trichloroethylene	ND	3.3	0.65	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Trichlorofluoromethane (Freon 11)	ND	6.5	0.48	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,2,3-Trichloropropane	ND	6.5	0.70	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	3.3	0.64	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,2,4-Trimethylbenzene	ND	3.3	0.59	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
1,3,5-Trimethylbenzene	ND	3.3	0.42	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Vinyl Chloride	ND	6.5	0.43	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
m+p Xylene	ND	6.5	0.83	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
o-Xylene	ND	3.3	0.43	mg/Kg	1		SW-846 8260C	8/31/17	9/11/17 11:56	MFF
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
1,2-Dichloroethane-d4	119		70-130				9/11/17 11:56			
Toluene-d8	104		70-130				9/11/17 11:56			
4-Bromofluorobenzene	106		70-130				9/11/17 11:56			

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Project Location: 245 Andrews St., Rochester, NY

Sample Description:

Work Order: 17H1560

Date Received: 8/30/2017

Field Sample #: D-02

Sampled: 8/28/2017 13:00

Sample ID: 17H1560-18

Sample Matrix: Product/Solid

Polychlorinated Biphenyls By GC/ECD

Analyte	Results	RL	DL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Aroclor-1016 [1]	ND	0.10	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:35	TG
Aroclor-1221 [1]	ND	0.10	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:35	TG
Aroclor-1232 [1]	ND	0.10	0.0090	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:35	TG
Aroclor-1242 [1]	ND	0.10	0.010	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:35	TG
Aroclor-1248 [1]	ND	0.10	0.012	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:35	TG
Aroclor-1254 [1]	ND	0.10	0.013	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:35	TG
Aroclor-1260 [1]	ND	0.10	0.014	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:35	TG
Aroclor-1262 [1]	ND	0.10	0.010	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:35	TG
Aroclor-1268 [1]	ND	0.10	0.0080	mg/Kg	1		SW-846 8082A	9/7/17	9/9/17 21:35	TG
Surrogates	% Recovery		Recovery Limits		Flag/Qual					
Decachlorobiphenyl [1]	35.1		30-150							
Decachlorobiphenyl [2]	36.8		30-150							
Tetrachloro-m-xylene [1]	36.8		30-150							
Tetrachloro-m-xylene [2]	38.7		30-150							

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Sample Extraction Data

Prep Method: SW-846 3580A-EPA 600 4-81-045

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-14 [ACF-01]	B185683	0.201	10.0	09/07/17
17H1560-15 [ACF-02]	B185683	0.201	10.0	09/07/17

Prep Method: % Solids-SM 2540G

Lab Number [Field ID]	Batch	Date
17H1560-01 [SD-01]	B185290	08/31/17
17H1560-02 [SD-02]	B185290	08/31/17

SW-846 1030

Lab Number [Field ID]	Batch	Initial [g]	Date
17H1560-03 [BW-01]	B185355	50.0	08/31/17
17H1560-04 [BW-02]	B185355	50.0	08/31/17
17H1560-05 [CS-01]	B185355	50.0	08/31/17
17H1560-06 [CS-02]	B185355	50.0	08/31/17
17H1560-07 [CS-03]	B185355	50.0	08/31/17

SW-846 1030

Lab Number [Field ID]	Batch	Initial [g]	Date
17H1560-01 [SD-01]	B185354	50.0	08/31/17

Prep Method: SW-846 3050B-SW-846 6010C Modified

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-11 [P-01]	B185875	0.0495	25.0	09/11/17

Prep Method: SW-846 3010A-SW-846 6010C-D

Leachates were extracted on 8/31/2017 per SW-846 1311 in Batch B185336

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17H1560-01 [SD-01]	B185409	50.0	50.0	09/01/17

Prep Method: SW-846 3010A-SW-846 6010C-D

Leachates were extracted on 9/5/2017 per SW-846 1311 in Batch B185507

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17H1560-03 [BW-01]	B185664	50.0	50.0	09/06/17
17H1560-04 [BW-02]	B185664	50.0	50.0	09/06/17
17H1560-05 [CS-01]	B185664	50.0	50.0	09/06/17
17H1560-06 [CS-02]	B185664	50.0	50.0	09/06/17
17H1560-07 [CS-03]	B185664	50.0	50.0	09/06/17

Prep Method: SW-846 7470A Prep-SW-846 7470A

Leachates were extracted on 8/31/2017 per SW-846 1311 in Batch B185336

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17H1560-01 [SD-01]	B185410	6.00	6.00	09/01/17

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Sample Extraction Data

Prep Method: SW-846 7470A Prep-SW-846 7470A

Leachates were extracted on 9/5/2017 per SW-846 1311 in Batch B185507

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17H1560-03 [BW-01]	B185753	6.00	6.00	09/07/17
17H1560-04 [BW-02]	B185753	6.00	6.00	09/07/17
17H1560-05 [CS-01]	B185753	6.00	6.00	09/07/17
17H1560-06 [CS-02]	B185753	6.00	6.00	09/07/17
17H1560-07 [CS-03]	B185753	6.00	6.00	09/07/17

Prep Method: SW-846 3546-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-08 [C-01]	B185823	0.517	10.0	09/08/17
17H1560-09 [C-02]	B185823	0.508	10.0	09/08/17
17H1560-10 [C-03]	B185823	0.507	10.0	09/08/17

Prep Method: SW-846 3546-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-12 [P-02]	B185824	0.209	10.0	09/08/17
17H1560-13 [P-03]	B185824	0.206	10.0	09/08/17

Prep Method: SW-846 3546-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-03 [BW-01]	B185745	2.05	10.0	09/07/17
17H1560-04 [BW-02]	B185745	2.00	10.0	09/07/17
17H1560-05 [CS-01]	B185745	2.04	10.0	09/07/17
17H1560-06 [CS-02]	B185745	2.05	10.0	09/07/17
17H1560-07 [CS-03]	B185745	2.06	10.0	09/07/17
17H1560-18 [D-02]	B185745	2.01	10.0	09/07/17

Prep Method: SW-846 3546-SW-846 8082A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-01 [SD-01]	B185743	10.0	10.0	09/07/17
17H1560-02 [SD-02]	B185743	10.0	10.0	09/07/17

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Sample Amount(g)	Methanol Volume(mL)	Methanol Aliquot(mL)	Final Volume(mL)	Date
17H1560-17 [D-01]	B185296	0.230	15.0	1	50	08/31/17

Prep Method: SW-846 5030B-SW-846 8260C

Leachates were extracted on 8/31/2017 per SW-846 1311 in Batch B185329

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17H1560-03 [BW-01]	B185702	5.00	5.00	09/07/17
17H1560-04 [BW-02]	B185702	5.00	5.00	09/07/17
17H1560-05 [CS-01]	B185702	5.00	5.00	09/07/17

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Sample Extraction Data

Prep Method: SW-846 5030B-SW-846 8260C
Leachates were extracted on 8/31/2017 per SW-846 1311 in Batch B185329

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17H1560-06 [CS-02]	B185873	5.00	5.00	09/11/17
17H1560-07 [CS-03]	B185873	5.00	5.00	09/11/17

Prep Method: SW-846 5035-SW-846 8260C

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-02 [SD-02]	B185318	3.26	10.0	08/31/17

Prep Method: SW-846 5030B-SW-846 8260C
Leachates were extracted on 8/31/2017 per SW-846 1311 in Batch B185332

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17H1560-01 [SD-01]	B185874	5.00	5.00	09/08/17

Prep Method: SW-846 3510C-SW-846 8270D
Leachates were extracted on 9/5/2017 per SW-846 1311 in Batch B185507

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17H1560-03 [BW-01]	B185800	200	1.00	09/08/17
17H1560-05 [CS-01]	B185800	200	1.00	09/08/17
17H1560-06 [CS-02]	B185800	200	1.00	09/08/17
17H1560-07 [CS-03]	B185800	200	1.00	09/08/17

Prep Method: SW-846 3510C-SW-846 8270D
Leachates were extracted on 8/31/2017 per SW-846 1311 in Batch B185336

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17H1560-01 [SD-01]	B185803	200	1.00	09/08/17

Prep Method: SW-846 3510C-SW-846 8270D
Leachates were extracted on 9/5/2017 per SW-846 1311 in Batch B185507

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
17H1560-04RE1 [BW-02]	B185865	200	1.00	09/09/17

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-03 [BW-01]	B185645	25.3	250	09/06/17
17H1560-04 [BW-02]	B185645	25.2	250	09/06/17
17H1560-05 [CS-01]	B185645	25.4	250	09/06/17
17H1560-06 [CS-02]	B185645	25.1	250	09/06/17
17H1560-07 [CS-03]	B185645	25.6	250	09/06/17

SW-846 9014

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-01 [SD-01]	B185540	25.7	250	09/05/17

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Sample Extraction Data**SW-846 9030A**

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-03 [BW-01]	B185647	25.3	250	09/06/17
17H1560-04 [BW-02]	B185647	25.2	250	09/06/17
17H1560-05 [CS-01]	B185647	25.4	250	09/06/17
17H1560-06 [CS-02]	B185647	25.1	250	09/06/17
17H1560-07 [CS-03]	B185647	25.6	250	09/06/17

SW-846 9030A

Lab Number [Field ID]	Batch	Initial [g]	Final [mL]	Date
17H1560-01 [SD-01]	B185539	25.7	250	09/05/17

SW-846 9045C

Lab Number [Field ID]	Batch	Initial [g]	Date
17H1560-01 [SD-01]	B185237	20.0	08/30/17

SW-846 9045C

Lab Number [Field ID]	Batch	Initial [g]	Date
17H1560-03 [BW-01]	B185238	20.0	08/30/17
17H1560-04 [BW-02]	B185238	20.0	08/30/17
17H1560-05 [CS-01]	B185238	20.0	08/30/17
17H1560-06 [CS-02]	B185238	20.0	08/30/17
17H1560-07 [CS-03]	B185238	20.0	08/30/17

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185296 - SW-846 5035										
Blank (B185296-BLK1)				Prepared: 08/31/17 Analyzed: 09/11/17						
Acetone	ND	2.5	mg/Kg							
Acrylonitrile	ND	0.25	mg/Kg							
tert-Amyl Methyl Ether (TAME)	ND	0.025	mg/Kg							
Benzene	ND	0.050	mg/Kg							
Bromobenzene	ND	0.050	mg/Kg							
Bromochloromethane	ND	0.050	mg/Kg							
Bromodichloromethane	ND	0.050	mg/Kg							
Bromoform	ND	0.050	mg/Kg							
Bromomethane	ND	0.10	mg/Kg							
2-Butanone (MEK)	ND	1.0	mg/Kg							
tert-Butyl Alcohol (TBA)	ND	1.0	mg/Kg							
n-Butylbenzene	ND	0.050	mg/Kg							
sec-Butylbenzene	ND	0.050	mg/Kg							
tert-Butylbenzene	ND	0.050	mg/Kg							
tert-Butyl Ethyl Ether (TBEE)	ND	0.025	mg/Kg							
Carbon Disulfide	ND	0.15	mg/Kg							
Carbon Tetrachloride	ND	0.050	mg/Kg							
Chlorobenzene	ND	0.050	mg/Kg							
Chlorodibromomethane	ND	0.025	mg/Kg							
Chloroethane	ND	0.10	mg/Kg							
Chloroform	ND	0.10	mg/Kg							
Chloromethane	ND	0.10	mg/Kg							L-04
2-Chlorotoluene	ND	0.050	mg/Kg							
4-Chlorotoluene	ND	0.050	mg/Kg							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.25	mg/Kg							
1,2-Dibromoethane (EDB)	ND	0.025	mg/Kg							
Dibromomethane	ND	0.050	mg/Kg							
1,2-Dichlorobenzene	ND	0.050	mg/Kg							
1,3-Dichlorobenzene	ND	0.050	mg/Kg							
1,4-Dichlorobenzene	ND	0.050	mg/Kg							
trans-1,4-Dichloro-2-butene	ND	0.10	mg/Kg							
Dichlorodifluoromethane (Freon 12)	ND	0.10	mg/Kg							
1,1-Dichloroethane	ND	0.050	mg/Kg							
1,2-Dichloroethane	ND	0.050	mg/Kg							
1,1-Dichloroethylene	ND	0.050	mg/Kg							
cis-1,2-Dichloroethylene	ND	0.050	mg/Kg							
trans-1,2-Dichloroethylene	ND	0.050	mg/Kg							
1,2-Dichloropropane	ND	0.050	mg/Kg							
1,3-Dichloropropane	ND	0.025	mg/Kg							
2,2-Dichloropropane	ND	0.050	mg/Kg							
1,1-Dichloropropene	ND	0.10	mg/Kg							
cis-1,3-Dichloropropene	ND	0.025	mg/Kg							
trans-1,3-Dichloropropene	ND	0.025	mg/Kg							
Diethyl Ether	ND	0.10	mg/Kg							
Diisopropyl Ether (DIPE)	ND	0.025	mg/Kg							
1,4-Dioxane	ND	2.5	mg/Kg							
Ethylbenzene	ND	0.050	mg/Kg							
Hexachlorobutadiene	ND	0.050	mg/Kg							
2-Hexanone (MBK)	ND	0.50	mg/Kg							
Isopropylbenzene (Cumene)	ND	0.050	mg/Kg							
p-Isopropyltoluene (p-Cymene)	ND	0.050	mg/Kg							
Methyl Acetate	ND	0.50	mg/Kg							

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185296 - SW-846 5035

Blank (B185296-BLK1)

Prepared: 08/31/17 Analyzed: 09/11/17

Methyl tert-Butyl Ether (MTBE)	ND	0.050	mg/Kg							
Methyl Cyclohexane	ND	0.050	mg/Kg							
Methylene Chloride	ND	0.25	mg/Kg							
4-Methyl-2-pentanone (MIBK)	ND	0.50	mg/Kg							
Naphthalene	ND	0.10	mg/Kg							
n-Propylbenzene	ND	0.050	mg/Kg							
Styrene	ND	0.050	mg/Kg							
1,1,1,2-Tetrachloroethane	ND	0.050	mg/Kg							
1,1,2,2-Tetrachloroethane	ND	0.025	mg/Kg							
Tetrachloroethylene	ND	0.050	mg/Kg							
Tetrahydrofuran	ND	0.50	mg/Kg							
Toluene	ND	0.050	mg/Kg							
1,2,3-Trichlorobenzene	ND	0.25	mg/Kg							
1,2,4-Trichlorobenzene	ND	0.050	mg/Kg							
1,3,5-Trichlorobenzene	ND	0.050	mg/Kg							
1,1,1-Trichloroethane	ND	0.050	mg/Kg							
1,1,2-Trichloroethane	ND	0.050	mg/Kg							
Trichloroethylene	ND	0.050	mg/Kg							
Trichlorofluoromethane (Freon 11)	ND	0.10	mg/Kg							
1,2,3-Trichloropropane	ND	0.10	mg/Kg							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.050	mg/Kg							
1,2,4-Trimethylbenzene	ND	0.050	mg/Kg							
1,3,5-Trimethylbenzene	ND	0.050	mg/Kg							
Vinyl Chloride	ND	0.10	mg/Kg							
m+p Xylene	ND	0.10	mg/Kg							
o-Xylene	ND	0.050	mg/Kg							
Surrogate: 1,2-Dichloroethane-d4	0.0292		mg/Kg	0.0250		117	70-130			
Surrogate: Toluene-d8	0.0262		mg/Kg	0.0250		105	70-130			
Surrogate: 4-Bromofluorobenzene	0.0255		mg/Kg	0.0250		102	70-130			

LCS (B185296-BS1)

Prepared: 08/31/17 Analyzed: 09/11/17

Acetone	0.100	0.057	mg/Kg	0.113		88.4	70-160			†
Acrylonitrile	0.0103	0.0057	mg/Kg	0.0113		90.5	70-130			
tert-Amyl Methyl Ether (TAME)	0.0122	0.00057	mg/Kg	0.0113		108	70-130			
Benzene	0.0118	0.0011	mg/Kg	0.0113		104	70-130			
Bromobenzene	0.0112	0.0011	mg/Kg	0.0113		98.8	70-130			
Bromochloromethane	0.0125	0.0011	mg/Kg	0.0113		110	70-130			
Bromodichloromethane	0.0133	0.0011	mg/Kg	0.0113		117	70-130			
Bromoform	0.0115	0.0011	mg/Kg	0.0113		101	70-130			
Bromomethane	0.00858	0.0023	mg/Kg	0.0113		75.7	40-130			†
2-Butanone (MEK)	0.0994	0.023	mg/Kg	0.113		87.7	70-160			†
tert-Butyl Alcohol (TBA)	0.109	0.023	mg/Kg	0.113		96.4	40-130		V-20	†
n-Butylbenzene	0.0127	0.0011	mg/Kg	0.0113		112	70-130			
sec-Butylbenzene	0.0122	0.0011	mg/Kg	0.0113		107	70-130			
tert-Butylbenzene	0.0121	0.0011	mg/Kg	0.0113		106	70-160			†
tert-Butyl Ethyl Ether (TBEE)	0.0111	0.00057	mg/Kg	0.0113		98.0	70-130			
Carbon Disulfide	0.0108	0.0034	mg/Kg	0.0113		95.1	70-130			
Carbon Tetrachloride	0.0134	0.0011	mg/Kg	0.0113		118	70-130			V-20
Chlorobenzene	0.0107	0.0011	mg/Kg	0.0113		94.1	70-130			
Chlorodibromomethane	0.0129	0.00057	mg/Kg	0.0113		114	70-130			
Chloroethane	0.00933	0.0023	mg/Kg	0.0113		82.3	70-130			
Chloroform	0.0130	0.0023	mg/Kg	0.0113		114	70-130			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185296 - SW-846 5035										
LCS (B185296-BS1)										
					Prepared: 08/31/17 Analyzed: 09/11/17					
Chloromethane	0.00607	0.0023	mg/Kg	0.0113		53.6	* 70-130			L-04, V-20
2-Chlorotoluene	0.0117	0.0011	mg/Kg	0.0113		103	70-130			
4-Chlorotoluene	0.0117	0.0011	mg/Kg	0.0113		103	70-130			
1,2-Dibromo-3-chloropropane (DBCP)	0.0123	0.0057	mg/Kg	0.0113		109	70-130			V-20
1,2-Dibromoethane (EDB)	0.0116	0.00057	mg/Kg	0.0113		103	70-130			
Dibromomethane	0.0127	0.0011	mg/Kg	0.0113		112	70-130			
1,2-Dichlorobenzene	0.0112	0.0011	mg/Kg	0.0113		99.2	70-130			
1,3-Dichlorobenzene	0.0114	0.0011	mg/Kg	0.0113		100	70-130			
1,4-Dichlorobenzene	0.0109	0.0011	mg/Kg	0.0113		96.2	70-130			
trans-1,4-Dichloro-2-butene	0.0107	0.0023	mg/Kg	0.0113		94.6	70-130			
Dichlorodifluoromethane (Freon 12)	0.00762	0.0023	mg/Kg	0.0113		67.2	40-160			†
1,1-Dichloroethane	0.0120	0.0011	mg/Kg	0.0113		106	70-130			
1,2-Dichloroethane	0.0134	0.0011	mg/Kg	0.0113		118	70-130			
1,1-Dichloroethylene	0.0112	0.0011	mg/Kg	0.0113		98.8	70-130			
cis-1,2-Dichloroethylene	0.0123	0.0011	mg/Kg	0.0113		108	70-130			
trans-1,2-Dichloroethylene	0.0118	0.0011	mg/Kg	0.0113		104	70-130			
1,2-Dichloropropane	0.0114	0.0011	mg/Kg	0.0113		100	70-130			
1,3-Dichloropropane	0.0120	0.00057	mg/Kg	0.0113		106	70-130			
2,2-Dichloropropane	0.0158	0.0011	mg/Kg	0.0113		140	* 70-130			L-02, V-20
1,1-Dichloropropene	0.0126	0.0023	mg/Kg	0.0113		112	70-130			
cis-1,3-Dichloropropene	0.0119	0.00057	mg/Kg	0.0113		105	70-130			
trans-1,3-Dichloropropene	0.0133	0.00057	mg/Kg	0.0113		118	70-130			
Diethyl Ether	0.00978	0.0023	mg/Kg	0.0113		86.3	70-130			
Diisopropyl Ether (DIPE)	0.00986	0.00057	mg/Kg	0.0113		87.0	70-130			
1,4-Dioxane	0.116	0.057	mg/Kg	0.113		103	40-160			†
Ethylbenzene	0.0112	0.0011	mg/Kg	0.0113		98.6	70-130			
Hexachlorobutadiene	0.0134	0.0011	mg/Kg	0.0113		118	70-160			†
2-Hexanone (MBK)	0.101	0.011	mg/Kg	0.113		89.3	70-160			†
Isopropylbenzene (Cumene)	0.0117	0.0011	mg/Kg	0.0113		104	70-130			
p-Isopropyltoluene (p-Cymene)	0.0121	0.0011	mg/Kg	0.0113		107	70-130			
Methyl tert-Butyl Ether (MTBE)	0.0134	0.0011	mg/Kg	0.0113		118	70-130			
Methylene Chloride	0.00932	0.0057	mg/Kg	0.0113		82.2	40-160			†
4-Methyl-2-pentanone (MIBK)	0.100	0.011	mg/Kg	0.113		88.3	70-160			†
Naphthalene	0.0103	0.0023	mg/Kg	0.0113		90.7	40-130			†
n-Propylbenzene	0.0115	0.0011	mg/Kg	0.0113		101	70-130			
Styrene	0.0108	0.0011	mg/Kg	0.0113		95.2	70-130			
1,1,1,2-Tetrachloroethane	0.0113	0.0011	mg/Kg	0.0113		99.4	70-130			
1,1,2,2-Tetrachloroethane	0.0108	0.00057	mg/Kg	0.0113		95.2	70-130			
Tetrachloroethylene	0.0128	0.0011	mg/Kg	0.0113		113	70-130			
Tetrahydrofuran	0.00983	0.011	mg/Kg	0.0113		86.7	70-130			J
Toluene	0.0115	0.0011	mg/Kg	0.0113		102	70-130			
1,2,3-Trichlorobenzene	0.0114	0.0057	mg/Kg	0.0113		101	70-130			
1,2,4-Trichlorobenzene	0.0116	0.0011	mg/Kg	0.0113		103	70-130			
1,3,5-Trichlorobenzene	0.0110	0.0011	mg/Kg	0.0113		97.1	70-130			
1,1,1-Trichloroethane	0.0137	0.0011	mg/Kg	0.0113		121	70-130			V-20
1,1,2-Trichloroethane	0.0120	0.0011	mg/Kg	0.0113		106	70-130			
Trichloroethylene	0.0122	0.0011	mg/Kg	0.0113		108	70-130			
Trichlorofluoromethane (Freon 11)	0.0109	0.0023	mg/Kg	0.0113		96.6	70-130			
1,2,3-Trichloropropane	0.0109	0.0023	mg/Kg	0.0113		96.1	70-130			
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0103	0.0011	mg/Kg	0.0113		90.7	70-130			
1,2,4-Trimethylbenzene	0.0116	0.0011	mg/Kg	0.0113		102	70-130			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185296 - SW-846 5035										
LCS (B185296-BS1)										
Prepared: 08/31/17 Analyzed: 09/11/17										
1,3,5-Trimethylbenzene	0.0110	0.0011	mg/Kg	0.0113		97.4	70-130			
Vinyl Chloride	0.00816	0.0023	mg/Kg	0.0113		72.0	40-130			†
m+p Xylene	0.0230	0.0023	mg/Kg	0.0227		101	70-130			
o-Xylene	0.0113	0.0011	mg/Kg	0.0113		99.5	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0334		mg/Kg	0.0283		118	70-130			
Surrogate: Toluene-d8	0.0293		mg/Kg	0.0283		104	70-130			
Surrogate: 4-Bromofluorobenzene	0.0293		mg/Kg	0.0283		103	70-130			
LCS Dup (B185296-BSD1)										
Prepared: 08/31/17 Analyzed: 09/11/17										
Acetone	0.0984	0.057	mg/Kg	0.113		86.8	70-160	1.72	25	†
Acrylonitrile	0.0103	0.0057	mg/Kg	0.0113		90.7	70-130	0.221	25	
tert-Amyl Methyl Ether (TAME)	0.0120	0.00057	mg/Kg	0.0113		106	70-130	1.31	25	
Benzene	0.0114	0.0011	mg/Kg	0.0113		101	70-130	3.71	25	
Bromobenzene	0.0108	0.0011	mg/Kg	0.0113		95.7	70-130	3.19	25	
Bromochloromethane	0.0123	0.0011	mg/Kg	0.0113		109	70-130	1.19	25	
Bromodichloromethane	0.0130	0.0011	mg/Kg	0.0113		115	70-130	2.07	25	
Bromoform	0.0112	0.0011	mg/Kg	0.0113		99.0	70-130	2.20	25	
Bromomethane	0.00952	0.0023	mg/Kg	0.0113		84.0	40-130	10.4	25	†
2-Butanone (MEK)	0.0988	0.023	mg/Kg	0.113		87.2	70-160	0.618	25	†
tert-Butyl Alcohol (TBA)	0.110	0.023	mg/Kg	0.113		97.3	40-130	0.898	25	V-20 †
n-Butylbenzene	0.0123	0.0011	mg/Kg	0.0113		108	70-130	3.36	25	
sec-Butylbenzene	0.0115	0.0011	mg/Kg	0.0113		101	70-130	5.95	25	
tert-Butylbenzene	0.0118	0.0011	mg/Kg	0.0113		104	70-160	2.09	25	†
tert-Butyl Ethyl Ether (TBEE)	0.0109	0.00057	mg/Kg	0.0113		96.3	70-130	1.75	25	
Carbon Disulfide	0.0106	0.0034	mg/Kg	0.0113		93.2	70-130	2.02	25	
Carbon Tetrachloride	0.0131	0.0011	mg/Kg	0.0113		115	70-130	2.65	25	V-20
Chlorobenzene	0.0108	0.0011	mg/Kg	0.0113		95.0	70-130	0.952	25	
Chlorodibromomethane	0.0122	0.00057	mg/Kg	0.0113		108	70-130	5.52	25	
Chloroethane	0.00911	0.0023	mg/Kg	0.0113		80.4	70-130	2.34	25	
Chloroform	0.0124	0.0023	mg/Kg	0.0113		110	70-130	4.10	25	
Chloromethane	0.00603	0.0023	mg/Kg	0.0113		53.2	* 70-130	0.749	25	L-04, V-20
2-Chlorotoluene	0.0113	0.0011	mg/Kg	0.0113		100	70-130	2.96	25	
4-Chlorotoluene	0.0113	0.0011	mg/Kg	0.0113		99.3	70-130	3.46	25	
1,2-Dibromo-3-chloropropane (DBCP)	0.0129	0.0057	mg/Kg	0.0113		114	70-130	4.40	25	V-20
1,2-Dibromoethane (EDB)	0.0115	0.00057	mg/Kg	0.0113		102	70-130	0.880	25	
Dibromomethane	0.0121	0.0011	mg/Kg	0.0113		107	70-130	5.02	25	
1,2-Dichlorobenzene	0.0108	0.0011	mg/Kg	0.0113		95.6	70-130	3.70	25	
1,3-Dichlorobenzene	0.0112	0.0011	mg/Kg	0.0113		99.0	70-130	1.20	25	
1,4-Dichlorobenzene	0.0109	0.0011	mg/Kg	0.0113		96.3	70-130	0.104	25	
trans-1,4-Dichloro-2-butene	0.0103	0.0023	mg/Kg	0.0113		91.0	70-130	3.88	25	
Dichlorodifluoromethane (Freon 12)	0.00749	0.0023	mg/Kg	0.0113		66.1	40-160	1.65	25	†
1,1-Dichloroethane	0.0120	0.0011	mg/Kg	0.0113		106	70-130	0.189	25	
1,2-Dichloroethane	0.0129	0.0011	mg/Kg	0.0113		114	70-130	3.88	25	
1,1-Dichloroethylene	0.0113	0.0011	mg/Kg	0.0113		99.5	70-130	0.706	25	
cis-1,2-Dichloroethylene	0.0118	0.0011	mg/Kg	0.0113		104	70-130	3.57	25	
trans-1,2-Dichloroethylene	0.0113	0.0011	mg/Kg	0.0113		99.7	70-130	4.61	25	
1,2-Dichloropropane	0.0110	0.0011	mg/Kg	0.0113		96.7	70-130	3.75	25	
1,3-Dichloropropane	0.0119	0.00057	mg/Kg	0.0113		105	70-130	0.853	25	
2,2-Dichloropropane	0.0155	0.0011	mg/Kg	0.0113		137	* 70-130	2.17	25	L-02, V-20
1,1-Dichloropropene	0.0127	0.0023	mg/Kg	0.0113		112	70-130	0.626	25	
cis-1,3-Dichloropropene	0.0120	0.00057	mg/Kg	0.0113		106	70-130	0.474	25	
trans-1,3-Dichloropropene	0.0132	0.00057	mg/Kg	0.0113		116	70-130	1.37	25	

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185296 - SW-846 5035

LCS Dup (B185296-BSD1)

Prepared: 08/31/17 Analyzed: 09/11/17

Diethyl Ether	0.0100	0.0023	mg/Kg	0.0113		88.4	70-130	2.40	25	
Diisopropyl Ether (DIPE)	0.0100	0.00057	mg/Kg	0.0113		88.6	70-130	1.82	25	
1,4-Dioxane	0.117	0.057	mg/Kg	0.113		103	40-160	0.942	50	† ‡
Ethylbenzene	0.0113	0.0011	mg/Kg	0.0113		99.5	70-130	0.909	25	
Hexachlorobutadiene	0.0124	0.0011	mg/Kg	0.0113		109	70-160	8.26	25	
2-Hexanone (MBK)	0.101	0.011	mg/Kg	0.113		88.9	70-160	0.472	25	†
Isopropylbenzene (Cumene)	0.0115	0.0011	mg/Kg	0.0113		102	70-130	2.05	25	
p-Isopropyltoluene (p-Cymene)	0.0120	0.0011	mg/Kg	0.0113		106	70-130	1.03	25	
Methyl tert-Butyl Ether (MTBE)	0.0134	0.0011	mg/Kg	0.0113		118	70-130	0.169	25	
Methylene Chloride	0.00946	0.0057	mg/Kg	0.0113		83.5	40-160	1.57	25	†
4-Methyl-2-pentanone (MIBK)	0.0992	0.011	mg/Kg	0.113		87.5	70-160	0.854	25	†
Naphthalene	0.0102	0.0023	mg/Kg	0.0113		90.4	40-130	0.331	25	†
n-Propylbenzene	0.0110	0.0011	mg/Kg	0.0113		97.5	70-130	3.72	25	
Styrene	0.0108	0.0011	mg/Kg	0.0113		95.4	70-130	0.210	25	
1,1,1,2-Tetrachloroethane	0.0111	0.0011	mg/Kg	0.0113		97.9	70-130	1.52	25	
1,1,2,2-Tetrachloroethane	0.0107	0.00057	mg/Kg	0.0113		94.7	70-130	0.527	25	
Tetrachloroethylene	0.0123	0.0011	mg/Kg	0.0113		109	70-130	4.06	25	
Tetrahydrofuran	0.00966	0.011	mg/Kg	0.0113		85.2	70-130	1.75	25	J
Toluene	0.0116	0.0011	mg/Kg	0.0113		102	70-130	0.294	25	
1,2,3-Trichlorobenzene	0.0114	0.0057	mg/Kg	0.0113		100	70-130	0.398	25	
1,2,4-Trichlorobenzene	0.0114	0.0011	mg/Kg	0.0113		100	70-130	2.27	25	
1,3,5-Trichlorobenzene	0.0105	0.0011	mg/Kg	0.0113		92.6	70-130	4.74	25	
1,1,1-Trichloroethane	0.0133	0.0011	mg/Kg	0.0113		118	70-130	2.60	25	V-20
1,1,2-Trichloroethane	0.0120	0.0011	mg/Kg	0.0113		106	70-130	0.661	25	
Trichloroethylene	0.0116	0.0011	mg/Kg	0.0113		102	70-130	5.25	25	
Trichlorofluoromethane (Freon 11)	0.0105	0.0023	mg/Kg	0.0113		92.8	70-130	4.01	25	
1,2,3-Trichloropropane	0.0110	0.0023	mg/Kg	0.0113		97.2	70-130	1.14	25	
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0103	0.0011	mg/Kg	0.0113		90.7	70-130	0.00	25	
1,2,4-Trimethylbenzene	0.0114	0.0011	mg/Kg	0.0113		101	70-130	1.08	25	
1,3,5-Trimethylbenzene	0.0108	0.0011	mg/Kg	0.0113		95.7	70-130	1.76	25	
Vinyl Chloride	0.00783	0.0023	mg/Kg	0.0113		69.1	40-130	4.11	25	†
m+p Xylene	0.0229	0.0023	mg/Kg	0.0227		101	70-130	0.198	25	
o-Xylene	0.0111	0.0011	mg/Kg	0.0113		98.0	70-130	1.52	25	
Surrogate: 1,2-Dichloroethane-d4	0.0328		mg/Kg	0.0283		116	70-130			
Surrogate: Toluene-d8	0.0290		mg/Kg	0.0283		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.0287		mg/Kg	0.0283		101	70-130			

Batch B185318 - SW-846 5035

Blank (B185318-BLK1)

Prepared & Analyzed: 08/31/17

Acetone	ND	0.10	mg/Kg wet
Benzene	ND	0.0020	mg/Kg wet
Bromochloromethane	ND	0.0020	mg/Kg wet
Bromodichloromethane	ND	0.0020	mg/Kg wet
Bromoform	ND	0.0020	mg/Kg wet
Bromomethane	ND	0.010	mg/Kg wet
2-Butanone (MEK)	ND	0.040	mg/Kg wet
Carbon Disulfide	ND	0.0060	mg/Kg wet
Carbon Tetrachloride	ND	0.0020	mg/Kg wet
Chlorobenzene	ND	0.0020	mg/Kg wet
Chlorodibromomethane	ND	0.0010	mg/Kg wet
Chloroethane	ND	0.020	mg/Kg wet

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QUALITY CONTROL
Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185318 - SW-846 5035										
Blank (B185318-BLK1)				Prepared & Analyzed: 08/31/17						
Chloroform	ND	0.0040	mg/Kg wet							
Chloromethane	ND	0.010	mg/Kg wet							
Cyclohexane	ND	0.0020	mg/Kg wet							
1,2-Dibromo-3-chloropropane (DBCP)	ND	0.0020	mg/Kg wet							
1,2-Dibromoethane (EDB)	ND	0.0010	mg/Kg wet							
1,2-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,3-Dichlorobenzene	ND	0.0020	mg/Kg wet							
1,4-Dichlorobenzene	ND	0.0020	mg/Kg wet							
Dichlorodifluoromethane (Freon 12)	ND	0.020	mg/Kg wet							
1,1-Dichloroethane	ND	0.0020	mg/Kg wet							
1,2-Dichloroethane	ND	0.0020	mg/Kg wet							
1,1-Dichloroethylene	ND	0.0040	mg/Kg wet							
cis-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
trans-1,2-Dichloroethylene	ND	0.0020	mg/Kg wet							
1,2-Dichloropropane	ND	0.0020	mg/Kg wet							
cis-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
trans-1,3-Dichloropropene	ND	0.0010	mg/Kg wet							
1,4-Dioxane	ND	0.10	mg/Kg wet							
Ethylbenzene	ND	0.0020	mg/Kg wet							
2-Hexanone (MBK)	ND	0.020	mg/Kg wet							
Isopropylbenzene (Cumene)	ND	0.0020	mg/Kg wet							
Methyl Acetate	ND	0.0020	mg/Kg wet							
Methyl tert-Butyl Ether (MTBE)	ND	0.0040	mg/Kg wet							
Methyl Cyclohexane	ND	0.0020	mg/Kg wet							
Methylene Chloride	ND	0.020	mg/Kg wet							
4-Methyl-2-pentanone (MIBK)	ND	0.020	mg/Kg wet							
Styrene	ND	0.0020	mg/Kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0010	mg/Kg wet							
Tetrachloroethylene	ND	0.0020	mg/Kg wet							
Toluene	ND	0.0020	mg/Kg wet							
1,2,3-Trichlorobenzene	ND	0.0020	mg/Kg wet							
1,2,4-Trichlorobenzene	ND	0.0020	mg/Kg wet							
1,1,1-Trichloroethane	ND	0.0020	mg/Kg wet							
1,1,2-Trichloroethane	ND	0.0020	mg/Kg wet							
Trichloroethylene	ND	0.0020	mg/Kg wet							
Trichlorofluoromethane (Freon 11)	ND	0.010	mg/Kg wet							
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	ND	0.010	mg/Kg wet							
Vinyl Chloride	ND	0.010	mg/Kg wet							
m+p Xylene	ND	0.0040	mg/Kg wet							
o-Xylene	ND	0.0020	mg/Kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0515		mg/Kg wet	0.0500		103	70-130			
Surrogate: Toluene-d8	0.0525		mg/Kg wet	0.0500		105	70-130			
Surrogate: 4-Bromofluorobenzene	0.0525		mg/Kg wet	0.0500		105	70-130			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185318 - SW-846 5035										
LCS (B185318-BS1)				Prepared & Analyzed: 08/31/17						
Acetone	0.169	0.10	mg/Kg wet	0.200		84.6	70-160			†
Benzene	0.0198	0.0020	mg/Kg wet	0.0200		98.8	70-130			
Bromochloromethane	0.0223	0.0020	mg/Kg wet	0.0200		112	70-130			
Bromodichloromethane	0.0200	0.0020	mg/Kg wet	0.0200		99.8	70-130			
Bromoform	0.0205	0.0020	mg/Kg wet	0.0200		103	70-130			
Bromomethane	0.0169	0.010	mg/Kg wet	0.0200		84.4	40-130			†
2-Butanone (MEK)	0.209	0.040	mg/Kg wet	0.200		105	70-160			†
Carbon Disulfide	0.0227	0.0060	mg/Kg wet	0.0200		114	70-130			
Carbon Tetrachloride	0.0200	0.0020	mg/Kg wet	0.0200		100	70-130			
Chlorobenzene	0.0198	0.0020	mg/Kg wet	0.0200		98.9	70-130			
Chlorodibromomethane	0.0233	0.0010	mg/Kg wet	0.0200		116	70-130			
Chloroethane	0.0132	0.020	mg/Kg wet	0.0200		66.0	* 70-130			L-07, J
Chloroform	0.0201	0.0040	mg/Kg wet	0.0200		100	70-130			
Chloromethane	0.0175	0.010	mg/Kg wet	0.0200		87.5	70-130			
Cyclohexane	0.0240	0.0020	mg/Kg wet	0.0200		120	70-130			V-20
1,2-Dibromo-3-chloropropane (DBCP)	0.0213	0.0020	mg/Kg wet	0.0200		106	70-130			
1,2-Dibromoethane (EDB)	0.0228	0.0010	mg/Kg wet	0.0200		114	70-130			
1,2-Dichlorobenzene	0.0209	0.0020	mg/Kg wet	0.0200		104	70-130			
1,3-Dichlorobenzene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130			
1,4-Dichlorobenzene	0.0206	0.0020	mg/Kg wet	0.0200		103	70-130			
Dichlorodifluoromethane (Freon 12)	0.0153	0.020	mg/Kg wet	0.0200		76.4	40-160			J †
1,1-Dichloroethane	0.0223	0.0020	mg/Kg wet	0.0200		111	70-130			
1,2-Dichloroethane	0.0229	0.0020	mg/Kg wet	0.0200		114	70-130			
1,1-Dichloroethylene	0.0216	0.0040	mg/Kg wet	0.0200		108	70-130			
cis-1,2-Dichloroethylene	0.0220	0.0020	mg/Kg wet	0.0200		110	70-130			
trans-1,2-Dichloroethylene	0.0255	0.0020	mg/Kg wet	0.0200		128	70-130			L-07, V-20
1,2-Dichloropropane	0.0217	0.0020	mg/Kg wet	0.0200		109	70-130			
cis-1,3-Dichloropropene	0.0200	0.0010	mg/Kg wet	0.0200		100	70-130			
trans-1,3-Dichloropropene	0.0216	0.0010	mg/Kg wet	0.0200		108	70-130			
1,4-Dioxane	0.207	0.10	mg/Kg wet	0.200		104	40-160			V-20 †
Ethylbenzene	0.0202	0.0020	mg/Kg wet	0.0200		101	70-130			
2-Hexanone (MBK)	0.226	0.020	mg/Kg wet	0.200		113	70-160			†
Isopropylbenzene (Cumene)	0.0219	0.0020	mg/Kg wet	0.0200		109	70-130			
Methyl Acetate	0.0223	0.0020	mg/Kg wet	0.0200		111	70-130			V-20
Methyl tert-Butyl Ether (MTBE)	0.0200	0.0040	mg/Kg wet	0.0200		100	70-130			
Methyl Cyclohexane	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130			
Methylene Chloride	0.0232	0.020	mg/Kg wet	0.0200		116	40-160			†
4-Methyl-2-pentanone (MIBK)	0.235	0.020	mg/Kg wet	0.200		118	70-160			†
Styrene	0.0200	0.0020	mg/Kg wet	0.0200		99.8	70-130			
1,1,2,2-Tetrachloroethane	0.0188	0.0010	mg/Kg wet	0.0200		94.1	70-130			
Tetrachloroethylene	0.0237	0.0020	mg/Kg wet	0.0200		118	70-130			
Toluene	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130			
1,2,3-Trichlorobenzene	0.0207	0.0020	mg/Kg wet	0.0200		104	70-130			
1,2,4-Trichlorobenzene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130			
1,1,1-Trichloroethane	0.0225	0.0020	mg/Kg wet	0.0200		112	70-130			
1,1,2-Trichloroethane	0.0198	0.0020	mg/Kg wet	0.0200		99.2	70-130			
Trichloroethylene	0.0215	0.0020	mg/Kg wet	0.0200		107	70-130			
Trichlorofluoromethane (Freon 11)	0.0218	0.010	mg/Kg wet	0.0200		109	70-130			V-20
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0212	0.010	mg/Kg wet	0.0200		106	70-130			
Vinyl Chloride	0.0168	0.010	mg/Kg wet	0.0200		83.9	40-130			†
m+p Xylene	0.0409	0.0040	mg/Kg wet	0.0400		102	70-130			

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QUALITY CONTROL

Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185318 - SW-846 5035										
LCS (B185318-BS1)										
Prepared & Analyzed: 08/31/17										
o-Xylene	0.0204	0.0020	mg/Kg wet	0.0200		102	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0508		mg/Kg wet	0.0500		102	70-130			
Surrogate: Toluene-d8	0.0527		mg/Kg wet	0.0500		105	70-130			
Surrogate: 4-Bromofluorobenzene	0.0515		mg/Kg wet	0.0500		103	70-130			
LCS Dup (B185318-BSD1)										
Prepared & Analyzed: 08/31/17										
Acetone	0.162	0.10	mg/Kg wet	0.200		81.0	70-160	4.32	25	†
Benzene	0.0200	0.0020	mg/Kg wet	0.0200		99.9	70-130	1.11	25	
Bromochloromethane	0.0234	0.0020	mg/Kg wet	0.0200		117	70-130	4.98	25	
Bromodichloromethane	0.0203	0.0020	mg/Kg wet	0.0200		101	70-130	1.49	25	
Bromoform	0.0188	0.0020	mg/Kg wet	0.0200		94.2	70-130	8.54	25	
Bromomethane	0.0189	0.010	mg/Kg wet	0.0200		94.6	40-130	11.4	25	†
2-Butanone (MEK)	0.209	0.040	mg/Kg wet	0.200		104	70-160	0.335	25	†
Carbon Disulfide	0.0225	0.0060	mg/Kg wet	0.0200		113	70-130	0.972	25	
Carbon Tetrachloride	0.0211	0.0020	mg/Kg wet	0.0200		105	70-130	5.16	25	
Chlorobenzene	0.0185	0.0020	mg/Kg wet	0.0200		92.4	70-130	6.80	25	
Chlorodibromomethane	0.0237	0.0010	mg/Kg wet	0.0200		118	70-130	1.62	25	
Chloroethane	0.0163	0.020	mg/Kg wet	0.0200		81.4	70-130	20.9	25	J
Chloroform	0.0201	0.0040	mg/Kg wet	0.0200		100	70-130	0.00	25	
Chloromethane	0.0180	0.010	mg/Kg wet	0.0200		89.9	70-130	2.71	25	
Cyclohexane	0.0246	0.0020	mg/Kg wet	0.0200		123	70-130	2.64	25	V-20
1,2-Dibromo-3-chloropropane (DBCP)	0.0205	0.0020	mg/Kg wet	0.0200		103	70-130	3.44	25	
1,2-Dibromoethane (EDB)	0.0223	0.0010	mg/Kg wet	0.0200		111	70-130	2.22	25	
1,2-Dichlorobenzene	0.0194	0.0020	mg/Kg wet	0.0200		97.2	70-130	7.05	25	
1,3-Dichlorobenzene	0.0199	0.0020	mg/Kg wet	0.0200		99.6	70-130	5.37	25	
1,4-Dichlorobenzene	0.0191	0.0020	mg/Kg wet	0.0200		95.3	70-130	7.77	25	
Dichlorodifluoromethane (Freon 12)	0.0137	0.020	mg/Kg wet	0.0200		68.4	40-160	11.0	25	J †
1,1-Dichloroethane	0.0225	0.0020	mg/Kg wet	0.0200		112	70-130	0.805	25	
1,2-Dichloroethane	0.0229	0.0020	mg/Kg wet	0.0200		114	70-130	0.00	25	
1,1-Dichloroethylene	0.0224	0.0040	mg/Kg wet	0.0200		112	70-130	3.64	25	
cis-1,2-Dichloroethylene	0.0217	0.0020	mg/Kg wet	0.0200		108	70-130	1.28	25	
trans-1,2-Dichloroethylene	0.0265	0.0020	mg/Kg wet	0.0200		133	* 70-130	3.92	25	V-20
1,2-Dichloropropane	0.0241	0.0020	mg/Kg wet	0.0200		120	70-130	10.4	25	
cis-1,3-Dichloropropene	0.0196	0.0010	mg/Kg wet	0.0200		98.2	70-130	2.02	25	
trans-1,3-Dichloropropene	0.0211	0.0010	mg/Kg wet	0.0200		106	70-130	2.06	25	
1,4-Dioxane	0.258	0.10	mg/Kg wet	0.200		129	40-160	22.0	50	V-20 † ‡
Ethylbenzene	0.0191	0.0020	mg/Kg wet	0.0200		95.3	70-130	6.01	25	
2-Hexanone (MBK)	0.220	0.020	mg/Kg wet	0.200		110	70-160	2.77	25	†
Isopropylbenzene (Cumene)	0.0210	0.0020	mg/Kg wet	0.0200		105	70-130	3.92	25	
Methyl Acetate	0.0215	0.0020	mg/Kg wet	0.0200		107	70-130	3.75	25	V-20
Methyl tert-Butyl Ether (MTBE)	0.0203	0.0040	mg/Kg wet	0.0200		102	70-130	1.49	25	
Methyl Cyclohexane	0.0212	0.0020	mg/Kg wet	0.0200		106	70-130	0.283	25	
Methylene Chloride	0.0237	0.020	mg/Kg wet	0.0200		118	40-160	2.13	25	†
4-Methyl-2-pentanone (MIBK)	0.226	0.020	mg/Kg wet	0.200		113	70-160	4.24	25	†
Styrene	0.0191	0.0020	mg/Kg wet	0.0200		95.4	70-130	4.51	25	
1,1,2,2-Tetrachloroethane	0.0192	0.0010	mg/Kg wet	0.0200		95.9	70-130	1.89	25	
Tetrachloroethylene	0.0238	0.0020	mg/Kg wet	0.0200		119	70-130	0.337	25	
Toluene	0.0205	0.0020	mg/Kg wet	0.0200		102	70-130	2.60	25	
1,2,3-Trichlorobenzene	0.0190	0.0020	mg/Kg wet	0.0200		94.9	70-130	8.67	25	
1,2,4-Trichlorobenzene	0.0186	0.0020	mg/Kg wet	0.0200		93.1	70-130	9.42	25	
1,1,1-Trichloroethane	0.0224	0.0020	mg/Kg wet	0.0200		112	70-130	0.446	25	
1,1,2-Trichloroethane	0.0188	0.0020	mg/Kg wet	0.0200		94.0	70-130	5.38	25	

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QUALITY CONTROL
Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185318 - SW-846 5035										
LCS Dup (B185318-BSD1)				Prepared & Analyzed: 08/31/17						
Trichloroethylene	0.0220	0.0020	mg/Kg wet	0.0200		110	70-130	2.48	25	
Trichlorofluoromethane (Freon 11)	0.0222	0.010	mg/Kg wet	0.0200		111	70-130	2.00	25	V-20
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	0.0214	0.010	mg/Kg wet	0.0200		107	70-130	1.22	25	
Vinyl Chloride	0.0207	0.010	mg/Kg wet	0.0200		103	40-130	20.8	25	†
m+p Xylene	0.0388	0.0040	mg/Kg wet	0.0400		97.1	70-130	5.22	25	
o-Xylene	0.0190	0.0020	mg/Kg wet	0.0200		94.9	70-130	7.31	25	
Surrogate: 1,2-Dichloroethane-d4	0.0522		mg/Kg wet	0.0500		104	70-130			
Surrogate: Toluene-d8	0.0527		mg/Kg wet	0.0500		105	70-130			
Surrogate: 4-Bromofluorobenzene	0.0523		mg/Kg wet	0.0500		105	70-130			

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QUALITY CONTROL

Polychlorinated Biphenyls By GC/ECD - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185683 - SW-846 3580A										
Blank (B185683-BLK1)										
Prepared & Analyzed: 09/07/17										
Aroclor-1016	ND	1.0	mg/Kg							
Aroclor-1016 [2C]	ND	1.0	mg/Kg							
Aroclor-1221	ND	1.0	mg/Kg							
Aroclor-1221 [2C]	ND	1.0	mg/Kg							
Aroclor-1232	ND	1.0	mg/Kg							
Aroclor-1232 [2C]	ND	1.0	mg/Kg							
Aroclor-1242	ND	1.0	mg/Kg							
Aroclor-1242 [2C]	ND	1.0	mg/Kg							
Aroclor-1248	ND	1.0	mg/Kg							
Aroclor-1248 [2C]	ND	1.0	mg/Kg							
Aroclor-1254	ND	1.0	mg/Kg							
Aroclor-1254 [2C]	ND	1.0	mg/Kg							
Aroclor-1260	ND	1.0	mg/Kg							
Aroclor-1260 [2C]	ND	1.0	mg/Kg							
Aroclor-1262	ND	1.0	mg/Kg							
Aroclor-1262 [2C]	ND	1.0	mg/Kg							
Aroclor-1268	ND	1.0	mg/Kg							
Aroclor-1268 [2C]	ND	1.0	mg/Kg							
Surrogate: Decachlorobiphenyl	6.72		mg/Kg	9.99		67.3	30-150			
Surrogate: Decachlorobiphenyl [2C]	7.08		mg/Kg	9.99		70.9	30-150			
Surrogate: Tetrachloro-m-xylene	6.16		mg/Kg	9.99		61.7	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	5.45		mg/Kg	9.99		54.5	30-150			
LCS (B185683-BS1)										
Prepared & Analyzed: 09/07/17										
Aroclor-1260	27	5.9	mg/Kg	27.4		100	85-115			
Aroclor-1260 [2C]	26	5.9	mg/Kg	27.4		94.7	85-115			
Surrogate: Decachlorobiphenyl	54.6		mg/Kg	59.0		92.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	49.5		mg/Kg	59.0		83.9	30-150			
Surrogate: Tetrachloro-m-xylene	48.4		mg/Kg	59.0		82.1	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	35.7		mg/Kg	59.0		60.6	30-150			
LCS Dup (B185683-BSD1)										
Prepared & Analyzed: 09/07/17										
Aroclor-1260	29	6.5	mg/Kg	27.4		106	85-115	5.77	30	
Aroclor-1260 [2C]	28	6.5	mg/Kg	27.4		101	85-115	5.97	30	
Surrogate: Decachlorobiphenyl	62.8		mg/Kg	64.9		96.8	30-150			
Surrogate: Decachlorobiphenyl [2C]	56.5		mg/Kg	64.9		87.0	30-150			
Surrogate: Tetrachloro-m-xylene	55.0		mg/Kg	64.9		84.7	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	40.0		mg/Kg	64.9		61.6	30-150			
Matrix Spike (B185683-MS1)										
Source: 17H1560-14 Prepared & Analyzed: 09/07/17										
Aroclor-1260	3.6	1.0	mg/Kg	4.24	ND	86.0	40-140			
Aroclor-1260 [2C]	3.5	1.0	mg/Kg	4.24	ND	83.4	40-140			
Surrogate: Decachlorobiphenyl	7.13		mg/Kg	9.97		71.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	7.28		mg/Kg	9.97		73.1	30-150			
Surrogate: Tetrachloro-m-xylene	12.5		mg/Kg	9.97		125	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	7.81		mg/Kg	9.97		78.4	30-150			

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QUALITY CONTROL
Polychlorinated Biphenyls By GC/ECD - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185683 - SW-846 3580A
Matrix Spike Dup (B185683-MSD1)
Source: 17H1560-14

Prepared & Analyzed: 09/07/17

Aroclor-1260	4.2	1.0	mg/Kg	4.63	ND	89.8	40-140	13.2		
Aroclor-1260 [2C]	4.0	1.0	mg/Kg	4.63	ND	86.6	40-140	12.8		
Surrogate: Decachlorobiphenyl	7.38		mg/Kg	9.96		74.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	7.46		mg/Kg	9.96		74.9	30-150			
Surrogate: Tetrachloro-m-xylene	10.7		mg/Kg	9.96		107	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	7.51		mg/Kg	9.96		75.4	30-150			

Reference (B185683-SRM1)

Prepared: 09/07/17 Analyzed: 09/12/17

Aroclor-1260	27.3	3.2	mg/Kg	50.0		54.6	0-200			
Aroclor-1260 [2C]	39.1	3.2	mg/Kg	50.0		78.2	0-200			
Surrogate: Decachlorobiphenyl	30.8		mg/Kg	31.7		97.1	30-150			
Surrogate: Decachlorobiphenyl [2C]	39.4		mg/Kg	31.7		124	30-150			
Surrogate: Tetrachloro-m-xylene	23.6		mg/Kg	31.7		74.4	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	32.5		mg/Kg	31.7		102	30-150			

Batch B185743 - SW-846 3546
Blank (B185743-BLK1)

Prepared: 09/07/17 Analyzed: 09/10/17

Aroclor-1016	ND	0.020	mg/Kg wet							
Aroclor-1016 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1221	ND	0.020	mg/Kg wet							
Aroclor-1221 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1232	ND	0.020	mg/Kg wet							
Aroclor-1232 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1242	ND	0.020	mg/Kg wet							
Aroclor-1242 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1248	ND	0.020	mg/Kg wet							
Aroclor-1248 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1254	ND	0.020	mg/Kg wet							
Aroclor-1254 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1260	ND	0.020	mg/Kg wet							
Aroclor-1260 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1262	ND	0.020	mg/Kg wet							
Aroclor-1262 [2C]	ND	0.020	mg/Kg wet							
Aroclor-1268	ND	0.020	mg/Kg wet							
Aroclor-1268 [2C]	ND	0.020	mg/Kg wet							
Surrogate: Decachlorobiphenyl	0.213		mg/Kg wet	0.200		107	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.231		mg/Kg wet	0.200		116	30-150			
Surrogate: Tetrachloro-m-xylene	0.182		mg/Kg wet	0.200		90.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.195		mg/Kg wet	0.200		97.7	30-150			

LCS (B185743-BS1)

Prepared: 09/07/17 Analyzed: 09/10/17

Aroclor-1016	0.19	0.020	mg/Kg wet	0.200		96.9	40-140			
Aroclor-1016 [2C]	0.22	0.020	mg/Kg wet	0.200		108	40-140			
Aroclor-1260	0.18	0.020	mg/Kg wet	0.200		89.9	40-140			
Aroclor-1260 [2C]	0.20	0.020	mg/Kg wet	0.200		98.9	40-140			
Surrogate: Decachlorobiphenyl	0.218		mg/Kg wet	0.200		109	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.239		mg/Kg wet	0.200		120	30-150			
Surrogate: Tetrachloro-m-xylene	0.192		mg/Kg wet	0.200		95.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.207		mg/Kg wet	0.200		104	30-150			

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QUALITY CONTROL
Polychlorinated Biphenyls By GC/ECD - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185743 - SW-846 3546
LCS Dup (B185743-BSD1)

Prepared: 09/07/17 Analyzed: 09/10/17

Aroclor-1016	0.17	0.020	mg/Kg wet	0.200		87.3	40-140	10.3	30	
Aroclor-1016 [2C]	0.19	0.020	mg/Kg wet	0.200		96.3	40-140	11.0	30	
Aroclor-1260	0.17	0.020	mg/Kg wet	0.200		86.9	40-140	3.31	30	
Aroclor-1260 [2C]	0.19	0.020	mg/Kg wet	0.200		95.1	40-140	3.91	30	
Surrogate: Decachlorobiphenyl	0.215		mg/Kg wet	0.200		107	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.233		mg/Kg wet	0.200		116	30-150			
Surrogate: Tetrachloro-m-xylene	0.161		mg/Kg wet	0.200		80.6	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.172		mg/Kg wet	0.200		86.0	30-150			

Batch B185745 - SW-846 3546
Blank (B185745-BLK1)

Prepared: 09/07/17 Analyzed: 09/09/17

Aroclor-1016	ND	0.10	mg/Kg							
Aroclor-1016 [2C]	ND	0.10	mg/Kg							
Aroclor-1221	ND	0.10	mg/Kg							
Aroclor-1221 [2C]	ND	0.10	mg/Kg							
Aroclor-1232	ND	0.10	mg/Kg							
Aroclor-1232 [2C]	ND	0.10	mg/Kg							
Aroclor-1242	ND	0.10	mg/Kg							
Aroclor-1242 [2C]	ND	0.10	mg/Kg							
Aroclor-1248	ND	0.10	mg/Kg							
Aroclor-1248 [2C]	ND	0.10	mg/Kg							
Aroclor-1254	ND	0.10	mg/Kg							
Aroclor-1254 [2C]	ND	0.10	mg/Kg							
Aroclor-1260	ND	0.10	mg/Kg							
Aroclor-1260 [2C]	ND	0.10	mg/Kg							
Aroclor-1262	ND	0.10	mg/Kg							
Aroclor-1262 [2C]	ND	0.10	mg/Kg							
Aroclor-1268	ND	0.10	mg/Kg							
Aroclor-1268 [2C]	ND	0.10	mg/Kg							
Surrogate: Decachlorobiphenyl	1.01		mg/Kg	1.00		101	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.964		mg/Kg	1.00		96.4	30-150			
Surrogate: Tetrachloro-m-xylene	0.960		mg/Kg	1.00		96.0	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.963		mg/Kg	1.00		96.3	30-150			

LCS (B185745-BS1)

Prepared: 09/07/17 Analyzed: 09/09/17

Aroclor-1016	0.94	0.10	mg/Kg	1.00		94.0	40-140			
Aroclor-1016 [2C]	0.91	0.10	mg/Kg	1.00		90.6	40-140			
Aroclor-1260	0.86	0.10	mg/Kg	1.00		86.0	40-140			
Aroclor-1260 [2C]	0.79	0.10	mg/Kg	1.00		79.5	40-140			
Surrogate: Decachlorobiphenyl	1.01		mg/Kg	1.00		101	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.964		mg/Kg	1.00		96.4	30-150			
Surrogate: Tetrachloro-m-xylene	0.956		mg/Kg	1.00		95.6	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.967		mg/Kg	1.00		96.7	30-150			

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QUALITY CONTROL
Polychlorinated Biphenyls By GC/ECD - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185745 - SW-846 3546
LCS Dup (B185745-BSD1)

Prepared: 09/07/17 Analyzed: 09/09/17

Aroclor-1016	0.91	0.10	mg/Kg	1.00		91.3	40-140	2.97	30	
Aroclor-1016 [2C]	0.89	0.10	mg/Kg	1.00		89.3	40-140	1.45	30	
Aroclor-1260	0.85	0.10	mg/Kg	1.00		84.9	40-140	1.33	30	
Aroclor-1260 [2C]	0.78	0.10	mg/Kg	1.00		78.0	40-140	1.94	30	
Surrogate: Decachlorobiphenyl	0.990		mg/Kg	1.00		99.0	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.950		mg/Kg	1.00		95.0	30-150			
Surrogate: Tetrachloro-m-xylene	0.890		mg/Kg	1.00		89.0	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.899		mg/Kg	1.00		89.9	30-150			

Batch B185823 - SW-846 3546
Blank (B185823-BLK1)

Prepared: 09/08/17 Analyzed: 09/11/17

Aroclor-1016	ND	0.20	mg/Kg							
Aroclor-1016 [2C]	ND	0.20	mg/Kg							
Aroclor-1221	ND	0.20	mg/Kg							
Aroclor-1221 [2C]	ND	0.20	mg/Kg							
Aroclor-1232	ND	0.20	mg/Kg							
Aroclor-1232 [2C]	ND	0.20	mg/Kg							
Aroclor-1242	ND	0.20	mg/Kg							
Aroclor-1242 [2C]	ND	0.20	mg/Kg							
Aroclor-1248	ND	0.20	mg/Kg							
Aroclor-1248 [2C]	ND	0.20	mg/Kg							
Aroclor-1254	ND	0.20	mg/Kg							
Aroclor-1254 [2C]	ND	0.20	mg/Kg							
Aroclor-1260	ND	0.20	mg/Kg							
Aroclor-1260 [2C]	ND	0.20	mg/Kg							
Aroclor-1262	ND	0.20	mg/Kg							
Aroclor-1262 [2C]	ND	0.20	mg/Kg							
Aroclor-1268	ND	0.20	mg/Kg							
Aroclor-1268 [2C]	ND	0.20	mg/Kg							
Surrogate: Decachlorobiphenyl	4.12		mg/Kg	4.00		103	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.83		mg/Kg	4.00		95.8	30-150			
Surrogate: Tetrachloro-m-xylene	3.59		mg/Kg	4.00		89.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	3.50		mg/Kg	4.00		87.4	30-150			

LCS (B185823-BS1)

Prepared: 09/08/17 Analyzed: 09/11/17

Aroclor-1016	3.8	0.20	mg/Kg	4.00		95.9	40-140			
Aroclor-1016 [2C]	3.6	0.20	mg/Kg	4.00		90.8	40-140			
Aroclor-1260	3.5	0.20	mg/Kg	4.00		88.7	40-140			
Aroclor-1260 [2C]	3.2	0.20	mg/Kg	4.00		79.6	40-140			
Surrogate: Decachlorobiphenyl	4.12		mg/Kg	4.00		103	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.84		mg/Kg	4.00		95.9	30-150			
Surrogate: Tetrachloro-m-xylene	3.57		mg/Kg	4.00		89.4	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	3.49		mg/Kg	4.00		87.3	30-150			

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QUALITY CONTROL

Polychlorinated Biphenyls By GC/ECD - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185823 - SW-846 3546

LCS Dup (B185823-BSD1)

Prepared: 09/08/17 Analyzed: 09/11/17

Aroclor-1016	3.9	0.20	mg/Kg	4.00		98.6	40-140	2.74		
Aroclor-1016 [2C]	3.7	0.20	mg/Kg	4.00		93.1	40-140	2.50		
Aroclor-1260	3.6	0.20	mg/Kg	4.00		90.3	40-140	1.87		
Aroclor-1260 [2C]	3.2	0.20	mg/Kg	4.00		81.0	40-140	1.77		
Surrogate: Decachlorobiphenyl	4.21		mg/Kg	4.00		105	30-150			
Surrogate: Decachlorobiphenyl [2C]	3.91		mg/Kg	4.00		97.8	30-150			
Surrogate: Tetrachloro-m-xylene	3.80		mg/Kg	4.00		95.0	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	3.70		mg/Kg	4.00		92.5	30-150			

Batch B185824 - SW-846 3546

Blank (B185824-BLK1)

Prepared: 09/08/17 Analyzed: 09/11/17

Aroclor-1016	ND	0.50	mg/Kg							
Aroclor-1016 [2C]	ND	0.50	mg/Kg							
Aroclor-1221	ND	0.50	mg/Kg							
Aroclor-1221 [2C]	ND	0.50	mg/Kg							
Aroclor-1232	ND	0.50	mg/Kg							
Aroclor-1232 [2C]	ND	0.50	mg/Kg							
Aroclor-1242	ND	0.50	mg/Kg							
Aroclor-1242 [2C]	ND	0.50	mg/Kg							
Aroclor-1248	ND	0.50	mg/Kg							
Aroclor-1248 [2C]	ND	0.50	mg/Kg							
Aroclor-1254	ND	0.50	mg/Kg							
Aroclor-1254 [2C]	ND	0.50	mg/Kg							
Aroclor-1260	ND	0.50	mg/Kg							
Aroclor-1260 [2C]	ND	0.50	mg/Kg							
Aroclor-1262	ND	0.50	mg/Kg							
Aroclor-1262 [2C]	ND	0.50	mg/Kg							
Aroclor-1268	ND	0.50	mg/Kg							
Aroclor-1268 [2C]	ND	0.50	mg/Kg							
Surrogate: Decachlorobiphenyl	10.5		mg/Kg	10.0		105	30-150			
Surrogate: Decachlorobiphenyl [2C]	9.73		mg/Kg	10.0		97.3	30-150			
Surrogate: Tetrachloro-m-xylene	9.60		mg/Kg	10.0		96.0	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	9.31		mg/Kg	10.0		93.1	30-150			

LCS (B185824-BS1)

Prepared: 09/08/17 Analyzed: 09/11/17

Aroclor-1016	2.4	0.50	mg/Kg	2.50		94.6	40-140			
Aroclor-1016 [2C]	2.4	0.50	mg/Kg	2.50		95.6	40-140			
Aroclor-1260	2.1	0.50	mg/Kg	2.50		85.2	40-140			
Aroclor-1260 [2C]	2.1	0.50	mg/Kg	2.50		85.4	40-140			
Surrogate: Decachlorobiphenyl	9.79		mg/Kg	10.0		97.9	30-150			
Surrogate: Decachlorobiphenyl [2C]	9.13		mg/Kg	10.0		91.3	30-150			
Surrogate: Tetrachloro-m-xylene	8.99		mg/Kg	10.0		89.9	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	8.77		mg/Kg	10.0		87.7	30-150			

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QUALITY CONTROL
Polychlorinated Biphenyls By GC/ECD - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185824 - SW-846 3546
LCS Dup (B185824-BSD1)

Prepared: 09/08/17 Analyzed: 09/11/17

Aroclor-1016	2.3	0.50	mg/Kg	2.50		93.9	40-140	0.785		
Aroclor-1016 [2C]	2.4	0.50	mg/Kg	2.50		94.8	40-140	0.815		
Aroclor-1260	2.2	0.50	mg/Kg	2.50		86.0	40-140	0.953		
Aroclor-1260 [2C]	2.1	0.50	mg/Kg	2.50		85.6	40-140	0.269		
Surrogate: Decachlorobiphenyl	9.76		mg/Kg	10.0		97.6	30-150			
Surrogate: Decachlorobiphenyl [2C]	9.08		mg/Kg	10.0		90.8	30-150			
Surrogate: Tetrachloro-m-xylene	8.68		mg/Kg	10.0		86.8	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	8.50		mg/Kg	10.0		85.0	30-150			

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QUALITY CONTROL
Metals Analyses (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185875 - SW-846 3050B										
Blank (B185875-BLK1)				Prepared & Analyzed: 09/11/17						
Lead	ND	25	mg/Kg							
LCS (B185875-BS1)				Prepared & Analyzed: 09/11/17						
Lead	88.7	25	mg/Kg	94.3		94.1	80-120			
LCS Dup (B185875-BSD1)				Prepared & Analyzed: 09/11/17						
Lead	106	25	mg/Kg	94.3		112	80-120	17.6	26.4	
MRL Check (B185875-MRL1)				Prepared & Analyzed: 09/11/17						
Lead	36.2	25	mg/Kg	25.3		143 *	80-120			L-10

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QUALITY CONTROL
Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185237 - SW-846 9045C										
LCS (B185237-BS1)				Prepared & Analyzed: 08/30/17						
pH	6.05		pH Units	6.00		101	98.5-110			
Batch B185238 - SW-846 9045C										
LCS (B185238-BS1)				Prepared & Analyzed: 08/30/17						
pH	6.05		pH Units	6.00		101	98.5-110			
Duplicate (B185238-DUP1)				Source: 17H1560-07		Prepared & Analyzed: 08/30/17				
pH	11		pH Units		12			0.261	5	H-01
Batch B185539 - SW-846 9030A										
Blank (B185539-BLK1)				Prepared: 09/05/17 Analyzed: 09/06/17						
Reactive Sulfide	ND	2.0	mg/Kg							
LCS (B185539-BS1)				Prepared: 09/05/17 Analyzed: 09/06/17						
Reactive Sulfide	15	2.0	mg/Kg	14.8		101	64.5-120			
Batch B185540 - SW-846 9014										
Blank (B185540-BLK1)				Prepared: 09/05/17 Analyzed: 09/06/17						
Reactive Cyanide	ND	0.40	mg/Kg							
LCS (B185540-BS1)				Prepared: 09/05/17 Analyzed: 09/06/17						
Reactive Cyanide	10	0.40	mg/Kg	10.0		103	85.9-110			
Batch B185645 - SW-846 9014										
Blank (B185645-BLK1)				Prepared: 09/06/17 Analyzed: 09/08/17						
Reactive Cyanide	ND	0.40	mg/Kg							
LCS (B185645-BS1)				Prepared: 09/06/17 Analyzed: 09/08/17						
Reactive Cyanide	10	0.40	mg/Kg	10.0		103	85.9-110			
Batch B185647 - SW-846 9030A										
Blank (B185647-BLK1)				Prepared: 09/06/17 Analyzed: 09/08/17						
Reactive Sulfide	ND	2.0	mg/Kg							

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QUALITY CONTROL
Conventional Chemistry Parameters by EPA/APHA/SW-846 Methods (Total) - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185647 - SW-846 9030A
LCS (B185647-BS1)

Prepared: 09/06/17 Analyzed: 09/08/17

Reactive Sulfide	15	2.0	mg/Kg	14.8		104	64.5-120			

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QUALITY CONTROL
TCLP - Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185702 - SW-846 5030B
Blank (B185702-BLK1)

Prepared: 09/07/17 Analyzed: 09/08/17

Benzene	ND	0.010	mg/L							
2-Butanone (MEK)	ND	0.20	mg/L							
Carbon Tetrachloride	ND	0.050	mg/L							
Chlorobenzene	ND	0.010	mg/L							
Chloroform	ND	0.020	mg/L							
1,4-Dichlorobenzene	ND	0.010	mg/L							
1,2-Dichloroethane	ND	0.010	mg/L							
1,1-Dichloroethylene	ND	0.010	mg/L							
Tetrachloroethylene	0.0030	0.010	mg/L							B-07, J
Trichloroethylene	ND	0.010	mg/L							
Vinyl Chloride	ND	0.020	mg/L							

Surrogate: 1,2-Dichloroethane-d4	0.0292		mg/L	0.0250		117	70-130			
Surrogate: Toluene-d8	0.0262		mg/L	0.0250		105	70-130			
Surrogate: 4-Bromofluorobenzene	0.0246		mg/L	0.0250		98.4	70-130			

LCS (B185702-BS1)

Prepared: 09/07/17 Analyzed: 09/08/17

Benzene	0.0104	0.0010	mg/L	0.0100		104	70-130			
2-Butanone (MEK)	0.0834	0.020	mg/L	0.100		83.4	40-160			†
Carbon Tetrachloride	0.0116	0.0050	mg/L	0.0100		116	70-130			
Chlorobenzene	0.00918	0.0010	mg/L	0.0100		91.8	70-130			
Chloroform	0.0111	0.0020	mg/L	0.0100		111	70-130			
1,4-Dichlorobenzene	0.00959	0.0010	mg/L	0.0100		95.9	70-130			
1,2-Dichloroethane	0.0111	0.0010	mg/L	0.0100		111	70-130			
1,1-Dichloroethylene	0.00979	0.0010	mg/L	0.0100		97.9	70-130			
Tetrachloroethylene	0.00998	0.0010	mg/L	0.0100		99.8	70-130			
Trichloroethylene	0.0108	0.0010	mg/L	0.0100		108	70-130			
Vinyl Chloride	0.00638	0.0020	mg/L	0.0100		63.8	40-160			†

Surrogate: 1,2-Dichloroethane-d4	0.0283		mg/L	0.0250		113	70-130			
Surrogate: Toluene-d8	0.0259		mg/L	0.0250		103	70-130			
Surrogate: 4-Bromofluorobenzene	0.0246		mg/L	0.0250		98.4	70-130			

LCS Dup (B185702-BSD1)

Prepared: 09/07/17 Analyzed: 09/08/17

Benzene	0.0109	0.0010	mg/L	0.0100		109	70-130	4.70	25	
2-Butanone (MEK)	0.0900	0.020	mg/L	0.100		90.0	40-160	7.58	25	†
Carbon Tetrachloride	0.0117	0.0050	mg/L	0.0100		117	70-130	1.37	25	
Chlorobenzene	0.00990	0.0010	mg/L	0.0100		99.0	70-130	7.55	25	
Chloroform	0.0114	0.0020	mg/L	0.0100		114	70-130	2.40	25	
1,4-Dichlorobenzene	0.00983	0.0010	mg/L	0.0100		98.3	70-130	2.47	25	
1,2-Dichloroethane	0.0115	0.0010	mg/L	0.0100		115	70-130	4.16	25	
1,1-Dichloroethylene	0.00975	0.0010	mg/L	0.0100		97.5	70-130	0.409	25	
Tetrachloroethylene	0.0107	0.0010	mg/L	0.0100		107	70-130	7.24	25	
Trichloroethylene	0.0112	0.0010	mg/L	0.0100		112	70-130	3.90	25	
Vinyl Chloride	0.00706	0.0020	mg/L	0.0100		70.6	40-160	10.1	25	†

Surrogate: 1,2-Dichloroethane-d4	0.0286		mg/L	0.0250		114	70-130			
Surrogate: Toluene-d8	0.0264		mg/L	0.0250		106	70-130			
Surrogate: 4-Bromofluorobenzene	0.0248		mg/L	0.0250		99.1	70-130			

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QUALITY CONTROL

TCLP - Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185873 - SW-846 5030B										
Blank (B185873-BLK1)				Prepared & Analyzed: 09/11/17						
Benzene	ND	0.010	mg/L							
2-Butanone (MEK)	ND	0.20	mg/L							
Carbon Tetrachloride	ND	0.050	mg/L							
Chlorobenzene	ND	0.010	mg/L							
Chloroform	ND	0.020	mg/L							
1,4-Dichlorobenzene	ND	0.010	mg/L							
1,2-Dichloroethane	ND	0.010	mg/L							
1,1-Dichloroethylene	ND	0.010	mg/L							
Tetrachloroethylene	ND	0.010	mg/L							
Trichloroethylene	ND	0.010	mg/L							
Vinyl Chloride	ND	0.020	mg/L							
Surrogate: 1,2-Dichloroethane-d4	0.0292		mg/L	0.0250		117	70-130			
Surrogate: Toluene-d8	0.0260		mg/L	0.0250		104	70-130			
Surrogate: 4-Bromofluorobenzene	0.0247		mg/L	0.0250		98.9	70-130			
LCS (B185873-BS1)				Prepared & Analyzed: 09/11/17						
Benzene	0.0104	0.0010	mg/L	0.0100		104	70-130			
2-Butanone (MEK)	0.0877	0.020	mg/L	0.100		87.7	40-160			†
Carbon Tetrachloride	0.0118	0.0050	mg/L	0.0100		118	70-130			V-20
Chlorobenzene	0.00941	0.0010	mg/L	0.0100		94.1	70-130			
Chloroform	0.0114	0.0020	mg/L	0.0100		114	70-130			
1,4-Dichlorobenzene	0.00962	0.0010	mg/L	0.0100		96.2	70-130			
1,2-Dichloroethane	0.0118	0.0010	mg/L	0.0100		118	70-130			
1,1-Dichloroethylene	0.00988	0.0010	mg/L	0.0100		98.8	70-130			
Tetrachloroethylene	0.0113	0.0010	mg/L	0.0100		113	70-130			
Trichloroethylene	0.0108	0.0010	mg/L	0.0100		108	70-130			
Vinyl Chloride	0.00720	0.0020	mg/L	0.0100		72.0	40-160			†
Surrogate: 1,2-Dichloroethane-d4	0.0295		mg/L	0.0250		118	70-130			
Surrogate: Toluene-d8	0.0259		mg/L	0.0250		104	70-130			
Surrogate: 4-Bromofluorobenzene	0.0258		mg/L	0.0250		103	70-130			
LCS Dup (B185873-BSD1)				Prepared & Analyzed: 09/11/17						
Benzene	0.0101	0.0010	mg/L	0.0100		101	70-130	3.71	25	
2-Butanone (MEK)	0.0872	0.020	mg/L	0.100		87.2	40-160	0.618	25	†
Carbon Tetrachloride	0.0115	0.0050	mg/L	0.0100		115	70-130	2.65	25	V-20
Chlorobenzene	0.00950	0.0010	mg/L	0.0100		95.0	70-130	0.952	25	
Chloroform	0.0110	0.0020	mg/L	0.0100		110	70-130	4.10	25	
1,4-Dichlorobenzene	0.00963	0.0010	mg/L	0.0100		96.3	70-130	0.104	25	
1,2-Dichloroethane	0.0114	0.0010	mg/L	0.0100		114	70-130	3.88	25	
1,1-Dichloroethylene	0.00995	0.0010	mg/L	0.0100		99.5	70-130	0.706	25	
Tetrachloroethylene	0.0109	0.0010	mg/L	0.0100		109	70-130	4.06	25	
Trichloroethylene	0.0102	0.0010	mg/L	0.0100		102	70-130	5.25	25	
Vinyl Chloride	0.00691	0.0020	mg/L	0.0100		69.1	40-160	4.11	25	†
Surrogate: 1,2-Dichloroethane-d4	0.0290		mg/L	0.0250		116	70-130			
Surrogate: Toluene-d8	0.0256		mg/L	0.0250		102	70-130			
Surrogate: 4-Bromofluorobenzene	0.0253		mg/L	0.0250		101	70-130			

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QUALITY CONTROL

TCLP - Volatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185874 - SW-846 5030B										
Blank (B185874-BLK1)				Prepared & Analyzed: 09/08/17						
Benzene	ND	0.010	mg/L							
2-Butanone (MEK)	ND	0.20	mg/L							
Carbon Tetrachloride	ND	0.050	mg/L							
Chlorobenzene	ND	0.010	mg/L							
Chloroform	ND	0.020	mg/L							
1,4-Dichlorobenzene	ND	0.010	mg/L							
1,2-Dichloroethane	ND	0.010	mg/L							
1,1-Dichloroethylene	ND	0.010	mg/L							
Tetrachloroethylene	0.0030	0.010	mg/L							B-07, J
Trichloroethylene	ND	0.010	mg/L							
Vinyl Chloride	ND	0.020	mg/L							
Surrogate: 1,2-Dichloroethane-d4	0.0292		mg/L	0.0250		117	70-130			
Surrogate: Toluene-d8	0.0262		mg/L	0.0250		105	70-130			
Surrogate: 4-Bromofluorobenzene	0.0246		mg/L	0.0250		98.4	70-130			
LCS (B185874-BS1)				Prepared & Analyzed: 09/08/17						
Benzene	0.0104	0.0010	mg/L	0.0100		104	70-130			
2-Butanone (MEK)	0.0834	0.020	mg/L	0.100		83.4	40-160			†
Carbon Tetrachloride	0.0116	0.0050	mg/L	0.0100		116	70-130			
Chlorobenzene	0.00918	0.0010	mg/L	0.0100		91.8	70-130			
Chloroform	0.0111	0.0020	mg/L	0.0100		111	70-130			
1,4-Dichlorobenzene	0.00959	0.0010	mg/L	0.0100		95.9	70-130			
1,2-Dichloroethane	0.0111	0.0010	mg/L	0.0100		111	70-130			
1,1-Dichloroethylene	0.00979	0.0010	mg/L	0.0100		97.9	70-130			
Tetrachloroethylene	0.00998	0.0010	mg/L	0.0100		99.8	70-130			
Trichloroethylene	0.0108	0.0010	mg/L	0.0100		108	70-130			
Vinyl Chloride	0.00638	0.0020	mg/L	0.0100		63.8	40-160			†
Surrogate: 1,2-Dichloroethane-d4	0.0283		mg/L	0.0250		113	70-130			
Surrogate: Toluene-d8	0.0259		mg/L	0.0250		103	70-130			
Surrogate: 4-Bromofluorobenzene	0.0246		mg/L	0.0250		98.4	70-130			
LCS Dup (B185874-BSD1)				Prepared & Analyzed: 09/08/17						
Benzene	0.0109	0.0010	mg/L	0.0100		109	70-130	4.70	25	
2-Butanone (MEK)	0.0900	0.020	mg/L	0.100		90.0	40-160	7.58	25	†
Carbon Tetrachloride	0.0117	0.0050	mg/L	0.0100		117	70-130	1.37	25	
Chlorobenzene	0.00990	0.0010	mg/L	0.0100		99.0	70-130	7.55	25	
Chloroform	0.0114	0.0020	mg/L	0.0100		114	70-130	2.40	25	
1,4-Dichlorobenzene	0.00983	0.0010	mg/L	0.0100		98.3	70-130	2.47	25	
1,2-Dichloroethane	0.0115	0.0010	mg/L	0.0100		115	70-130	4.16	25	
1,1-Dichloroethylene	0.00975	0.0010	mg/L	0.0100		97.5	70-130	0.409	25	
Tetrachloroethylene	0.0107	0.0010	mg/L	0.0100		107	70-130	7.24	25	
Trichloroethylene	0.0112	0.0010	mg/L	0.0100		112	70-130	3.90	25	
Vinyl Chloride	0.00706	0.0020	mg/L	0.0100		70.6	40-160	10.1	25	†
Surrogate: 1,2-Dichloroethane-d4	0.0286		mg/L	0.0250		114	70-130			
Surrogate: Toluene-d8	0.0264		mg/L	0.0250		106	70-130			
Surrogate: 4-Bromofluorobenzene	0.0248		mg/L	0.0250		99.1	70-130			

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QUALITY CONTROL

TCLP - Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185800 - SW-846 3510C										
Blank (B185800-BLK1)										
Prepared: 09/08/17 Analyzed: 09/11/17										
2,4-Dinitrotoluene	ND	0.050	mg/L							
Hexachlorobenzene	ND	0.050	mg/L							
Hexachlorobutadiene	ND	0.050	mg/L							
Hexachloroethane	ND	0.050	mg/L							
2-Methylphenol	ND	0.050	mg/L							
3/4-Methylphenol	ND	0.050	mg/L							
Nitrobenzene	ND	0.050	mg/L							
Pentachlorophenol	ND	0.050	mg/L							
Pyridine	ND	0.025	mg/L							
2,4,5-Trichlorophenol	ND	0.050	mg/L							
2,4,6-Trichlorophenol	ND	0.050	mg/L							
Surrogate: 2-Fluorophenol	0.550		mg/L	1.00		55.0	15-110			
Surrogate: Phenol-d6	0.466		mg/L	1.00		46.6	15-110			
Surrogate: Nitrobenzene-d5	0.355		mg/L	0.500		71.0	30-130			
Surrogate: 2-Fluorobiphenyl	0.350		mg/L	0.500		70.1	30-130			
Surrogate: 2,4,6-Tribromophenol	0.941		mg/L	1.00		94.1	15-110			
Surrogate: p-Terphenyl-d14	0.497		mg/L	0.500		99.4	30-130			
LCS (B185800-BS1)										
Prepared: 09/08/17 Analyzed: 09/11/17										
2,4-Dinitrotoluene	0.201	0.050	mg/L	0.250		80.3	40-140			
Hexachlorobenzene	0.212	0.050	mg/L	0.250		84.7	40-140			
Hexachlorobutadiene	0.230	0.050	mg/L	0.250		92.0	40-140			
Hexachloroethane	0.210	0.050	mg/L	0.250		83.9	40-140			
2-Methylphenol	0.162	0.050	mg/L	0.250		64.7	30-130			
3/4-Methylphenol	0.176	0.050	mg/L	0.250		70.2	30-130			
Nitrobenzene	0.208	0.050	mg/L	0.250		83.0	40-140			
Pentachlorophenol	0.161	0.050	mg/L	0.250		64.2	30-130			
Pyridine	0.174	0.025	mg/L	0.250		69.7	10-140			†
2,4,5-Trichlorophenol	0.196	0.050	mg/L	0.250		78.5	30-130			
2,4,6-Trichlorophenol	0.199	0.050	mg/L	0.250		79.6	30-130			
Surrogate: 2-Fluorophenol	0.826		mg/L	1.00		82.6	15-110			
Surrogate: Phenol-d6	0.815		mg/L	1.00		81.5	15-110			
Surrogate: Nitrobenzene-d5	0.497		mg/L	0.500		99.5	30-130			
Surrogate: 2-Fluorobiphenyl	0.426		mg/L	0.500		85.2	30-130			
Surrogate: 2,4,6-Tribromophenol	0.982		mg/L	1.00		98.2	15-110			
Surrogate: p-Terphenyl-d14	0.509		mg/L	0.500		102	30-130			
LCS Dup (B185800-BSD1)										
Prepared: 09/08/17 Analyzed: 09/11/17										
2,4-Dinitrotoluene	0.204	0.050	mg/L	0.250		81.7	40-140	1.70	20	
Hexachlorobenzene	0.227	0.050	mg/L	0.250		90.7	40-140	6.82	20	
Hexachlorobutadiene	0.253	0.050	mg/L	0.250		101	40-140	9.72	20	
Hexachloroethane	0.213	0.050	mg/L	0.250		85.2	40-140	1.61	50	‡
2-Methylphenol	0.166	0.050	mg/L	0.250		66.3	30-130	2.38	20	
3/4-Methylphenol	0.183	0.050	mg/L	0.250		73.0	30-130	3.91	20	
Nitrobenzene	0.210	0.050	mg/L	0.250		83.9	40-140	1.10	20	
Pentachlorophenol	0.160	0.050	mg/L	0.250		64.1	30-130	0.156	50	‡
Pyridine	0.172	0.025	mg/L	0.250		68.7	10-140	1.50	50	† ‡
2,4,5-Trichlorophenol	0.205	0.050	mg/L	0.250		82.1	30-130	4.38	20	
2,4,6-Trichlorophenol	0.219	0.050	mg/L	0.250		87.6	30-130	9.57	50	‡
Surrogate: 2-Fluorophenol	0.837		mg/L	1.00		83.7	15-110			
Surrogate: Phenol-d6	0.820		mg/L	1.00		82.0	15-110			
Surrogate: Nitrobenzene-d5	0.486		mg/L	0.500		97.2	30-130			

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QUALITY CONTROL

TCLP - Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185800 - SW-846 3510C

LCS Dup (B185800-BSD1)

Prepared: 09/08/17 Analyzed: 09/11/17

Surrogate: 2-Fluorobiphenyl	0.460		mg/L	0.500		92.0	30-130			
Surrogate: 2,4,6-Tribromophenol	1.10		mg/L	1.00		110	15-110			
Surrogate: p-Terphenyl-d14	0.554		mg/L	0.500		111	30-130			

Matrix Spike (B185800-MS1)

Source: 17H1560-05

Prepared: 09/08/17 Analyzed: 09/11/17

2,4-Dinitrotoluene	0.178	0.050	mg/L	0.250	ND	71.1	40-140			
Hexachlorobenzene	0.192	0.050	mg/L	0.250	ND	77.0	40-140			
Hexachlorobutadiene	0.202	0.050	mg/L	0.250	ND	81.0	40-140			
Hexachloroethane	0.181	0.050	mg/L	0.250	ND	72.5	40-140			
2-Methylphenol	0.148	0.050	mg/L	0.250	ND	59.1	40-140			
3/4-Methylphenol	0.158	0.050	mg/L	0.250	ND	63.1	40-140			
Nitrobenzene	0.187	0.050	mg/L	0.250	ND	74.8	40-140			
Pentachlorophenol	0.152	0.050	mg/L	0.250	ND	60.8	40-140			
Pyridine	0.166	0.025	mg/L	0.250	ND	66.4	40-140			
2,4,5-Trichlorophenol	0.172	0.050	mg/L	0.250	ND	68.9	40-140			
2,4,6-Trichlorophenol	0.179	0.050	mg/L	0.250	ND	71.5	40-140			
Surrogate: 2-Fluorophenol	0.669		mg/L	1.00		66.9	15-110			
Surrogate: Phenol-d6	0.644		mg/L	1.00		64.4	15-110			
Surrogate: Nitrobenzene-d5	0.428		mg/L	0.500		85.6	30-130			
Surrogate: 2-Fluorobiphenyl	0.368		mg/L	0.500		73.7	30-130			
Surrogate: 2,4,6-Tribromophenol	0.898		mg/L	1.00		89.8	15-110			
Surrogate: p-Terphenyl-d14	0.471		mg/L	0.500		94.2	30-130			

Batch B185803 - SW-846 3510C

Blank (B185803-BLK1)

Prepared: 09/08/17 Analyzed: 09/11/17

2,4-Dinitrotoluene	ND	0.050	mg/L							
Hexachlorobenzene	ND	0.050	mg/L							
Hexachlorobutadiene	ND	0.050	mg/L							
Hexachloroethane	ND	0.050	mg/L							
2-Methylphenol	ND	0.050	mg/L							
3/4-Methylphenol	ND	0.050	mg/L							
Nitrobenzene	ND	0.050	mg/L							
Pentachlorophenol	ND	0.050	mg/L							
Pyridine	ND	0.025	mg/L							
2,4,5-Trichlorophenol	ND	0.050	mg/L							
2,4,6-Trichlorophenol	ND	0.050	mg/L							
Surrogate: 2-Fluorophenol	0.703		mg/L	1.00		70.3	15-110			
Surrogate: Phenol-d6	0.664		mg/L	1.00		66.4	15-110			
Surrogate: Nitrobenzene-d5	0.469		mg/L	0.500		93.7	30-130			
Surrogate: 2-Fluorobiphenyl	0.423		mg/L	0.500		84.5	30-130			
Surrogate: 2,4,6-Tribromophenol	0.997		mg/L	1.00		99.7	15-110			
Surrogate: p-Terphenyl-d14	0.554		mg/L	0.500		111	30-130			

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QUALITY CONTROL

TCLP - Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185803 - SW-846 3510C										
LCS (B185803-BS1)				Prepared: 09/08/17 Analyzed: 09/11/17						
2,4-Dinitrotoluene	0.201	0.050	mg/L	0.250		80.3	40-140			
Hexachlorobenzene	0.212	0.050	mg/L	0.250		84.7	40-140			
Hexachlorobutadiene	0.230	0.050	mg/L	0.250		92.0	40-140			
Hexachloroethane	0.210	0.050	mg/L	0.250		83.9	40-140			
2-Methylphenol	0.162	0.050	mg/L	0.250		64.7	30-130			
3/4-Methylphenol	0.176	0.050	mg/L	0.250		70.2	30-130			
Nitrobenzene	0.208	0.050	mg/L	0.250		83.0	40-140			
Pentachlorophenol	0.161	0.050	mg/L	0.250		64.2	30-130			
Pyridine	0.174	0.025	mg/L	0.250		69.7	10-140			†
2,4,5-Trichlorophenol	0.196	0.050	mg/L	0.250		78.5	30-130			
2,4,6-Trichlorophenol	0.199	0.050	mg/L	0.250		79.6	30-130			
Surrogate: 2-Fluorophenol	0.826		mg/L	1.00		82.6	15-110			
Surrogate: Phenol-d6	0.815		mg/L	1.00		81.5	15-110			
Surrogate: Nitrobenzene-d5	0.497		mg/L	0.500		99.5	30-130			
Surrogate: 2-Fluorobiphenyl	0.426		mg/L	0.500		85.2	30-130			
Surrogate: 2,4,6-Tribromophenol	0.982		mg/L	1.00		98.2	15-110			
Surrogate: p-Terphenyl-d14	0.509		mg/L	0.500		102	30-130			
LCS Dup (B185803-BSD1)				Prepared: 09/08/17 Analyzed: 09/11/17						
2,4-Dinitrotoluene	0.204	0.050	mg/L	0.250		81.7	40-140	1.70	20	
Hexachlorobenzene	0.227	0.050	mg/L	0.250		90.7	40-140	6.82	20	
Hexachlorobutadiene	0.253	0.050	mg/L	0.250		101	40-140	9.72	20	
Hexachloroethane	0.213	0.050	mg/L	0.250		85.2	40-140	1.61	50	‡
2-Methylphenol	0.166	0.050	mg/L	0.250		66.3	30-130	2.38	20	
3/4-Methylphenol	0.183	0.050	mg/L	0.250		73.0	30-130	3.91	20	
Nitrobenzene	0.210	0.050	mg/L	0.250		83.9	40-140	1.10	20	
Pentachlorophenol	0.160	0.050	mg/L	0.250		64.1	30-130	0.156	50	‡
Pyridine	0.172	0.025	mg/L	0.250		68.7	10-140	1.50	50	† ‡
2,4,5-Trichlorophenol	0.205	0.050	mg/L	0.250		82.1	30-130	4.38	20	
2,4,6-Trichlorophenol	0.219	0.050	mg/L	0.250		87.6	30-130	9.57	50	‡
Surrogate: 2-Fluorophenol	0.837		mg/L	1.00		83.7	15-110			
Surrogate: Phenol-d6	0.820		mg/L	1.00		82.0	15-110			
Surrogate: Nitrobenzene-d5	0.486		mg/L	0.500		97.2	30-130			
Surrogate: 2-Fluorobiphenyl	0.460		mg/L	0.500		92.0	30-130			
Surrogate: 2,4,6-Tribromophenol	1.10		mg/L	1.00		110	15-110			
Surrogate: p-Terphenyl-d14	0.554		mg/L	0.500		111	30-130			
Matrix Spike (B185803-MS1)				Source: 17H1560-01 Prepared: 09/08/17 Analyzed: 09/11/17						
2,4-Dinitrotoluene	0.192	0.050	mg/L	0.250	ND	76.7	40-140			
Hexachlorobenzene	0.209	0.050	mg/L	0.250	ND	83.6	40-140			
Hexachlorobutadiene	0.234	0.050	mg/L	0.250	ND	93.7	40-140			
Hexachloroethane	0.190	0.050	mg/L	0.250	ND	76.1	40-140			
2-Methylphenol	0.159	0.050	mg/L	0.250	ND	63.5	40-140			
3/4-Methylphenol	0.169	0.050	mg/L	0.250	ND	67.5	40-140			
Nitrobenzene	0.192	0.050	mg/L	0.250	ND	76.7	40-140			
Pentachlorophenol	0.159	0.050	mg/L	0.250	ND	63.7	40-140			
Pyridine	0.165	0.025	mg/L	0.250	ND	65.9	40-140			
2,4,5-Trichlorophenol	0.178	0.050	mg/L	0.250	ND	71.2	40-140			
2,4,6-Trichlorophenol	0.201	0.050	mg/L	0.250	ND	80.4	40-140			
Surrogate: 2-Fluorophenol	0.759		mg/L	1.00		75.9	15-110			
Surrogate: Phenol-d6	0.714		mg/L	1.00		71.4	15-110			
Surrogate: Nitrobenzene-d5	0.457		mg/L	0.500		91.4	30-130			

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QUALITY CONTROL
TCLP - Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185803 - SW-846 3510C
Matrix Spike (B185803-MS1)
Source: 17H1560-01

Prepared: 09/08/17 Analyzed: 09/11/17

Surrogate: 2-Fluorobiphenyl	0.429		mg/L	0.500		85.8	30-130			
Surrogate: 2,4,6-Tribromophenol	1.03		mg/L	1.00		103	15-110			
Surrogate: p-Terphenyl-d14	0.529		mg/L	0.500		106	30-130			

Batch B185865 - SW-846 3510C
Blank (B185865-BLK1)

Prepared: 09/09/17 Analyzed: 09/11/17

2,4-Dinitrotoluene	ND	0.050	mg/L							
Hexachlorobenzene	ND	0.050	mg/L							
Hexachlorobutadiene	ND	0.050	mg/L							
Hexachloroethane	ND	0.050	mg/L							
2-Methylphenol	ND	0.050	mg/L							
3/4-Methylphenol	ND	0.050	mg/L							
Nitrobenzene	ND	0.050	mg/L							
Pentachlorophenol	ND	0.050	mg/L							
Pyridine	ND	0.025	mg/L							
2,4,5-Trichlorophenol	ND	0.050	mg/L							
2,4,6-Trichlorophenol	ND	0.050	mg/L							
Surrogate: 2-Fluorophenol	0.789		mg/L	1.00		78.9	15-110			
Surrogate: Phenol-d6	0.726		mg/L	1.00		72.6	15-110			
Surrogate: Nitrobenzene-d5	0.489		mg/L	0.500		97.7	30-130			
Surrogate: 2-Fluorobiphenyl	0.435		mg/L	0.500		87.0	30-130			
Surrogate: 2,4,6-Tribromophenol	1.03		mg/L	1.00		103	15-110			
Surrogate: p-Terphenyl-d14	0.536		mg/L	0.500		107	30-130			

LCS (B185865-BS1)

Prepared: 09/09/17 Analyzed: 09/11/17

2,4-Dinitrotoluene	0.180	0.050	mg/L	0.250		71.9	40-140			
Hexachlorobenzene	0.196	0.050	mg/L	0.250		78.5	40-140			
Hexachlorobutadiene	0.217	0.050	mg/L	0.250		86.9	40-140			
Hexachloroethane	0.192	0.050	mg/L	0.250		76.7	40-140			
2-Methylphenol	0.160	0.050	mg/L	0.250		64.1	30-130			
3/4-Methylphenol	0.167	0.050	mg/L	0.250		66.8	30-130			
Nitrobenzene	0.193	0.050	mg/L	0.250		77.3	40-140			
Pentachlorophenol	0.135	0.050	mg/L	0.250		53.9	30-130			
Pyridine	0.0506	0.025	mg/L	0.250		20.3	10-140			†
2,4,5-Trichlorophenol	0.181	0.050	mg/L	0.250		72.4	30-130			
2,4,6-Trichlorophenol	0.184	0.050	mg/L	0.250		73.6	30-130			
Surrogate: 2-Fluorophenol	0.732		mg/L	1.00		73.2	15-110			
Surrogate: Phenol-d6	0.713		mg/L	1.00		71.3	15-110			
Surrogate: Nitrobenzene-d5	0.454		mg/L	0.500		90.8	30-130			
Surrogate: 2-Fluorobiphenyl	0.397		mg/L	0.500		79.4	30-130			
Surrogate: 2,4,6-Tribromophenol	0.924		mg/L	1.00		92.4	15-110			
Surrogate: p-Terphenyl-d14	0.492		mg/L	0.500		98.4	30-130			

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QUALITY CONTROL

TCLP - Semivolatile Organic Compounds by GC/MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B185865 - SW-846 3510C										
LCS Dup (B185865-BSD1)										
				Prepared: 09/09/17 Analyzed: 09/11/17						
2,4-Dinitrotoluene	0.194	0.050	mg/L	0.250		77.6	40-140	7.63	20	
Hexachlorobenzene	0.211	0.050	mg/L	0.250		84.3	40-140	7.10	20	
Hexachlorobutadiene	0.241	0.050	mg/L	0.250		96.2	40-140	10.2	20	
Hexachloroethane	0.191	0.050	mg/L	0.250		76.4	40-140	0.392	50	‡
2-Methylphenol	0.158	0.050	mg/L	0.250		63.0	30-130	1.79	20	
3/4-Methylphenol	0.163	0.050	mg/L	0.250		65.3	30-130	2.30	20	
Nitrobenzene	0.199	0.050	mg/L	0.250		79.5	40-140	2.73	20	
Pentachlorophenol	0.136	0.050	mg/L	0.250		54.4	30-130	0.887	50	‡
Pyridine	0.0326	0.025	mg/L	0.250		13.0	10-140	43.5	50	† ‡
2,4,5-Trichlorophenol	0.190	0.050	mg/L	0.250		75.9	30-130	4.67	20	
2,4,6-Trichlorophenol	0.199	0.050	mg/L	0.250		79.6	30-130	7.83	50	‡
Surrogate: 2-Fluorophenol	0.710		mg/L	1.00		71.0	15-110			
Surrogate: Phenol-d6	0.689		mg/L	1.00		68.9	15-110			
Surrogate: Nitrobenzene-d5	0.453		mg/L	0.500		90.7	30-130			
Surrogate: 2-Fluorobiphenyl	0.436		mg/L	0.500		87.1	30-130			
Surrogate: 2,4,6-Tribromophenol	1.02		mg/L	1.00		102	15-110			
Surrogate: p-Terphenyl-d14	0.516		mg/L	0.500		103	30-130			
Matrix Spike (B185865-MS1)										
				Source: 17H1560-04RE1		Prepared: 09/09/17 Analyzed: 09/11/17				
2,4-Dinitrotoluene	0.199	0.050	mg/L	0.250	ND	79.7	40-140			
Hexachlorobenzene	0.215	0.050	mg/L	0.250	ND	86.0	40-140			
Hexachlorobutadiene	0.243	0.050	mg/L	0.250	ND	97.3	40-140			
Hexachloroethane	0.214	0.050	mg/L	0.250	ND	85.4	40-140			
2-Methylphenol	0.156	0.050	mg/L	0.250	ND	62.3	40-140			
3/4-Methylphenol	0.181	0.050	mg/L	0.250	ND	72.5	40-140			
Nitrobenzene	0.216	0.050	mg/L	0.250	ND	86.4	40-140			
Pentachlorophenol	0.159	0.050	mg/L	0.250	ND	63.4	40-140			
Pyridine	0.0590	0.025	mg/L	0.250	ND	23.6	40-140	*		MS-08
2,4,5-Trichlorophenol	0.187	0.050	mg/L	0.250	ND	74.8	40-140			
2,4,6-Trichlorophenol	0.211	0.050	mg/L	0.250	ND	84.2	40-140			
Surrogate: 2-Fluorophenol	0.812		mg/L	1.00		81.2	15-110			
Surrogate: Phenol-d6	0.774		mg/L	1.00		77.4	15-110			
Surrogate: Nitrobenzene-d5	0.500		mg/L	0.500		100	30-130			
Surrogate: 2-Fluorobiphenyl	0.442		mg/L	0.500		88.4	30-130			
Surrogate: 2,4,6-Tribromophenol	0.996		mg/L	1.00		99.6	15-110			
Surrogate: p-Terphenyl-d14	0.513		mg/L	0.500		103	30-130			

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QUALITY CONTROL
TCLP - Metals Analyses - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185409 - SW-846 3010A
Blank (B185409-BLK1)

Prepared: 09/01/17 Analyzed: 09/05/17

Arsenic	ND	0.010	mg/L							
Barium	ND	0.050	mg/L							
Cadmium	ND	0.0040	mg/L							
Chromium	ND	0.010	mg/L							
Lead	ND	0.010	mg/L							
Selenium	ND	0.050	mg/L							
Silver	ND	0.0050	mg/L							

LCS (B185409-BS1)

Prepared: 09/01/17 Analyzed: 09/05/17

Arsenic	0.519	0.010	mg/L	0.500		104	80-120			
Barium	0.500	0.050	mg/L	0.500		99.9	80-120			
Cadmium	0.535	0.0040	mg/L	0.500		107	80-120			
Chromium	0.500	0.010	mg/L	0.500		100	80-120			
Lead	0.475	0.010	mg/L	0.500		94.9	80-120			
Selenium	0.564	0.050	mg/L	0.500		113	80-120			
Silver	0.596	0.0050	mg/L	0.500		119	80-120			

LCS Dup (B185409-BSD1)

Prepared: 09/01/17 Analyzed: 09/05/17

Arsenic	0.518	0.010	mg/L	0.500		104	80-120	0.159	20	
Barium	0.505	0.050	mg/L	0.500		101	80-120	0.954	20	
Cadmium	0.539	0.0040	mg/L	0.500		108	80-120	0.860	20	
Chromium	0.508	0.010	mg/L	0.500		102	80-120	1.50	20	
Lead	0.470	0.010	mg/L	0.500		94.0	80-120	1.02	20	
Selenium	0.564	0.050	mg/L	0.500		113	80-120	0.0526	20	
Silver	0.592	0.0050	mg/L	0.500		118	80-120	0.635	20	

Batch B185410 - SW-846 7470A Prep
Blank (B185410-BLK1)

Prepared: 09/01/17 Analyzed: 09/06/17

Mercury	0.000037	0.00010	mg/L							J

LCS (B185410-BS1)

Prepared: 09/01/17 Analyzed: 09/06/17

Mercury	0.00184	0.00010	mg/L	0.00200		92.0	80-120			

LCS Dup (B185410-BSD1)

Prepared: 09/01/17 Analyzed: 09/06/17

Mercury	0.00197	0.00010	mg/L	0.00200		98.5	80-120	6.89	20	

Batch B185664 - SW-846 3010A
Blank (B185664-BLK1)

Prepared: 09/06/17 Analyzed: 09/07/17

Arsenic	ND	0.010	mg/L							
Barium	ND	0.050	mg/L							
Cadmium	ND	0.0040	mg/L							
Chromium	ND	0.010	mg/L							
Lead	ND	0.010	mg/L							
Selenium	ND	0.050	mg/L							
Silver	ND	0.0050	mg/L							

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QUALITY CONTROL
TCLP - Metals Analyses - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Batch B185664 - SW-846 3010A
LCS (B185664-BS1)

Prepared: 09/06/17 Analyzed: 09/07/17

Arsenic	0.503	0.010	mg/L	0.500		101	80-120			
Barium	0.528	0.050	mg/L	0.500		106	80-120			
Cadmium	0.547	0.0040	mg/L	0.500		109	80-120			
Chromium	0.527	0.010	mg/L	0.500		105	80-120			
Lead	0.503	0.010	mg/L	0.500		101	80-120			
Selenium	0.567	0.050	mg/L	0.500		113	80-120			
Silver	0.560	0.0050	mg/L	0.500		112	80-120			

LCS Dup (B185664-BSD1)

Prepared: 09/06/17 Analyzed: 09/07/17

Arsenic	0.489	0.010	mg/L	0.500		97.8	80-120	2.93	20	
Barium	0.507	0.050	mg/L	0.500		101	80-120	3.96	20	
Cadmium	0.527	0.0040	mg/L	0.500		105	80-120	3.55	20	
Chromium	0.510	0.010	mg/L	0.500		102	80-120	3.41	20	
Lead	0.495	0.010	mg/L	0.500		99.0	80-120	1.47	20	
Selenium	0.553	0.050	mg/L	0.500		111	80-120	2.54	20	
Silver	0.541	0.0050	mg/L	0.500		108	80-120	3.45	20	

Matrix Spike (B185664-MS1)
Source: 17H1560-03

Prepared: 09/06/17 Analyzed: 09/07/17

Arsenic	0.499	0.010	mg/L	0.500	ND	99.9	75-125			
Barium	0.897	0.050	mg/L	0.500	0.404	98.6	75-125			
Cadmium	0.554	0.0040	mg/L	0.500	0.00189	110	75-125			
Chromium	0.483	0.010	mg/L	0.500	ND	96.5	75-125			
Lead	0.451	0.010	mg/L	0.500	ND	90.2	75-125			
Selenium	0.375	0.050	mg/L	0.500	ND	75.1	75-125			
Silver	0.602	0.0050	mg/L	0.500	ND	120	75-125			

Batch B185753 - SW-846 7470A Prep
Blank (B185753-BLK1)

Prepared: 09/07/17 Analyzed: 09/11/17

Mercury	ND	0.00010	mg/L							

LCS (B185753-BS1)

Prepared: 09/07/17 Analyzed: 09/11/17

Mercury	0.00177	0.00010	mg/L	0.00200		88.7	80-120			

LCS Dup (B185753-BSD1)

Prepared: 09/07/17 Analyzed: 09/11/17

Mercury	0.00177	0.00010	mg/L	0.00200		88.3	80-120	0.494	20	

Matrix Spike (B185753-MS1)
Source: 17H1560-03

Prepared: 09/07/17 Analyzed: 09/11/17

Mercury	0.00185	0.00010	mg/L	0.00200	ND	92.7	75-125			

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**IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES***SW-846 8082A***SD-01**

Lab Sample ID: 17H1560-01 Date(s) Analyzed 09/11/2017 09/11/2017
Instrument ID (1): _____ Instrument ID (2): _____
GC Column (1): _____ ID: _____ (mm) GC Column (2): _____ ID: _____ (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1254	1	0.000	0.000	0.000	0.084	
	2	0.000	0.000	0.000	0.13	43.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

SD-02

Lab Sample ID: 17H1560-02 Date(s) Analyzed 09/11/2017 09/11/2017

Instrument ID (1): Instrument ID (2):

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1254	1	0.000	0.000	0.000	0.25	
	2	0.000	0.000	0.000	0.37	38.7
Aroclor-1260	1	0.000	0.000	0.000	0.066	
	2	0.000	0.000	0.000	0.066	0.0

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

C-01

Lab Sample ID: 17H1560-08 Date(s) Analyzed 09/11/2017 09/11/2017

Instrument ID (1): ECD4 Instrument ID (2): ECD4

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1254	1	0.000	0.000	0.000	0.16	
	2	0.000	0.000	0.000	0.21	27.0
Aroclor-1260	1	0.000	0.000	0.000	0.14	
	2	0.000	0.000	0.000	0.15	6.9

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

C-02

Lab Sample ID: 17H1560-09 Date(s) Analyzed 09/11/2017 09/11/2017
Instrument ID (1): ECD4 Instrument ID (2): ECD4
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1254	1	0.000	0.000	0.000	0.22	
	2	0.000	0.000	0.000	0.17	25.6
Aroclor-1260	1	0.000	0.000	0.000	0.15	
	2	0.000	0.000	0.000	0.11	30.8

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

P-02

Lab Sample ID: 17H1560-12 Date(s) Analyzed 09/11/2017 09/11/2017

Instrument ID (1): ECD4 Instrument ID (2): ECD4

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1254	1	0.000	0.000	0.000	1.5	
	2	0.000	0.000	0.000	1.8	18.2
Aroclor-1260	1	0.000	0.000	0.000	0.73	
	2	0.000	0.000	0.000	0.66	11.4

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

P-03

Lab Sample ID: 17H1560-13 Date(s) Analyzed 09/11/2017 09/11/2017
Instrument ID (1): ECD4 Instrument ID (2): ECD4
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1248	1	0.000	0.000	0.000	1.9	
	2	0.000	0.000	0.000	1.6	17.1
Aroclor-1254	1	0.000	0.000	0.000	2.2	
	2	0.000	0.000	0.000	2.7	20.4
Aroclor-1260	1	0.000	0.000	0.000	1.4	
	2	0.000	0.000	0.000	1.3	7.4

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**IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES***EPA 600 4-81-045***LCS**

Lab Sample ID: B185683-BS1 Date(s) Analyzed 09/07/2017 09/07/2017
Instrument ID (1): ECD 9 Instrument ID (2): ECD 9
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1260	1	0.000	0.000	0.000	27	
	2	0.000	0.000	0.000	26	3.8

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**IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES***EPA 600 4-81-045***LCS Dup**

Lab Sample ID: B185683-BSD1 Date(s) Analyzed 09/07/2017 09/07/2017
Instrument ID (1): ECD 9 Instrument ID (2): ECD 9
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1260	1	0.000	0.000	0.000	29	
	2	0.000	0.000	0.000	28	3.5

**IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES***EPA 600 4-81-045***Matrix Spike**

Lab Sample ID: B185683-MS1 Date(s) Analyzed 09/07/2017 09/07/2017
Instrument ID (1): ECD 9 Instrument ID (2): ECD 9
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1260	1	0.000	0.000	0.000	3.6	
	2	0.000	0.000	0.000	3.5	2.8

**IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES***EPA 600 4-81-045***Matrix Spike Dup**

Lab Sample ID: B185683-MSD1 Date(s) Analyzed 09/07/2017 09/07/2017
Instrument ID (1): ECD 9 Instrument ID (2): ECD 9
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1260	1	0.000	0.000	0.000	4.2	
	2	0.000	0.000	0.000	4.0	4.9

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B185743-BS1 Date(s) Analyzed 09/10/2017 09/10/2017

Instrument ID (1): ECD5 Instrument ID (2): ECD5

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	0.19	
	2	0.000	0.000	0.000	0.22	14.6
Aroclor-1260	1	0.000	0.000	0.000	0.18	
	2	0.000	0.000	0.000	0.20	10.5

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IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B185743-BSD1 Date(s) Analyzed 09/10/2017 09/10/2017

Instrument ID (1): ECD5 Instrument ID (2): ECD5

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	0.17	
	2	0.000	0.000	0.000	0.19	5.4
Aroclor-1260	1	0.000	0.000	0.000	0.17	
	2	0.000	0.000	0.000	0.19	11.1

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS

Lab Sample ID: B185745-BS1 Date(s) Analyzed 09/09/2017 09/09/2017
Instrument ID (1): ECD4 Instrument ID (2): ECD4
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	0.94	
	2	0.000	0.000	0.000	0.91	3.2
Aroclor-1260	1	0.000	0.000	0.000	0.86	
	2	0.000	0.000	0.000	0.79	8.5

**IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES***SW-846 8082A***LCS Dup**

Lab Sample ID: B185745-BSD1 Date(s) Analyzed 09/09/2017 09/09/2017
Instrument ID (1): ECD4 Instrument ID (2): ECD4
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	0.91	
	2	0.000	0.000	0.000	0.89	2.2
Aroclor-1260	1	0.000	0.000	0.000	0.85	
	2	0.000	0.000	0.000	0.78	8.6

**IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES***SW-846 8082A***LCS**

Lab Sample ID: B185823-BS1 Date(s) Analyzed 09/11/2017 09/11/2017
Instrument ID (1): ECD4 Instrument ID (2): ECD4
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	3.8	
	2	0.000	0.000	0.000	3.6	5.4
Aroclor-1260	1	0.000	0.000	0.000	3.5	
	2	0.000	0.000	0.000	3.2	11.8

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B185823-BSD1 Date(s) Analyzed 09/11/2017 09/11/2017
Instrument ID (1): ECD4 Instrument ID (2): ECD4
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	3.9	
	2	0.000	0.000	0.000	3.7	5.3
Aroclor-1260	1	0.000	0.000	0.000	3.6	
	2	0.000	0.000	0.000	3.2	11.8

**IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES***SW-846 8082A***LCS**

Lab Sample ID: B185824-BS1 Date(s) Analyzed 09/11/2017 09/11/2017
Instrument ID (1): ECD4 Instrument ID (2): ECD4
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	2.4	
	2	0.000	0.000	0.000	2.4	0.0
Aroclor-1260	1	0.000	0.000	0.000	2.1	
	2	0.000	0.000	0.000	2.1	0.0

IDENTIFICATION SUMMARY FOR SINGLE COMPONENT ANALYTES

SW-846 8082A

LCS Dup

Lab Sample ID: B185824-BSD1 Date(s) Analyzed 09/11/2017 09/11/2017
Instrument ID (1): ECD4 Instrument ID (2): ECD4
GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%RPD
			FROM	TO		
Aroclor-1016	1	0.000	0.000	0.000	2.3	
	2	0.000	0.000	0.000	2.4	0.0
Aroclor-1260	1	0.000	0.000	0.000	2.2	
	2	0.000	0.000	0.000	2.1	4.7

FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit
DL	Method Detection Limit
MCL	Maximum Contaminant Level
	Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.
	No results have been blank subtracted unless specified in the case narrative section.
B-07	Data is not affected by elevated level in blank since sample result is >10x level found in the blank.
H-01	Recommended sample holding time was exceeded, but analysis was performed before 2X the allowable holding time.
H-09	Sample received by laboratory with insufficient time remaining to perform analysis within the recommended holding time.
J	Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated concentration (CLP J-Flag).
L-02	Laboratory fortified blank/laboratory control sample recovery and duplicate recoveries outside of control limits. Data validation is not affected since all results are "not detected" for associated samples in this batch and bias is on the high side.
L-04	Laboratory fortified blank/laboratory control sample recovery and duplicate recovery are outside of control limits. Reported value for this compound is likely to be biased on the low side.
L-07	Either laboratory fortified blank/laboratory control sample or duplicate recovery is outside of control limits, but the other is within limits. RPD between the two LFB/LCS results is within method specified criteria.
L-10	The reporting limit verification for the AIHA lead program is outside of control limits for this element. Any reported result at or near the detection limit may be bias on the high side.
MS-08	Matrix spike recovery outside of control limits. Possibility of sample matrix effects that lead to a low bias for reported result or non-homogeneous sample aliquots cannot be eliminated.
PR-15	According to the NY ELAP program, all voa results less than 0.2mg/Kg are estimated and biased low if not collected according to SW-846 5035-L/5035A-L.
S-12	Surrogate recovery is outside of control limits on confirmatory column, but within control limits on primary column. Data validation is not affected.
V-20	Continuing calibration did not meet method specifications and was biased on the high side. Data validation is not affected since sample result was "not detected" for this compound.

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>EPA 600 4-81-045 in Oil</i>	
Aroclor-1016	MA,NY,ME
Aroclor-1016 [2C]	MA,NY,ME
Aroclor-1221	MA,NY,ME
Aroclor-1221 [2C]	MA,NY,ME
Aroclor-1232	MA,NY,ME
Aroclor-1232 [2C]	MA,NY,ME
Aroclor-1242	MA,NY,ME
Aroclor-1242 [2C]	MA,NY,ME
Aroclor-1248	MA,NY,ME
Aroclor-1248 [2C]	MA,NY,ME
Aroclor-1254	MA,NY,ME
Aroclor-1254 [2C]	MA,NY,ME
Aroclor-1260	MA,NY,ME
Aroclor-1260 [2C]	MA,NY,ME
Aroclor-1262	MA,NY,ME
Aroclor-1262 [2C]	MA,NY,ME
Aroclor-1268	MA,NY,ME
Aroclor-1268 [2C]	MA,NY,ME
<i>SW-846 1030 in Product/Solid</i>	
Ignitability	NY,NH,NC,CT,ME,VA
<i>SW-846 1030 in Soil</i>	
Ignitability	NY,NH,CT,NC,ME,VA
<i>SW-846 6010C Modified in Paint</i>	
Lead	AIHA,ME,CT,NY
<i>SW-846 6010C-D in Water</i>	
Arsenic	NY,CT,NC,ME,NH,VA
Barium	NY,CT,ME,NC,NH,VA
Cadmium	NY,CT,ME,NC,NH,VA
Chromium	NY,CT,ME,NC,NH,VA
Lead	NY,CT,ME,NC,NH,VA
Selenium	CT,ME,NC,NH,NY,VA
Silver	CT,ME,NC,NH,NY,VA
<i>SW-846 7470A in Water</i>	
Mercury	CT,ME,NC,NH,NY,VA
<i>SW-846 8082A in Product/Solid</i>	
Aroclor-1016	CT,NH,NY,NC,ME,VA
Aroclor-1016 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1221	CT,NH,NY,NC,ME,VA
Aroclor-1221 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1232	CT,NH,NY,NC,ME,VA
Aroclor-1232 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1242	CT,NH,NY,NC,ME,VA
Aroclor-1242 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1248	CT,NH,NY,NC,ME,VA
Aroclor-1248 [2C]	CT,NH,NY,NC,ME,VA

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8082A in Product/Solid</i>	
Aroclor-1254	CT,NH,NY,NC,ME,VA
Aroclor-1254 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1260	CT,NH,NY,NC,ME,VA
Aroclor-1260 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1262	NH,NY,NC,ME,VA
Aroclor-1262 [2C]	NH,NY,NC,ME,VA
Aroclor-1268	NH,NY,NC,ME,VA
Aroclor-1268 [2C]	NH,NY,NC,ME,VA
<i>SW-846 8082A in Soil</i>	
Aroclor-1016	CT,NH,NY,NC,ME,VA
Aroclor-1016 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1221	CT,NH,NY,NC,ME,VA
Aroclor-1221 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1232	CT,NH,NY,NC,ME,VA
Aroclor-1232 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1242	CT,NH,NY,NC,ME,VA
Aroclor-1242 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1248	CT,NH,NY,NC,ME,VA
Aroclor-1248 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1254	CT,NH,NY,NC,ME,VA
Aroclor-1254 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1260	CT,NH,NY,NC,ME,VA
Aroclor-1260 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1262	NH,NY,NC,ME,VA
Aroclor-1262 [2C]	NH,NY,NC,ME,VA
Aroclor-1268	NH,NY,NC,ME,VA
Aroclor-1268 [2C]	NH,NY,NC,ME,VA
<i>SW-846 8082A in Water</i>	
Aroclor-1016	CT,NH,NY,NC,ME,VA
Aroclor-1016 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1221	CT,NH,NY,NC,ME,VA
Aroclor-1221 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1232	CT,NH,NY,NC,ME,VA
Aroclor-1232 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1242	CT,NH,NY,NC,ME,VA
Aroclor-1242 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1248	CT,NH,NY,NC,ME,VA
Aroclor-1248 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1254	CT,NH,NY,NC,ME,VA
Aroclor-1254 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1260	CT,NH,NY,NC,ME,VA
Aroclor-1260 [2C]	CT,NH,NY,NC,ME,VA
Aroclor-1262	NH,NY,NC,ME,VA
Aroclor-1262 [2C]	NH,NY,NC,ME,VA
Aroclor-1268	NH,NY,NC,ME,VA
Aroclor-1268 [2C]	NH,NY,NC,ME,VA

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8260C in Product/Solid</i>	
Benzene	NY,CT,NC,ME,VA
2-Butanone (MEK)	NY,CT,NC,ME,VA
Carbon Tetrachloride	NY,CT,NC,ME,VA
Chlorobenzene	NY,CT,NC,ME,VA
Chloroform	NY,CT,NC,ME,VA
1,4-Dichlorobenzene	NY,CT,NC,ME,VA
1,2-Dichloroethane	NY,CT,NC,ME,VA
1,1-Dichloroethylene	NY,CT,NC,ME,VA
Tetrachloroethylene	NY,CT,NC,ME,VA
Trichloroethylene	NY,CT,NC,ME,VA
Vinyl Chloride	NY,CT,NC,ME,VA
<i>SW-846 8260C in Soil</i>	
Acetone	CT,NH,NY,ME,VA
Acetone	ME,NY,VA
Acrylonitrile	CT,NH,NY,ME,VA
Benzene	ME,NY,CT,NC,VA
Benzene	CT,NH,NY,ME,VA
Bromobenzene	NH,NY,ME,VA
Bromobenzene	ME,NY,VA
Bromochloromethane	NH,NY,ME,VA
Bromochloromethane	ME,NY,VA
Bromodichloromethane	ME,NY,VA
Bromodichloromethane	CT,NH,NY,ME,VA
Bromoform	CT,NH,NY,ME,VA
Bromoform	ME,NY,VA
Bromomethane	ME,NY,VA
Bromomethane	CT,NH,NY,ME,VA
2-Butanone (MEK)	ME,NY,CT,NC,VA
2-Butanone (MEK)	CT,NH,NY,ME,VA
tert-Butyl Alcohol (TBA)	NY
n-Butylbenzene	CT,NH,NY,ME,VA
n-Butylbenzene	ME,NY,VA
sec-Butylbenzene	CT,NH,NY,ME,VA
sec-Butylbenzene	ME,NY,VA
tert-Butylbenzene	ME,NY,VA
tert-Butylbenzene	CT,NH,NY,ME,VA
Carbon Disulfide	ME,VA
Carbon Disulfide	CT,NH,NY,ME,VA
Carbon Tetrachloride	ME,NY,CT,NC,VA
Carbon Tetrachloride	CT,NH,NY,ME,VA
Chlorobenzene	CT,NH,NY,ME,VA
Chlorobenzene	ME,NY,CT,NC,VA
Chlorodibromomethane	ME,NY,VA
Chlorodibromomethane	CT,NH,NY,ME,VA
Chloroethane	ME,NY,VA
Chloroethane	CT,NH,NY,ME,VA

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8260C in Soil</i>	
Chloroform	CT,NH,NY,ME,VA
Chloroform	ME,NY,CT,NC,VA
Chloromethane	CT,NH,NY,ME,VA
Chloromethane	ME,NY,VA
2-Chlorotoluene	ME,NY,VA
2-Chlorotoluene	CT,NH,NY,ME,VA
4-Chlorotoluene	ME,NY,VA
4-Chlorotoluene	CT,NH,NY,ME,VA
Cyclohexane	NY
Dibromomethane	ME,NY,VA
Dibromomethane	NH,NY,ME,VA
1,2-Dichlorobenzene	CT,NH,NY,ME,VA
1,2-Dichlorobenzene	ME,NY,VA
1,3-Dichlorobenzene	ME,NY,VA
1,3-Dichlorobenzene	CT,NH,NY,ME,VA
1,4-Dichlorobenzene	ME,NY,CT,NC,VA
1,4-Dichlorobenzene	CT,NH,NY,ME,VA
trans-1,4-Dichloro-2-butene	NY
Dichlorodifluoromethane (Freon 12)	NH,NY,ME,VA
Dichlorodifluoromethane (Freon 12)	ME,NY,VA
1,1-Dichloroethane	CT,NH,NY,ME,VA
1,1-Dichloroethane	ME,NY,VA
1,2-Dichloroethane	CT,NH,NY,ME,VA
1,2-Dichloroethane	ME,NY,CT,NC,VA
1,1-Dichloroethylene	ME,NY,CT,NC,VA
1,1-Dichloroethylene	CT,NH,NY,ME,VA
cis-1,2-Dichloroethylene	ME,NY,VA
cis-1,2-Dichloroethylene	CT,NH,NY,ME,VA
trans-1,2-Dichloroethylene	CT,NH,NY,ME,VA
trans-1,2-Dichloroethylene	ME,NY,VA
1,2-Dichloropropane	ME,NY,VA
1,2-Dichloropropane	CT,NH,NY,ME,VA
1,3-Dichloropropane	ME,NY,VA
1,3-Dichloropropane	NH,NY,ME,VA
2,2-Dichloropropane	ME,NY,VA
2,2-Dichloropropane	NH,NY,ME,VA
1,1-Dichloropropene	NH,NY,ME,VA
1,1-Dichloropropene	ME,NY,VA
cis-1,3-Dichloropropene	CT,NH,NY,ME,VA
cis-1,3-Dichloropropene	ME,NY,VA
trans-1,3-Dichloropropene	CT,NH,NY,ME,VA
trans-1,3-Dichloropropene	ME,NY,VA
1,4-Dioxane	NY
Ethylbenzene	CT,NH,NY,ME,VA
Ethylbenzene	ME,NY,VA
Hexachlorobutadiene	ME,NY,VA
Hexachlorobutadiene	NH,NY,ME,VA

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8260C in Soil</i>	
2-Hexanone (MBK)	ME,NY,VA
2-Hexanone (MBK)	CT,NH,NY,ME,VA
Isopropylbenzene (Cumene)	ME,NY,VA
Isopropylbenzene (Cumene)	CT,NH,NY,ME,VA
p-Isopropyltoluene (p-Cymene)	NY
p-Isopropyltoluene (p-Cymene)	NH,NY
Methyl Acetate	NY
Methyl tert-Butyl Ether (MTBE)	NY,VA
Methyl tert-Butyl Ether (MTBE)	NY,VA
Methyl Cyclohexane	NY
Methylene Chloride	ME,NY,VA
Methylene Chloride	CT,NH,NY,ME,VA
4-Methyl-2-pentanone (MIBK)	NY,VA
4-Methyl-2-pentanone (MIBK)	CT,NH,NY,VA
Naphthalene	ME,NY,VA
Naphthalene	NH,NY,ME,VA
n-Propylbenzene	NH,NY
n-Propylbenzene	NY
Styrene	ME,NY,VA
Styrene	CT,NH,NY,ME,VA
1,1,1,2-Tetrachloroethane	CT,NH,NY,ME,VA
1,1,1,2-Tetrachloroethane	ME,NY,VA
1,1,2,2-Tetrachloroethane	ME,NY,VA
1,1,2,2-Tetrachloroethane	CT,NH,NY,ME,VA
Tetrachloroethylene	CT,NH,NY,ME,VA
Tetrachloroethylene	ME,NY,CT,NC,VA
Toluene	CT,NH,NY,ME,VA
Toluene	ME,NY,VA
1,2,3-Trichlorobenzene	NY,ME
1,2,4-Trichlorobenzene	NH,NY,ME,VA
1,2,4-Trichlorobenzene	ME,NY,VA
1,3,5-Trichlorobenzene	ME
1,1,1-Trichloroethane	CT,NH,NY,ME,VA
1,1,1-Trichloroethane	ME,NY,VA
1,1,2-Trichloroethane	CT,NH,NY,ME,VA
1,1,2-Trichloroethane	ME,NY,VA
Trichloroethylene	ME,NY,CT,NC,VA
Trichloroethylene	CT,NH,NY,ME,VA
Trichlorofluoromethane (Freon 11)	CT,NH,NY,ME,VA
Trichlorofluoromethane (Freon 11)	NY,VA
1,2,3-Trichloropropane	ME,NY,VA
1,2,3-Trichloropropane	NH,NY,ME,VA
1,2,4-Trimethylbenzene	CT,NH,NY,ME,VA
1,2,4-Trimethylbenzene	ME,NY,VA
1,3,5-Trimethylbenzene	CT,NH,NY,ME,VA
1,3,5-Trimethylbenzene	ME,NY,VA
Vinyl Chloride	CT,NH,NY,ME,VA

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8260C in Soil</i>	
Vinyl Chloride	ME,NY,CT,NC,VA
m+p Xylene	CT,NH,NY,ME,VA
m+p Xylene	ME,VA
o-Xylene	ME,VA
o-Xylene	CT,NH,NY,ME,VA
<i>SW-846 8260C in Water</i>	
Acetone	ME,NY,VA
tert-Amyl Methyl Ether (TAME)	NY,VA
Benzene	ME,NY,CT,NC,VA
Bromochloromethane	ME,NY,VA
Bromodichloromethane	ME,NY,VA
Bromoform	ME,NY,VA
Bromomethane	ME,NY,VA
2-Butanone (MEK)	ME,NY,CT,NC,VA
n-Butylbenzene	ME,NY,VA
sec-Butylbenzene	ME,NY,VA
tert-Butylbenzene	ME,NY,VA
tert-Butyl Ethyl Ether (TBEE)	ME,NY,VA
Carbon Disulfide	ME,NY,VA
Carbon Tetrachloride	ME,NY,CT,NC,VA
Chlorobenzene	ME,NY,CT,NC,VA
Chlorodibromomethane	ME,NY,VA
Chloroethane	ME,NY,VA
Chloroform	ME,NY,CT,NC,VA
Chloromethane	ME,NY,VA
2-Chlorotoluene	ME,NY,VA
4-Chlorotoluene	ME,NY,VA
Dibromomethane	ME,NY,VA
1,2-Dichlorobenzene	ME,NY,VA
1,3-Dichlorobenzene	ME,NY,VA
1,4-Dichlorobenzene	ME,NY,CT,NC,VA
Dichlorodifluoromethane (Freon 12)	ME,NY,VA
1,1-Dichloroethane	ME,NY,VA
1,2-Dichloroethane	ME,NY,CT,NC,VA
1,1-Dichloroethylene	ME,NY,CT,NC,VA
cis-1,2-Dichloroethylene	ME,NY
trans-1,2-Dichloroethylene	ME,NY,VA
1,2-Dichloropropane	ME,NY,VA
1,3-Dichloropropane	ME,NY,VA
2,2-Dichloropropane	ME,NY,VA
1,1-Dichloropropene	ME,NY,VA
cis-1,3-Dichloropropene	ME,NY,VA
trans-1,3-Dichloropropene	ME,NY,VA
Diisopropyl Ether (DIPE)	ME,NY,VA
Ethylbenzene	ME,NY,VA
Hexachlorobutadiene	ME,NY,VA

CERTIFICATIONS
Certified Analyses included in this Report

Analyte	Certifications
<i>SW-846 8260C in Water</i>	
2-Hexanone (MBK)	ME,NY,VA
Isopropylbenzene (Cumene)	ME,NY,VA
p-Isopropyltoluene (p-Cymene)	ME,NY
Methyl tert-Butyl Ether (MTBE)	ME,NY,VA
Methylene Chloride	ME,NY,VA
4-Methyl-2-pentanone (MIBK)	ME,NY,VA
Naphthalene	ME,NY,VA
n-Propylbenzene	ME,NY,VA
Styrene	ME,NY,VA
1,1,1,2-Tetrachloroethane	ME,NY,VA
1,1,2,2-Tetrachloroethane	ME,NY,VA
Tetrachloroethylene	ME,NY,CT,NC,VA
Tetrahydrofuran	NY
Toluene	ME,NY,VA
1,2,3-Trichlorobenzene	ME,NY,VA
1,2,4-Trichlorobenzene	ME,NY,VA
1,1,1-Trichloroethane	ME,NY,VA
1,1,2-Trichloroethane	ME,NY,VA
Trichloroethylene	ME,NY,CT,NC,VA
Trichlorofluoromethane (Freon 11)	ME,NY,VA
1,2,3-Trichloropropane	ME,NY,VA
1,2,4-Trimethylbenzene	ME,NY,VA
1,3,5-Trimethylbenzene	ME,NY,VA
Vinyl Chloride	ME,NY,CT,NC,VA
m+p Xylene	ME,VA
o-Xylene	ME,VA
<i>SW-846 8270D in Water</i>	
1,2-Dichlorobenzene	ME,NC,NH,NY,VA
1,3-Dichlorobenzene	ME,NC,NH,NY,VA
1,4-Dichlorobenzene	ME,NC,NH,NY,VA
2,4-Dinitrotoluene	ME,NC,NH,CT,NY,VA
Hexachlorobenzene	ME,NC,NH,CT,NY,VA
Hexachlorobutadiene	ME,NC,NH,CT,NY,VA
Hexachloroethane	ME,NC,NH,CT,NY,VA
2-Methylphenol	ME,NC,NH,CT
3/4-Methylphenol	ME,NC,NH,CT
Naphthalene	ME,NC,NH,NY,VA
Nitrobenzene	ME,NC,NH,CT,NY,VA
Pentachlorophenol	ME,NC,NH,CT,NY,VA
Pyridine	ME,NC,NH,CT,NY,VA
1,2,4-Trichlorobenzene	ME,NC,NH,NY,VA
2,4,5-Trichlorophenol	ME,NC,NH,CT,NY,VA
2,4,6-Trichlorophenol	ME,NC,NH,CT,NY,VA
2-Fluorophenol	NC

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2005	100033	02/1/2018
MA	Massachusetts DEP	M-MA100	06/30/2018
CT	Connecticut Department of Public Health	PH-0567	09/30/2017
NY	New York State Department of Health	10899 NELAP	04/1/2018
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2018
RI	Rhode Island Department of Health	LAO00112	12/30/2017
NC	North Carolina Div. of Water Quality	652	12/31/2017
NJ	New Jersey DEP	MA007 NELAP	06/30/2018
FL	Florida Department of Health	E871027 NELAP	06/30/2018
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2018
ME	State of Maine	2011028	06/9/2019
VA	Commonwealth of Virginia	460217	12/14/2017
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2017
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2018
NC-DW	North Carolina Department of Health	25703	07/31/2018

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http://www.contestlabs.com

CHAIN OF CUSTODY RECORD (New York)

39 Spruce Street
East Longmeadow, MA 01028

Doc # 380 Rev 1_03242017

Page 2 of 2

Company Name: **ARCADIS**
Address: **50 FOUNTAIN PLAZA BUFFALO NY 14204**
Phone: **(716) 570-5911**
Project Name:
Project Location: **245 Andrews St Rochester, NY 14604**
Project Number: **MARK FLASCHE**
Project Method: **00266426.0000.00004**
Con-Test Quote Name/Number:
Invoice Recipient:
Sampled By:

Requested Turnaround Time
Due Date: ☒ 7-Day ☐ 10-Day ☐
Rush Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐
Data Delivery
Format: PDF ☒ EXCEL ☒
Other:
CLP Like Data Pkg Required: ☐
Email To: **sandy.hathaway@arcadis.com**
Fax To #:

Con-Test Work Order #	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Composite	Grab	Matrix Code	Conc Code
11	P-01	8/24/17 1445			X	SOL	
12	P-02	8/26/17 1445			X	SOL	
13	P-03	8/26/17 1450			X	SOL	
14	ACF-01	8/24/17 1210			X	O	
15	ACF-02	8/24/17 1210			X	O	
16	F-01	8/24/17 1310			X	O	
17	D-01	8/24/17 1300		X		SOL	
18	D-02	8/24/17 1300		X		SOL	

Comments: **cc results to luke.goetz@arcadis.com**

Spl. F-01 cancelled. Water sample not enough volume rec'd. ALB 8/30

Please run sample P-01, P-02, P-03 for Total lead not PCB per client request - EES 9/6/17

Relinquished by (signature): **[Signature]** Date/Time: **8/29/17 1600**
Received by (signature): **[Signature]** Date/Time: **3:30 8/30/17**
Pushed by (signature): **[Signature]** Date/Time:
Pushed by (signature): **[Signature]** Date/Time:
Pushed by (signature): **[Signature]** Date/Time:
Pushed by (signature): **[Signature]** Date/Time:
Pushed by (signature): **[Signature]** Date/Time:

Program & Regulatory Information
☐ AWQ STDs ☐ NY TOGS
☐ NYC Sewer Discharge ☐ NY CP-51
☐ Part 360 GW (Landfill)
☐ NY Restricted Use
☐ NY Unrestricted Use
☐ NY Part 375

Deliverables
☐ Enhanced Data Package
☐ NYSED EQuIS EDD
☐ EQuIS (Standard) EDD
☐ NY Regulatory EDD
☐ NY Regs Hits-Only EDD

Other:
NELAC and AIHA-LAP, LLC Accredited

Project Entity
☐ Government ☐ Municipality ☐ MWRA ☐ WRTA
☐ Federal ☐ 21 J ☐ School ☐ Chromatogram
☐ City ☐ Brownfield ☐ MBTA ☐ AIHA-LAP, LLC

PCB ONLY
☐ Soxhlet
☐ Non Soxhlet



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IMPORTANT!**Tropical Storm Harvey is causing hazardous conditions in Texas and Louisiana. Learn More**

FedEx® Tracking

787551821716

Ship date:

Tue 8/29/2017

FAIR LAWN, NJ US

**Delivered**

Signed for by: B.FAUST

Actual delivery:

Wed 8/30/2017 9:35 am

EAST LONGMEADOW, MA US

Travel History

▲ Date/Time	Activity	Location
8/30/2017 - Wednesday		
9:35 am	Delivered	EAST LONGMEADOW, MA
7:20 am	On FedEx vehicle for delivery	WINDSOR LOCKS, CT
7:13 am	At local FedEx facility	WINDSOR LOCKS, CT
6:23 am	At destination sort facility	EAST GRANBY, CT
3:22 am	Departed FedEx location	MEMPHIS, TN
8/29/2017 - Tuesday		
10:54 pm	Arrived at FedEx location	MEMPHIS, TN
8:28 pm	Left FedEx origin facility	ROCHESTER, NY
5:42 pm	In FedEx possession	ROCHESTER, NY
4:19 pm	In FedEx possession	ROCHESTER, NY
3:26 pm	Tendered at FedEx location	
	Shipment information sent to FedEx	

Shipment Facts

Tracking number	787551821716	Service	FedEx Priority Overnight
Weight	45 lbs / 20.41 kgs	Dimensions	21x14x15 in.
Delivered To	Shipping/Receiving	Total pieces	1
Total shipment weight	45 lbs / 20.41 kgs	Terms	Third Party
Packaging	Your Packaging	Special handling section	Deliver Weekday, Additional Handling Surcharge
Standard transit	8/30/2017 by 10:30 am		



Search or tracking number

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New Customer Center
Small Business Center
Service Guide
Customer Support

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FedEx TechConnect
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Online Retail Solutions
Packaging Services
Ancillary Clearance Services

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Developer Resource Center
FedEx Ship Manager Software
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Companies

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FedEx Ground
FedEx Office
FedEx Freight
FedEx Custom Critical
FedEx Trade Networks
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con-test®
ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client Arcadis

Received By WLG Date 8/30/17 Time 9:35

How were the samples received? In Cooler T No Cooler On Ice T No Ice
Direct from Sampling Ambient Melted Ice T

Were samples within Temperature? 2-6°C T By Gun # 1 Actual Temp - 3.6°C
By Blank # Actual Temp -

Was Custody Seal Intact? N/A Were Samples Tampered with? N/A
Was COC Relinquished? T Does Chain Agree With Samples? T

Are there broken/leaking/loose caps on any samples? T

Is COC in ink/ Legible? T Were samples received within holding time? T
Did COC include all Client T Analysis T Sampler Name F
pertinent Information? Project T ID's T Collection Dates/Times T

Are Sample labels filled out and legible? T

Are there Lab to Filters? F Who was notified?
Are there Rushes? F Who was notified?
Are there Short Holds? T Who was notified? Lucy

Is there enough Volume? T

Is there Headspace where applicable? T MS/MSD? N/A
Proper Media/Containers Used? T Is splitting samples required? N/A
Were trip blanks received? N/A On COC? N/A
Do all samples have the proper pH? Acid N/A Base N/A

Vials	#	Containers:	#	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear
DI-		Other Plastic		Other Glass		Encore
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:
Sulfuric-		Perchlorate		Ziplock		

Unused Media

Vials	#	Containers:	#	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic		16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic		8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic		4oz Amb/Clear
Bisulfate-		Col./Bacteria		Flashpoint		2oz Amb/Clear
DI-		Other Plastic		Other Glass		Encore
Thiosulfate-		SOC Kit		Plastic Bag		Frozen:
Sulfuric-		Perchlorate		Ziplock		

Comments:

16 oz Amber "SD-02" broken on arrival.

APPENDIX C

Photographic Log – General Site Conditions



PHOTOGRAPH LOG

New York State Department of Environmental Conservation
Site #828186 Former Silver Cleaners
Rochester, New York 14604



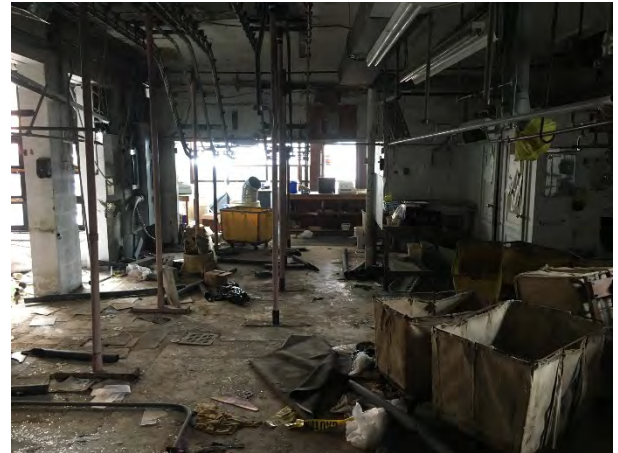
View of Building Exterior- Facing South



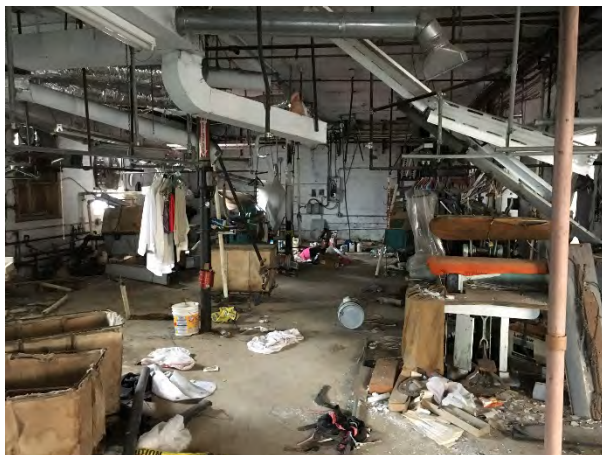
View of Rear Building Exterior- Facing Northwest



General Site Conditions- Western Portion Facing South



General Site Conditions- Central Portion Facing Andrews St



General Site Conditions- Central Portion Facing South



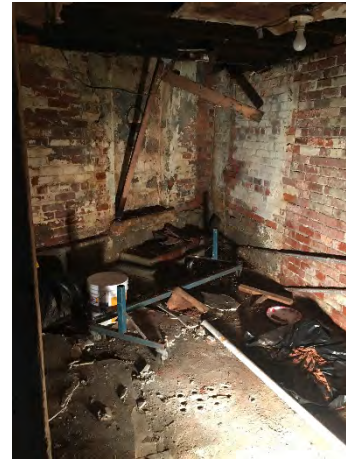
CS-01: Concrete Slab Sample Location

PHOTOGRAPH LOG

New York State Department of Environmental Conservation
Site #828186 Former Silver Cleaners
Rochester, New York 14604



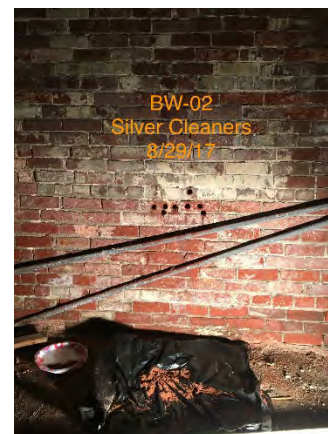
CS-02: Concrete Slab Sample Location



CS-03: Concrete Slab Sample Location- Building Basement



BW-01: Brick Wall Sample Location



BW-02: Brick Wall Sample Location- Building Basement



C-01: Caulk/Glazing Sample Location- Building Exterior Adjacent to Andrews St Parking Lot



C-02: Caulk/Glazing Sample Location- Building Exterior at Andrews St Entrance

PHOTOGRAPH LOG

New York State Department of Environmental Conservation
Site #828186 Former Silver Cleaners
Rochester, New York 14604



C-03: Caulk/Glazing Sample Location- Building Exterior



P-01: Paint Chip Sample Location- Customer Service Area near Andrews St Entrance



P-02: Paint Chip Sample Location



P-03: Paint Chip Sample Location



SD-01: Residual Sample Location- Floor Drain



SD-02: Residual Sample Location

PHOTOGRAPH LOG

New York State Department of Environmental Conservation
Site #828186 Former Silver Cleaners
Rochester, New York 14604



D-01: Dust Sample Location- Air Duct



D-02: Dust Sample Location- Collected from Steam Press



ACF-01: Fluid Sample Location- Collected from Air Compressor Motor



ACF-02: Fluid Sample Location- Collected from Air Compressor Motor

Arcadis U.S., Inc.

50 Fountain Plaza

Suite 600

Buffalo, New York 14202

Tel 716 667 0900

Fax 716 667 0279

www.arcadis.com

Appendix B

Injection Design and Sodium Permanganate Safety Data Sheet

SAFETY DATA SHEET

40% SODIUM PERMANGANATE

Revision date 4/6/2017

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name: Sodium permanganate
Description: 40% minimum as NaMnO₄

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

Identified uses: Chemical oxidation of organic compounds for remediation

1.3 Details of the supplier of the safety data sheet

Company: Compass Remediation Chemicals
2028 East Ben White Blvd
#240-1974
Austin, TX 78741
Telephone: (866) 221-9167

1.4 Emergency telephone number

Emergency Phone #: CHEMTREC 1-800-424-9300

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Oxidizing liquids (Category 2), H272
Acute toxicity, Oral (Category 4), H302
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Specific target organ toxicity, single exposure (Category 3, Respiratory Tract irritation)
Acute aquatic toxicity (Category 1), H400
Chronic aquatic toxicity (Category 1), H410
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram



Signal word

Danger

Hazard statement(s)

H272 May intensify fire; oxidizer.
H302 Harmful if swallowed.

SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

H314 Causes severe skin burns and eye damage.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P210 Keep away from heat.
P220 Keep/store away from clothing/combustible materials.
P221 Take any precaution to avoid mixing with combustibles.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection
P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all Contaminated clothing. Rinse skin with water/ shower.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/ physician.
P321 Specific treatment (see supplemental first aid instructions on this label).
P363 Wash contaminated clothing before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P391 Collect spillage.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS – none

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Substances		
Chemical name	CAS number	%
Sodium Permanganate	10101-50-5	36 - 40

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

Remove victim to fresh air and keep at rest in a position comfortable for breathing. For breathing difficulties, oxygen may be necessary. Get medical attention immediately

In case of skin contact

Take off immediately all contaminated clothing. (Caution: Solution may ignite certain textiles.)

Immediately flush skin with plenty of water. Get medical attention immediately. Wash contaminated clothing before reuse.

Contact with skin may leave a brown stain of insoluble manganese dioxide. This can be easily removed by washing with a mixture of equal volume of household vinegar and 3% hydrogen peroxide, followed by washing with soap and water

In case of eye contact

Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyelids wide apart. Continue rinsing. Get medical attention immediately

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

Contact with this material will cause burns to the skin, eyes and mucous membranes. Permanent eye damage including blindness could result.

4.3 Indication of any immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. In case of shortness of breath, give oxygen. Decomposition products are alkaline. Brown stain is insoluble manganese dioxide.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Use large amounts of water. Dike to contain.

DO NOT USE dry chemicals, foams

5.2 Special hazards arising from the substance or mixture

Sodium oxides, Manganese/manganese oxides

May intensify fire; oxidizer. May ignite combustibles (wood, paper, oil, clothing, etc.). Contact with incompatible materials or heat (135 °C / 275 °F) could result in violent exothermic chemical reaction. Oxidizing agent, may cause spontaneous ignition of combustible materials. By heating and fire, corrosive vapors/gases may be formed.

SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

5.3 Special protective equipment and precautions for firefighters

Wear self-contained breathing apparatus for firefighting.

5.4 Further information

Move container from fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. Prevent runoff from fire control or dilution from entering streams, sewers, or drinking water supply. Dike fire control water for later disposal. Water runoff can cause environmental damage.

The product is not flammable. May intensify fire; oxidizer. May ignite combustibles (wood, paper, oil, clothing, etc.). Contact with incompatible materials or heat (135 °C / 275 °F) could result in violent exothermic chemical reaction.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Keep combustibles (wood, paper, oil, etc.) away from spilled material. Should not be released into the environment. This product is miscible in water. Stop leak if possible without any risk. Dike the spilled material, where this is possible. Clean up spills immediately by sweeping or shoveling up the material. Do not return spilled material to the original container; transfer to a clean metal or plastic drum. To clean up potassium permanganate solutions, follow either of the following two options:

Option # 1: Dilute to approximately 6% with water, and then reduce with sodium thiosulfate, a bisulfite or ferrous salt solution. The bisulfite or ferrous salt may require some dilute sulfuric acid (10% w/w) to promote reduction. Neutralize with sodium carbonate to neutral pH, if acid was used. Decant or filter and deposit sludge in approved landfill. Where permitted, the sludge may be drained into sewer with large quantities of water.

Option # 2: Absorb with inert media like diatomaceous earth or inert floor dry, collect into a drum and dispose of properly. Do not use saw dust or other incompatible media. Disposal of all materials shall be in full and strict compliance with all federal, state, and local regulations pertaining to permanganates. To clean contaminated floors, flush with abundant quantities of water into sewer, if permitted by federal, state, and local regulations. If not, collect water and treat as described above.

SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

Never return spills in original containers for re-use. For waste disposal, see Section 13 of the SDS

- 6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

- 7.1 Precautions for safe handling
Take any precaution to avoid mixing with combustibles. Do not get this material in your eyes, on your skin, or on your clothing. Do not breathe dust or mist or vapor of the solution. Use personal protective equipment as recommended in Section 8 of the SDS. If clothing becomes contaminated, remove and wash off immediately. Spontaneous ignition may occur in contact with cloth or paper. When using, do not eat, drink or smoke. Good personal hygiene is necessary. Wash hands and contaminated areas with water and soap before leaving the work site. Avoid release to the environment.
- 7.2 Conditions for safe storage, including any incompatibilities
Store locked up. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Segregate from acids, peroxides, formaldehyde, and all combustible, organic, or easily oxidized materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Sodium Permanganate (CAS 10101-50-5)	Ceiling	5 mg/m3

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Sodium Permanganate (CAS 10101-50-5)	TWA	0.1 mg/m3	Inhalable fraction.
		0.02 mg/m3	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Sodium Permanganate (CAS 10101-50-5)	STEL	3 mg/m3	Fume.
	TWA	1 mg/m3	Fume.

Biological limit values No biological exposure limits noted for the ingredient(s).

Exposure guidelines Follow standard monitoring procedures.

SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. Provide adequate general and local exhaust ventilation. An eye wash and safety shower must be available in the immediate work area.

Personal protective equipment

Eye/face protection	Wear safety glasses with side shields (or goggles). Wear face shield if there is risk of splashes.
Skin protection	
Hand protection	Wear chemical-resistant, impervious gloves. Use protective gloves made of: Rubber or plastic. Suitable gloves can be recommended by the glove supplier.
Other	Wear appropriate chemical resistant clothing. Rubber or plastic apron.
Respiratory protection	In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA 29 CFR 1910.134.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene Considerations	When using, do not eat, drink or smoke. Keep from contact with clothing and other combustible materials. Remove and wash contaminated clothing promptly. Wash hands before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form:	Purple liquid
b) Odor	Odorless
c) Odor Threshold	No data available
d) pH	5-8
e) Melting point/freezing point	< 24.8 °F (< -4 °C)
f) Initial boiling point and boiling range	>213.8 °F (> 101 °C)
g) Flash point	Does not flash.
h) Evaporation rate	As water.

SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

i) Flammability (solid, gas)	Not applicable
j) Upper/lower flammability or explosive limits	Not applicable
k) Vapor pressure	760 mm @ 105 degrees C
l) Vapor density	Not applicable
m) Relative density	1.391 g/cm ³
n) Water solubility	Miscible with water.
o) Partition coefficient: noctanol/water	No data available
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	Not explosive. Can explode in contact with sulfuric acid, peroxides, and metal powders.
t) Oxidizing properties	Strong oxidizing agent.

10. STABILITY AND REACTIVITY

- 10.1 Reactivity
No data available
- 10.2 Chemical stability
Stable under recommended storage conditions.
- 10.3 Possibility of hazardous reactions
Contact with combustible material may cause fire. Can explode in contact with sulfuric acid, peroxides and metal powders.
- 10.4 Conditions to avoid
Contact with incompatible materials or heat (135 °C / 275 °F) could result in violent exothermic chemical reaction.
- 10.5 Incompatible materials
Acids, peroxides, and all combustible organic or readily oxidizable materials including inorganic oxidizable materials and metal powders. With hydrochloric acid, chlorine gas is liberated.
- 10.6 Hazardous decomposition products
By heating and fire, corrosive vapors/gases may be formed. Contact with hydrochloric acid liberates chlorine gas.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Information on likely routes of exposure

Ingestion	Harmful if swallowed.
Inhalation	May cause irritation to the respiratory system.
Skin contact	Causes severe skin burns.
Eye contact	Causes serious eye damage.

SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

Symptoms related to the physical, chemical and toxicological characteristics
Contact with this material will cause burns to the skin, eyes and mucous membranes.
Permanent eye damage including blindness could result.

Information on toxicological effects	Acute toxicity Harmful if swallowed.
Skin corrosion/irritation	Causes severe skin burns.
Serious eye damage/eye irritation	
Respiratory or skin sensitization	
Respiratory sensitization	Not classified.
Skin sensitization	Not classified.
Germ cell mutagenicity	Not classified.
Carcinogenicity	Not classified.
Reproductive toxicity	Not classified.
Specific target organ toxicity - single exposure	May cause irritation of respiratory tract.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not classified.

Chronic effects

May cause damage to respiratory system. Prolonged exposure, usually over many years, to manganese oxide fume/dust can lead to chronic manganese poisoning, chiefly affecting the central nervous system. Chronic effects Chronic effects are not expected when this product is used as intended.

12. ECOLOGICAL INFORMATION

- 12.1 Toxicity
Very toxic to aquatic life with long lasting effects.
- 12.2 Persistence and degradability
Expected to be readily converted by oxidizable materials to insoluble manganese oxide.
- 12.3 Bioaccumulative potential
Potential to bioaccumulate is low.
- 12.4 Mobility in soil
The product is miscible with water. May spread in water systems
- 12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted
- 12.6 Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

13. DISPOSAL CONSIDERATIONS

Disposal instructions	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazardous waste code	D001: Ignitable waste The Waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues/ Unused products	Do not allow this material to drain into sewers/water supplies. Dispose in accordance with all applicable regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Rinse container at least three times to an absence of pink color before disposing. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION

DOT (US)

UN number: 3214

Class: 5.1

Packing group: II

Proper shipping name: Permanganates, inorganic, aqueous solution, n.o.s.
(Sodium permanganate)

Reportable Quantity (RQ):

Poison Inhalation Hazard: No

DOT Hazard Class: 49 CFR172.101

5.1

Hazard Class: 49 CFR172.101

Oxidizer

IMDG

UN number: 3214

Class: 5.1

Packing group: II

EMS-No: F-H, S-Q

Proper shipping name: PERMANGANATES, INORGANIC, AQUEOUS SOLUTION, N.O.S. (Sodium permanganate)

Marine pollutant: yes

IATA

UN number: 3214

Class: 5.1

Packing group: II

Proper shipping name: Permanganates, inorganic, aqueous solution, n.o.s. (Sodium permanganate)

15. REGULATORY INFORMATION

US federal regulations	This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List.

SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

CERCLA/SARA Hazardous Substances – Not applicable.

Drug Enforcement Administration (DEA) (21 CFR 1310.02
(b) 8: List II chemical.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)
Reportable Quantity - * pounds (RCRA hazardous waste)
Superfund Amendments and Reauthorization Act of 1986 (SARA)
Hazard categories Immediate Hazard - No
 Delayed Hazard - No
 Fire Hazard – No
 Pressure Hazard - No
 Reactivity Hazard - No

SARA 302 Extremely hazardous substance
Not listed.

SARA 311/312 Hazardous chemical

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Sodium Permanganate	10101-50-5	36 – 40

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Sodium Permanganate (CAS 10101-50-5)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR
68.130)
Not regulated.

Safe Drinking Water Act (SDWA)
Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR
1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Sodium Permanganate (CAS 10101-50-5)	6588

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21
CFR 1310.12(c))

Sodium Permanganate (CAS 10101-50-5)	15 % wt

DEA Exempt Chemical Mixtures Code Number

Sodium Permanganate (CAS 10101-50-5)	6588

US state regulations This product does not contain a chemical known to the
State of California to cause cancer, birth defects or other
reproductive harm.
California OSH Hazardous Substance List: Listed.

SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

US. Massachusetts RTK - Substance List

Not regulated.

US. New Jersey Worker and Community Right-to-Know Act

Sodium Permanganate (CAS 10101-50-5)

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

US. Rhode Island RTK

Sodium Permanganate (CAS 10101-50-5)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Not listed.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Acute Tox. Acute toxicity

Aquatic Acute Acute aquatic toxicity

Aquatic Chronic Chronic aquatic toxicity

Eye Dam. Serious eye damage

H272 May intensify fire; oxidizer.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

Ox. Sol. Oxidizing solids

Skin Corr. Skin corrosion

HMIS Rating

Health: 1

Flammability: 0

Physical Hazard: 0

Protective Equipment: D

NFPA Rating



SAFETY DATA SHEET – 40% SODIUM PERMANGANATE

List of abbreviations

TWA: Time weighted average. LD50: Lethal Dose, 50%.

LC50: Lethal Concentration, 50%.

IMDG: International Maritime Dangerous Goods.

IATA: International Air Transport Association.

MARPOL: International Convention for the Prevention of Pollution from Ships.

Disclaimer

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Appendix B

Limited Site Specific Data

Appendix C

Design Drawings



Department of
Environmental
Conservation

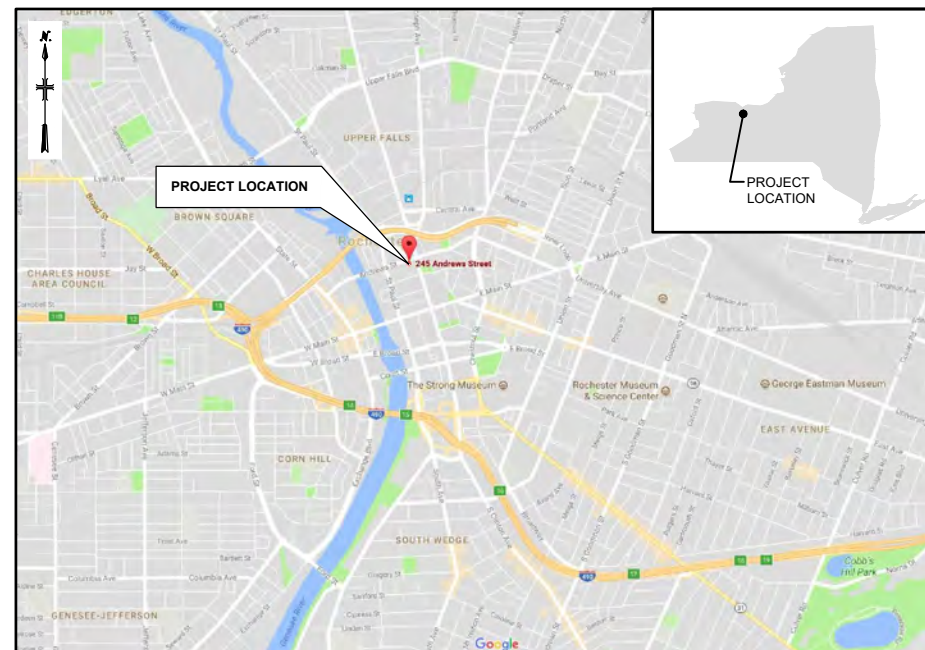
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION

FORMER SILVER CLEANERS, SITE NO. 828186

245 ANDREWS STREET, CITY OF ROCHESTER, MONROE COUNTY, NEW YORK

FORMER SILVER CLEANERS REMEDIAL CONSTRUCTION PROJECT

DECEMBER 2022



SITE LOCATION MAP

0 1000' 2000'
APPROX. SCALE

INDEX TO DRAWINGS	
GENERAL	
SHEET NO.	TITLE
G-00	COVER SHEET
G-01	ABBREVIATIONS AND SYMBOLS
CIVIL	
SHEET NO.	TITLE
C-01	EXISTING SITE PLAN
C-02	SITE CONTROLS PLAN
C-03	DEMOLITION PLAN
C-04	PROPOSED EXCAVATION
C-05	RESTORATION PLAN
C-06	DETAILS I
C-07	DETAILS II
C-08	DETAILS III

REMEDIAL DESIGN FOR CALL OUT IMPLEMENTATION

APPROVED FOR
ARCADIS OF NEW YORK, INC. _____

LEGAL ENTITY: ARCADIS OF NEW YORK, INC.



NOTE:
SCALES SHOWN HEREIN ARE FOR FULL SIZE 22"x34"
PLOTS. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR
CONVERTING SCALES ON REDUCED OR ENLARGED PLOTS.

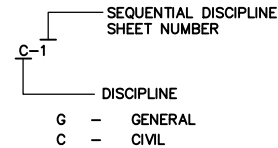
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GENERAL NOTES

1. THE "DEPARTMENT" OR "NYSDEC" SHALL BE DEFINED AS THE NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION.
2. THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT, MATERIALS, SUPPLIES, FACILITIES, POWER AND INCIDENTALS NECESSARY TO FULLY COMPLETE THE WORK AS SHOWN, AS SPECIFIED AND AS DIRECTED BY THE DEPARTMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL WORK DESCRIBED IN THE CONTRACT DOCUMENTS, INCLUDING ITEMS NOT SPECIFICALLY IDENTIFIED, AS REQUIRED TO COMPLETE THE WORK.
3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS, AND THE CONTRACTOR'S APPROVED SUBMITTALS. IF ANY LAW, REGULATION AND/OR CONTRACT DOCUMENTS HAVE CONTRADICTING REQUIREMENTS, THEN THE MOST STRINGENT REQUIREMENT SHALL APPLY. LOCAL LAWS SHALL INCLUDE ANY TOWN, VILLAGE, CITY OR OTHER LOCAL REGULATORY AUTHORITY HAVING JURISDICTION.
4. THE CONTRACTOR IS RESTRICTED FROM PERFORMING ANY OPERATIONS OUTSIDE THE DEFINED CONTRACT LIMITS UNLESS OTHERWISE APPROVED BY THE DEPARTMENT. ADDITIONALLY, ALL WORK COMPLETED ON TEMPORARY EASEMENTS SHALL CONFORM WITH APPLICABLE ACCESS AGREEMENTS, INCLUDING TEMPORARY AND PERMANENT EASEMENTS OBTAINED FOR THE PROJECT.
5. THE CONTRACTOR SHALL IDENTIFY, APPLY FOR AND OBTAIN, PAY ALL FEES FOR, AND COMPLY WITH ALL REQUIREMENTS OF ALL ISSUED LICENSES, PERMITS, APPROVALS AND INSURANCE REQUIRED FROM FEDERAL, STATE AND LOCAL GOVERNMENT AND PUBLIC AGENCIES AND AUTHORITIES NECESSARY TO PERFORM THE WORK. THE CONTRACTOR SHALL PROVIDE INDEMNIFICATIONS TO PUBLIC AND PRIVATE AGENCIES AND AUTHORITIES AS NECESSARY TO PERFORM THE WORK.
6. PLANS DO NOT SHOW ALL UTILITIES. THE EXISTENCE AND LOCATION OF ANY UTILITIES INDICATED ON THE PLANS ARE NOT GUARANTEED AND SHALL BE INVESTIGATED AND VERIFIED IN THE FIELD BY THE CONTRACTOR BEFORE STARTING WORK. PUBLIC AND PRIVATE UTILITIES SHALL BE LOCATED BY THE CONTRACTOR, AT NO ADDITIONAL COST TO THE DEPARTMENT, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY NO LATER THAN 48 HOURS PRIOR TO ANY EXCAVATION THAT MAY AFFECT THAT UTILITY. EXCAVATION IN THE VICINITY OF UNDERGROUND UTILITIES SHALL BE DUG BY HAND. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES.
7. CONTRACTOR SHALL NOT TURN OFF UTILITIES SERVICING PROPERTIES ADJACENT TO THE SITE WITHOUT PRIOR WRITTEN APPROVAL FROM ARCADIS. WORK SHALL BE SEQUENCED AS NEEDED TO MINIMIZE DURATION OF UTILITY SHUTOFFS.
8. ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL STATUTES AND U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS (OSHA). CONTRACTOR ALONE WILL BE RESPONSIBLE FOR THE EXECUTION OF THE WORK IN ACCORDANCE WITH ALL APPLICABLE HEALTH AND SAFETY REQUIREMENTS. THE DEPARTMENT SHALL INSPECT THE WORK OR THE METHODS OF CONSTRUCTION FOR COMPLIANCE WITH THESE REQUIREMENTS.
9. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND CONDITIONS BEFORE COMMENCING WORK. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REPORT ANY DISCREPANCIES TO THE DEPARTMENT IN A TIMELY MANNER. FAILURE TO PROSPECT IN ADVANCE OF WORK OR VERIFY DIMENSIONS SHALL NOT BE CAUSE FOR ADDITIONAL COSTS OR TIME TO THE DEPARTMENT.
10. SCALES SHOWN HEREIN ARE FOR FULL SIZE PLOTS ON 22" X 34" SHEETS. THE CONTRACTOR IS RESPONSIBLE FOR CONVERTING SCALES ON REDUCED OR ENLARGED PLOTS.
11. CONTRACTOR SHALL RESTORE SITE TO A CONDITION AT LEAST AS GOOD AS EXISTED PRIOR TO DISTURBANCE (IN KIND) UNLESS OTHERWISE SPECIFICALLY DIRECTED IN THE CONTRACT DOCUMENTS. DAMAGED ITEMS SHALL BE REPLACED AT THE CONTRACTOR EXPENSE.
12. BASE MAP SUPPLIED BY RAVI ENGINEERING AND LAND SURVEYING, P.C., AUTOCAD FILE: ACAD_2010_20-16-025_MAP_SUR_2DH.DWG, DATED FEBRUARY 3, 2016. HORIZONTAL COORDINATE SYSTEM: CITY OF ROCHESTER DATUM (NAD83). VERTICAL COORDINATE SYSTEM: CITY OF ROCHESTER DATUM.

DRAWING IDENTIFICATION SYSTEM



ABBREVIATIONS

AC	ACRE
A/C	AIR CONDITIONING
ADD'L	ADDITIONAL
AMSL	ABOVE MEAN SEA LEVEL
APPROX.	APPROXIMATE
ASPH	ASPHALT
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
⊙	AT
&	AND
BC	BOTTOM OF CURB
BE	BOTTOM ELEVATION
BFF	BELOW FINISHED FLOOR
BIT.	BITUMINOUS
BL	BASELINE
BLS	BELOW LAND SURFACE
CB	CATCH BASIN
℄	CENTERLINE
C.O.	CLEAN OUT
CL	CHAIN LINK
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CONT	CONTINUE, CONTINUOUS
DEPT	DEPARTMENT
DET	DETAIL
DIA./∅	DIAMETER
DIM	DIMENSION
DWG(S)	DRAWING(S)
EA	EACH
EL, ELEV	ELEVATION
ELEC	ELECTRIC
ENT	ENTRANCE
EQ	EQUAL
EQUIP	EQUIPMENT
ETC	ET CETERA
EXIST	EXISTING
FF	FINISHED FLOOR
FT	FEET
GAL	GALLON
GC	GENERAL CONTRACTOR
HDPE	HIGH DENSITY POLYETHYLENE
ID	INSIDE DIAMETER
IW	INJECTION WELL
±	PLUS OR MINUS
LBS, #	POUNDS
LF	LINEAR FEET
MAX	MAXIMUM
MFTR/MFG	MANUFACTURER
MIN	MINIMUM
MUTCO	MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
MW	MONITORING WELL
N	NORTH
NAD	NORTH AMERICAN DATUM
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NO/#	NUMBER
NTS	NOT TO SCALE
NYS DOT	NEW YORK STATE DEPARTMENT OF TRANSPORTATION
OBW	OBSERVATION WELL
O.C.	ON CENTER
PCE	TETRACHLOROETHYLENE
℄	PLATE/PROPERTY LINE
PSI	POUND PER SQUARE INCH
PT OR PNT	POINT
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PZ	PIEZOMETER
REQ'D	REQUIRED
SB	SOIL BORING
SCH	SCHEDULE
SPECS	SPECIFICATIONS
SQ.	SQUARE
SQ. FT.	SQUARE FEET
SQ. IN.	SQUARE INCH
STD	STANDARD
TC	TOP OF CURB
TEMP.	TEMPORARY
TRAF	TRAFFIC
TYP	TYPICAL
UST	UNDERGROUND STORAGE TANK
W/	WITH
W/O	WITHOUT
WWF	WELDED WIRE FABRIC

			SITE BOUNDARY LINE/LIMITS OF WORK
			APPROXIMATE PROPERTY LINE
			FENCE LINE
			DRAINAGE CATCH BASIN
			WATER VALVE
			SIGN POST
			LIGHT POLE
			TRAFFIC LIGHT POLE
			SOIL BORING
			GEOTECHNICAL BORING
			PIEZOMETER
			OBSERVATION WELL
			TELEPHONE LINE
			COMMUNICATIONS LINE
			UNDERGROUND ELECTRIC LINE
			UNDERGROUND GAS LINE
			EXTERIOR BUILDING WALL
			UTILITY VAULT
			CONTOUR LINE (PRE-CONSTRUCTION)
			SPOT ELEVATION (FT. AMSL)
			GAS LINE STUB-UP
			ELECTRIC LINE STUB-UP



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SEALS

REMEDIAL DESIGN FOR
CALL OUT IMPLEMENTATION



Division of Environmental Remediation

FORMER SILVER CLEANERS
REMEDIAL CONSTRUCTION
PROJECT

FORMER SILVER CLENAERS
SITE NO. 828186
245 ANDREWS STREET
CITY OF ROCHESTER
MONROE COUNTY
NEW YORK

NO.	DATE	ISSUED FOR	BY

COPYRIGHT: 2022 ARCADIS OF NEW YORK, INC.

DATE: DECEMBER 2022

PROJECT NO.: 30085744

FILE NAME: IRM-DESIGN-DR-G01

DESIGNED BY: T. MINEHARDT

DRAWN BY: A. AMAYA

CHECKED BY: D. LOEWENSTEIN

SHEET TITLE

GENERAL

ABBREVIATIONS
AND SYMBOLS

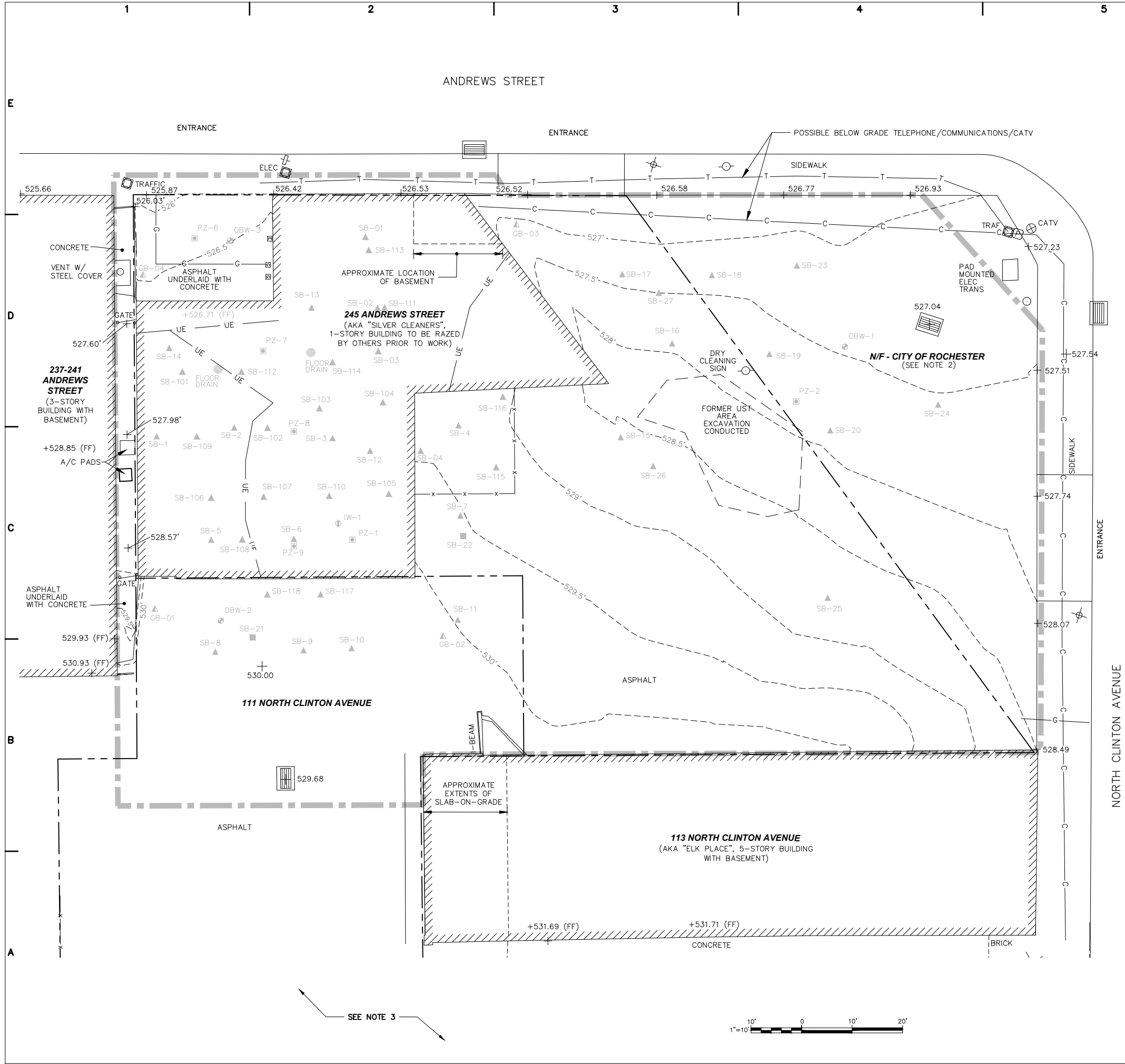
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SHEET 1 OF 9

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LEGEND

- SITE BOUNDARY LINE/LIMITS OF WORK
- PROPOSED SOIL BORING
- GEOTECHNICAL SOIL BORING
- PIEZOMETER
- OBSERVATION WELL
- INJECTION WELL
- EXTERIOR BUILDING WALL
- PROPOSED GEOTECHNICAL BORING

- NOTES:**
- PRIOR TO THE DEMOLITION, THE UTILITIES ASSOCIATED WITH THE BUILDING WERE REMOVED.
 - PARCEL OWNER BY THE CITY OF ROCHESTER. CONTRACTOR SHALL ASSUME DEC WILL OBTAIN AN ACCESS AGREEMENT TO OCCUPY DURING REMEDIAL CONSTRUCTION ACTIVITIES.
 - CONTRACTOR SHALL NOTE THAT ROCHESTER EARLY CHILDHOOD DEVELOPMENT BUILDING IS LOCATED IMMEDIATELY SOUTH OF THE SITE JUST BEYOND THE LIMITS OF THIS MAP.

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**FORMER SILVER CLEANERS
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DESIGNED BY: T. MINEHARDT

DRAWN BY: A. AMAYA

CHECKED BY: D. LOEWENSTEIN

SHEET TITLE

CIVIL

EXISTING SITE PLAN

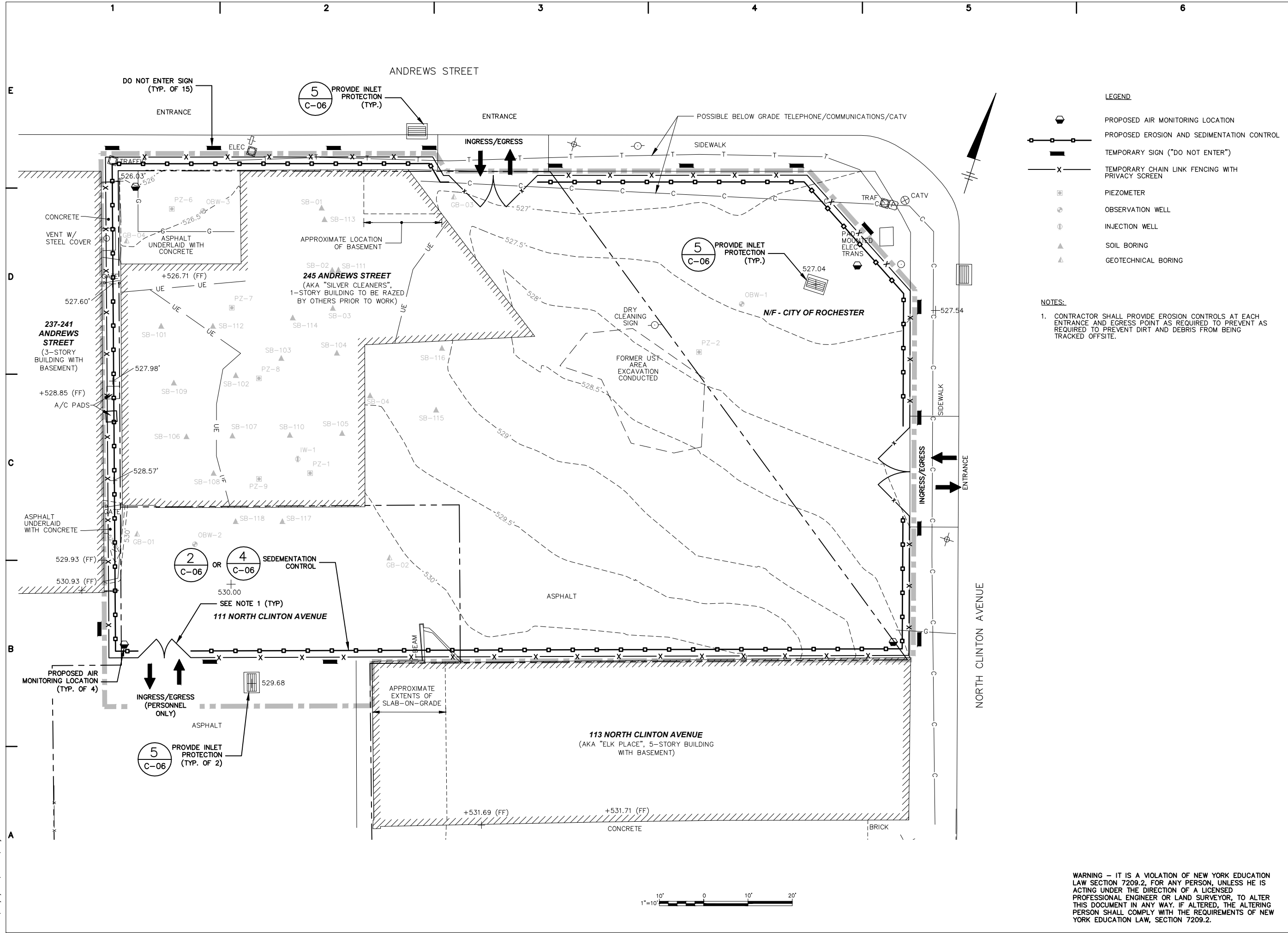
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Division of Environmental Remediation

FORMER SILVER CLEANERS
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PROJECT NO.: 30085744

FILE NAME: IRM-DESIGN-DR-C02

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DRAWN BY: A. AMAYA

CHECKED BY: D. LOEWENSTEIN

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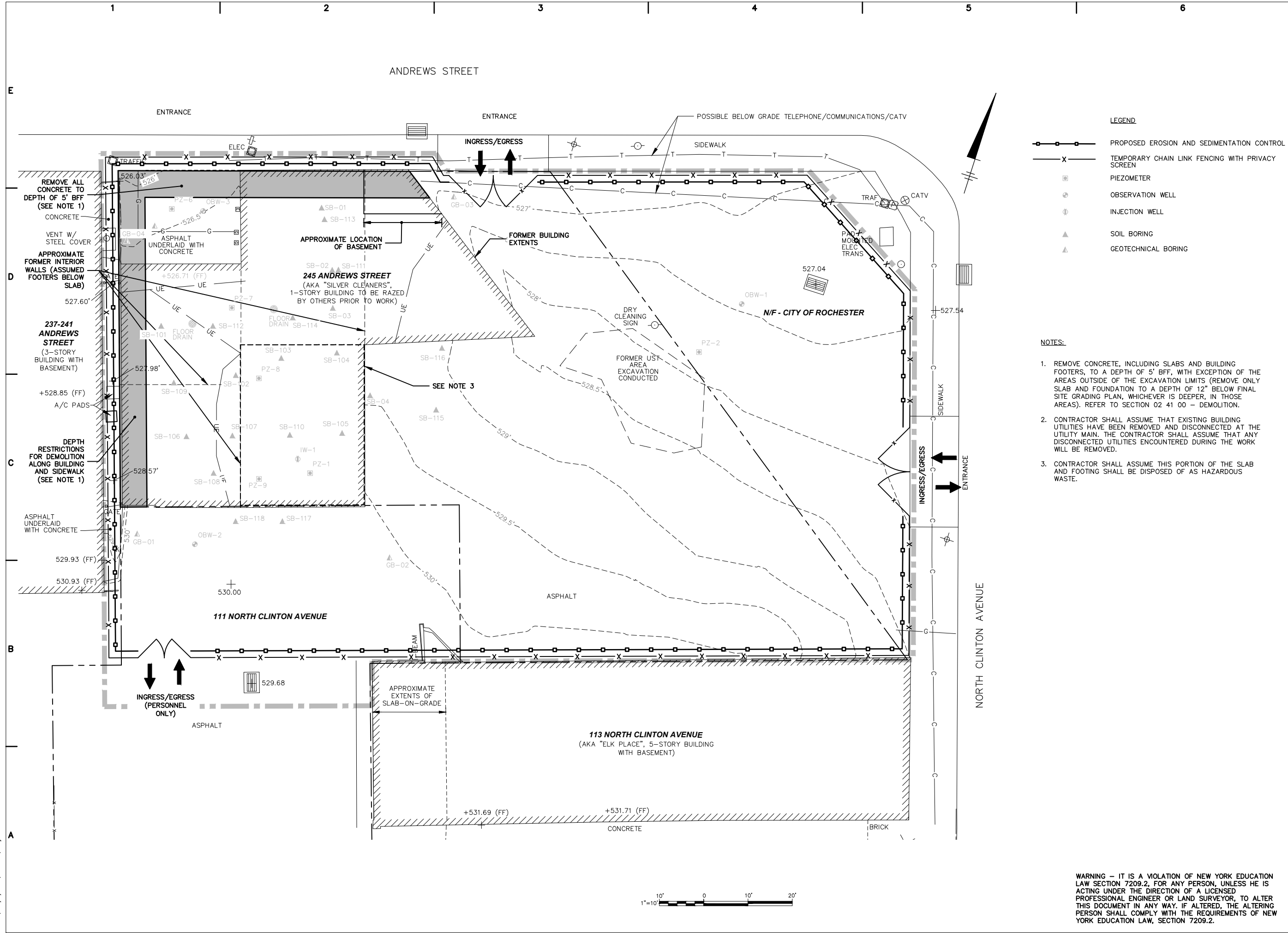
CIVIL

SITE CONTROLS PLAN

SCALE: AS SHOWN

C-02
SHEET 3 OF 9

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SITE NO. 828186
245 ANDREWS STREET
CITY OF ROCHESTER
MONROE COUNTY
NEW YORK

NO.	DATE	ISSUED FOR	BY

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DATE: DECEMBER 2022

PROJECT NO.: 30085744

FILE NAME: IRM-DESIGN-DR-C03

DESIGNED BY: T. MINEHARDT

DRAWN BY: A. AMAYA

CHECKED BY: D. LOEWENSTEIN

SHEET TITLE

CIVIL

DEMOLITION PLAN

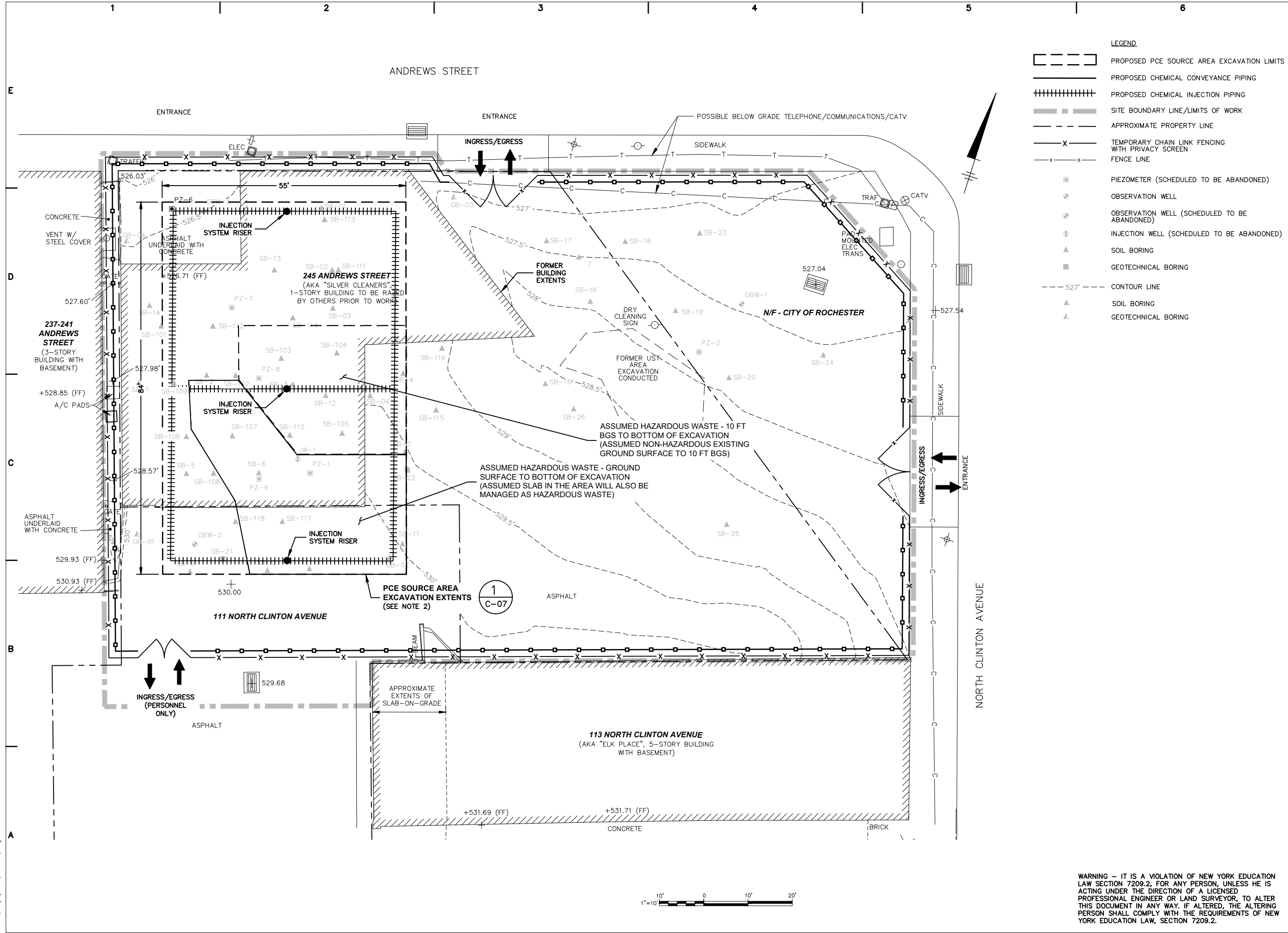
SCALE: AS SHOWN

C-03

SHEET 4 OF 9

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User:AMAYA Spec:AUS-NCMOD File:C:\USERS\AMAYA\ARCADIS\VF-86697816 - MARKS NYSED PROJECTS - SILVER CLEANERS\REMEDIAL DESIGN\REMEDIATION CONSTRUCTION CALL OUT\CALL OUT DRAWINGS\CADD\IRM-DESIGN-DR-C04.DWG Scale:1:1 1/2 SaveDate:12/5/2022 Time:13:08 Plot Date: Amaya, Andrew, 12/9/2022, 10:03 ; LayoutC-04



LEGAL ENTITY:
ARCADIS OF NEW YORK, INC.

CONSULTANTS

SEALS

REMEDIAL DESIGN FOR CALL
OUT IMPLEMENTATION

Division of Environmental Remediation
**FORMER SILVER CLEANERS
REMEDIAL CONSTRUCTION
PROJECT**

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DATE: DECEMBER 2022

PROJECT NO.: 30085744

FILE NAME: IRM-DESIGN-DR-C04

DESIGNED BY: T. MINEHARDT

DRAWN BY: A. AMAYA

CHECKED BY: D. LOEWENSTEIN

SHEET TITLE

CIVIL

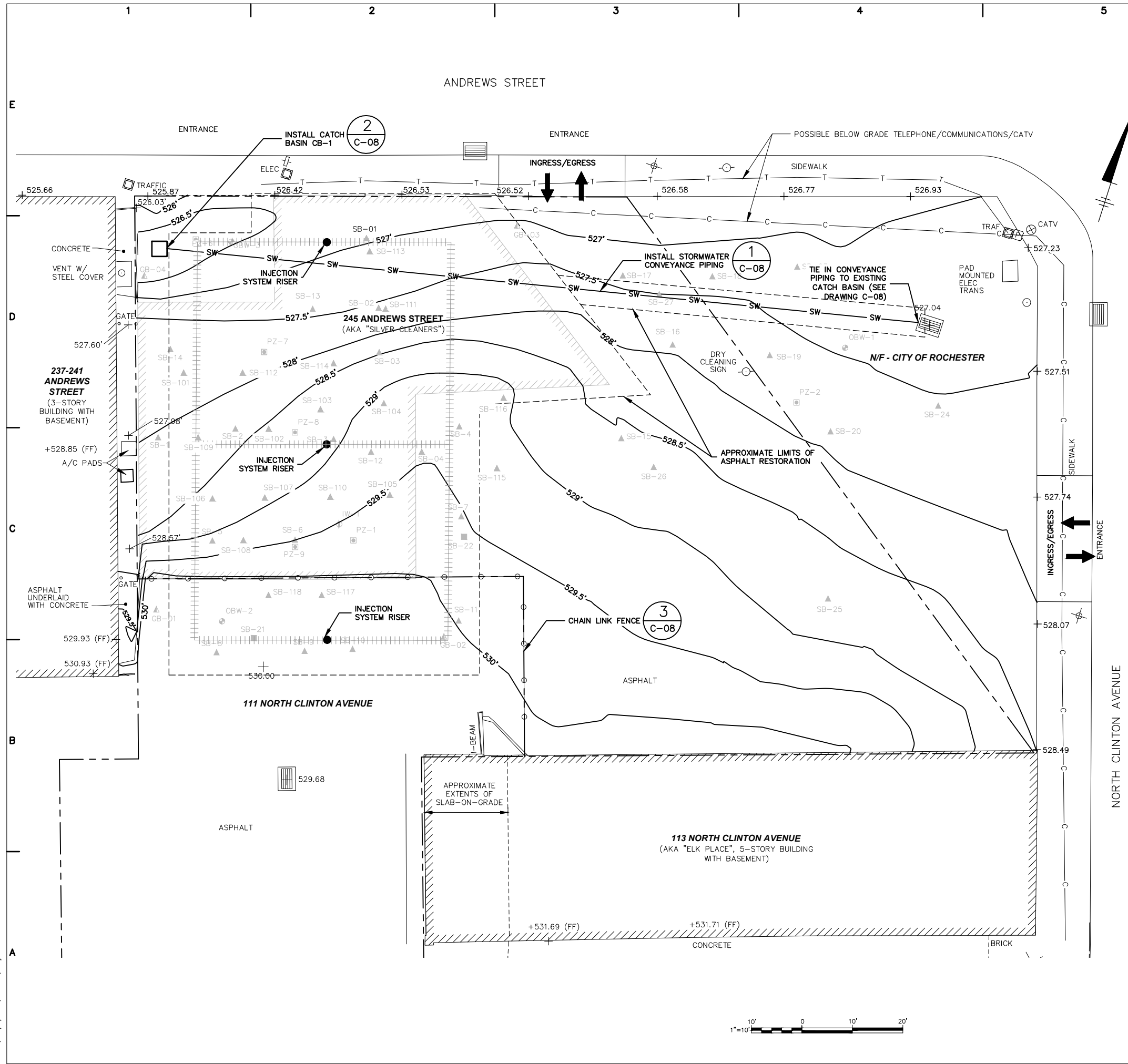
PROPOSED
EXCAVATION

SCALE: AS SHOWN

C-04

SHEET 5 OF 9

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Division of Environmental Remediation
FORMER SILVER CLEANERS
REMEDIAL CONSTRUCTION
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PROJECT NO.: 30085744

FILE NAME: IRM-DESIGN-DR-C05

DESIGNED BY: T. MINEHARDT

DRAWN BY: A. AMAYA

SHEET TITLE

CIVIL

RESTORATION PLAN

SCALE: AS SHOWN

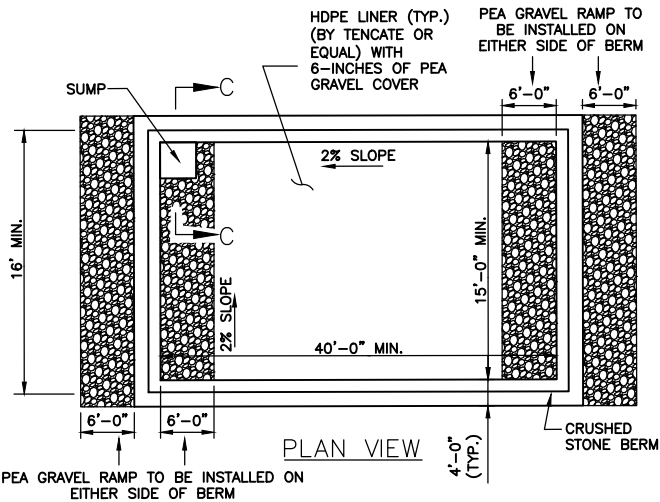
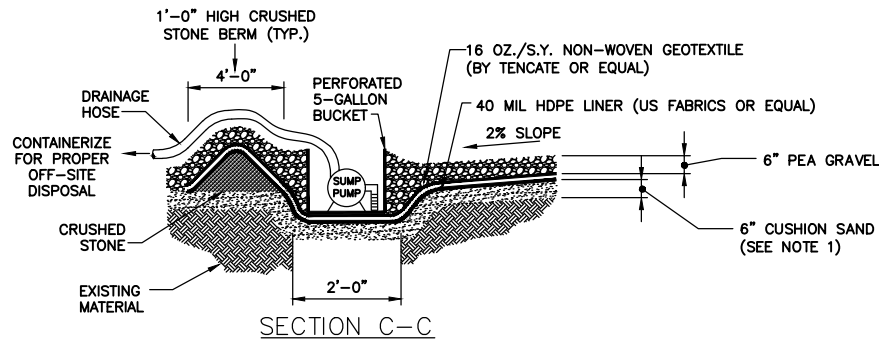
C-05

SHEET 6 OF 9

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User: AAMAYA Spec: AUS-NCSMOD File: C:\USERS\AAMAYA\ARCADIS\PROJECTS\MARK'S NYSDOT PROJECTS - SILVER CLEANERS\REMEDIAL DESIGN\RM-DESIGN-DR-C06.DWG Scale: 1:1 Saved Date: 12/5/2022 Time: 13:54
Plot Date: Aamaya, Andrew: 12/9/2022: 10:48 : Layout: C-06

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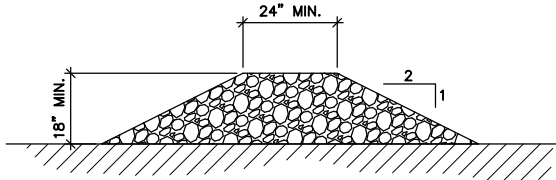


NOTES:

- CUSHION SAND SHALL CONSIST OF CONCRETE SAND CONFORMING TO THE REQUIREMENTS OF SECTION 703-07 OF THE NYSDOT STANDARD SPECIFICATIONS.
- CONTRACTOR SHALL EXCAVATE MATERIAL TO THE DEPTH SHOWN AS NEEDED TO INSTALL EQUIPMENT DECONTAMINATION AREA AT LOCATION AS SELECTED BY SUBCONTRACTOR AND ACCEPTABLE BY ARCADIS.
- UPON COMPLETION OF CONSTRUCTION ACTIVITIES, THE MATERIALS USED FOR THE EQUIPMENT DECONTAMINATION AREA SHALL BE REMOVED, TRANSPORTED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES.
- UPON COMPLETION OF CONSTRUCTION ACTIVITIES, CONTRACTOR SHALL RESTORE AREA IN-KIND TO THE LINES, GRADES AND DIMENSIONS OF THE EXISTING CONDITIONS (AS THEY EXISTED PRIOR TO INSTALLATION OF THE EQUIPMENT DECONTAMINATION AREA).

1 EQUIPMENT DECONTAMINATION AREA DETAIL

NOT TO SCALE

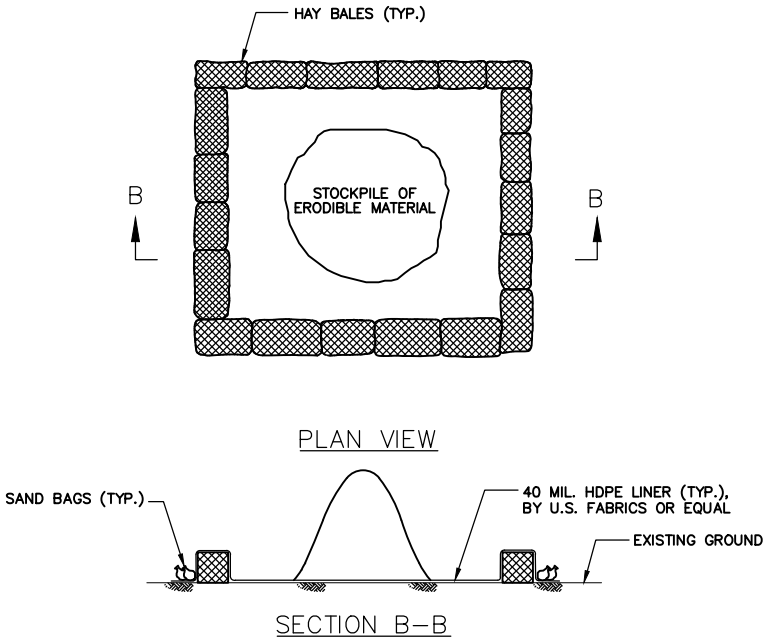


NOTES:

- USE ONLY OPEN-GRADED ROCK WITH MOST OF THE FINES REMOVED.
- STONE SHALL BE CRUSHED AND, UNLESS OTHERWISE SPECIFIED, SHALL BE AT LEAST 3" IN DIAMETER AND LESS THAN 1 CUBIC FOOT IN VOLUME.
- THE STONE SHALL BE REPLACED WHEN THE BERM CEASES TO FUNCTION AS INTENDED.

2 SEDIMENTATION CONTROL ROCK BERM DETAIL

NOT TO SCALE

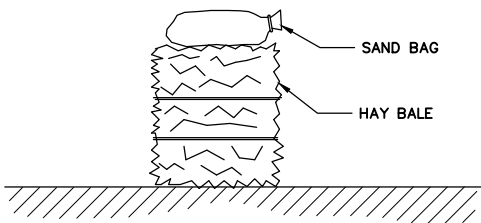


NOTES:

- CONTRACTOR SHALL COORDINATE REMOVAL AND REPLACEMENT OF HAY BALES, AS NECESSARY, TO FACILITATE ACCESS TO STOCKPILED MATERIAL.
- ADD GEOCUSHION BENEATH LINER WHEN EXISTING GROUND SURFACE IS CONCRETE OR ASPHALT.
- STOCKPILED MATERIAL SHALL BE COVERED DAILY. SUBCONTRACTOR SHALL MAINTAIN COVER AND PREVENT WATER FROM ACCUMULATING ON STOCKPILED MATERIAL.

3 SEDIMENT CONTROL DETAIL FOR STOCKPIILING OF ERODIBLE MATERIAL

NOT TO SCALE



NOTES:

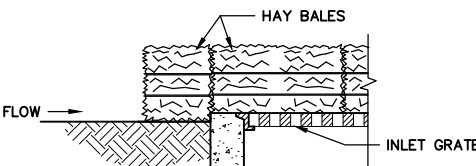
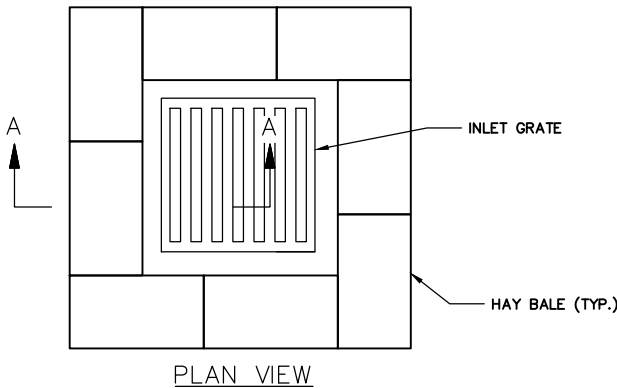
- CONTRACTOR SHALL FURNISH AND INSTALL SEDIMENT CONTROL BERM AT THE LOCATIONS SHOWN.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL CLEANED OR REMOVED AND REPLACED WHEN SILT AND SEDIMENT FOUL MATERIAL.
- BERM SHALL BE CONSTRUCTED OF HAY BALES PLACED IN A SINGLE ROW WITH ENDS OF BALES TIGHTLY ABUTTING ONE ANOTHER. BALES SHALL BE WEIGHTED DOWN WITH SANDBAGS AS NEEDED.

4 SEDIMENTATION CONTROL BERM DETAIL

NOT TO SCALE

SEDIMENT, EROSION & STORMWATER CONTROL NOTES:

- ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES TO BE INSTALLED PRIOR TO ALL SOIL DISTURBANCE AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
- SOIL EROSION AND SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH THE NEW YORK STATE DEPARTMENT OF CONSERVATION'S 2016 NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL HEREIN REFERRED TO AS THE "STATE STANDARDS".
- THE CONTRACTOR SHALL TAKE NECESSARY MEASURES TO MAINTAIN DUST CONTROL.
- ALL SOIL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE LOCATED IN THE FIELD IN ACCORDANCE WITH THE CONTRACTOR'S APPROVED STORM WATER MANAGEMENT PLAN. THE CONTRACT DRAWINGS ARE NOT INTENDED TO SHOW THE LOCATION AND DETAILS FOR ALL SUCH DEVICES BUT ARE TO BE USED AS A REASONABLE GUIDE.
- ANY CHANGES TO THE CERTIFIED SOIL EROSION AND SEDIMENT CONTROL PLANS WILL REQUIRE THE SUBMISSION OF REVISED SOIL EROSION AND SEDIMENT CONTROL PLANS TO THE DEPARTMENT. THE REVISED PLANS MUST BE PREPARED BY THE CONTRACTOR AND MUST MEET ALL CURRENT NEW YORK STATE SOIL EROSION AND SEDIMENT CONTROL PRACTICES.
- CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS.
- UPON COMPLETION OF CONSTRUCTION WORK AND AFTER FINAL GRADING AND WHEN PERMANENT STABILIZATION HAS BEEN ESTABLISHED, HAY BALES, SILT FENCES AND ALL OTHER SOIL PLAN APPURTENANCES WILL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR, UNLESS ORDERED TO REMAIN BY THE DEPARTMENT.
- CATCH BASIN INLETS MUST BE PROTECTED PRIOR TO START OF CONSTRUCTION.
- THE CONTRACTOR SHALL PROVIDE A DETAILED SEQUENCE OF CONSTRUCTION OPERATIONS FOR REVIEW AND SUBMITTAL TO THE DEPARTMENT.
- THE CONTRACTOR SHALL CONFINE SOIL DISTURBANCE ACTIVITY TO THE AREAS CONTAINED WITHIN THE "LIMITS OF WORK" LINES EXCEPT AS DIRECTED BY THE DEPARTMENT.
- SEDIMENT FILTERS PROPOSED BY THE CONTRACTOR SHALL BE INSTALLED IN ACCORDANCE WITH STATE STANDARDS AND THE DETAILS OF DESIGN AND CONSTRUCTION SHALL BE PREPARED AND SUBMITTED BY THE CONTRACTOR TO THE DEPARTMENT, AND ALL OTHER PERTINENT AGENCIES FOR REVIEW.
- CONTRACTOR SHALL INSPECT SEDIMENT AND EROSION CONTROL MEASURES DAILY AND AS NECESSARY DURING STORM EVENTS TO MAINTAIN PROPER FUNCTION. EROSION CONTROL MEASURES SHALL BE REPAIRED OR REPLACED IMMEDIATELY AS REQUIRED.



NOTES:

- BALES SHALL BE PLACED IN A SINGLE ROW AROUND THE INLET WITH ENDS OF BALES TIGHTLY ABUTTING ONE ANOTHER.
- BALES SHALL BE WEIGHTED DOWN WITH SANDBAGS AS NEEDED.

5 INLET SILT PROTECTION DETAIL

NOT TO SCALE

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LEGAL ENTITY:
ARCADIS OF NEW YORK, INC.

CONSULTANTS

SEALS

REMEDIAL DESIGN FOR CALL OUT IMPLEMENTATION



Division of Environmental Remediation

FORMER SILVER CLEANERS REMEDIAL CONSTRUCTION PROJECT

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MONROE COUNTY
NEW YORK

NO.	DATE	ISSUED FOR	BY

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PROJECT NO.: 30085744

FILE NAME: IRM-DESIGN-DR-C06

DESIGNED BY: T. MINEHARDT

DRAWN BY: A. AMAYA

CHECKED BY: D. LOEWENSTEIN

SHEET TITLE

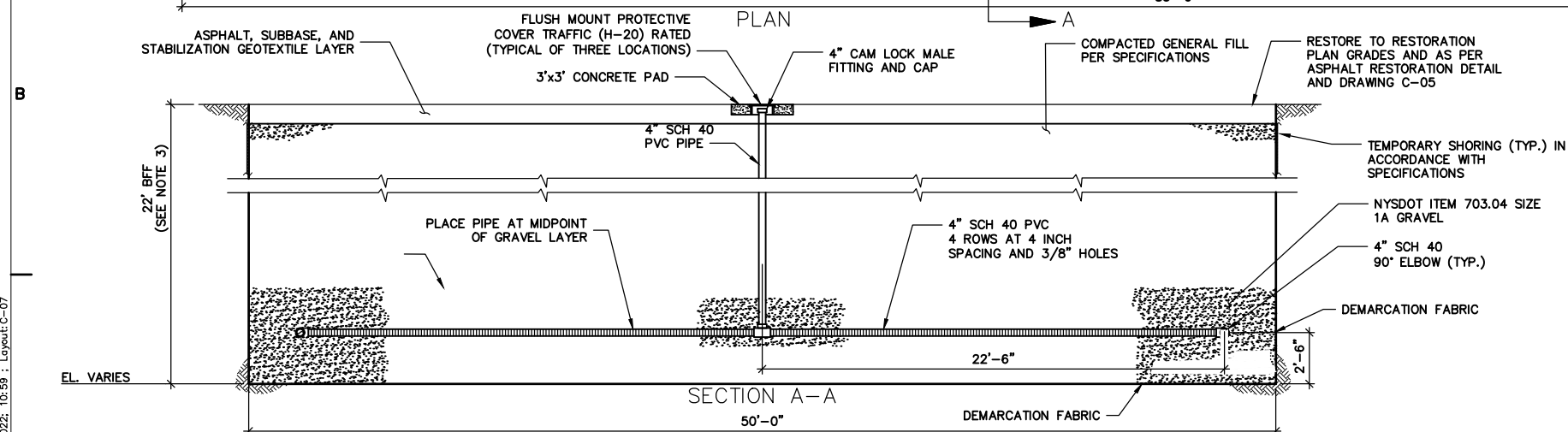
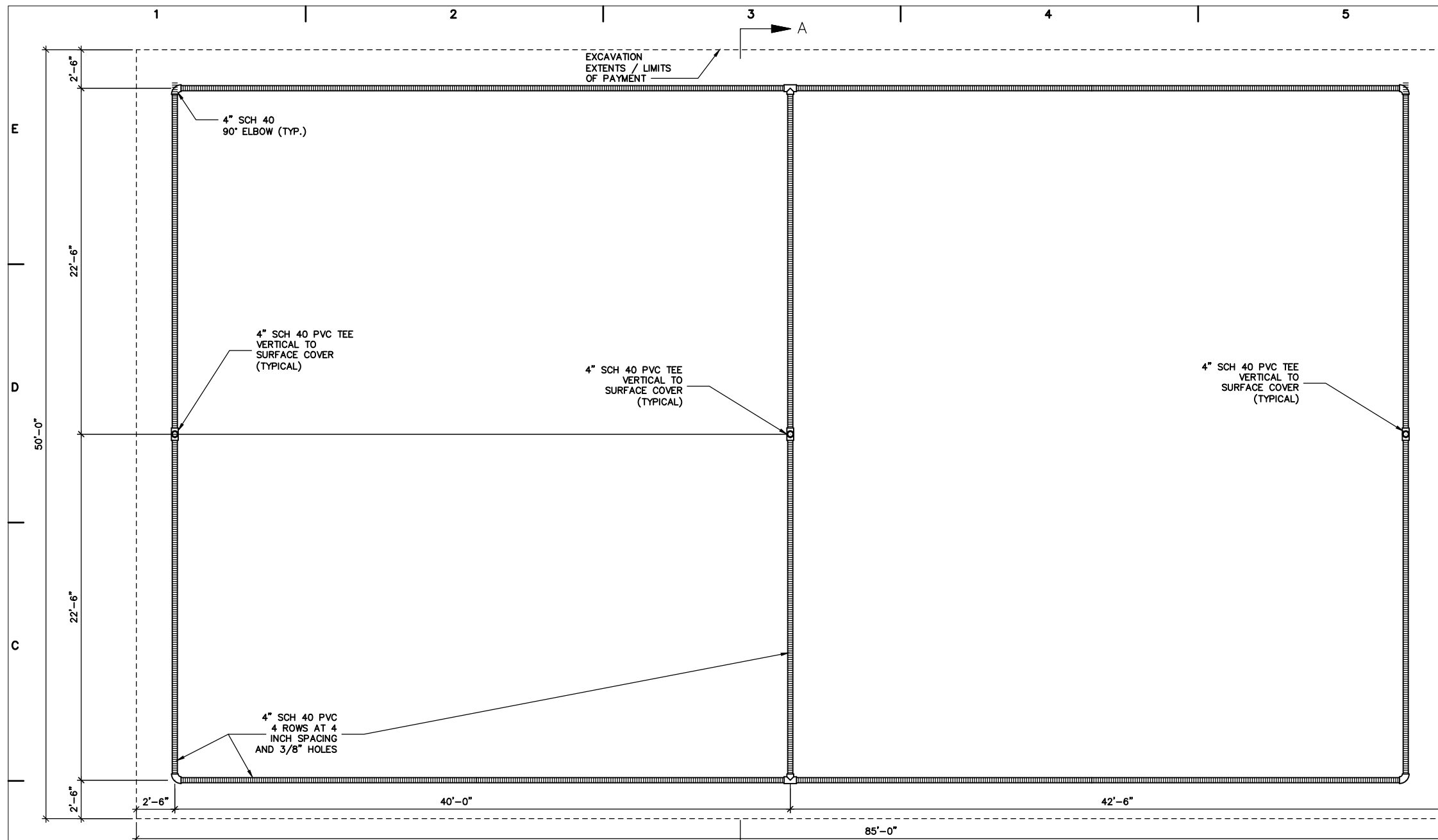
CIVIL

DETAILS I

SCALE: NOT TO SCALE

C-06

SHEET 7 OF 9



A cross-sectional diagram of a pavement structure. From top to bottom, the layers are: a thin hatched layer labeled "1" TOP COURSE"; a thicker hatched layer labeled "3" BASE COURSE"; a layer of small circles labeled "8" SUBBASE MATERIAL"; a horizontal line labeled "STABILIZATION FABRIC"; and a bottom layer with diagonal hatching labeled "COMPACTED SUBGRADE/GENERAL FILL".

- NOTES:**
1. REFER TO SECTION 31 04 19 - GEOSYNTHETICS FOR EARTHWORK, FOR STABILIZATION FABRIC REQUIREMENTS.
 2. REFER TO SECTION 32 12 00 - FLEXIBLE PAVEMENT, FOR PAVEMENT REQUIREMENTS.
 3. THIS DETAIL IS TYPICAL FOR ALL SURFACE RESTORATION.
 4. CONTRACTOR SHALL SAWCUT EXISTING PAVEMENT TO CREATE A CLEAN AND UNIFORM TIE-IN AT EXISTING PAVEMENT.

2 ASPHALT PAVEMENT DETAIL

NOT TO SCALE

NOTES:

1. REFER TO SECTION 31 23 05 - EXCAVATION AND FILL, FOR BACKFILL MATERIAL REQUIREMENTS.
2. REFER TO SECTION 31 05 19 - GEOSYNTHETICS FOR EARTHWORK, FOR REQUIREMENTS FOR DEMARCATION AND SEPARATION FABRICS.
3. MAXIMUM DEPTH OF EXCAVATION WILL BE 22 FEET. MINIMUM DEPTH IS ASSUMED 20 FEET. EXCAVATION WILL BE A MINIMUM OF 1 FEET AND A MAXIMUM OF 2 FEET INTO DENSE GLACIAL TILL.

PCE SOURCE AREA CHEMICAL INJECTION SYSTEM

NOT TO SCALE



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ARCADIS OF NEW YORK, INC.

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REMEDIAL DESIGN FOR CALL OUT IMPLEMENTATION



Division of Environmental Remediation

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SITE NO. 828186
245 ANDREWS STREET
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NEW YORK

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PROJECT NO.:	30085744

FILE NAME: IRM-DESIGN-DR-C07

DESIGNED BY: T. MINEHARDT

DRAWN BY: A. AMAYA

CHECKED BY: D. LOEWENSTEIN

SHEET TITLE

CIVIL

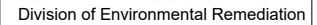
DETAILS II

SCALE: AS SHOWN

C-07

SHEET 8 OF 9

REMEDIAL DESIGN FOR CALL OUT IMPLEMENTATION



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FILE NAME: IRM-DESIGN-DR-C08

DESIGNED BY: T. MINEHARDT

DRAWN BY: A. AMAYA

CHECKED BY: D. LOEWENSTEIN

SHEET TITLE

CIVIL

DETAILS III

SCALE: AS SHOWN

C-08

SHEET 9 OF 9



1. REFER TO SECTION 31 23 05 - EXCAVATION AND FILL, FOR BACKFILL MATERIAL REQUIREMENTS.
2. REFER TO SECTION 31 05 19 - GEOSYNTHETICS FOR EARTHWORK, FOR REQUIREMENTS FOR STABILIZATION AND SEPARATION FABRICS.
3. REDUCE GENERAL FILL AND SAND FILL THICKNESS AS NEEDED TO MEET THE SUBBASE MATERIAL AND ASPHALT THICKNESS, AND FINAL GRADE.

STORMWATER CONVEYANCE PIPE TRENCH DETAIL

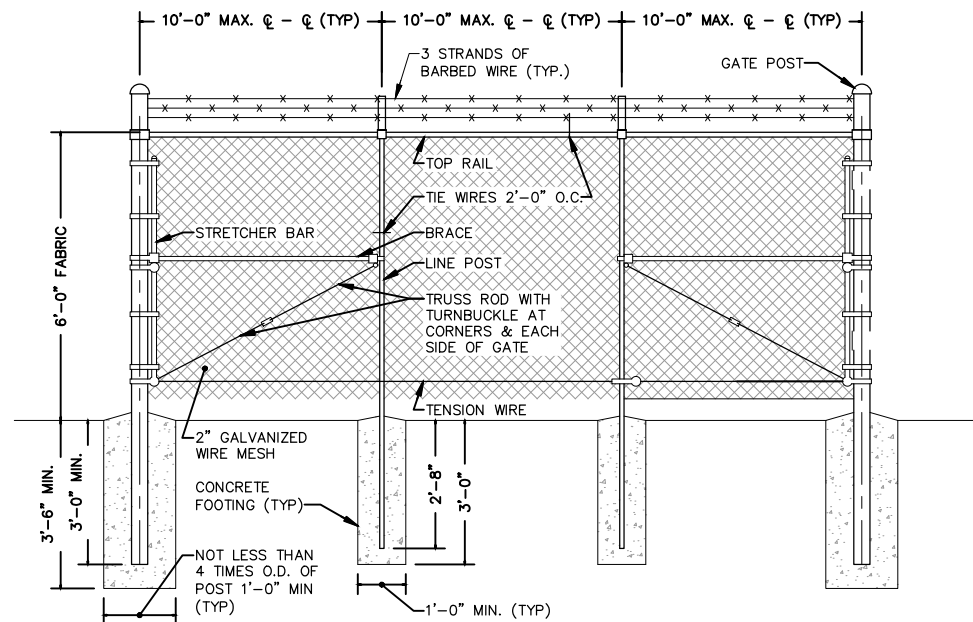
NOT TO SCALE



1. ALL CATCH BASINS, STRUCTURES, FRAMES, AND GRATES SHALL BE DESIGNED FOR H2O LOADING.
2. REFER TO SECTION 31 23 05 - EXCAVATION AND FILL, FOR BACKFILL MATERIAL REQUIREMENTS.
3. REFER TO SECTION 31 05 19 - GEOSYNTHETICS FOR EARTHWORK, FOR REQUIREMENTS FOR STABILIZATION AND SEPARATION FABRICS.

CATCH BASIN DETAIL

NOT TO SCALE



CHAIN LINK FENCE

$$1'' = 1'$$

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Appendix D

Design Specifications



Department of
Environmental
Conservation

Division of Environmental Remediation

**Site Name: Former Silver Cleaners
Remedial Construction Project**

Site Number: 828186

**Location: City of Rochester, Monroe
County, New York**

Technical Specifications

ARCADIS of New York, Inc.

December 2022

New York State Department of Environmental Conservation
KATHY HOCHUL, *Governor* Basil Seggos, *Commissioner*

STANDARD SPECIFICATIONS

Division 1

01 31 19.13	Pre-Construction Conference.....	01 31 19.13-1
01 31 19.23	Progress Meetings	01 31 19.23-1
01 31 26	Electronic Communication Protocols.....	01 31 26-1
01 32 16	Progress Schedule	01 32 16-1
01 32 33	Photographic Documentation	01 32 33-1
01 33 00	Submittal Procedures.....	01 33 00-1
01 35 29	Contractor's Health and Safety Plan	01 35 29-1
01 35 33	COVID-19 Management	01 35 33-1
01 35 33A	COVID-19 Contractors Guidance for Construction Jobsites	01 35 33A-1
01 35 43.13	Environmental Procedures for Hazardous Materials	01 35 43.13-1
01 42 00	References	01 42 00-1
01 45 29.13	Testing Laboratory Services Furnished by Contractor	01 45 29.13-1
01 51 05	Temporary Utilities and Controls	01 51 05-1
01 52 13	Contractors Field Office and Sheds	01 52 13-1
01 55 13	Access Roads and Parking Areas.....	01 55 13-1
01 57 33	Security	01 57 33-1
01 71 23	Field Engineering.....	01 71 23-1
01 76 50	Nuisance Controls, Management and Corrective Measures.....	01 76 50-1
01 77 23	Inspection.....	01 77 23-1
01 78 39	Project Record Documents	01 78 39-1
01 89 29	Green Remediation Practices.....	01 89 29-1
01 89 29A	Green Remediation – Form A.....	01 89 29A-1
34 78 13	Portable Truck Scales.....	34 78 13-1

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SECTION 01 31 19.13

PRE-CONSTRUCTION CONFERENCE

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. A pre-construction conference will be held for the Project in accordance with General Conditions, Section VIII, Article 1.2.
 - 2. CONTRACTOR shall attend the conference prepared to discuss all items on the pre-construction conference agenda.
 - 3. CONTRACTOR will distribute an agenda, preside at conference, and prepare and distribute minutes to all conference participants and others as requested.
- B. Purpose of Pre-construction Conference:
 - 1. Purpose of conference is to designate responsible personnel, establish working relationships, discuss preliminary schedules submitted by CONTRACTOR, and formalize procedures for the preparation and review administrative and procedural requirements for the Project.
 - 2. Review and comply with the requirements of the General Conditions.
 - 3. Review CONTRACTOR's plans for complying with the requirements of Article 5 of the General Conditions.
 - 4. Discuss any conflicts, errors or discrepancies that CONTRACTOR has discovered by review of the Contract Documents.
 - 5. Unless otherwise indicated in the Contract Documents or otherwise agreed to by the entities involved, Site mobilization meeting will be part of the pre-construction conference.

1.2 PREPARATION FOR PRE-CONSTRUCTION CONFERENCE

- A. Date, Time, and Location:
 - 1. Conference will be held no later than twenty calendar days after the effective Date of the Agreement, but before the CONTRACTOR starts the Work.
 - 2. Department will establish the date, time, and location of conference and notify the interested and involved entities.
- B. CONTRACTOR shall furnish information required and contribute appropriate items for discussion at the pre-construction conference.
- C. Handouts for Pre-Construction Conference:
 - 1. CONTRACTOR shall bring to the conference the following, with sufficient number of copies for each attendee:
 - a. Preliminary Progress Schedule, as submitted to the DEPARTMENT.
 - b. Preliminary Schedule of Submittals, as submitted to the DEPARTMENT.

- c. Preliminary Schedule of Values, as submitted to DEPARTMENT.
- d. Listing of identity and general scope of Work or supply of planned Subcontractors and Suppliers.
- e. List of emergency contact information.

1.3 REQUIRED ATTENDEES

- A. Representative of each entity attending the conference shall be authorized to act on that entity's behalf.
- B. CONTRACTOR Attendance: Conference shall be attended by CONTRACTOR's:
 - 1. Project manager.
 - 2. Site superintendent
 - 3. Site Health and Safety Officer
 - 4. Project managers for major Subcontractors, and major equipment Suppliers as CONTRACTOR deems appropriate.
- C. Other attendees will be representatives of:
 - 1. DEPARTMENT.
 - 2. ENGINEER.
 - 3. Authorities having jurisdiction over the Work, if available.
 - 4. Utility owners, as applicable.
 - 5. Others as requested by DEPARTMENT, CONTRACTOR, or ENGINEER.

1.4 AGENDA

- A. Preliminary Agenda: Be prepared to discuss in detail the topics indicated below. Revisions, if any, to the agenda below will be furnished to required attendees prior to the pre-construction conference.
 - 1. Procedural and Administrative:
 - a. Personnel and Teams:
 - 1) Designation of roles and personnel.
 - 2) Limitations of authority of personnel, including personnel who will sign Contract modifications and make binding decisions.
 - 3) Subcontractors and Suppliers in attendance.
 - 4) Authorities having jurisdiction.
 - b. Procedures for communications and correspondence, including electronic communication protocols.
 - c. Copies of the Contract Documents and availability.
 - d. Subcontractors and Suppliers.
 - 1) Lists of proposed Subcontractors and Suppliers.
 - e. The Work and Scheduling:
 - 1) General scope of the Work.
 - 2) Contract Times, including Milestones (if any).
 - 3) Phasing and sequencing.
 - 4) Preliminary Progress Schedule.
 - 5) Critical path activities.

- f. Safety:
 - 1) Responsibility for safety.
 - 2) Contractor's safety representative.
 - 3) Emergency procedures and accident reporting.
 - 4) Emergency contact information.
 - 5) Confined space entry permits.
 - 6) Hazardous materials communication program.
 - 7) Impact of Project on public safety.
- g. Permits.
- h. Review of insurance requirements and insurance claims.
- i. Coordination:
 - 1) Project coordination, and coordination among contractors.
 - 2) Construction coordinator.
 - 3) Coordination with DEPARTMENT's operations.
 - 4) Progress meetings.
 - 5) Preliminary Schedule of Submittals.
 - 6) Procedures for furnishing and processing submittals.
 - 7) Work not eligible for payment until submittals are approved or accepted (as required).
 - 8) Construction photographic documentation.
- k. Substitutes and "Or-Equals":
 - 1) Product options.
 - 2) Procedures for proposing "or-equals".
 - 3) Procedures for proposing substitutes.
- l. Contract Modification Procedures
 - 1) Requests for interpretation
 - 2) Written clarifications
 - 3) Field Orders
 - 4) Proposal Requests
 - 5) Change Proposals
 - 6) Work Change Directives.
 - 7) Change Orders.
 - 8) Procedure for Claims and dispute resolution
- m. Payment:
 - 1) DEPARTMENT's Project financing and funding, as applicable.
 - 2) DEPARTMENT's tax-exempt status.
 - 3) Preliminary Schedule of Values
 - 4) Procedures for measuring for payment.
 - 5) Retainage.
 - 6) Progress payment procedures.
 - 7) Prevailing wage rates and payrolls.
- n. Testing and inspections, including notification requirements.
- o. Disposal of demolition materials.
- p. Record documents.
- q. Preliminary Discussion of Contract Closeout:
 - 1) Procedures for Substantial Completion.
 - 2) Contract closeout requirements.

- 3) Correction period.
- 4) Duration of bonds and insurance.
- 2. Site Mobilization (if not covered in a separate meeting):
 - a. Working hours and overtime.
 - b. Field offices, storage trailers, and staging areas.
 - c. Temporary facilities.
 - d. Temporary utilities and limitations on utility consumption (where applicable).
 - e. Utility company coordination (if not done as a separate meeting).
 - f. Access to Site, access roads, and parking for construction vehicles.
 - g. Maintenance and protection of traffic.
 - h. Use of Site and premises.
 - i. Protection of property.
 - j. Security.
 - k. Temporary controls, such as sediment and erosion controls, noise controls, dust control, storm water controls, and other such measures.
 - l. Site barriers and temporary fencing.
 - m. Storage of materials and equipment.
 - n. Reference points and benchmarks; surveys and layouts.
 - o. Site maintenance during the Project.
 - p. Cleaning and removal of trash and debris.
 - q. Restoration.
- 3. General discussion and questions.
- 4. Next meeting.
- 5. Site visit, if required.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01 31 19.23

PROGRESS MEETINGS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. Progress meetings will be held throughout the Project. CONTRACTOR shall attend each progress meeting prepared to discuss in detail all items on the agenda.
2. CONTRACTOR will preside at progress meetings and will prepare and distribute minutes of progress meetings to all meeting participants and others as requested.

1.2 PREPARATION FOR PROGRESS MEETINGS

A. Date and Time:

1. Regular Meetings: Bi-weekly, occurring twice per month, on a day and time agreeable to DEPARTMENT, ENGINEER, and CONTRACTOR.
2. Other Meetings: Weekly meetings may be requested to discuss and/or resolve matters concerning various elements of the Work.

B. Location:

1. CONTRACTOR's field office at the Site or other location mutually agreed upon by DEPARTMENT, CONTRACTOR, and ENGINEER.

C. Handouts:

1. CONTRACTOR shall bring to each progress meeting not less than eight copies of each of the following:
 - a. List of Work accomplished since the previous progress meeting.
 - b. Up-to-date Progress Schedule.
 - c. Up-to-date Schedule of Submittals.
 - d. Health and Safety/Community Air Monitoring Summary.
 - e. Quality control testing including analytical testing Summary.
 - f. Detailed "look-ahead" schedule of Work planned through the next progress meeting, with specific starting and ending dates for each activity, including shutdowns, deliveries of important materials and equipment, Milestones (if any), and important activities affecting the DEPARTMENT, Project, and Site.
 - g. When applicable, list of upcoming, planned time off (with dates) for personnel with significant roles on the Project, and the designated contact person in their absence.
2. CONTRACTOR shall bring to each progress meeting not less than eight (-8-) copies of each of the following:

- a. Up-to-date Schedule of Submittals including identification of outstanding critical submittals.
- b. Up-to-date Status tracking logs for RFI, PCOs, and Field Orders.

1.3 REQUIRED ATTENDANCE

- A. Representatives present for each entity shall be authorized to act on that entity's behalf.
- B. Required Attendees:
 - 1. CONTRACTOR:
 - a. Project manager.
 - b. Site superintendent.
 - c. Safety representative.
 - d. When needed for the discussion of a particular agenda item, representatives of Subcontractors and Suppliers shall attend meetings.
 - 2. Construction coordinator (if any).
 - 3. ENGINEER:
 - a. Project manager or designated representative
 - b. Others as required by ENGINEER.
 - 4. Department 's representative(s), as required.
 - 5. Testing and inspection entities, as required.
 - 6. Others, as appropriate.

1.4 AGENDA

- A. Preliminary Agenda: Be prepared to discuss in detail the topics listed below. Revised agenda, if any, will be furnished to CONTRACTOR prior to first progress meeting. Progress meeting agenda may be modified by CONTRACTOR during the Project as required.
 - 1. Safety
 - 2. Review, comment, and amendment (if required) of minutes of previous progress meeting.
 - 3. Review of progress since the previous progress meeting.
 - 4. Planned progress through next progress meeting.
 - 5. Review of Progress Schedule
 - a. Contract Times, including Milestones (if any)
 - b. Critical path.
 - c. Schedules for fabrication and delivery of materials and equipment.
 - d. Corrective measures, if required.
 - 6. Submittals:
 - a. Review status of critical submittals.
 - b. Review revisions to Schedule of Submittals.
 - 7. Contract Modifications
 - a. Requests for Interpretation.
 - b. Field Orders.
 - c. Proposed Change Orders.

- d. Approved Change Orders.
- e. Claims.
- 8. Applications for progress payments status
- 8. Problems, conflicts, and observations.
- 9. Quality standards, testing, and inspections.
- 10. Coordination between parties.
- 11. Site management issues, including access, security, maintenance and protection of traffic, maintenance, cleaning, and other Site issues.
- 12. Permits.
- 13. Construction photographic documentation, as applicable.
- 14. Record documents status, as applicable.
- 15. Punch list status, as applicable.
- 16. Other business.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

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SECTION 01 31 26

ELECTRONIC COMMUNICATION PROTOCOLS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. This Section establishes the procedures with which the parties will comply regarding transmission or exchange of electronic data for the Project.
 - 2. CONTRACTOR shall provide labor, materials, tools, equipment, services, utilities, and incidentals shown, specified, and required for complying with this Section throughout the Project.
 - 3. In addition to the requirements of this Section, comply with requirements for exchange of electronic data in the following:
 - a. Section 01 32 16, Progress Schedule.
 - b. Section 01 32 33, Photographic Documentation.
 - c. Section 01 33 00, Submittal Procedures.
 - d. Section 01 78 39, Project Record Documents.
- B. Coordination:
 - 1. CONTRACTOR shall require all Subcontractors and Suppliers to comply with the electronic communication protocols established in this Section.
- C. Related Sections:
 - 1. Section 01 32 16, Progress Schedule.
 - 2. Section 01 32 33, Photographic Documentation.
 - 3. Section 01 33 00, Submittal Procedures.
 - 4. Section 01 78 39, Project Record Documents.

1.2 TERMINOLOGY

- A. The following words or terms are not defined but, when used in this Section, have the following meaning:
 - 1. “Electronic data” means information, communications, drawings, or designs created or stored for the Project in electronic or digital form.
 - 2. “Confidential information” means electronic data that the transmitting party has designated as confidential and clearly marked with an indication such as “Confidential”, “Business Proprietary”, or similar designation.
 - 3. “Written” or “in writing” means any and all communications, including without limitation a notice, consent, or interpretation, prepared and sent to an address provided in the Contract Documents or otherwise agreed upon by the parties and DEPARTMENT using a transmission method sent forth in this Section that allows the recipient to print or store the communication. Communications transmitted electronically are presumed received when

sent in conformance with this Paragraph 1.2.A.3.

1.3 TRANSMISSION OF ELECTRONIC DATA

- A. Transmission of electronic data constitutes a warrant by the transmitting party to the receiving party that the transmitting party is one or more of the following:
 - 1. The copyright owner of the electronic data.
 - 2. Has permission from the copyright owner to transmit the electronic data for its use on the Project.
 - 3. Is authorized to transmit confidential information.
- B. Receiving party agrees to keep confidential information confidential and not to disclose it to another person except to (1) its employees, (2) those who need to know the content of the confidential information to perform services or construction solely and exclusively for the Project, or (3) its Consultants, Contractors, Subcontractors, and Suppliers whose contracts include similar restrictions on the use of electronic data and confidential information.
- C. Transmitting party does not convey any right in the electronic data or in the software used to generate or transmit such data. Receiving party may not use electronic data unless permission to do so is provided in the Contract Documents, or in a separate license.
- D. Unless otherwise granted in a separate license, receiving party's use, modification, or further transmission of electronic data, as provided the Contract Documents, is specifically limited to the design and construction of the Project in accordance with this Section, and nothing contained in this Section conveys any other right to use the electronic data for any other purpose.
- E. Means of Transmitting Electronic Data: Unless otherwise indicated in Table 01 31 26-A of this Section or elsewhere in the Contract Documents, transmission of electronic data for the Project will generally be via:
 - 1. E-mail and files attached to e-mail. Maintain e-mail system capable of transmitting and receiving files not less than 20 megabytes (MB) file size.

1.4 ELECTRONIC DATA PROTOCOLS

- A. Comply with the data formats, transmission methods, and permitted uses set forth in Table 01 31 26-A, Electronic Data Protocol Table, below, when transmitting or using electronic data on the Project. Where a row in the table has no indicated means of transmitting electronic data, use for such documents only printed copies transmitted to the receiving party via appropriate delivery method.

TABLE 01 31 26-A
ELECTRONIC DATA PROTOCOL TABLE (E-MAIL ATTACHMENTS)

Electronic Data	Data Format	Transmitting Party	Transmission Method	Receiving Party	Permitted Uses	Notes
1.4.A.1. Project communications						
General communications & correspondence	EM, PDF	D, C	EM, EMA	D, C	R	
Meeting notices and agendas	EM, PDF	C	EM, EMA	D, C	R	
Meeting minutes	PDF	C	EM, EMA	D, C	R	
1.4.A.2. Contractor's submittals to Department						
Shop Drawings	PDF	C	EMA	D	M (1)	(1)
Product data	PDF	C	EMA	D	M (1)	(1)
Informational and closeout submittals:	PDF	C	EMA	D	M (1)	(1)
Documentation of delivery of maintenance materials submittals	PDF	C	EMA	D	M (1)	
1.4.A.3. Department's return of reviewed submittals to Contractor						
Shop Drawings	PDF	D	EMA	D, C	R	
Product data	PDF	D	EMA	D, C	R	
Informational and closeout submittals:	PDF	D	EMA	D, C	R	
Documentation of delivery of maintenance materials submittals	PDF	D	EMA	D, C	R	
1.4.A.4. Contract Modifications Documents						
Requests for interpretation to Department	PDF	C, D	EMA	D	M (1)	(1)
Department's interpretations (RFI responses)	PDF	D	EMA	C, D	R	
Department's clarifications to Contractor	EM, PDF	D	EM, EMA	C, D	R	
Department's issuance of Field Orders	PDF	D	EMA	C, D	R	
Potential Change Orders	PDF	E, D	EMA	C	R	
Change Proposals – submitted to Department	PDF	C	EMA	D, C	S	
Change Proposals – Department's response	PDF	D	EMA	C, D		
Change Orders (for Contractor signature)	PDF	D	EMA	C	R	(2)
1.4.A.5. Applications for Payment						(3)
1.4.A.6. Claims and other notices						(4)
1.4.A.7. Closeout Documents						
Record drawings (As-Built)	DWG and PDF	C	EMA	D	M (5)	(5)
Other record documents	PDF	C	EMA	D	M (5)	(5)
Contract closeout documents						

B. Key to Electronic Data Protocol Table:

Data Format:

EM .msg, .htm, .txt, .rtf, e-mail text
W .docx, Microsoft® Word 2007 or later
EX .xlsx, Microsoft® Excel 2007 or later
PDF .pdf. Portable Document Format
DWG .dwg. Autodesk AutoCAD 2013 drawing.

Transmitting Party:

- D DEPARTMENT (Department may assign some responsibilities to Arcadis as the Department's agent)
- C CONTRACTOR

Transmission Method:

- EM Via e-mail
- EMA As an attachment to an e-mail transmission
- CD Delivered via compact disc
- PW Posted to Project website
- FTP FTP transfer to receiving FTP server

Receiving Party:

- D DEPARTMENT (Department may assign some responsibilities to Arcadis as the Department's agent)
- C CONTRACTOR

Permitted Uses:

- S Store and view only
- R Reproduce and distribute
- I Integrate (incorporate additional electronic data without modifying data received)
- M Modify as required to fulfill obligations for the Project

Notes:

- (1) Modifications by DEPARTMENT to CONTRACTOR's submittals and requests for interpretations are limited to printing out, marking-up, and adding comment sheets.
- (2) May be distributed only to affected Subcontractors and Suppliers. Print out, sign document, and return executed ("wet") signatures to ENGINEER after Department Approval.
- (3) Submit printed Applications for Payment with original ("wet") signatures.
- (4) Submit notices, including Claims, in accordance with the notice provisions of the General Conditions.
- (5) Submit record drawings in native CAD format indicated when CONTRACTOR has executed Arcadis' standard agreement for release of electronic files. In addition, always submit record drawings as a PDF file. Comply with requirements of Section 01 78 39, Project Record Documents.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

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SECTION 01 32 16

PROGRESS SCHEDULE

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. Prepare and submit Progress Schedules in accordance with this Section, unless otherwise accepted by DEPARTMENT.
2. Maintain and update Progress Schedules. Submit updated Progress Schedules as specified in this Section unless otherwise directed by DEPARTMENT.
3. DEPARTMENT's acceptance of the Progress Schedule, and comments or opinions concerning the activities in the Progress Schedule shall not control CONTRACTOR's independent judgment relative to means, methods, techniques, sequences, and procedures of construction. CONTRACTOR is solely responsible for complying with the Contract Times.

1.2 SUBMITTALS

A. Informational Submittals: Submit the following:

1. Interim Schedule:
 - a. Submit an interim schedule indicating CONTRACTOR's anticipated schedule for the Work for the first three (3) weeks in detail and for the remainder of the Work in summary form.
2. Progress Schedules:
 - a. Submit in accordance with Section 01 33 00, Submittal Procedures and Section 01 31 26, Electronic Communication Protocols.
 - b. Preliminary Progress Schedule shall consist of a CPM Diagram and schedule narrative.
 - c. After making revisions in accordance with DEPARTMENT's comments on the preliminary Progress Schedule. Submit in accordance with Section 01 33 00, Submittal Procedures. This schedule will constitute the Baseline Schedule.
 - d. Bi-monthly (every two weeks) project schedules with a 2-week look ahead shall be submitted in Excel format.
 - e. Submit updated Baseline Progress Schedule with schedule narrative as part of the monthly Contractor's Application for Payment. If a Progress Schedule remains unchanged from one payment application to the next, submit a written statement to that effect.
 - f. Furnish each Progress Schedule submittal with letter of transmittal complying with requirements of Section 01 33 00, Submittal Procedures, and specifically indicating the following:
 - 1) Listing of activities and dates that have changed since the previous Progress Schedule submittal.

- 2) Discussion of problems causing delays, anticipated duration of delays, and proposed countermeasures.
3. Recovery Schedules: Submit in accordance with this Section.
4. If CONTRACTOR doesn't intend to perform Work on the date with the Contract Time commences, CONTRACTOR must notify the DEPARTMENT as soon as possible in writing when work will commence. An interim schedule shall be submitted in accordance with Section VIII, Article 1.4. Within 20 days after starting work at the site, an updated Baseline Project Schedule shall be provided to the DEPARTMENT for review.
5. DEPARTMENT reviewed project schedules shall be managed as Record Documentation.

1.3 PROGRESS SCHEDULE FORMAT AND CONTENT

A. Format:

1. Type:
 - a. Gantt chart prepared using software such as Microsoft Project 2007 or later edition, Oracle Primavera P6, Oracle Primavera Project Planner – P3, or similar software.
2. Sheet Size: 11x17, unless otherwise accepted by DEPARTMENT.
3. Time Scale: Indicate first date of each work week.
4. Organization:
 - a. Indicate on the separate Schedule of Submittals dates for submitting and reviewing Shop Drawings, Samples, and other submittals.
 - b. Group deliveries of materials and equipment into a separate sub-schedule that is part of the Progress Schedule.
 - c. Group construction into a separate sub-schedule (that is part of the Progress Schedule) by activity.
 - d. Group critical activities that dictate the rate of progress (the “critical path”) into a separate sub-schedule that is part of the Progress Schedule. Clearly indicate the critical path on the Progress Schedule. At minimum activities should align with Bid Form.
 - e. Organize each sub-schedule item in accordance with the approved Schedule of Values.
5. Activity Designations: Indicate title and related Specification Section number.
6. Deliver schedules in both working file and PDF formats with the accompanying narrative.

B. Content: Progress Schedules shall indicate the following:

1. Dates for shop-testing, as applicable.
2. Delivery dates for materials and equipment to be incorporated into the Work.
3. Dates for beginning and completing each phase of the Work by activity and by trade.
4. Dates for start-up and check-out, field-testing, and instruction of operations and maintenance personnel.

5. Dates corresponding to the Contract Times, and planned completion date associated with each Milestone (if any), Substantial Completion, and readiness for final payment.
- C. Coordinate the Progress Schedule with the Schedule of Submittals.
 - D. Progress Schedules anticipating achievement of Substantial Completion ahead of the corresponding Contract Time(s), but with zero Contract Float as opposed to positive Contract Float, will be returned as either "Approved as Noted," "Resubmit with Revisions," or "Disapproved." Submittals stamped as "Approved as Noted" will indicate DEPARTMENT's approval thereof, subject to the limitations set forth, including DEPARTMENT's computation of the appropriate Contract Float implied by the anticipated early completion.
 - E. Any float identified in the approved (or approved as noted) Baseline Schedule will be available for the project. The use of float shall be documented in each progress payment. If the CONTRACTOR disputes the availability of Contract Float and proposes that compensation for delay shall be measured from the anticipated early completion date(s) as opposed to the corresponding Contract Time(s), CONTRACTOR agrees and understands that said proposal will represent a request to the DEPARTMENT that the approved Progress Schedule be evaluated as a substitute Progress Schedule for the purposes of changing the Contract Time(s) to those supported by the CONTRACTOR's early-completion Progress Schedule. Evaluation of that substitution will require additional supporting data that explains and substantiates the basis of the anticipated Early Schedules. Such supporting data shall consist of: 1) notice of any scheduled Work during hours other than normal work hours, 2) information related to rates of production including pertinent quantities, crew sizes, man-day requirements, major items of equipment, etc., for Critical and other significant Activities, 3) express or implied contingency allowances figured in for Activities for such factors as weather, delays, activities of DEPARTMENT and DEPARTMENT to respond to reports of differing site conditions, and other relevant factors. Acceptance of that substitution will be evidenced by a Change Order shortening the Contract Time, or Contract Times accordingly, but maintaining the Contract Price and the provisions for liquidated and actual damages set forth in the Agreement.

1.4 RECOVERY SCHEDULES

- A. Recovery Schedules – General:
 1. When updated Progress Schedule indicates that the ability to comply with the Contract Times falls five or more days behind schedule, and the delay is within the control of CONTRACTOR, and there is no corresponding Change Order or Work Change Directive to support an extension of the Contract Times, CONTRACTOR shall prepare and submit a Progress Schedule demonstrating

CONTRACTOR's plan to accelerate the Work to achieve compliance with the Contract Times ("recovery schedule") for DEPARTMENT's acceptance.

2. Submit recovery schedule within five days after submittal of updated Progress Schedule where need for recovery schedule is indicated.
- B. Implementation of Recovery Schedule:
1. At no additional cost to DEPARTMENT, do one or more of the following: furnish additional resources (additional workers, additional construction equipment, increased work hours or additional shifts, and other resources), provide suitable materials, expedite procurement of materials and equipment to be incorporated into the Work, and other measures necessary to complete the Work within the Contract Times.
 2. Upon acceptance of recovery schedule by DEPARTMENT, incorporate recovery schedule into the next Progress Schedule update.
- C. Lack of Action:
1. CONTRACTOR's refusal, failure, or neglect to take appropriate recovery action, or to submit a recovery schedule, shall constitute reasonable evidence that CONTRACTOR is not prosecuting the Work or separable part thereof with the diligence that will ensure completion within the Contract Times. Such lack of action shall constitute sufficient basis for Department to exercise remedies available to Department under the Contract.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. Furnish photographic documentation for the following:
 - a. Pre-construction.
 - b. Construction progress.
 - c. Final.
- B. Image Quality:
 - 1. Photographic documentation shall be in color.
 - 2. Photographic images shall be suitably staged and set up (“framed”), focused, and shall have adequate lighting to illuminate the Work and conditions that are the subject of the photograph.

1.2 QUALITY ASSURANCE

- A. At the Site, CONTRACTOR shall be responsible for photo documenting daily activity, the photographic subjects, views, and angles will vary with progress of the Work.

1.3 SUBMITTALS

- A. Informational Submittals: Submit the following:
 - 1. Pre-construction Photographic Documentation: Submit acceptable pre-construction photographic documentation (prints and digital files) prior to mobilizing to and disturbing the Site. Submit pre-construction photographic documentation not later than the first Application for Payment, unless other schedule for pre-construction photographic documentation is accepted by DEPARTMENT.
 - 2. Construction Progress Photographic Documentation: Submit acceptable construction progress photographic documentation (prints and digital files) not less-often than monthly. Submit with each Application for Payment, unless otherwise agreed to by DEPARTMENT.
 - 3. Qualifications Statements:
 - a. When requested by DEPARTMENT, prior to starting photographic documentation, submit photographer qualifications and record of experience. List of construction photography experience shall include the following for each project:
 - 1) Project name and location
 - 2) Nature of construction.

- 3) Photographer's client with contract information.
- 4) Approximate duration of photographer's services.

B. Closeout Submittals: Submit the following:

1. Final Photographic Documentation: Submit acceptable final photographic documentation (prints and digital files) prior to requesting the final inspection by DEPARTMENT, not otherwise provided under Paragraph A (2.) .
2. Photographic Documentation shall be considered part of the Record Documentation.

1.4 PHOTOGRAPHIC DOCUMENTATION – GENERAL

A. Digital Files of Photographs:

1. For each photograph taken, furnish high-quality digital image in “JPG” file format compatible with Microsoft Windows 7 and higher operating systems.
2. Image resolution shall be sufficient for clear, high-resolution prints. Minimum resolution shall be 150 dots per inch (dpi). Minimum size of digital images shall be equal to specified print size.
3. Do not imprint date and time in the image.
4. Electronic image filename shall describe the image; do not submit filenames automatically created by digital camera. For example, an acceptable electronic filename would be, “Dewatering Building – Looking West at Centrifuge No. 2.jpg”.
5. Form of Digital Submittal – Images on temporary storage devices or through file transfer:
 - a. Submit digital files on compact discs (CD).
 - b. Submit three copies of each temporary storage device with digital files of photographic images.
 - c. Include file index for each file transfer containing photographic documentation:
 - 1) Date(s) photographs were taken.
 - 2) Name of Owner.
 - 3) Name of the Site.
 - 4) Project name.
 - 5) Photographer name and address.

1.5 PRE-CONSTRUCTION PHOTOGRAPHIC DOCUMENTATION

A. Pre-construction Photographic Documentation:

1. Obtain and submit pre-construction photographic documentation to record Site conditions prior to construction. Photographs shall document work areas of all prime contracts under the Project.
2. Pre-construction photographs are not part of required number of construction progress photographs specified in Article 1.6 of this Section.
3. Furnish pre-construction video of all work areas included in all prime contracts on the Project, including indoor and outdoor work areas and staging areas.

- B. If disagreement arises on the condition of the Site and insufficient pre-construction photographic documentation was submitted prior to the disagreement, restore the grounds or area in question to extent directed by DEPARTMENT and to satisfaction of DEPARTMENT.

1.6 CONSTRUCTION PROGRESS PHOTOGRAPHIC DOCUMENTATION

- A. Progress Photographs:
 - 1. Take photographs not less often than twice per month.
 - 2. Take not less than 20 photographs each time photographer is at the Site.
 - 3. Obtain and submit interior and exterior photographic documentation of each structure in the work area as directed by DEPARTMENT at the time photographic documentation is taken.

1.7 FINAL PHOTOGRAPHIC DOCUMENTATION

- A. Final Photographs:
 - 1. Take photographs at time and day acceptable to DEPARTMENT. Work documented in final (record) photographs shall be generally complete, including major features of completed work, as determined by the DEPARTMENT and DEPARTMENT.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

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SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. Provide submittals well in advance of need for the material or equipment, or procedure (as applicable), in the Work and with ample time required for delivery of materials and equipment and to implement procedures following DEPARTMENT's approval or acceptance of the associated submittal. Work covered by a submittal will not be included in progress payments until approval or acceptance of related submittals has been obtained in accordance with the Contract Documents.
2. CONTRACTOR is responsible for dimensions to be confirmed and corrected at the Site; quantities; information pertaining solely to fabrication processes; means, methods, sequences, procedures, and techniques of construction; safety precautions and programs incident thereto; and for coordinating the work of all trades.
3. CONTRACTOR's signature of submittal's stamp and letter of transmittal shall be CONTRACTOR's representation that CONTRACTOR has complied with his obligations under the Contract Documents relative to that submittal. DEPARTMENT and OWNER shall be entitled to rely on such representations by CONTRACTOR.

B. Samples:

1. Submittal of Samples shall comply with this Section, and the Specifications Section in which the Sample is specified.
2. Furnish at the same time those Samples and submittals that are related to the same element of the Work or Specifications Section. DEPARTMENT will not review submittals without associated Samples and will not review Samples without associated submittals.
3. Samples shall clearly illustrate functional characteristics of materials, all related parts and attachments, and full range of color, texture, pattern, and materials.

C. Restrictions on Quantity of Submittals and Compensation of OWNER:

1. CONTRACTOR shall furnish required submittals with sufficient information and accuracy to obtain required approval or acceptance of submittal by DEPARTMENT.
2. Total number of CONTRACTOR's submittals shall not exceed 25 percent above the total number of first-time submittals indicated in the Schedule of Submittals initially accepted by DEPARTMENT. DEPARTMENT will record DEPARTMENT's time for reviewing submittals of Shop Drawings, Samples,

and other submittals and items requiring approval or acceptance, beyond the quantity of first-time submittals indicated in the Schedule of Submittals initially accepted by DEPARTMENT, and CONTRACTOR shall reimburse OWNER for DEPARTMENT's charges for such time.

3. In the event that CONTRACTOR requests a substitution for a previously approved item, Contractor shall reimburse the DEPARTMENT for such time unless the need for such substitution is beyond the control of CONTRACTOR.
4. OWNER may impose set-offs against CONTRACTOR for the costs for which CONTRACTOR is to reimburse or compensate the DEPARTMENT.

1.2 TYPES OF SUBMITTALS

A. Submittal types are classified as follows: 1) Action Submittals, 2) Informational Submittals, 3) Closeout Submittals, and 4) Maintenance Material submittals. Type of each required submittal is designated in the respective Specifications Sections; when type of submittal is not designated in the associated Specification Section, submittal will be classified as follows:

1. Action Submittals include:
 - a. Shop Drawings.
 - b. Product data.
 - c. Delegated design submittals, which include documents prepared, sealed, and signed by a design professional retained by CONTRACTOR, Subcontractor, or Supplier for materials and equipment to be incorporated into the completed Work. Delegated design submittals do not include submittals related to temporary construction unless specified otherwise in the related Specifications Section. Delegated design submittals include: design drawings, design data including calculations, specifications, certifications, and other submittals prepared by such design professional.
 - d. Samples.
 - e. Testing plans, procedures, and testing limitations.
2. Informational Submittals include:
 - a. Certificates.
 - b. Design data not sealed and signed by a design professional retained by CONTRACTOR, Subcontractor, or Supplier.
 - c. Pre-construction test and evaluation reports, such as reports on pilot testing, subsurface investigations, testing for a potential Hazardous Environmental Condition, and similar reports.
 - d. Supplier instructions, including installation data, and instructions for handling, starting-up, and troubleshooting.
 - e. Source quality control submittals (other than testing plans, procedures, and testing limitations), including results of shop testing.
 - f. Field or Site quality control submittals (other than testing plans, procedures, and testing limitations), including results of operating and acceptability tests at the Site.
 - g. Supplier reports.
 - h. Sustainable design submittals (other than sustainable design closeout

- documentation).
 - i. Special procedure submittals, including plans for shutdowns and tie-ins and other procedural submittals.
 - j. Qualifications statements.
 - k. Administrative submittals including:
 - 1) Progress Schedules.
 - 2) Schedules of Submittals.
 - 3) Schedules of Values.
 - 4) Photographic documentation.
 - 5) Coordination drawings, when submittal of such is required.
 - 6) Copies of permits obtained by CONTRACTOR.
 - 7) Field engineering reports, survey data, and similar information.
 - 3. Closeout Submittals include:
 - a. Maintenance contracts.
 - b. Operations and maintenance data.
 - c. Bonds, such as special maintenance bonds and bonds for a specific material, equipment item, or system.
 - d. Warranty documentation.
 - e. Record documentation.
 - f. Sustainable design closeout documentation.
 - g. Software.
 - i. Keying.
 - 4. Maintenance Material Submittals include:
 - a. Spare parts.
 - b. Extra stock materials.
 - c. Tools.
 - 5. When type of submittal is not specified and is not included in the list above, request an interpretation from DEPARTMENT and DEPARTMENT will determine the type of submittal.
- B. Not Included in this Section: Administrative and procedural requirements for following are covered elsewhere in the Contract Documents:
- 1. Requests for interpretations of the Contract Documents.
 - 2. Change Orders, Work Change Directives, and Field Orders.
 - 3. Applications for Payment
 - 4. Reports, documentation, and permit applications required to be furnished by CONTRACTOR to authorities having jurisdiction.
- C. In accordance with Section III, Article 5, the Apparent Low Bidder shall, at a minimum, submit the following with the required five-day submittal package, 5 days following the Notice of Apparent Low Bidder.
- 1. Health and Safety Plan
 - a. Health and Safety.
 - b. Decontamination of Equipment and Personnel.
 - c. Contingency Measures.
 - d. Community Air Monitoring.
 - e. Odor Control Plan.

2. Work Plan at minimum shall include:
 - a. Procedures for adequate and safe excavation of soils and materials including a contingency plan detailing procedures and methods to be employed to prevent, contain, and recover spills during the work.
 - b. Description of equipment to be used on site with appropriate safety devices needed to undertake the remediation of the site.
 - c. Identification of the permitted treatment, storage, and disposal facilities (TSDF) proposed to receive liquid or solid wastes to be transported off-site.
 - d. Identification of permits required to conduct the work.
 - e. Worksite layout showing, at a minimum, equipment and material staging areas, trailers, decontamination station, and staging procedures.
 - f. Detailed construction drawing(s) of the proposed decontamination station.
 - g. Procedures for excavating, handling, storing, and placing soils.
 - h. Procedures for handling liquid wastes and groundwater.
 - i. Provisions for control of fugitive air emissions and dust control.
 - j. Other requirements necessary to provide security, staging, sampling, testing, removal, and disposal of wastes.
 - k. Procedures for completing any other major aspect of the work including:
 1. Sampling and Quality Control Plan
 2. Sequencing of Work.
 3. Soil Erosion and Sedimentation Control Measures.
 4. Monitoring Well Decommissioning and Installation Plan
 5. Transportation Plans
 6. Site Security.
 7. Miscellaneous Requirements.

- D. Required for Notice of Intent to Award and Notice to Proceed. The CONTRACTOR shall submit the following plans for the Work by the time of the Notice to Proceed, following receipt of the Notice to Intent to Award:
 1. Bid Breakdown of items reflecting adjusted contract amount as reflected in Section III- Bidding Information and Requirements, Article 12- Bid Breakdown.
 2. Six (6) Executed copies of the contract agreements with original signatures;
 3. Performance Bond and Insurances;
 4. M/WBE waiver form if contract goals are not expected to be met;
 5. Completed NYS Office of State Comptroller Substitute Form W-9;
 6. Service-Disabled Veteran-Owned Business SDVOB Utilization Plan on Form SDVOC 100.
 7. Acceptable 5-day submittal package as described in Paragraph 1.2.C above; and
 8. Authorizing resolution for (Authority to sign Contract on behalf of the firm).

- E. Submittals following Notice to Proceed. Major submittal requirements identified in other sections of the Specifications are listed below, however, this list is not inclusive of all submittals required elsewhere:

1. Final plans, engineered approved plans, as described in Paragraph 1.2.C.
2. Interim progress schedule, schedule of values, and technical submittals detailed in the first three months of the progress schedule
3. All other technical submittals required by the contract in accordance with the approved Submittal Registry.
4. All other submittals as required by the Supplementary Specifications applicable to the Work being performed or as requested by the ENGINEER.

1.3 REQUIREMENTS FOR SCHEDULE OF SUBMITTALS

A. Informational Submittals: Submit the following:

1. Schedule of Submittals:
 - a. Timing:
 - 1) Furnish submittal within time frames indicated in the Contract Documents.
 - 2) Submit updated Schedule of Submittals with each submittal of the updated Progress Schedule.
 - b. Content: In accordance with this Section, requirements for content of preliminary Schedule of Submittals and subsequent submittals of the Schedule of Submittals are identical. Identify on Schedule of Submittals all submittals required in the Contract Documents. Updates of Schedule of Submittals shall show scheduled dates and actual dates for completed tasks. Indicate submittals that are on the Project's critical path. Indicate the following for each submittal:
 - 1) Date by which submittal will be received by ENGINEER.
 - 2) Whether submittal will be for a substitution or "or-equal".
 - 3) Date by which ENGINEER's response is required. Not less than 14 days shall be allowed for ENGINEER's review, starting upon ENGINEER's actual receipt of each submittal. Allow increased time for large or complex submittals.
 - 4) For submittals for materials or equipment, date by which material or equipment must be at the Site to avoid delaying the Work and to avoid delaying the work of other contractors, if any.
 - c. Prepare Schedule of Submittals using same software, and in same format, specified for Progress Schedules in Section 01 32 16, Progress Schedule.
 - d. Coordinate Schedule of Submittals with the Progress Schedule.
 - e. Schedule of Submittals that is not compatible with the Progress Schedule, or that does not indicate submittals on the Project's critical path, or that that places extraordinary demands on ENGINEER for time and resources, is unacceptable. Do not include submittals not required by the Contract Documents.
 - f. In preparing Schedule of Submittals:
 - 1) Considering the nature and complexity of each submittal, allow sufficient time for review and revision.
 - 2) Reasonable time shall be allowed for: ENGINEER's review and processing of submittals, for submittals to be revised and resubmitted, and for returning submittals to CONTRACTOR.

- 3) Identify and accordingly schedule submittals that are expected to have long anticipated review times.

1.4 PROCEDURE FOR SUBMITTALS

- A. Submittal Identification System: Use the following submittal identification system, consisting of submittal number and review cycle number.
1. Submittal Number: Shall be separate and unique number correlating to each individual submittal required. Assign submittal numbers as follows:
 - a. First part of submittal number shall be the applicable Specifications Section number, followed by a hyphen.
 - b. Second part of submittal number shall be a three-digit number (sequentially numbered from 001 through 999) assigned to each separate and unique submittal furnished under the associated Specifications Section.
 - c. Typical submittal number for the third submittal furnished for Section 40 05 19, Ductile Iron Process Pipe, would be “40 05 19-003”.
 2. Review Cycle Number: Shall be a number indicating the initial submittal or re-submittal associated with each submittal number:
 - a. “01” = Initial (first) submittal.
 - b. “02” = Second submittal (e.g., first re-submittal).
 - c. “03” = Third submittal (e.g., second re-submittal).
 3. Examples:

Example Description	Submittal Identification	
	Submittal No.	Review Cycle
Initial (first) review cycle of the third submittal provided under Section 40 05 19, Ductile Iron Process Pipe	40 05 19-003-	01
Second review cycle (first re-submittal) of third submittal provided under Section 40 05 19, Ductile Iron Process Pipe	40 05 19-003-	02

- B. Letter of Transmittal for Submittals:
1. Furnish separate letter of transmittal with each submittal. Each submittal shall be for one Specifications Section.
 2. At beginning of each letter of transmittal, include a reference heading indicating: CONTRACTOR’s name, OWNER’s name, Project name, Contract designation, transmittal number, and submittal number.
 3. For submittals with proposed deviations from requirements of the Contract Documents, letter of transmittal shall specifically describe each proposed variation.
- C. Contractor’s Review and Stamp:
1. Contractor’s Review: Before transmitting submittals to ENGINEER, review submittals to:
 - a. ensure proper coordination of the Work;

- b. determine that each submittal is in accordance with CONTRACTOR's desires;
 - c. verify that submittal contains sufficient information for ENGINEER to determine compliance with the Contract Documents.
- 2. Incomplete or inadequate submittals will be returned without review.
- 3. Contractor's Stamp and Signature:
 - a. Each submittal furnished shall bear CONTRACTOR's stamp of approval and signature, as evidence that submittal has been reviewed by CONTRACTOR and verified as complete and in accordance with the Contract Documents.
 - b. Submittals without CONTRACTOR's stamp and signature will be returned without review. Signatures that appear to be computer-generated will be regarded as unsigned and the associated submittal will be returned without review.
 - c. CONTRACTOR's stamp shall contain the following:

"Project Name: _____

Contractor's Name: _____

Contract Designation: _____

Date: _____

----- *Reference* -----

Submittal Title: _____

Specifications:

Section: _____

Page No.: _____

Paragraph No.: _____

Drawing No.: _____ of _____

Location of Work: _____

Submittal No. and Review Cycle: _____

Coordinated by Contractor with Submittal Nos.: _____

I hereby certify that the Contractor has satisfied Contractor's obligations under the Contract Documents relative to Contractor's review and approval of this submittal.

Approved for Contractor by: _____"

D. Submittal Marking and Organization:

- 1. Mark on each page of submittal and each individual component submitted with submittal number and applicable Specifications paragraph. Mark each page of each submittal with the submittal page number.

2. Arrange submittal information in same order as requirements are written in the associated Specifications Section.
 3. Each Shop Drawing sheet shall have title block with complete identifying information satisfactory to ENGINEER.
 4. Package together submittals for the same Specifications Section. Do not furnish required information piecemeal.
- E. Format of Submittal and Recipients:
1. Action Submittals and Informational Submittals: Furnish in accordance with Table 01 33 00-A, except that submittals of Samples shall be as specified elsewhere in this Section:

**TABLE 01 33 00-A: SUBMITTAL CONTACTS
AND REQUIRED FORMAT**

	Address for Deliveries	Contact Person	E-mail Address	Format*	No. of Printed Copies
a.	Engineer: (TBD)	(TBD)	(TBD)	E	Zero
b.	Resident Project Representative: At the Site.	(TBD)	(TBD)	E & P	One
* Format: E = Electronic files; P = Printed copies. TBD = To Be Determined					

2. Samples:
 - a. Securely label or tag Samples with submittal identification number. Label or tag shall include clear space at least four inches by four inches in size for affixing ENGINEER's review stamp. Label or tag shall not cover, conceal, or alter appearance or features of Sample. Label or tag shall not be separated from the Sample.
 - b. Submit quantity of Samples required in Specifications. If quantity of Samples is not indicated in the associated Specifications Section, furnish not less than two identical Samples of each item required for ENGINEER's approval. Samples will not be returned to CONTRACTOR. If CONTRACTOR requires Sample(s) for CONTRACTOR's use, so advise ENGINEER in writing and furnish additional Sample(s). CONTRACTOR is responsible for furnishing, shipping, and transporting additional Samples.
 - c. Deliver one Sample to ENGINEER's field office at the Site. Deliver balance of Samples to ENGINEER at address indicated in Table 01 33 00-A, unless otherwise directed by ENGINEER.
3. Closeout Submittals:
 - a. Furnish the following Closeout Submittals in accordance with Table 01 33 00-A: maintenance contracts; bonds for specific materials, equipment, or systems; warranty documentation; and sustainable design closeout documentation. On documents such as maintenance contracts and bonds, include on each document furnished original ("wet") signature of entity issuing said document. When original "wet" signatures are required, furnish such submittals in printed form and electronic form to

ENGINEER, and to other entities furnish as indicated in Table 01 33 00-A.

- b. Record Documentation: Submit in accordance with Section 01 78 39, Project Record Documentation.
 - c. Software: Submit number of copies required in Specifications Section where the software is specified. If number of copies is not specified, provide two copies on compact disc in addition to software loaded on OWNER's computer(s) or microprocessor(s).
4. Maintenance Material Submittals: For spare parts, extra stock materials, and tools, furnish quantity of items specified in associated Specifications Section.

F. Electronic Submittals:

- 1. Format: Electronic files shall be in "portable document format" (.PDF). Files shall be electronically searchable.
- 2. Organization and Content:
 - a. Each electronic submittal shall be one file; do not divide individual submittals into multiple files each.
 - b. When submittal is large or contains multiple parts, furnish PDF file with bookmark for each section of submittal.
 - c. Content shall be identical to printed submittal. First page of electronic submittal shall be CONTRACTOR's letter of transmittal.
- 3. Quality and Legibility: Electronic submittal files shall be made from the original and shall be clear and legible. Do not submit scans of faxed copies. Electronic file shall be full size of original, printed documents. Properly orient all pages for reading on a computer screen.
- 4. Provide sufficient Internet service and e-mail capability for CONTRACTOR's use in transferring electronic submittals, receiving responses to electronic submittals, and associated electronic correspondence. Check not less than once per day for distribution of electronic submittals, electronic responses to submittal, and electronic correspondence related to submittals.
- 5. Submitting Electronic Files:
 - a. Transmit electronic files in accordance with Section 01 31 26, Electronic Communication Protocols.

G. Distribution:

- 1. Distribution of ENGINEER's Response via Electronic Files: Upon completion of ENGINEER's review, electronic submittal response will be distributed by ENGINEER to
 - a. CONTRACTOR.
 - b. Other prime contractors.
 - c. OWNER.
 - d. Resident Project Representative (RPR).
 - e. ENGINEER's file.

H. Resubmittals: Submit resubmittals promptly to allow review and approval.

I. CONTRACTOR shall furnish required submittals with complete information and

accuracy in order to achieve required approval of an item within two submittals. All costs to DEPARTMENT involved with subsequent submittals of Shop Drawings, Samples or other items requiring approval, will be back-charged to CONTRACTOR, at the rate equal to the DEPARTMENT's cost. In the event CONTRACTOR fails to pay such costs within 30 days after receipt of an invoice from DEPARTMENT, funds will be withheld from payment requests and at the completion of Work, a Change Order or proposed Change Order will be issued incorporating the unpaid amount, and DEPARTMENT will be entitled to an appropriate decrease in Contract price. In the event that CONTRACTOR requests a substitution for a previously approved item, all of DEPARTMENT'S costs in the reviewing and approval of the substitution will be back-charged to CONTRACTOR unless the need for such substitution is beyond the control of CONTRACTOR.

- J. Shop Drawings shall be submitted well in advance of the need for the material or equipment for construction and with ample allowance for the time required to make delivery of material or equipment after data covering such is approved. CONTRACTOR shall assume the risk for all materials or equipment which are fabricated or delivered prior to the approval of Shop Drawings. Materials or equipment will not be included in periodic progress payments until approval thereof has been obtained in the specified manner.
- K. DEPARTMENT will review and approve or disapprove Shop Drawings and samples within 14 days of receipt from CONTRACTOR. The DEPARTMENT will process all submittals promptly, but a reasonable time should be allowed for this, for the Shop Drawings being revised and resubmitted, and for time required to return the approved Shop Drawings to CONTRACTOR.
- L. It is CONTRACTOR'S responsibility to review submittals made by his suppliers and Subcontractors before transmitting them to DEPARTMENT to assure proper coordination of the Work and to determine that each submittal is in accordance with his desires and that there is sufficient information about materials and equipment for DEPARTMENT to determine compliance with the Contract Documents. Incomplete or inadequate submittals will be returned for revision without review.
- M. Any related Work performed or equipment installed without an "Approved" or "Approved as Noted" Shop Drawing will be at the sole responsibility of the CONTRACTOR.

1.5 DEPARTMENT'S REVIEW

- A. Timing: DEPARTMENT's review will conform with timing indicated in the Schedule of Submittals accepted by DEPARTMENT.
- B. Submittals not required by the Contract Documents will not be reviewed by DEPARTMENT and will not be recorded in submittal log. All printed copies of

such submittals will be returned to CONTRACTOR. Electronic copies of such submittals, if any, will not be retained by DEPARTMENT.

C. Action Submittals, Results of DEPARTMENT's Review: Each submittal will be given one of the following dispositions by DEPARTMENT:

1. Approved: Upon return of submittal marked "Approved", order, ship, or fabricate materials and equipment included in the submittal (pending DEPARTMENT's approval or acceptance, as applicable, of source quality control submittals) or otherwise proceed with the Work in accordance with the submittal and the Contract Documents.
2. Approved as Corrected: Upon return of submittal marked "Approved as Corrected", order, ship, or fabricate materials and equipment included in the submittal (pending DEPARTMENT's approval or acceptance, as applicable, of source quality control submittals) or otherwise proceed with the Work in accordance with the submittal and the Contract Documents, and in accordance with the corrections indicated in the DEPARTMENT's submittal response.
3. Approved as Corrected – Resubmit: Upon return of submittal marked "Approved as Corrected – Resubmit", order, ship, or fabricate materials and equipment included in the submittal (pending DEPARTMENT's approval or acceptance, as applicable, of source quality control submittals) or otherwise proceed with the Work in accordance with the submittal and the Contract Documents, and in accordance with corrections indicated in DEPARTMENT's submittal response. Furnish to DEPARTMENT record re-submittal with all corrections made. Receipt of corrected re-submittal is required before materials or equipment covered in the submittal will be eligible for payment.
4. Revise and Resubmit: Upon return of submittal marked "Revise and Resubmit", make the corrections indicated and re-submit to DEPARTMENT for approval.
5. Not Approved: This disposition indicates material or equipment that cannot be approved. "Not Approved" disposition may also be applied to submittals that are incomplete. Upon return of submittal marked "Not Approved", repeat initial submittal procedure utilizing approvable material or equipment, with a complete submittal clearly indicating all information required.

D. Informational Submittals, Results of DEPARTMENT's Review:

1. Each submittal will be given one of the following dispositions:
 - a. Accepted: Information included in submittal complies with the applicable requirements of the Contract Documents and is acceptable. No further action by CONTRACTOR is required relative to this submittal, and the Work covered by the submittal may proceed, and materials and equipment with submittals with this disposition may be shipped or operated, as applicable.
 - b. Not Accepted: Submittal does not indicate compliance with applicable requirements of the Contract Documents and is not acceptable. Revise submittal and re-submit to indicate acceptability and compliance with the Contract Documents.

- E. Closeout Submittals, Results of DEPARTMENT's Review: Dispositions and meanings are the same as specified for Informational Submittals. When acceptable, Closeout Submittals will not receive a written response from DEPARTMENT. Disposition as "accepted" will be recorded in DEPARTMENT's submittal log. When Closeout Submittal is not acceptable, DEPARTMENT will provide written response to CONTRACTOR.
- F. Maintenance Material Submittals, Results of DEPARTMENT's Review: Dispositions and meanings are the same as specified for Informational Submittals. When acceptable, Maintenance Material Submittals will not receive a written response from DEPARTMENT. Disposition as "accepted" will be recorded in DEPARTMENT's submittal log. When Maintenance Material Submittal is not acceptable, DEPARTMENT will provide written response to CONTRACTOR, and CONTRACTOR is responsible for costs associated with transporting and handling of maintenance materials until compliance with the Contract Documents is achieved.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01 35 29

CONTRACTOR'S HEALTH AND SAFETY PLAN

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall prepare and maintain a written, Site-specific, health and safety plan (SSHASP), and conduct all construction activities in safe manner that avoids:
 - a. injuries to employees, Subcontractors, and other persons with an interest at or near the Site;
 - b. employee exposures to health hazards above occupational limits established by Laws or Regulations, American Conference of Governmental Industrial Hygienists (ACGIH), and Nuclear Regulatory Commission (NRC), as applicable;
 - c. exposure of the public and DEPARTMENT's employees to air contaminants above levels established for public exposure by the USEPA, NRC, and by other authorities having jurisdiction at the Site;
 - d. significant increases in concentrations of contaminants in soil, water, or sediment near the Site; or
 - e. violations of OSHA Regulations, or other Laws or Regulations.
2. The CONTRACTOR is solely responsible and liable for the health and safety of all on-site personnel and any off-site community potentially impacted by the remediation.
3. This section describes the minimum health and safety requirements for this project including the requirements for the development of a written Health and Safety Plan (HASP). All on-site workers must comply with the requirements of the HASP. The CONTRACTOR's HASP must comply with all applicable federal and state regulations protecting human health and the environment from the hazards posed by activities during this site remediation. The HASP is a required deliverable for this project. The HASP will be reviewed by the DEPARTMENT. The CONTRACTOR will resubmit the HASP, addressing all review comments from the DEPARTMENT. The CONTRACTOR shall not initiate on-site work in contaminated areas until an acceptable HASP addressing all comments has been developed.
4. Consistent disregard for the provision of these health and safety specifications shall be deemed just and sufficient cause for immediate stoppage of work and/or termination of the Contract or any Subcontract without compromise or prejudice to the rights of the DEPARTMENT.
5. The safety and health of the public and project personnel and the protection of the environment will take precedence over cost and schedule considerations for all project work. Any additional costs will be considered only after the cause for suspension of operations is addressed and work is resumed. The DEPARTMENT's on-site representative and the CONTRACTOR's Superintendent will be kept apprised, by the Safety Officer, of conditions which may adversely affect the safety and health of project personnel and the community. The DEPARTMENT may stop work for health

and safety reasons. If work is suspended for health and/or safety reasons, it shall not resume until approval is obtained from the DEPARTMENT. The cost of work stoppage due to health and safety is the responsibility of the CONTRACTOR under this Contract.

B. Related Sections:

1. Section 01 35 43.13, Environmental Procedures for Hazardous Materials.

1.2 QUALITY ASSURANCE

A. Qualifications:

1. Preparer of SSHASP:

- a. Engage a Certified Industrial Hygienist (CIH), accredited by the American Board of Industrial Hygiene, or Certified Safety Professional certified by the Board of Certified Safety Professionals, to prepare or supervise preparation of SSHASP. The CIH must have a minimum of two years of experience in hazardous waste site remediations or related industries and have a working knowledge of federal and state occupational health and safety regulations.
- b. SSHASP preparer shall be thoroughly familiar with: (i) Laws and Regulations and industry standards of safety and protection relating to health and safety pertaining to the Work; (ii) the requirements of the Contract Documents relative to health, safety, and protection; (iii) health and safety hazards associated with the Work and appropriate protections therefor; and (iv) CONTRACTOR's and DEPARTMENT's safety programs.
- c. SSHASP preparer shall have previously prepared site-specific health and safety plans for not less than five construction projects similar in nature, scope, and complexity to the Work.
- d. Submit preparer's qualifications with SSHASP.

2. Safety Officer:

- a. The designated Safety Officer (SO) must have, at a minimum, two years of experience in the remediation of hazardous waste sites or related field experience. The SO must have formal training in health and safety and be conversant with federal and state regulations governing occupational health and safety. The SO must be certified in CPR and first aid and have experience and training in the implementation of personal protection and air monitoring programs. The SO must have "hands-on" experience with the operation and maintenance of real-time air monitoring equipment. The SO must be thoroughly knowledgeable of the operation and maintenance of air-purifying respirators (APR) and supplied-air respirators (SAR) including SCBA and airline respirators.

3. Health and Safety Technicians:

- a. The Health and Safety Technician (HST) must have one year of hazardous waste site or related experience and be knowledgeable of applicable occupational health and safety regulations. The HST must be certified in CPR and first aid. The HST will be under direct supervision of the SO during on-site work. The HST must be familiar with the operations, maintenance and calibration of monitoring

equipment used in this remediation. An HST will be assigned to each work crew or task in potentially hazardous areas.

- B. Regulatory Requirements: Laws and Regulations applying to the Work under this Section include, but are not limited to:
1. 29 CFR 1904 (OSHA), Recording and Reporting Occupational Injuries and Illnesses.
 2. 29 CFR 1910 (OSHA), Occupational Safety and Health Standards.
 3. 29 CFR 1926 (OSHA), Safety and Health Regulations for Construction.
 4. 49 CFR 171.8, Transportation, Definitions and Abbreviations.
 5. 40 CFR 261.3, 264, and 265, Resource Conservation and Recovery Act (RCRA).

1.3 SUBMITTALS

- A. Informational Submittals: Submit the following:
1. CONTRACTOR's SSHASP, in accordance with this Section. Submit within times indicated in Article 1.4 of this Section.
 2. Job safety analyses (JSA) submittals for each action required for the Work that is not covered in CONTRACTOR's SSHASP.
 3. Reports:
 - a. Health and safety reports.
 - b. Accident reports.
 4. Qualifications Statements:
 - a. Qualifications for SSHASP preparer, including copy of valid, applicable certifications.

1.4 SSHASP AND JSA SUBMITTALS

- A. Timing of Submittals:
1. Submit SSHASP the sooner of: seven days prior to pre-construction conference, or 30 days prior to CONTRACTOR's scheduled mobilization at the Site.
 2. Do not perform Work at the Site until written SSHASP has been accepted by DEPARTMENT.
 3. When an element of the Work or work activity is not covered by the SSHASP, prepare and submit a JSA and obtain DEPARTMENT's acceptance of JSA before performing the work activity or activities covered by such JSA.
 4. Delays in the Work Associated with Submittal or Review of SSHASP and JSAs:
 - a. Notwithstanding other provisions of the Contract Documents, changes in the Contract Price or Contract Times will not be authorized due to delay by CONTRACTOR in developing, submitting, revising, or obtaining acceptance of the SSHASP.
- B. Limitations of DEPARTMENT's Review of SSHASP and JSAs:
1. DEPARTMENT's review and acceptance of SSHASP and JSAs (if any) will be only to determine if the topics covered in SSHASP comply with the Contract Documents and specific requirements of safety documents referenced therein (such as DEPARTMENT's safety programs, if any).

2. DEPARTMENT's review and acceptance will not extend to safety measures, means, methods, techniques, procedures of construction, or whether representations made in the SSHASP and JSAs (if any) comply with Laws and Regulations, or standards of good practice.
3. CONTRACTOR's responsibility for safety and protection at the Site shall be as indicated in the Contract Documents. Nothing associated with DEPARTMENT's review or acceptance of SSHASP or JSAs will create or imply any obligation by DEPARTMENT to oversee or become, in any way, responsible for CONTRACTOR's safety obligations under the Contract Documents.

1.5 CONTRACTOR'S HEALTH AND SAFETY PROGRAM

A. General:

1. Known prior use(s) of the Site are indicated.
2. The Site is classified as hazardous waste site. Presence of Constituents of Concern (if any), where known to DEPARTMENT, are indicated in the reports and drawings (if any) of such Hazardous Environmental Conditions listed in the Supplementary Conditions and/or Limited Site Data.
3. Each employer working at the Site shall develop and implement a written SSHASP for their employees and other individuals for whom such employer is responsible.
4. When applicable (including when the Site includes one or more Hazardous Environmental Conditions), SSHASP shall comply with 29 CFR 1904, 29 CFR 1910, 29 CFR 1926, and other Laws and Regulations.
5. Include in the SSHASP requirements for complying with DEPARTMENT's Site-specific hazard/emergency response plans, if any. During the Project, comply with DEPARTMENT's hazard/emergency response plans.
6. The HASP is a deliverable product of this project. The DEPARTMENT will review and comment on the CONTRACTOR's HASP. Agreed upon responses to all comments will be incorporated into the final copy of the HASP. The HASP shall govern all work performed for this contract. The HASP shall address, at a minimum, the items in accordance with 29 CFR 1910.120(I)(2).

B. Location:

1. Retain at the Site a copy of complete SSHASP, JSAs (if any), and related information.
2. Retain copy of SSHASP, JSAs (if any), and related information at CONTRACTOR's project office.
3. Throughout the Project, update as necessary all copies of SSHASP, JSAs, and related information.
4. Copies of SSHASP, JSAs, and other related information shall be made available to CONTRACTOR's employees, Subcontractors, Suppliers, DEPARTMENT, and DEPARTMENT immediately upon request.

C. SSHASP Content: SSHASP shall address and include the following:

1. Address safety and health hazards of each phase of operations at the Site and shall include requirements and procedures for employee protection.

2. CONTRACTOR's organizational structure and other information required by Paragraph 1.5.D of this Section.
3. Comprehensive work plan.
4. Job safety and health risk or hazard analysis for each task and operation found in the work plan.
5. Employee training assignments including copies of OSHA 40-hour, 24-hour supervised field activities, eight-hour supervisors, and eight-hour refresher training certificates for each CONTRACTOR and Subcontractor employee assigned to the Project.
6. Personal protective equipment (PPE) to be used by employees for each task and activity performed. Include respirator fit test certificates for CONTRACTOR and Subcontractor employees assigned to the Project.
7. Medical Surveillance Requirements: Medical clearance certificates for all CONTRACTOR and Subcontractor employees assigned to the Project. The physical examination shall also include but not be limited to the following minimum requirements:
 - a. Complete blood profile;
 - b. Blood chemistry to include: chloride, CO₂, potassium, sodium, BUN, glucose, globulin, total protein, albumin, calcium, cholesterol, alkaline phosphatase, triglycerides, uric acid, creatinine, total bilirubin, phosphorous, lactic dehydrogenase, SGPT, SGOT;
 - c. Urine analysis;
 - d. "Hands on" physical examination to include a complete evaluation of all organ systems including any follow-up appointments deemed necessary in the clinical judgement of the examining physician to monitor any chronic conditions or abnormalities;
 - e. Electrocardiogram;
 - f. Chest X-ray (if recommended by examining physician in accordance with good medical practice);
 - g. Pulmonary function;
 - h. Audiometry - To be performed by a certified technician, audiologist, or physician. The range of 500 to 8,000 hertz should be assessed.
 - i. Vision screening - Use a battery (TITMUS) instrument to screen the individual's ability to see test targets well at 13 to 16 inches and at 20 feet. Tests should include an assessment of muscle balance, eye coordination, depth perception, peripheral vision, color discrimination, and tonometry.
 - j. Tetanus booster shot (if no inoculation has been received within the last five years); and
 - k. Complete medical history.
8. Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.
9. Site control measures, including procedures for:
 - a. preventing trespassing;
 - b. preventing unqualified or unprotected workers from entering restricted areas;
 - c. preventing "tracking" of contaminants out of the Site;

- d. maintaining log of employees at the Site and visitors to the Site;
- e. communicating routes of escape and gathering points.
- f. ensuring safe handling of Constituents of Concern during the Work, including excavating, handling, loading, and transporting activities. Include procedures for ensuring safety when working in or proximity to Hazardous Environmental Conditions,
- g. delineating “hot” (e.g., contaminated), “cold”, and support zones;
- h. locating personnel and equipment decontamination zones; and
- i. decontamination.
- j. first aid facilities including fully equipped first aid station and routine replenishment of supplies.
- k. sanitary facilities including potable drinking water, washing facilities and portable toilets.
- l. The CONTRACTOR shall be responsible for maintaining a log of security incidents and visitor access granted.
- m. The CONTRACTOR shall require all personnel having access to the project site to sign-in and sign-out and shall keep a record of all site access.
- n. All approved visitors to the site shall be briefed by the SO on safety and security, provided with temporary identification and safety equipment, and escorted throughout their visit.
- o. Site visitors shall not be permitted to enter the hazardous work zone unless approved by the DEPARTMENT.
- p. Project sites shall be posted, "Warning Hazardous Work Area, Do Not Enter Unless Authorized," and access restricted by the use of a snow fence or equal at a minimum. Warning signs shall be posted at a minimum of every 500 feet.
- 10. Plan for safe and effective responses to emergencies, including necessary PPE and other equipment.
- 11. Community Protection Plan consisting of the following:
 - a. Develop, as part of this HASP, a Community Protection Plan (CPP). The CPP shall outline those steps to be implemented to protect the health and safety of surrounding human population and the environment.
 - b. Air Monitoring consisting of the following:
 - 1. As part of the Air Monitoring Program, use real-time monitoring and documentation sampling as described in the Subpart “Air Monitoring Program” of this section to determine if off-site emission, as a result of site work, poses a threat to the surrounding community.
 - 2. Provide real-time air monitoring for volatile compounds and particulate levels as the perimeter of the work area as necessary. Include the following:
 - a.) Volatile organic compounds must be monitored at the downwind perimeter of the work area on a continuous basis. If total organic vapor levels exceed 5 ppm above background, work activities shall be halted and monitoring continued under the provisions of a Vapor Emission Response Plan. All readings shall be recorded and be available for State (DEC & DOH) personnel to review.
 - b.) Particulates shall be continuously monitored at the 4 documentation sampling stations for a total of 4 dust monitors. If the downwind

particulate level is 150 ug/m³ greater than the upwind particulate level, dust suppression techniques shall be employed. All readings shall be recorded and be available for State (DEC & DOH) personnel to review.

- c. Vapor Emission Response Plan consisting of the following:
 - 1. If the ambient air concentration of organic vapors exceed 5 ppm above background at the perimeter of the work area, activities shall be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities may resume. If the organic vapor levels are greater than 5 ppm over background but less than 225 ppm over background at the perimeter of the work area, activities may resume provided the organic vapor level 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.
 - 2. If the organic vapor level is above 25 ppm at the perimeter of the work area, activities shall be shutdown. When work shutdown occurs, downwind air monitoring as directed by the SO shall be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.
- d. Major Vapor Emission consisting of the following:
 - 1. If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities shall be halted.
 - 2. If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, the air quality shall be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).
 - 3. If efforts to abate the emission source are unsuccessful and if organic vapor levels are approaching 5 ppm above background and persist for more than 30 minutes in the 20 Foot Zone, the Major Vapor Emission Response Plan shall automatically be placed into effect.
 - 4. However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background levels.
- e. Major Vapor Emission Response Plan consisting of the following:
 - 1. Upon activation, the following shall be undertaken:
 - a) All Emergency Response Contracts as listed in the Subpart titled "Emergency Response and Contingency Plan" paragraph titled "Telephone List."
 - b) The local police authorities shall immediately be contacted by the SO and advised of the situation. Coordinate with local officials to arrange for notification and evacuation of the surrounding community.

- c) Frequent air monitoring shall be conducted at 30 minutes intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the SO.
 - 2. The Air Monitoring Program shall include real-time air monitoring and shall be conducted at the perimeter of the site. Particulates should be continuously monitored upwind, downwind and within the Exclusion Zone at temporary particulate monitoring stations. If the downwind particulate level is more than 2.5 times greater than the upwind particulate level and greater than 150 ug/m³, then dust suppression techniques shall be employed. This is a general action level. A site-specific action level shall be developed based on available analytical data. All readings shall be recorded and be available for DEPARTMENT, DEPARTMENT, and NYSDOH personnel to review.
 - 3. Coordinate with local officials to arrange for notification and evacuation of the surrounding community in the event that off-site emissions pose a threat.
- f. Odor control consisting of the following:
 - 1. Foam active work areas to reduce odors if odor complaints are received from nearby residences during site activities. Odor masking agents or other odor control methods may be used subject to DEPARTMENT's review. Continue odor suppression during each day that odor complaints are received.
- g. Off-Site Spill Response consisting of the following:
 - 1. Produce as part of the HASP a Spill Response Plan, also coordinated with local officials, in case of an off-site spill of either liquid or solid wastes. The plan shall include transportation routes and times, as well as the minimum requirements set forth in the Subpart titled "On-Site Spill Containment Plan." The driver shall be supplied with Material Safety Data Sheets (MSDSs), a 24-hour emergency phone number, and instructions for reporting emergencies to local agencies and the project site.
- 12. Spill containment program. Comply with Section 01 35 44, Spill Prevention Control and Countermeasures Plan.
- 13. Requirements for complying with Section 01 35 43.13, Environmental Procedures for Hazardous Materials.

D. CONTRACTOR's Organizational Structure:

- 1. Organizational structure portion of the SSHASP shall refer to or incorporate information on specific chain of command and specify the overall responsibilities of supervisors and employees, and shall include the following:
 - a. Name and contact information for CONTRACTOR's "competent person(s)" for various work-related activities.
 - b. Name and contact information for CONTRACTOR's safety representative.
 - c. Designation of general supervisor who has responsibility and authority to direct operations involving handling of Constituents of Concern and work in or near Hazardous Environmental Conditions.
 - c. Other personnel required for operations involving Constituents of Concern and Hazardous Environmental Conditions and emergency response, and general functions and responsibilities of each.
 - d. Lines of authority, responsibility, and communication.

2. Review and update organizational structure as necessary to reflect current status of work activities on the Project and status of personnel.
- E. Work Plan:
1. Comprehensive work plan portion of SSHASP shall refer to or incorporate information on the following:
 - a. Tasks and objectives of work activities, onsite operations, and logistics and resources necessary to achieve such tasks and objectives.
 - b. Anticipated activities and CONTRACTOR's normal operating procedures.
 - c. Personnel and equipment requirements for implementing the work plan.

1.6 ACCIDENT REPORTING AND INVESTIGATION

- A. Comply with 29 CFR 1904.29, including using OSHA Forms 300, 300A, and 301 (or equivalent) to document all accidents that result in bodily injury.
- B. Accident Report Submittals:
1. Submit copies of completed accident reports to DEPARTMENT within 24 hours of the accident.
 2. By the tenth day of each month, submit monthly summary of accident reports from the prior month. Monthly summary report shall indicate for each accident the root cause and descriptions of corrective actions to reduce the probability of similar accidents.
 3. Submit to DEPARTMENT a copy of all accident and health or safety hazard reports received from OSHA or other authority having jurisdiction within 24 hours of CONTRACTOR's receipt.
- C. Based upon results of accident investigation, modify the SSHASP as required by changing tasks or procedures to prevent reoccurrence of accident.
- D. Post current copy of CONTRACTOR's OSHA 300A report, Summary of Work-related Injuries and Illnesses, at conspicuous place at the Site during period of February 1 through April 30 of each year.

1.7 DAILY HEALTH AND SAFETY FIELD REPORTS

- A. Submit to DEPARTMENT daily health and safety field reports.
- B. Content of CONTRACTOR's Daily Health and Safety Field Reports: Reports shall include, but not necessarily be limited to, the following:
1. Weather conditions.
 2. Delays encountered in construction
 3. Acknowledgment of deficiencies noted along with corrective actions taken on current and previous deficiencies.
 4. Daily health and safety air monitoring results (when air monitoring is performed).
 5. Documentation of instrument calibrations performed.
 6. New hazards encountered.

7. PPE utilized.
8. Description of problems, real or anticipated, encountered during the Work that should be brought to attention of DEPARTMENT and notification of deviations from planned Work shown in previously submitted daily health and safety field report(s).

1.8 STANDARD OPERATING PROCEDURES

- A. The following are Standard Operating Procedures (SOPs) that should be employed as part of the H&S program:
 1. During periods of prolonged respirator usage in contaminated areas, respirator filters will be changed upon breakthrough. Respirator filters will always be changed daily.
 2. All respirators will be individually assigned and not interchanged between workers without cleaning and sanitizing.
 3. CONTRACTOR, subcontractor and service personnel unable to pass a fit test as a result of facial hair or facial configuration shall not enter or work in an area that requires respiratory protection.
 4. Footwear used on site will be covered by rubber overboots or booties when entering or working in the Exclusion Zone area or Contamination Reduction Zone. Boots or booties will be washed with water and detergents to remove dirt and contaminated sediment before leaving the Exclusion Zone or Contamination Reduction Zone.
 5. The CONTRACTOR will ensure that all project personnel shall have vision or corrected vision to at least 20/40 in one eye.
 6. Eating, drinking, chewing gum or tobacco, smoking, etc., will be prohibited in the hazardous work zones and neutral zones.
 7. No alcohol, firearms or drugs (without prescriptions) will be allowed on site at any time.
 8. All personnel who are on medication should report it to the SO who will make a determination whether or not the individual will be allowed to work and in what capacity. The SO may require a letter from the individual's personal physician stating what limitations (if any) the medication may impose on the individual.
 9. The CONTRACTOR shall provide all equipment and personnel necessary to monitor and control air emissions. The determination of the proper level of protection for each task and safety equipment shall be the responsibility of the CONTRACTOR. These task specific levels of protection shall be stated in the CONTRACTOR's HASP.
 10. The CONTRACTOR shall provide a hygiene facility on site. The hygiene facility shall include the following:
 - a. Adequate lighting and heat;
 - b. Shower facilities for project personnel;
 - c. Laundry facilities for washing work clothes and towels;
 - d. Areas for changing into and out of work clothing. Work clothing should be stored separately from street clothing;
 - e. Clean and "dirty" locker facilities; and
 - f. Storage area for work clothing, etc.

11. The CONTRACTOR shall provide a portable decontamination station, commonly referred to as a "Boot Wash" facility for each hazardous work zone requiring decontamination for project personnel. These facilities shall be constructed to contain spent wash water, contain a reservoir of clean wash water, a power supply to operate a pump for the wash water, a separate entrance and exit to the decontamination platform, with the equipment being mobile, allowing easy transport from one hazardous work zone to the next. All such wash water shall be disposed of at the dewatering facility. An appropriate detergent such as trisodium phosphate shall be used.
12. The CONTRACTOR shall provide full decontamination facilities at all hazardous zones. Decontamination facilities must be described in detail in the HASP.
13. Contaminated clothing, used respirator cartridges, and other disposable items will be put into drums/containers for transport and proper disposal in accordance with TSCA and RCRA requirements.
14. All equipment and material used in this project shall be thoroughly washed down in accordance with established federal and state procedures before it is removed from the project. With the exception of the excavated materials, all other contaminated debris, clothing, etc. that cannot be decontaminated shall be disposed at the CONTRACTOR's expense by a method permitted by appropriate regulatory agencies. The cost for this element of work shall be incorporated in the lump sum bid for mobilization/demobilization the unit prices bid for disposal of decontamination liquids or as otherwise directed on this project. All vehicles and equipment used in the "Dirty Area" will be decontaminated to the satisfaction of the SO in the decontamination area on site prior to leaving the project. The CONTRACTOR will certify, in writing, that each piece of equipment has been decontaminated prior to removal from the site.
15. The CONTRACTOR shall develop, as part of the HASP, an air monitoring program (AMP). The purpose of the AMP is to determine that the proper level of personnel protective equipment is used, to document that the level of worker protection is adequate, and to assess the migration of contaminants to off-site receptors as a result of site work.
16. The CONTRACTOR shall supply all personnel, equipment, facilities, and supplies to develop and implement the air monitoring program described in this section. Equipment shall include at a minimum real-time aerosol monitors, depending on work activities and environmental conditions.
17. The CONTRACTOR's AMP shall include both real-time and documentation air monitoring (personal and area sampling as needed). The purpose of real-time monitoring will be to determine if an upgrade (or downgrade) of PPE is required while performing on-site work and to implement engineering controls, protocols, or emergency procedures if CONTRACTOR-established action levels are encountered.
18. The CONTRACTOR shall also use documentation monitoring to ensure that adequate PPE is being used and to determine if engineering controls are mitigating the migration of contamination to off-site receptors. Documentation monitoring shall include the collection and analysis of samples for total nuisance dust.

19. Real-time monitoring shall be conducted using the following equipment:
- a. Organic vapor photoionizers shall be Photovac TIP, total organic vapor analyzer as manufactured by Photovac International, 739B Park Avenue, Huntington, New York 11743 or equal. The CONTRACTOR shall provide one Photovac TIP for each and every hazardous work zone operation.
 - b. Particulate monitoring must be performed using real-time particulate monitors (MiniRam Model MIEPDM-3, or equal) and shall monitor particulate matter in the range of 0-10 microns diameter (PM10) with the following minimum performance standards:

Object to be measured: Dust, Mists, Aerosols

Measurement Ranges: 0.001 to 400 mg/m³ (1 to 400,000 µg/m³)

Precision (2-sigma) at constant temperature: +/- 10 µg/m³ for one second averaging; +/- 1.5 µg/m³ for sixty second averaging

Accuracy: +/- 5% of reading +/- precision (Referred to gravimetric calibration with SAE fine test dust (mmd= 2 to 3 µm, g= 2.5, as aerosolized)

Resolution: 0.1% of reading or 1 µg/m³, whichever is larger

Particle Size Range of Maximum Response: 0.1-10 µ

Total Number of Data Points in Memory: 10,000

Logged Data: Each Data Point: average concentration, time/date, and data point number
Run Summary: overall average, maximum concentrations, time/date of maximum, total number of logged points, start time/date, total elapsed time (run duration), STEL concentration and time/date occurrence, averaging (logging) period, calibration factor, and tag number.

Alarm Averaging Time (user selectable): real-time (1-60 seconds) or STEL (15 minutes)

Operating Time: 48 hours (fully charged NiMH battery); continuously with charger

Operating Temperature: -10 to 50°C (14 to 122°F)

Automatic alarms are suggested.

- c. Particulate levels will be monitored and integrated over a period not to exceed 15 minutes. Consequently, instrumentation shall require necessary

averaging hardware to accomplish this task. A monitor such as the personal DataRAM, manufactured by Monitoring Instruments for the Environment, Inc., or equivalent, can be used as a real time particulate screening tool. Although the instrument's design does not allow it to make a sharp differentiation of particulates at the PM10 standard, the instrument could be used in the passive mode without a pump to provide readings in the 0.1 to 10 μ range in the immediate vicinity of construction activities.

- d. Monitor the air, using the same equipment, for 10-15 minutes upwind of the work site to establish background level. The background level shall be established before the start of each shift every day. In the event that downwind particulates are detected at levels in excess of 150 ug/m³ or 2.5 times the established background level at the work site, re-measure the background concentrations upwind of the work zone using the same equipment. If the measured particulate level at the work zone is 100 ug/m³ above background, monitor the downwind site perimeter and implement additional dust controls in the work zone. Continue to take hourly measurements of the upwind background concentrations and compare such concentrations with the particulate level at the work zone, until the downwind level at the work zone is less than 100 ug/m³ above the upwind level. If at any time the measured particulate level at the work zone is more than 150 ug/m³ over background concentration, the CONTRACTOR shall immediately suspend work at the site, promptly notify the Safety Officer, and implement suitable corrective action or engineering controls before work resumes.
 - e. Real-time monitoring will be conducted at any excavation of contaminated soil or sediments. Real-time monitoring will also be conducted at perimeter locations including an upwind (background) and three downwind locations. A background reading will be established daily at the beginning of the work shift. If the wind direction changes during the course of the day, a new background reading will be made. Downwind readings at the perimeter will be made when CONTRACTOR action levels have been exceeded at the excavation face or at a minimum of twice a day.
 - f. If action levels are exceeded at the perimeter location for fugitive dust, work must be suspended and engineering controls must be implemented to bring concentrations back down to acceptable levels.
 - g. Construction activities generate dust which could potentially transport contaminants off site. There may be situations when visible dust is being generated and leaving the site and the monitoring equipment does not measure PM10 at or above the action level. Therefore, if dust is observed leaving the working site, additional dust suppression techniques must be employed by the CONTRACTOR.
20. The following master telephone list will be completed and prominently posted at the field office. At minimum, the list will have telephone numbers of all project personnel, emergency services including hospital, fire, police, and utilities. In addition, two copies with telephone numbers are to be given to the

DEPARTMENT for emergency reference purposes.

<u>Emergency Service</u>	<u>Telephone Number</u>
Fire Department	911
Police Department	911
Ambulance	911
Hospital/Emergency Care Facility (INSERT NAME Hospital)	ADD
Poison Control Center	(800) 336-6997
Chemical Emergency Advice (CHEMTREC)	(800) 424-9300
NYSDEC Central Office	Work Hours (518) 457-7878 After Hours (800) 342-9296 (leave message)
NYSDEC Regional Office	Work Hours ADD
INSERT County Dept. of Health	ADD
New York State Dept. of Health - Albany	(518) 402-7890
New York State Dept. of Health - Region	ADD

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01 35 33 – COVID-19 RISK MANAGEMENT

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes requirements for managing and minimizing the potential for transmission of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) virus, which causes the Novel Coronavirus Disease 2019 (COVID-19). COVID-19 typically causes respiratory illness in people.
- B. Transmission: SARS-CoV-2 is currently known to spread via respiratory droplets produced when a person infected with the virus coughs or sneezes, the same way flu and other respiratory illnesses spread. SARS-CoV-2 can also be transmitted if people touch surfaces and objects with the virus on it.
- C. Symptoms: COVID-19 can cause mild to severe respiratory illness with symptoms of fever, cough, and difficulty breathing. Preliminary information suggests older adults and people with underlying health conditions or compromised immune systems may be at higher risk of severe illness from this virus. Center for Disease Control (CDC) believes that symptoms of COVID-19 begin between 2 and 14 days after exposure.
- D. Best Practices to Prevent Infection: Currently the best way identified to prevent infection is to minimize the potential of exposure to SARS-CoV-2. CDC recommends everyday actions to help prevent the spread of any respiratory viruses
- Wash your hands often with soap and water for at least 20 seconds. If soap and water are not available, use an alcohol-based hand sanitizer, containing at least 60% alcohol.
 - Avoid touching your eyes, nose, and mouth with unwashed hands.
 - Avoid close contact with people who are sick.
 - Stay home when you are sick.
 - Cover your cough or sneeze with a tissue, then throw the tissue in the trash can and wash hands or use hand sanitizer.
 - Clean and disinfect frequently touched objects and surfaces.
 - Wear face masks
 - Safe social distancing (e.g., maintain a distance of 6 feet between people, limited group meetings)

1.2 OBJECTIVE

- A. The objective of this specification is to minimize transmission and subsequent infections of COVID-19 in project staff that may arise as a result of exposure to SARS-CoV-2 released into the environment during construction and renovation activities. Controlling the dispersal of airborne infectious agents is critical to achieving this objective.

1.3 PERFORMANCE REQUIREMENTS AND RESPONSIBILITIES

- A. The intent of this Section is to document and formalize the Contractor's requirements for minimizing the risk of transmission of COVID-19 among site workers, project staff, and the surrounding community during construction per the latest recommendations of

federal, state and local health agencies. This includes developing a COVID-19 Management Plan, establishing procedures for conducting onsite work activities to prevent virus transmission, monitoring staff health, and reporting requirements.

- B. The Contractor is expected to communicate the requirements described in this section to all site workers, subcontractors, and visitors to the site daily, during daily Health and Safety meetings as well as through site postings (see attachment).
- C. Contractors and their subcontractors are required at all times to guard the safety and health of all persons on and in the vicinity of the work site.
- D. Contractors and their subcontractors are required to comply with all applicable rules, regulations, codes, and bulletins of the New York State Department of Labor and the standards imposed under the Federal Occupational Safety and Health Act of 1970, as amended ("OSHA").
- E. Contractors and their subcontractors must comply with all City or State of New York safety requirements for projects within the City or State of New York constructed in accordance with the applicable building code.
- F. Contractors and their subcontractors shall stay current and immediately implement the most up-to-date government issued practices to protect the safety and health of your employees, clients, and the general public.

1.4 RELATED SECTIONS

- A. Section 01 35 29, Contractor's Health and Safety Plan

1.5 REFERENCES

- A. Occupational Safety and Health Administration (OSHA) Guidance on Preparing Workplaces for COVID-19
- B. New York State Department of Health
- C. Centers for Disease Control and Prevention (CDC)
- D. National Institute for Occupational Safety and Health (NIOSH)
- E. Health Insurance Portability and Accountability Act (HIPAA)

1.6 SUBMITTALS

- A. The Contractor shall prepare a COVID-19 Management Plan which can be a Supplement, or Addendum, to the Contractor's Health and Safety Plan
- B. The CONTRACTOR shall develop a one-page summary of site-specific practices for COVID-19 management and clearly display on site. Operating hours, delivery times, and extra considerations for works involving a high volume of personnel or potential for interaction with community members could also be included in the summary.

- C. The Contractor's Daily Field Report shall include a Daily Health Checklist, with the following questions at a minimum:

DAILY HEALTH CHECKLIST

Is social distancing being practiced?	Yes ☐	No ☐
Is the tail gate safety meeting held outdoors?	Yes ☐	No ☐
Are remote/call-in job meetings being held in lieu of meeting in person where possible?	Yes ☐	No ☐
Were personal protective gloves, masks, and eye protection being used?	Yes ☐	No ☐
Are sanitizing wipes, wash stations or spray available?	Yes ☐	No ☐
Have any workers/visitors been excluded based on close contact with individuals diagnosed with COVID-19, have recently traveled to restricted areas or countries, or are symptomatic (fever, chills, cough/shortness of breath)?	Yes ☐	No ☐
<u>Comments:</u> 		

1.7 COVID-19 MANAGEMENT PLAN

- A. At a minimum, the COVID-19 Management Plan shall include:
1. Identification of potential exposure pathways and exposure risks associated with work tasks, e.g. activity hazard analysis (AHA).
 2. Identification of local health department contact information and COVID-19 testing sites and procedures.
 3. Detailed written description of the onsite personnel protection measures that will be utilized and a detailed explanation of how they will be implemented, monitored, and communicated.
 4. Detailed written description of measures that will be taken to prevent transmission to or from the surrounding community and how they will be implemented and communicated.
 5. Procedures to be followed in the event a site worker is diagnosed with or is suspected of having COVID-19, including identification of all personnel potentially exposed and isolation requirements.
 6. Daily cleaning schedules and disinfection procedures per the most recent CDC guidelines.
 7. Cleaning and disinfection procedures in the event there is/are suspected COVID-19 case(s) among site personnel.
 8. Site access controls and entry/exit procedures.
 9. Plan view of points of egress and delivery locations.
- B. The COVID-19 Management Plan must be updated following any issued change(s) in federal, state, or local health agency guidance.

1.8 PRECONSTRUCTION CONFERENCE

- A. Pre-Construction Conference shall include a review of methods and procedures related to COVID-19 risk management including, but not limited to the following:
1. Review of COVID-19 Management Plan

2. Review infection control procedures
3. Review staff monitoring and reporting requirements.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 RISK IDENTIFICATION

- A. COVID-19 is a new disease; scientists and health agencies are continuously learning about how it spreads. The Contractor shall adjust site policies based on the most up to date government issued guidance regarding transmission.
- B. Contractor shall confirm staff that have worked in locations where quarantine orders are in place, have met the minimum quarantine guidance and do not have symptoms prior to mobilizing to site.
- C. Contractor shall monitor staff daily, including checking, and documenting, temperature with no contact infrared thermometer, to confirm onsite staff do not exhibit COVID-19 symptoms. Contractor shall provide daily reports of those tests upon NYSDEC's request.

3.2 RISK MINIMIZATION

- A. Engineering Controls
 1. Increasing ventilation rates of interior workspaces.
 2. Access controls, including fences and locking gates.
 3. Maintain 6 feet distances, using distance markers where appropriate in the field.
- B. Administrative Controls
 1. Continuous and effective communication of administrative controls/requirements to all site personnel and visitors, through the posting of site signage, preparation and distribution of site plans, presented during site meetings, and verbal warnings if necessary.
 2. Require that all employees exhibiting any COVID-19 symptom do not enter the site and provide sick leave policies to support this requirement.
 3. To minimize face-to-face interaction, the Site's Health & Safety Officer's (or other designated employee) phone number shall be prominently posted and disseminated to project staff to be called for the purpose of site sign in and sign out by all visitors to the site upon arrival and exit. The designated employee will receive entry and exit calls each day and will fill out the site entry/exit log for each site visitor to reduce traffic in site trailer and/or the number of individuals contacting the site access tracking log.
 4. Staffing: only those employees necessary to complete critical path task(s) shall be present on-site at any given time. Work shall be scheduled to minimize the density of personnel in any given area at any given time.
 5. Working Remotely; employees shall be encouraged to complete work remotely if possible.
 6. Face-to-face meetings shall be replaced with video or phone conferences when practicable.

7. Social distancing shall be exercised for face-to-face meetings e.g. daily Health and Safety tailgate meeting. In addition, the Contractor shall plan to have multiple meetings (if necessary) to keep the number of participants to a threshold that allows for the practice of social distancing protocol. The Health and Safety officer will keep a record of all present for each meeting on the Health and Safety log.
8. Quarantine staff that have been in contact with anyone that tested positive and notify NYSDEC immediately.

C. Safe Work Practices

1. The Contractor shall employ social distancing protocol for all onsite activities when able.
2. The Contractor provide PPE and adequate hand washing stations and hand sanitizer (containing a minimum of 60% alcohol) to allow site personnel and visitors to practice good personal hygiene.
3. The Contractor shall provide tissues, paper towels, no-touch trash cans, and disinfectants to maintain site cleanliness.
4. Sharing of tools and heavy equipment shall be limited to the extent practicable; handles of shared tools and equipment shall be sanitized regularly.

D. Personal Protective Equipment

1. Employees shall be provided disposable personal protective equipment (PPE), including gloves, goggles, face shields, face masks, and respiratory protection, as appropriate based on work environment and current recommendations by OSHA and CDC.
2. All PPE must be selected based on hazard to the worker, properly fitted and periodically refitted, consistently and properly worn when required, regularly inspected, maintained, and replaced, as necessary, and properly removed, cleaned, and stored or disposed of, to avoid contamination of self, others, or the environment.
3. PPE worn to prevent transmission of COVID-19 is not to be confused with PPE for protection against site contaminants.
4. PPE must be worn, removed, and disposed of correctly in order to remain effective.
 - a. Face masks should fit snugly but comfortable against the side of the face and over the nose and be secured with ties or ear loops; cloth masks must include multiple layers of fabric, allow for breathing without restriction, and be able to be laundered and machine dried without damage.
 - b. Face masks should be worn consistently and removed without touching eyes, nose, and mouth. An individual should wash their hands after handling a used face mask.
 - c. Cloth face coverings should be sterilized by machine washing between use; disposable face masks shall be disposed of properly after using.
 - d. Gloves are only effective if changed and disposed of frequently, to avoid cross-contamination.

3.3 NOTIFICATION OF POTENTIAL OR CONFIRMED INFECTION

- A. The Contractor shall notify the Department immediately upon identification of a suspected or confirmed infection of COVID-19. This notification shall comply with HIPAA regulations.
- B. The Contractor shall remove an individual suspected to have COVID-19 from the site immediately (to the individuals' hotel or local place of residence if transport home is not immediately feasible), as well as those who have worked in close contact with that individual for extended periods of time (an hour at a time or more) over the previous week. The individual with suspected infection shall contact their health care provider and/or follow local health department testing procedures and protocol.
- C. While in the process of removing an employee exhibiting symptoms, steps should be taken to isolate the individual, place a surgical mask on the individual and inform the local health department and the NYSDEC.
- D. In the event the individual with suspected infection cannot get home right away, they shall isolate in their hotel room (notifying hotel management of their symptoms), contact their health care provider, and/or follow local health department testing procedures and protocol.
- E. In the absence of local health department information, the individual may call the New York State Hotline at 1-888-364-3065.
- F. The Contractor shall maintain communication with potentially infected individual(s) and notify the Department upon receipt of COVID-19 test results.
- G. Positively infected individuals may return to work at the site after 72 hours of being symptom-free and 7 days of isolation after the first symptoms appeared, or in accordance with the current federal, state, and local guidelines
- H. OSHA recordkeeping requirements at 29 CFR Part 1904 mandate covered employers record certain work-related injuries and illnesses on their OSHA 300 log. COVID-19 can be a recordable illness if a worker is infected as a result of performing their work-related duties. However, employers are only responsible for recording cases of COVID-19 if all the following are met:
 - 1. The case is a confirmed case of COVID-19 (see CDC information on persons under investigation and presumptive positive and laboratory-confirmed cases of COVID-19).
 - 2. The case is work-related, as defined by 29 CFR 1904.5; and
 - 3. The case involves one or more of the general recording criteria set forth in 29 CFR 1904.7 (e.g. medical treatment beyond first-aid, days away from work).

++ END OF SECTION ++

COVID-19 CONTRACTOR GUIDANCE FOR CONSTRUCTION JOBSITES

In response to the public health emergency for the COVID-19, Governor Andrew Cuomo has declared a State disaster emergency and temporarily suspended or modified laws that would prevent, hinder, or delay action necessary to cope with the disaster or emergency. The Governor has also issued directives to allow for the expansion of certain services including those relating to emergency procurement, and to facilitate the continued work of essential businesses. Under Executive Order 202.6, as amended March 27, 2020, a construction project is permitted to continue if it is essential. Please refer to Empire State Development (ESD) guidance to determine if your project is essential. <https://esd.ny.gov/guidance-executive-order-2026> The purpose of this guidance is to set forth the recommended practices for contractors performing work at construction sites in the context of the COVID-19 health crisis.

Contractor Responsibilities

Under standard contracting agency/authority agreements,

- o Contractors and their subcontractors are required at all times to guard the safety and health of all persons on and in the vicinity of the work site
- o Contractors and their subcontractors are required to comply with all applicable rules, regulations, codes, and bulletins of the New York State Department of Labor and the standards imposed under the Federal Occupational Safety and Health Act of 1970, as amended (“OSHA”)
- o Contractors and their subcontractors are also required to comply with all Client safety requirements
- o Contractors and their subcontractors must comply with all City or State of New York safety requirements for projects within the City or State of New York constructed in accordance with the applicable building code, and contractors are required to provide written safety plans for the site showing how all safety requirements of applicable law will be implemented for the duration of the contract.

Contractors and their subcontractors must also adhere to the following practices to help prevent exposure and spread of COVID-19. The following recommendations are based on what is currently known about COVID-19. Contractors and their subcontractors are advised to stay current and immediately implement the most up-to-date practices to protect the safety and health of your employees, clients, and the general public.

General Responsibilities:

- Contractors and their subcontractors should educate their employees on the symptoms of COVID-19, which include cough, fever, trouble breathing, and pneumonia. Contractors

and their subcontractors must instruct any employee who feels they may meet the above criteria to refrain from reporting to the jobsite and immediately contact their local health department in the county in which they reside .

- If the employee begins to exhibit these symptoms while in the workplace, steps should be taken to isolate the individual, place a surgical mask on the individual and inform your local health department and the contracting agency/authority
- Personnel should be advised to self-quarantine in accordance with the requirements of the New York State and local health department. Contracting agencies/authorities reserve the right to require any employee of the Contractor, and their subcontractors exhibiting symptoms, to be removed from the jobsite
- If an employee is confirmed to have COVID-19 infection, contractors and their subcontractors should inform fellow employees, who have been in contact with this employee, of their possible exposure to COVID-19 in the workplace while maintaining confidentiality as required by applicable New York State and federal law. The fellow employees should then self-monitor for symptoms (i.e., cough, fever, trouble breathing, and pneumonia) and self-quarantine in accordance with the requirements of the New York State and local health department
- If an employee tests positive for COVID-19, Contractors and their subcontractors should direct the employee to self-quarantine or remain quarantined for 14 days, following the guidance of New York State and local health department
 - Contractors and their subcontractors may permit such employee to return to the jobsite when this employee produces a negative COVID-19 test or receives medical clearance to return to work
- If an employee tests negative for COVID-19, contractors and their subcontractors may direct the employee to return to work after recovery from their illness. Any direct contacts on pre-cautionary quarantine may return to the jobsite and resume their work activities.

Social Distancing:

- Do not host large group meetings or congregate in large groups. When meetings are necessary, maintain a distance of 6-feet between people.
- Perform any tool box or other training maintaining the distance of 6-feet between people.
- Perform meetings online or via conference call whenever possible
- Only essential personnel should be permitted on the jobsite
- Discourage handshaking and other contact greetings

General Jobsite Practices

- Procedures and supplies should be in place to encourage proper hand and respiratory hygiene.
 - Hand hygiene:

Signage with handwashing procedures should be posted in prominent locations promoting hand hygiene

- Regular handwashing with soap and water for at least 20 seconds should be done:
 - Before and after eating
 - After sneezing, coughing, or nose blowing
 - After using the restroom
 - Before handling food
 - After touching or cleaning surfaces that may be contaminated
 - After using shared equipment and supplies; and also
 - Whenever a contractor or subcontractor believes it is necessary
- If soap and water are not available, use an alcohol-based hand sanitizer that contains at least 60% alcohol
- Respiratory Hygiene:
 - Covering coughs and sneezes with tissues or the corner of elbow
 - Disposing of soiled tissues immediately after use
 - Where possible, have disposable masks available to cover an employee's mouth and nose if they develop symptoms on the job to protect others from exposure.
- Practice routine environmental cleaning and disinfecting of all frequently touched surfaces on the jobsite. This includes work stations, project trailers and offices, portable toilets, countertops, handles, doorknobs, gang boxes, tools and equipment. See OSHA Guidance on Preparing Workplaces for COVID-19. www.osha.gov/Publications/OSHA3990.pdf
- Appropriate cleaning agents and directions should be utilized to perform all cleaning. Ensure all workers are trained on the hazards of cleaning chemicals used in the workplace and comply with all OSHA requirements regarding same in accordance with the Hazard Communication (Global Harmonization) Standard. Information about <https://coronavirus.health.ny.gov/home>
- Do not use a common water bottle
- If using a common water cooler clean dispenser knob after use
- Do not share tools
- Utilize personal protection equipment (PPE) for the job being performed
- Sanitize reusable PPE per manufacturer's recommendation prior to each use
- Do not share PPE
- Ensure used PPE and other trash is disposed of properly
- Utilize disposable gloves where appropriate and instruct workers to wash hands after removing gloves
- Disinfect reusable supplies and equipment
- Don't stack trades, if possible

- Stagger work schedules to minimize the number of people on a job site at any one time.
- Keep one contractor or subcontractor in an area at a time. Indicate an area is occupied with workers with a sign or flag indicating which contractor or subcontractor is in the area at that time. Remove the sign or flag after completion of work in that area to let others know they may then enter into that area to perform their work. The next contractor or subcontractor will then post their sign or flag to notify others that the area is occupied.
- Minimize the number of workers in an area as much as possible by using indicators of an occupied area (signs or flags) scheduling work activities to stagger those required to be in any one time to a minimal number of workers.
- Minimize entryways into a work area so that employees will be able to observe flagging practices described above. Do not reduce number of emergency exits.
- Avoid cleaning techniques, such as pressurized air or water sprays that may result in generation of bioaerosols

Contracting agencies/authorities may request an updated written safety plan for the site to address practices to help prevent exposure and spread of COVID-19 at the jobsite pursuant to New York State, OSHA recommendations and Centers for Disease Control requirements, which include:

- Assessment of potential worker exposure hazards, taking into account the specific recommendations and controls for the four levels of worker exposure risk identified in OSHA's Guidance on Preparing Workplaces for COVID-19 (i.e., very high, high, medium, and lower)
- Evaluation of exposure to risk;
- Selecting, implementing, and ensuring the use of controls (i.e., social distancing appropriate personal protective equipment, hygiene, and cleaning supplies);
- Minimizing the number of workers in an area as much as possible by using indicators of an occupied area (signs or flags) and scheduling work activities to stagger those required to be in any one area to a minimal number of workers.
- Minimize entryways into a work area so that employees will be able to observe flagging practices described above. Do not reduce number of emergency exits; and
- Additional criteria consistent with health and safety practices at the work site.

Project Closure:

- Where work is suspended on a project, contractors are directed to follow any additional project shut-down protocols as provided by the contracting agency/authority

For additional resources:

OSHA COVID-19 Resources

OSHA Guidance on Preparing Workplaces for COVID-19

DOL COVID-19 Resources

Interim Guidance for Business and Employers

Centers for Disease Control -- <https://www.cdc.gov/coronavirus/2019-ncov/index.html>

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SECTION 01 35 43.13

ENVIRONMENTAL PROCEDURES FOR HAZARDOUS MATERIALS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment, tools, and incidentals necessary to comply with environmental procedures for Constituents of Concern.
2. CONTRACTOR shall develop, implement, and maintain throughout the Project a hazardous materials management program (HMMP) as part of the SSHASP in accordance with Laws and Regulations.
3. Constituents of Concern Brought to Site by CONTRACTOR: Transport, handle, store, label, use, and dispose of in accordance with this Section, other applicable provisions of the Contract Documents, and Laws and Regulations.
4. Constituents of Concern Generated by CONTRACTOR:
 - a. Materials containing Constituents of Concern shall be properly handled, stored, labeled, transported and disposed of by CONTRACTOR in accordance with Laws and Regulations, and this Section.
 - b. If CONTRACTOR will generate or has generated materials containing Constituents of Concern at the Site, obtain a USEPA identification number listing CONTRACTOR's name and address of the Site as generator of the Constituents of Concern. Obtain identification number from state environmental agency or similar authority having jurisdiction at the Site. Submit identification number within time frame specified in Article 1.3 of this Section.
 - c. CONTRACTOR shall be responsible for identifying, analyzing, profiling, transporting, and disposing of Constituents of Concern generated by CONTRACTOR.
5. Fines or civil penalties levied against DEPARTMENT for violations committed at the Site by CONTRACTOR, and costs to DEPARTMENT (if any) associated with cleanup of a Hazardous Environmental Condition created by CONTRACTOR shall be paid by CONTRACTOR. If CONTRACTOR has exacerbated a Hazardous Environmental Condition existing at the Site prior to the start of the Work, CONTRACTOR shall pay a share of costs associated with fines, civil penalties, and cleanup costs to in proportion equal to the extent of CONTRACTOR's responsibility for creating the Hazardous Environmental Condition and fines and civil penalties associated therewith.

- B. Enforcement of Laws and Regulations:
1. Interests of DEPARTMENT are that accidental spills and emissions, Site contamination, and injury of personnel at and near the Site are to be avoided.
 2. When DEPARTMENT is aware of suspected violations, DEPARTMENT will notify CONTRACTOR, and authorities having jurisdiction if DEPARTMENT reasonably concludes that doing so is required by Laws or Regulations.
 3. Responsibilities regarding Laws and Regulations shall be in accordance with the General Conditions, as may be modified by the Supplementary Conditions.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable Laws and Regulations.

1.3 SUBMITTALS

- A. Informational Submittals: Submit the following to the entity(ies) specified for each:
1. Constituents of Concern (including Chemicals) Proposed for Use at the Site:
 - a. Content:
 - 1) Current (dated within the past two years) material safety data sheets (MSDS) in accordance with 29 CFR 1910.1200 (OSHA Hazard Communication Standard).
 - 2) Manufacturer of material or equipment containing such substance.
 - 3) Supplier (if different than manufacturer).
 - 4) Container size(s) and number of containers proposed to be at the Site.
 - 5) Minimum and maximum volume of material intended to be stored at the Site.
 - 6) Description of process or procedures in which Constituent of Concern will be used at the Site.
 - b. Furnish the information required above in sufficient time to obtain DEPARTMENT's acceptance not later least three days before bringing Constituent of Concern to the Site.
 - c. Submit to DEPARTMENT.
 2. Material Containing Constituents of Concern Generated at the Site:
 - a. Submit for each Constituent of Concern generated at the Site identification number, analysis results, and number and size of storage containers at the Site.
 - b. Furnish such information within not less than 48 hours after CONTRACTOR's receipt of analytical results.
 - c. Submit to DEPARTMENT.

3. Permits:
 - a. Submit copies of permits for storing, handling, using, transporting, and disposing of materials containing Constituents of Concern, obtained from authorities having jurisdiction.
 - b. Submit to DEPARTMENT.
4. Other Documents required for the HMMP: Submit to DEPARTMENT's environmental representative the requested documents within 72 hours of CONTRACTOR's receipt of such request. HMMP documents may include emergency/spill response plan, communication plan, and other documents.

1.4 HAZARDOUS MATERIALS MANAGEMENT

- A. Obtain DEPARTMENT's environmental representative's acceptance before bringing to the Site each material containing a Constituent of Concern.
- B. Communication Plan:
 1. CONTRACTOR shall develop a communication plan relative to materials containing one or more Constituents of Concern.
 2. MSDS Notebooks:
 - a. At minimum, maintain at the Site two notebooks containing: 1) Inventory of materials containing a Constituent of Concern (including all chemicals); and, 2) Current (dated within the past two years) material safety data sheets (MSDS) for all materials being used to accomplish the Work, whether or not defined as a Constituent of Concern.
 - b. Keep one notebook in CONTRACTOR's field office at the Site; keep second notebook at location acceptable to DEPARTMENT.
 - c. Keep notebooks up-to-date as materials are brought to and removed from the Site.
- C. Emergency/Spill Response Plan: Develop, implement, and maintain an emergency/spill response plan, for each Constituent of Concern or each class/group of material containing a Constituent of Concern, as applicable. At minimum, response plan shall include the following:
 1. Description of equipment available at the Site to contain or respond to emergency related to or spill of the material.
 2. Procedures for notifying, and contact information for: authorities having jurisdiction, emergency responders, DEPARTMENT, the public as applicable, and other entities as required.
 3. Response coordination procedures between CONTRACTOR, DEPARTMENT and others as appropriate.

4. Site plan showing proposed location of Constituents of Concern storage area and location of spill containment/response equipment, and location of storm water drainage inlets and drainage routes, including storm sewers, ditches and swales, and surface waters.
 5. Description of Constituent of Concern handling and spill response training provided to CONTRACTOR's and Subcontractors' employees, in accordance with 29 CFR 1926.21(b) and other Laws and Regulations.
 6. Comply with Section 01 35 44, Spill Prevention Control and Countermeasures Plan.
- D. Storage of Materials Containing Constituents of Concern and Storage of Non-Hazardous Materials:
1. Vessels containing materials with a Constituent of Concern shall bear applicable hazard diamond(s).
 2. Container Labeling:
 - a. Properly label each container of consumable materials, whether or not classified as containing a Constituent of Concern.
 - b. Stencil CONTRACTOR's name and, as applicable, Subcontractor's name, on each vessel containing a Constituent of Concern and, for non-hazardous materials, on each container over five-gallon capacity. Containers shall bear securely-attached label clearly identifying contents. Label containers that are filled from larger containers.
 - c. If DEPARTMENT becomes aware of unlabeled containers at the Site, ENGINEER and/or DEPARTMENT's environmental representative will so advise CONTRACTOR. Properly label container(s) within one hour of receipt of such notice from DEPARTMENT or remove container from the Site.
 3. To greatest extent possible, store off-Site materials containing a Constituent of Concern until required for use in the Work.
- E. Area for Storing Materials Containing a Constituent of Concern:
1. Maintain designated storage area for materials containing a Constituent of Concern. Storage area shall include secondary containment to prevent release of spilled or leaking substances. Storage area shall include barriers to prevent vehicles from colliding with storage containers and shall include protection from environmental factors such as weather.
 2. Provide signage in accordance with Laws and Regulations, clearly identifying the storage area.
- F. Not less than monthly, CONTRACTOR's safety representative shall meet with the DEPARTMENT's environmental representative to review CONTRACTOR's HMMP documents, procedures, and inspect storage areas and the Site in general, to verify compliance with this Section.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

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SECTION 01 42 00

REFERENCES

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. Section includes the following:
 - a. Definitions and terminology in general use in the Contract Documents.
 - b. Applicable codes.
 - c. DEPARTMENTS's referenced specifications, where applicable.
 - d. Abbreviations in general use throughout the Contract Documents.
 - e. General requirements regarding reference standards, including a listing of standard-issuing organizations (and their acronyms) used in the Contract Documents.

1.2 DEFINITIONS AND TERMINOLOGY

- A. Definitions and terminology applicable to all the Contract Documents are included in the General Conditions, as may be modified by the Supplementary Conditions.
- B. Additional terminology used in the Contract Documents includes the following:
 - 1. "Indicated" refers to graphic representations, notes, or schedules on the Drawings, or to other paragraphs, provisions, tables, or schedules in the Specifications and similar locations in the other Contract Documents. Terminology such as "shown", "noted", "scheduled", and "specified" are used to help the user locate the reference without limitation on the location.
 - 2. "Installer", "applicator", or "erector" is CONTRACTOR or another person or entity engaged by CONTRACTOR, either as an employee or Subcontractor, to perform a particular construction activity, including installation, erection, application, or similar Work. Installers shall be experienced in the Work that installer is engaged to perform.
 - a. The term "experienced", when used in conjunction with the term "installer", means having successfully completed not less than five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated and required; being familiar with Laws and Regulations; and having complied with requirements of authorities having jurisdiction, and complying with requirements of the Supplier of the material or equipment being installed, unless other experience requirements specific to that element of the Work are indicated elsewhere in the Contract Documents.
 - 3. Trades: Use of terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter", unless

otherwise indicated in the Contract Documents or required by Laws or Regulations. Such terminology also does not imply that specified requirements apply exclusively to trade personnel of the corresponding generic name.

4. “Assigned specialists” and similar terms: Certain Sections of the Specifications require that specific construction activities be performed by specialists with recognized, extensive experience in such operations. Engage said specialists for such activities, and their engagement is a requirement over which CONTRACTOR has no option. These requirements do not conflict with enforcement of building codes and other Laws and Regulations. Also, such requirements are not intended to interfere with local trade union jurisdictional settlements and similar conventions. Such assignments shall not relieve CONTRACTOR of responsibility for complying with the requirements of the Contract Documents.

1.3 APPLICABLE CODES

- A. References in the Contract Documents to local code(s) shall mean the following:
 1. National Electric Code in effect at the location of the Project.
 2. NFPA 101, Life Safety Code.

1.4 ABBREVIATIONS

- A. Common abbreviations that may be found in the Contract Documents are indicated below, alphabetically by their written-out meaning:

alternating current	a-c
ampere	A
antemeridian	a.m.
Architectural Barriers Act	ABA
Americans with Disabilities Act	ADA
Americans with Disabilities Act Accessibility Guidelines	ADAAG
ante meridian	a.m.
average	avg
biochemical oxygen demand	BOD
five-day biochemical oxygen demand	BOD ₅
brake horsepower	bhp
British thermal unit	Btu
building information model	BIM
carbonaceous biochemical oxygen demand	CBOD
five-day carbonaceous biochemical oxygen demand	CBOD ₅
chemical oxygen demand	COD
Centigrade (or Celsius)	C

chlorinated polyvinyl chloride		CPVC
chlorofluorocarbons		CFC
Code of Federal Regulations		CFR
computer-aided drafting and design		CADD, or CAD
cubic inch		cu in
cubic foot		cu ft
cubic yard		cu yd, or CY
cubic feet per minute		cfm
cubic feet per second		cfs
decibel		db
degree Centigrade (or Celsius)	(Write)	degrees C, °C, or deg C
degrees Fahrenheit		degrees F, °F, or deg F
diameter		dia
direct current		d-c
dollars		\$
each		ea
efficiency		eff
Fahrenheit		F
feet		ft
feet per hour		fph, or ft/hr
feet per minute		fpm
feet per second		fps, or ft/min
figure		fig
flange		flg
foot-pound		ft-lb
gallon		gal
gallons per hour		gph, or gal/hr
gallons per minute		gpm
gallons per second		gps
gram		g
grams per liter		g/L
Hertz		Hz
horsepower		hp or HP
hour		hr
human-machine interface		HMI
inch		in.

inches of mercury	in. Hg
inches water gage	in. w.g.
inch-pound	in.-lb
inside diameter	ID
iron pipe size	IPS
thousand pounds	kips
thousand pounds per square inch	ksi
kilovolt-ampere	kva
kilowatt	kw
kilowatt-hour	kwhr or kwh
linear foot	lin ft or LF
liter	L
Leadership in Energy and Environmental Design (USGBC)	LEED
maximum	max
mercury	Hg
milligram	mg
milligrams per liter	mg/l or mg/L
milliliter	ml
millimeter	mm
million gallons per day	mgd or MGD
million gallon	MG
minimum	min
national pipe threads	NPT
net positive suction head	NPSH
net positive suction head available	NPSHA
net positive suction head required	NPSHR
nitrogen oxide (total concentration of mono-nitrogen oxides such as nitric oxide (NO) and nitrogen dioxide (NO ₂))	NO _x
nominal pipe size	NPS
number	no.
operator interface terminal	OIT
ounce	oz
ounce-force	ozf
outside diameter	OD
parts per hundred	pph
parts per million	ppm

parts per billion	ppb
polyvinyl chloride	PVC
post meridian	p.m.
pound	lb
pounds per square inch	psi
pounds per square inch absolute	psia
pounds per square inch gauge	psig
pounds per square foot	psf
process control system	PCS
programmable logic controller	PLC
revolutions per minute	rpm
second	sec
specific gravity	sp gr, or SG
square	sq
square foot	sq ft, sf, or ft ²
square inch	sq in., or in ²
square yard	sq yd, or SY
standard	std
standard cubic feet per minute	scfm
total dynamic head	TDH
totally-enclosed fan-cooled	TEFC
volt	V
volts alternating current	vac
volts direct current	vdc
volatile organic compounds	VOC

1.6 REFERENCE STANDARDS

- A. Refer to Article 3 of the General Conditions, as may be modified by the Supplementary Conditions, relative to reference standards and resolving discrepancies between reference standards and the Contract Documents. Provisions of reference standards are in effect in accordance with the Specifications.
- B. Copies of Standards: Each entity engaged in the Work shall be familiar with reference standards applicable to its construction activity. Copies of applicable reference standards are not bound with the Contract Documents. Where reference standards are needed for a construction activity, obtain copies of standards from the publication source.

- C. Abbreviations and Names: Where reference standards, specifications, codes, manuals, Laws or Regulations, or other published data of international, national, regional or local organizations are referred to in the Contract Documents, the organization issuing the standard may be referred to by their acronym or abbreviation only. The following acronyms or abbreviations that may appear in the Contract Documents shall have the meanings indicated below. Listing is alphabetical by acronym.

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ACS	American Chemical Society
ADSC- IAFD	International Association of Foundation Drilling.
AEIC	Association of Edison Illuminating Companies
AF&PA	American Forest and Paper Association
ABMA	American Bearing Manufacturers Association (formerly Anti-Friction Bearing Manufacturers Association (AFBMA))
AGMA	American Gear Manufacturers Association
AI	Asphalt Institute
AIA	American Institute of Architects
AIChE	American Institute of Chemical Engineers
AISC	American Institute of Steel Construction
ISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALSC	American Lumber Standards Committee
AMA	Acoustical Materials Association
AMCA	Air Movement and Control Association
AMP	National Association of Architectural Metal Manufacturers, Architectural Metal Products Division
ANSI	American National Standards Institute
APA	The Engineered Wood Association
APHA	American Public Health Association
API	American Petroleum Institute
AREA	American Railway Engineering Association
ARI	Air Conditioning and Refrigeration Institute
ASAE	American Society of Agricultural Engineers
ASCE	American Society of Civil Engineers

ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASNT	American Society for Non-Destructive Testing
ASQ	American Society for Quality
ASSE	American Society of Safety Engineers
ASTM	American Society for Testing and Materials
AWCI	Association of the Wall and Ceiling Industry
AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BAAQM	Bay Area Air Quality Management District
D	
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association
CBMA	Certified Ballast Manufacturers Association
CDA	Copper Development Association
CEMA	Conveyor Equipment Manufacturers Association
CGA	Compressed Gas Association
CISCA	Ceilings and Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CMAA	Crane Manufacturers Association of America
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DIN	Deutsches Institut für Normung eV (German Institute for Standardization)
DIPRA	Ductile Iron Pipe Research Association
EJCDC	Engineers Joint Contract Documents Committee
EJMA	Expansion Joint Manufacturers Association, Inc.
ETL	Intertek Testing Services, Inc. (formerly ETL Testing Laboratories, Inc.)
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FM	Factory Mutual (FM Global)
FRPI	Fiberglass Reinforced Plastics Institute
FS	Federal Specification

GA	Gypsum Association
GANA	Glass Association of North America
HEW	United States Department of Health, Education and Welfare
HI	Hydraulic Institute
HMI	Hoist Manufacturers Institute
HUD	United States Department of Housing and Urban Development
IBC	International Building Code
ICC	International Code Council
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronics Engineers
IESNA	Illuminating Engineering Society of North America
IFI	Industrial Fasteners Institute
IRI	Industrial Risk Insurers
ISA	Instrumentation, Systems, and Automation Society (formerly Instrument Society of America)
ISO	Insurance Services Office
ISO	International Organization for Standardization
LPI	Lightning Protection Institute
MIA	Marble Institute of America
ML/SFA	Metal Lath/Steel Framing Association
MS	Military Specifications
MSS	Manufacturers' Standardization Society
MMA	Monorail Manufacturers Association
NAAMM	National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NAPF	National Association of Pipe Fabricators, Inc.
NARUC	National Association of Regulatory Utilities Commissioners
NBHA	National Builders Hardware Association
NBS	United States Department of Commerce, National Bureau of Standards
NCMA	National Concrete Masonry Association
NEC	National Electric Code
NELMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NESC	National Electrical Safety Code
NETA	International Electrical Testing Association
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NGA	National Glass Association

NHLA	National Hardwood Lumber Association
NHPMA	Northern Hardwood and Pine Manufacturers Association
NIST	United States Department of Commerce, National Institute of Standards and Technology
NLGA	National Lumber Grades Authority
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	National Sanitation Foundation
NSSGA	National Stone, Sand, and Gravel Association
NTMA	National Terrazzo and Mosaic Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Precast/Prestressed Concrete Institute
PEI	Porcelain Enamel Institute
PFI	Pipe Fabrication Institute
PPI	Plastics Pipe Institute
PGMC	Primary Glass Manufacturers Council
PS	Product Standards Section, United States Department of Commerce
RCSC	Research Council on Structural Connections (part of AISC)
RMA	Rubber Manufacturers Association
SAE	Society of Automotive Engineers
SCAQMD	Southern California Air Quality Management District
SCPRF	Structural Clay Products Research Foundation
SCTE	Society of Cable Telecommunications Engineers
SDI	Steel Deck Institute
SDI	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturing Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association
SPI	Society of the Plastics Industry
SPIB	Southern Pine Inspection Bureau
SSPC	Society for Protective Coatings
SWI	Steel Window Institute
TCNA	Tile Council of North America
TEMA	Tubular Exchanger Manufacturers Association
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
UL	Underwriters Laboratories, Inc.

USAB	United States Access Board
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency
USGBC	United States Green Building Council
USGS	United States Geological Survey
USPHS	United States Public Health Service
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association
WCMA	Wood Component Manufacturers Association
WDMA	Window and Door Manufacturers Association
WEF	Water Environment Federation
WWEMA	Water and Wastewater Equipment Manufacturers Association
WWPA	Western Wood Products Association

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01 45 29

TESTING LABORATORY SERVICES FURNISHED BY CONTRACTOR

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. This section includes requirements for sampling services furnished by the CONTRACTOR for sampling, analysis, and reporting, or as provided in the supplementary conditions.
2. CONTRACTOR shall employ and pay for services of independent testing laboratory to perform specified services.
3. Inspection, sampling, and testing shall be as specified in the Specifications including but not limited to:
 - a. Section 02 51 40, Off-Site Transportation and Disposal.
 - b. Section 31 23 05, Excavation and Fill.
 - c. Section 32 92 00, Lawns and Meadows.
 - d. Section 44 00 05, Water Treatment.
3. CONTRACTOR shall pay for:
 - a. Tests not specifically indicated in the Contract Documents as being DEPARTMENT 's responsibility.
 - b. Tests made for CONTRACTOR's convenience.
 - c. Repeat tests required because of CONTRACTOR's negligence or defective Work and retesting after failure of test for the same item to comply with the Contract Documents.
4. Testing laboratory is not authorized to approve or accept any portion of the Work or defective Work; rescind, alter, or augment requirements of Contract Documents; and perform duties of CONTRACTOR.

1.2 REFERENCES

A. Standards referenced in this Section are:

1. New York State Analytical Services Protocol (ASP)
2. NYSDEC Technical Guidance for Site Investigation and Remediation DER-10, Appendix 2-B

1.3 QUALITY ASSURANCE

A. Qualifications:

1. Testing Laboratory:
 - a. Comply with applicable requirements of New York State Department of Environmental Conservation, DER-10 Technical Guidance for Site Investigation and Remediation (May 2010)

- b. Testing laboratory shall be NYSDOH ELAP certified.

1.4 SUBMITTALS

- A. Informational Submittals: Submit the following:
 - 1. Sampling Plan and Quality Control Project Plan Submittals: The sampling Plan shall include the following:
 - a. A chart and/or map indicating the approximate number of samples to be collected and the matrices of each, including anticipated QA/QC samples.
 - b. Procedures for sample collection.
 - c. Description of sampling equipment and maintenance procedures for the equipment.
 - d. Procedures for decontamination of sampling equipment.
 - e. Sample handling, labeling and regulatory compliance procedures for shipping.
 - f. Training requirements for environmental sampling for new employees and refresher training requirements for current employees.
 - 2. The QAPP shall be project specific and include the following:
 - a. Organizational chart, including a designated QA Officer.
 - b. Data quality objectives for the site.
 - c. A chart reflecting types of samples, approximate number of samples, matrices, holding times, analytical protocols and anticipated QA/QC samples to be collected or analyzed.
 - d. Specific limits of concern for each analyte for each matrix to be sampled.
 - e. The matrix specific method detection limit that must be obtained for each of the analytes and matrices listed.
 - f. The analytical laboratory to be used and evidence of their certification for all subcategories of solid and hazardous waste, including CLP metals, under the NYSDOH ELAP CLP.
 - g. Criteria for laboratory selection and audits.
 - h. Criteria for field sampling audits.
 - i. Record maintenance and archive methods.
 - j. Review and checking procedures for the sampling plan and the analytical results reporting.
 - k. Copy of the QAO's resume and training certificates. QAO must be proficient in analytical methodology, data interpretation and validation, quality control procedures and auditing techniques. The QAO shall interface with laboratory and data validator to make requests and or resolve issues specific to data usability.
 - 3. Test Reports: Testing laboratory shall promptly submit to CONTRACTOR results of testing and inspections, including:
 - a. Date issued.
 - b. Project title, number, and name of the Site.
 - c. Testing laboratory name and address.
 - d. Name and signature of inspector or person obtaining samples.

- e. Date of inspection or sampling.
 - f. Record of temperature and weather conditions.
 - g. Date of test.
 - h. Identification of material or item tested, and associated Specifications Section.
 - i. Location in the Project.
 - j. Type of inspection or test.
 - k. Results of tests and observations regarding compliance with this section and supplementary sections, as applicable
 - j. Category B deliverables for the reporting of deliverables package as per Volume 1 of the NYSDEC ASP.
 - i. Electronic deliverables shall conform to DER-10, Appendix 2B requirements.
4. Qualifications Statements:
- a. Testing Laboratory:
 - 1) NYSDOH ELAP certification. – Analytical Labs
 - 2) Statement of Qualifications – Geotechnical Labs

1.5 TESTING LABORATORY DUTIES

- A. Testing laboratory shall:
- 1. Complete analytical services in compliance with NYSDOH ELAP certification and NYSDEC ASP Protocol.
 - 2. Perform required inspections, sampling, and testing of materials and methods of construction; comply with applicable reference standards and the Contract Documents; and ascertain compliance with requirements of the Contract Documents.
 - 3. Promptly notify DEPARTMENT and CONTRACTOR of irregularities or deficiencies in the Work that are observed during performance of services.
 - 4. Promptly submit to CONTRACTOR reports of inspections and tests.
 - 5. Perform additional tests and services, as required by CONTRACTOR.
 - 6. Data deliverables shall conform to Guidance for Data Deliverables, DER-10 Appendix 2-B.

1.6 CONTRACTOR'S RESPONSIBILITIES

- A. CONTRACTOR shall:
- 1. Cooperate with testing laboratory personnel.
 - 2. Provide to testing laboratory preliminary representative samples of materials and items to be tested, in required quantities.
 - 3. Promptly submit to DEPARTMENT results of tests and inspections received from testing laboratory.
 - 4. Furnish to laboratory the preliminary design mix proposed for concrete and other material mixes to be tested by testing laboratory.
 - 5. Provide labor and facilities:

- a. For access to the Work to be tested, and where required, to Suppliers' operations.
- b. For obtaining and handling samples at the Site.
- c. For facilitating inspections and tests.
- d. For testing laboratory's exclusive use for storing and curing of test samples.
- e. Forms for preparing concrete test beams and cylinders.
6. Notify laboratory and DEPARTMENT sufficiently in advance of operations to allow assignment of personnel and scheduling of tests.
7. Arrange with laboratory and pay for additional services, sampling, and testing required for CONTRACTOR's convenience.
8. Confirm that analytical data deliverables conform to DER-10, Appendix 2B prior to submittal to the DEPARTMENT for review.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01 51 05

TEMPORARY UTILITIES AND CONTROLS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all temporary utilities and temporary facilities required for the Project, including the following:
 - a. Electricity.
 - b. Lighting.
 - c. Telephone and communications.
 - d. Heating, cooling, ventilating, and temporary enclosures.
 - e. Water.
 - f. Fire protection.
2. Make all arrangements with utility owners for temporary utilities and with others as appropriate for temporary facilities. Obtain required permits and approvals for temporary utilities and temporary facilities.
3. Pay all service costs for utilities and facilities indicated in this Section as CONTRACTOR's responsibility, including cost of electricity, water, fuel, and other utility services and temporary facilities required for the Work.
4. At minimum, provide and maintain temporary utilities and temporary facilities through Substantial Completion unless otherwise approved in writing by DEPARTMENT.
5. Maintain, including cleaning, temporary utilities and temporary facilities, and continuously provide consumables (i.e. potable water, soap, paper towels, toilet paper, etc.) as required.
6. Temporary utilities and temporary facilities shall be adequate for personnel using the Site and the needs of the Project.
7. Provide temporary utilities and temporary facilities in compliance with Laws and Regulations and, when applicable, requirements of utility owners.

1.2 REQUIREMENTS FOR TEMPORARY UTILITIES AND TEMPORARY FACILITIES

A. Electrical:

1. Provide temporary electrical service required for the Work, including continuous power for temporary field offices and sheds. Provide temporary outlets with circuit breaker protection and ground fault protection.
2. Provide written plan for electrical service including; approved service requests and work orders; as applicable
3. Provide materials that comply with applicable NEMA, NECA, and UL standards and governing regulations of temporary electrical services.

4. Provide grounded extension cords with waterproof connectors. Use "hard service" cords where there is exposure to abrasion and traffic.
5. Provide general service lamps and guard cages or tempered glass enclosures where lamp is exposed to breakage by removal operations. Use liquid-tight enclosures or boxes for the devices.
6. The CONTRACTOR shall provide a weatherproof, grounded temporary electrical power service and distribution system of sufficient size, capacity, and power characteristics to accommodate performance of the work.
7. Install overload protection and disconnect switches for each temporary circuit at the power source.
8. Install all cable or extension cords in the work area in such a manner that visual surveillance is easily accomplished.

B. Lighting.

1. Provide lighting at the Site of not less than five foot-candles for open areas and not less than ten foot-candles for stairs and shops. Provide not less than one, 300-watt lamp every 15 feet in indoor work areas. Provide night security lighting of not less than five foot-candles within 50 feet of all parts of the Site during hours of darkness, controlled by photocell.
2. Do not work in areas with insufficient lighting. Where lighting is insufficient for the work activities to be performed, provide additional temporary lighting.
3. Provide temporary lighting sufficient for observation of the Work by DEPARTMENT and inspection by CONTRACTOR and authorities having jurisdiction. Where required by DEPARTMENT, provide additional temporary lighting.

C. Telephone and Communications.

1. Provide temporary telephone and communications required for CONTRACTOR's operations at the Site and for summoning emergency medical assistance.

D. Heating, Ventilating, and Enclosures.

1. Provide sufficient temporary heating, cooling, ventilating, and enclosures to ensure safe working conditions and prevent damage to existing facilities and the Work.
2. Maintain temperature of areas occupied by DEPARTMENT's personnel or electronic equipment, including offices, lunch rooms, locker rooms, toilet rooms, and rooms containing computers, microprocessors, and control equipment, between 65 degrees F and 80 degrees F with relative humidity less than 75 percent.
4. Required temperature range for storage areas and certain elements of the Work, including preparation of materials and surfaces, installation or application, and curing as applicable, shall be in accordance with the supplementary conditions for the associated Work and/or the Supplier's recommended temperature range for storage, application, or installation, as appropriate.

5. Provide temporary ventilation sufficient to prevent accumulation in construction areas and areas occupied by DEPARTMENT of hazardous and nuisance levels or concentrations of dust and particulates, mist, fumes or vapors, odors, and gases, associated with construction.
6. Provide temporary enclosures and partitions required to maintain required temperature and humidity.

E. Water:

1. General:
 - a. Provide temporary water facilities including piping, valves, meters if not provided by DEPARTMENT of existing waterline, backflow preventers, pressure regulators, and other appurtenances. Provide freeze-protection as required.
 - b. Continuously maintain adequate water flow and pressure for all purposes during the Project, until removal of temporary water systems.
2. Water for Construction Purposes:
 - a. Provide water for Site maintenance and cleaning and, water necessary for construction activities, and water for disinfecting and testing of systems.
 - b. CONTRACTOR may use existing hose bibbs for short-term wash-downs and intermittent use of water for work areas in the existing building. Obtain consent of DEPARTMENT if connections to existing hose bibbs and similar existing connections will be used for more than one day at a time.
3. Water for Human Consumption and Sanitation:
 - a. Provide potable water in accordance with NYSDOH Laws and Regulations for consumption by personnel at the Site, for field offices, and for sanitary facilities.
 - b. When necessary, provide bottled, potable water for use and consumption by personnel at the Site, including CONTRACTOR and visitors to the Site.
 - c. Provide separate sanitary facilities for males and females.

F. Fire Protection.

1. Provide temporary fire protection, including portable fire extinguishers rated not less than 2A or 5B in accordance with NFPA 10, Portable Fire Extinguishers, for each temporary building and for every 3,000 square feet of floor area under construction.
2. Provide Class A (ordinary combustibles), Class B (combustible liquids and gases), and Class C (electrical equipment) fire extinguishers as necessary.
3. Comply with NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, and requirements of fire marshals and authorities having jurisdiction at the Site.

G. Staging Area:

1. Staging areas (if required) shall be located on the site in areas (exclusion zone) approved by the DEPARTMENT in order to minimize possible cross contamination.
2. The staging areas for waste materials shall have a lined bottom with a minimum 40-mil sealed, HDPE watertight liner or 20-mil pre-seamed LLDPE liner, as approved by the DEPARTMENT. Remove the liners when the staging area is no longer needed and dispose off-site.
3. Waste materials shall be covered at all times with a minimum 6-mil poly liner sealed, watertight liner to prevent contaminated runoff. Remove the liners when the staging area is no longer needed and dispose off-site.
4. All staging areas shall be constructed to prevent the spread of any contamination to the surrounding soils, surfaces, and/or groundwater.
5. Water spray or equivalent shall be utilized as necessary to prevent dust generation. Monitoring shall be provided to ensure that unacceptable levels of dust generated from the movement and handling of soil do not migrate from the site.
6. Shop Drawings of all staging areas shall be submitted by the CONTRACTOR to the DEPARTMENT for review and approval prior to the start of work.
7. The CONTRACTOR shall decontaminate staging areas on concrete pads as directed by the DEPARTMENT.
8. Clean soil staging areas: Can be located outside the exclusion zone over non-remedial areas, as applicable, erosion controls shall be maintained at the perimeter of piles. Long-term storage of piles may require additional stabilization measures, as directed by the DEPARTMENT or required in the supplementary conditions.
9. Materials staging area: provide and maintain material staging areas as needed in locations indicated on the CONTRACTOR's work site layout, or as approved by the DEPARTMENT.

H. Decontamination Trailer and Personal Hygiene Facility:

1. A separate trailer for personnel decontamination shall be provided. The equipment and fixtures specified below shall be provided:
 - a. Shower facilities with at least one shower for every six on-site personnel. Separate showers shall be provided for men and women.
 - b. Locker room with one locker for each employee.
 - c. A room where all personnel safety equipment and protective clothing can be stored.
 - d. Laundry area equipped with automatic washing and drying machines or sub-contract laundering to a service firm approved by the DEPARTMENT.
 - e. Boot rack for wash boots to drain.
 - f. Toilet facilities in accordance with OSHA and local health organizations.
 - g. Sanitary waste holding tank and piping from the decontamination facility and site offices.

2. All equipment and fixtures shall be maintained in clean condition. No storage of any equipment will be allowed in the decontamination trailer. The installation shall be in accordance with the HASP.
 3. Shop drawing of the trailer and facilities shall be submitted by the CONTRACTOR to the DEPARTMENT for review and approval.
- I. Temporary (Work Zone) Fencing:
1. Work Zone Fencing, unless otherwise detailed in the supplementary conditions, provide a temporary, secure 4-foot high, high strength polyethylene orange plastic fence around the operations and work areas to control access. Fence posts shall be a minimum of 5- feet in total length and shall adequately support the fence and prevent leaning. Fence posts shall be set a maximum 10 feet apart.
 2. Perimeter Fencing, unless otherwise detailed in the supplementary conditions, shall consist of temporary or driven post fence panels a minimum of 6-feet in height. Privacy screening shall be provided
- J. Water Control:
1. Comply with procedures outlined in the NYSDEC Stormwater Management Design Manual.
- K. Pollution Control:
1. Maintain work areas on and off site free from further environmental pollution that would be in violation of any federal, state, or local regulations.
 2. Minimize air pollution by wetting down bare soils with clean water, requiring use of properly operating combustion emission control devices on construction vehicles and equipment used by CONTRACTORS, and encouraging shutdown of motorized equipment not actually in use.
 3. Any emissions during site activities that may have an adverse health effect on workers or the community shall be suppressed to the extent possible.
 4. Chemicals used, whether herbicide, pesticide, disinfectant, polymer, reactant, or other classification, must be approved by either the DEPARTMENT or any other applicable regulatory agency and the DEPARTMENT and be used in a manner as their original purpose was intended.
 5. Use of such chemicals and disposal of residues shall be in conformance with manufacturers' instructions.
 6. Use of chemicals must be approved in advance by the DEPARTMENT.
 7. Disposal of volatile fluid wastes (such as mineral spirits, oil, or paint thinner) in storm or sanitary sewer system or into streams or waterways is not permitted.
 8. Volatile wastes generated will be handled as hazardous wastes and reported to NYSDEC.
 9. The CONTRACTOR shall provide that the generated project hazardous waste (if any) and any existing hazard waste to be removed under this project shall be transported, manifested, and disposed in accordance with the current regulations.

10. More specific requirements are given in other sections of this document.

L. Traffic Control:

1. The CONTRACTOR shall maintain all on-site temporary roads necessary for performance of the Work. Temporary access roads will be repaired as necessary to insure unimpeded daily operations. This may include at a minimum, routine grading and repairs to areas subject to settling resulting from site-related traffic.
2. Park vehicles in areas designated and approved in the Work Plan.
3. Keep the designated parking areas clear of dirt and debris resulting from the work.

M. Rubbish Control (Noncontaminated)

1. Clean up the debris resulting from the work at the end of each day and leave work areas broom clean. Locate containers where directed.
2. Remove debris from the site at least once a week or more often if it presents a fire hazard or becomes excessive. Burning of waste material will not be permitted.
3. Containers shall have secure tops.

N. Protection of Natural Resources:

1. General:
 - a. Preserve the natural resources within the project site that are not specified for removal or change or in accordance with supplementary permit conditions.
 - b. Preserve the natural resources outside the project site impacted by the work.
 - c. Conform to federal, state and local permitting requirements.
 - d. Restore disturbed resources to an equivalent or improved condition upon completion of work.
 - e. Vehicles, equipment and machinery delivered or used at the site that have visible oil or hydraulic leaks will not be allowed on site. Clean up any oil or hydraulic fluid spills immediately.
2. Land Resources:
 - a. Except in areas specified to be cleared, do not remove, cut, deface, injure, or destroy existing vegetation.
 - b. Protect vegetation, that is to remain, from damage by construction operations.
 - c. Vegetation, intended to remain, that is scarred or damaged by construction operations shall be removed and replaced with equivalent undamaged vegetation.
 - d. Removal of scarred or damaged vegetation shall be in accordance with the specifications.
 - e. Trees or shrubs with 30 percent or more of their root systems damaged shall require removal and replacement.

- f. Replacement vegetation shall be approved by the DEPARTMENT before replacement.
- 3. Water Resources:
 - a. Prevent oily or hazardous substances from entering the ground, drainage areas, or local bodies of water.
 - b. Provide secondary containment of temporary fuel oil, petroleum, or hazardous substance storage tanks of sufficient size and strength to contain the contents of the tanks.
- 4. Fish and Wildlife Resources:
 - a. Do not alter or significantly disturb water flows on or adjacent to the project site, except as indicated or specified.
 - b. Do not alter or significantly disturb native habitat on or adjacent to the project site, except as indicated or specified.
 - c. Conformance with supplementary permit conditions, as applicable.
- O. Noise, Vibration and Dust Control:
 - 1. Conduct operations in compliance with applicable local noise ordinance.
 - 2. Dust shall be controlled in compliance with approved CONTRACTOR's Vapor Control Emissions Plan, Community Health and Safety Plan, and Site-Specific Health and Safety Plan (SSHASP), or otherwise directed by the DEPARTMENT.
 - 3. Equip compressors, hoists, and other apparatus with such mechanical devices as may be necessary to minimize noise, vibration and dust. Equip compressors with silencers on intake lines.
 - 4. Equip gasoline or oil-operated equipment with silencers or mufflers on intake and exhaust lines.
 - 5. Provide unpaved roads, detours, or haul roads used in construction areas with water treatment to minimize dust. No visible dust, as determined by the DEPARTMENT, will be permitted beyond the limits of the exclusion zone.
 - 6. CONTRACTOR is responsible for providing all sound barriers needed to meet the requirements of these specifications. CONTRACTOR is responsible for all costs related to the manufacturer's representatives or consultants (contractors) who specialize in addressing such problems.
 - 7. Control noise levels associated with site operations in accordance with local noise ordinances.
 - 8. Measure noise levels in decibels with a sound level meter conforming to the American National Standard Specification.
 - 9. Measurements shall be made at site perimeter.
 - 10. Measurements shall be continuous during the first week of construction activities. Additional measurements may be directed by the DEPARTMENT throughout the course of the project.
 - 11. Measurements shall be documented and reported to the DEPARTMENT.
 - 12. If the Leq levels are not maintained the CONTRACTOR shall take appropriate measures to bring the noise under control at no additional cost to the DEPARTMENT.
 - 13. Comply with DER-10, Appendix 1A.

PART 2 – PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Materials and equipment for temporary utilities and temporary facilities may be new or used but shall be adequate for purposes intended and shall not create unsafe conditions and shall comply with Laws and Regulations.
- B. Provide required materials, equipment, and facilities, including piping, cabling, controls, and appurtenances.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install temporary utilities and temporary facilities in neat, orderly, manner, and make structurally, mechanically, and electrically sound throughout.
- B. Location of Temporary Utilities and Temporary Facilities:
 - 1. Locate temporary systems for proper function and service.
 - 2. Temporary systems shall not interfere with or provide hazards or nuisances to: the Work under this and other contracts, movement of personnel, traffic areas, materials handling, hoisting systems, storage areas, finishes, and work of utility DEPARTMENT s and others.
 - 3. Do not install temporary utilities on the ground, with the exception of temporary extension cords, hoses, and similar systems in place for short durations.
- C. Modify and extend temporary systems as required by progress of the Work.

3.2 USE

- A. Maintain temporary systems to provide safe, continuous service as required.
- B. Properly supervise operation of temporary systems:
 - 1. Enforce compliance with Laws and Regulations.
 - 2. Enforce safe practices.
 - 3. Prevent abuse of services.
 - 4. Prevent nuisances and hazards caused by temporary systems and their use.
 - 5. Prevent damage to finishes.
 - 6. Ensure that temporary systems and equipment do not interrupt continuous progress of construction.

- C. At end of each work day check temporary systems and verify that sufficient consumables are available to maintain operation until work is resumed at the Site. Provide additional consumables if the supply on hand is insufficient.

3.3 REMOVAL

- A. Completely remove temporary utilities, temporary facilities, equipment, and materials when no longer required. Repair damage caused by temporary systems and their removal and restore the Site to condition required by the Contract Documents; if restoration of damaged areas is not specified, restore to preconstruction condition.
- B. Where temporary utilities are disconnected from existing utility, provide suitable, watertight or gastight (as applicable) cap or blind flange, as applicable, on service line, in accordance with requirements of utility owner .
- C. Where permanent utilities and systems were used for temporary utilities, upon Substantial Completion replace all consumables such as filters and light bulbs and parts used during the Work.

+ + END OF SECTION + +

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SECTION 01 52 13

CONTRACTOR'S FIELD OFFICE AND SHEDS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide a temporary field office for CONTRACTOR's use with not less than the minimum facilities specified in the Contract Documents.
 - 2. Provide required temporary storage and work sheds, as applicable.
 - 3. Obtain and pay for required permits and utilities. Field offices and sheds shall comply with local ordinances unless otherwise modified in the Supplementary Conditions.
- B. Coordination:
 - 1. Coordinate with DEPARTMENT use of the Site including the location of field offices and sheds.
- C. Location:
 - 1. Locate field offices and sheds in accordance with the Contract Documents and in accordance with the approved submittals.
- D. Furnish in CONTRACTOR's field office one complete set of the Contract Documents for ready reference by interested persons. In addition to the reference set, comply with Section 01 78 39, Project Record Documents and related provisions of the General Conditions, as may be modified by the Supplementary Conditions.

PART 2 – PRODUCTS

2.1 FIELD OFFICE AND SHEDS – FURNISHINGS, AND EQUIPMENT

- A. Contractor's Field Office and Furnishings:
 - 1. Construction: As required by CONTRACTOR and sufficient for Project meetings.
 - 2. Utilities and Services: Provide the following:
 - a. Telephone service, capable of group teleconference
 - b. Computer network and related facilities as required for CONTRACTOR's needs.
 - 3. Furnishings:
 - a. Conference Facilities: Provide conference area with conference table and chairs sufficient for 10 people. Conference facilities and furnishings

shall be provided with suitable utilities, lighting, ventilation, and temperature controls prior to the first progress meeting, unless otherwise approved by ENGINEER.

b. Other furnishings required by CONTRACTOR.

4. Provide on field office's exterior an identification sign displaying CONTRACTOR's company name and emergency contact number. Maximum size of sign shall be four feet by four feet. Sign shall be suitable for outdoor use for the duration of the Project.
5. Furnish and maintain at CONTRACTOR's field office six (6) protective helmets ("hard hats") for use by visitors to the Site.

B. Contractor's Storage and Work Sheds:

1. Provide storage and work sheds sized, furnished, and equipped to accommodate personnel, materials, and equipment involved in the Work, including temporary utility services and facilities required for environmental controls sufficient for personnel, materials, and equipment.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Installation:

1. Install CONTRACTOR's temporary field offices, sheds, and related facilities in accordance with Laws and Regulations.
2. Install materials and equipment, including prefabricated structures, in accordance with manufacturer's instructions.

3.2 MAINTENANCE AND REMOVAL

A. Maintenance:

1. Clean and maintain field offices and sheds as required.
2. Provide consumables as required.

B. Removal:

1. Do not remove temporary field offices and sheds until after Substantial Completion of the entire Work, unless otherwise approved by ENGINEER.
2. Remove field offices and sheds and restore areas prior to final inspection.

+ + END OF SECTION + +

SECTION 01 55 13

ACCESS ROADS AND PARKING AREAS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide temporary construction roads, walks, parking areas, and appurtenances required during the Project for use by CONTRACTOR, DEPARTMENT and emergency vehicles.
 - 2. Temporary roads and parking areas shall be designed and maintained by CONTRACTOR and shall be fully passable to vehicles in all weather conditions.
- B. Use of Existing Access Roads:
 - 1. CONTRACTOR is allowed to use DEPARTMENT's existing roads starting on the Effective Date of the Contract and satisfying other Contract requirements relative to starting the Work.
 - 2. Prevent interference with traffic on existing roads and parking areas. Always keep access roads and entrances serving the Site clear and available to DEPARTMENT and their respective employees; emergency vehicles; and other contractors. Do not use access roads or Site entrances for parking or storage of materials or equipment.
 - 3. CONTRACTOR shall indemnify and hold harmless DEPARTMENT from expenses and losses caused by CONTRACTOR's operations over existing roads, drives, and parking areas.
 - 4. Schedule deliveries to minimize use of driveways and Site entrances.

1.2 SITE ACCESS

- A. Site Access:
 - 1. CONTRACTOR access to the Site shall be as shown on the drawings.

1.3 CONTRACTOR PARKING

- A. CONTRACTOR employee vehicles shall park in area(s) as shown on the drawings.
- B. Park construction vehicles and equipment in work areas off of permanent roads and parking areas, in areas of the Site designated for CONTRACTOR staging.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Materials for temporary roads and parking areas shall comply with the Contract Documents' requirements for permanent roads, drives, and parking areas.
- B. Traffic controls shall comply with requirements of authorities having jurisdiction. When such authority is the DEPARTMENT or facility manager, and no requirements are indicated, comply with the standard specifications of the state department of transportation in the area of the Project.

PART 3 – EXECUTION

3.1 TEMPORARY ROADS AND PARKING AREAS

- A. Temporary Roads and Parking in Areas Different from Permanent Pavement:
 - 1. Provide temporary roads and parking areas adequate to support and withstand traffic loads during the Project. Locate temporary roads and parking areas.
 - 2. Provide reasonably-level, graded, well-drained subgrade of satisfactory soil material, compacted to not less than 95 percent of maximum dry density in the upper six inches.
 - 3. Where required to support loads and provide separation between subgrade and subbase materials, provide geosynthetic separation fabric as required.
 - 4. Subbase:
 - a. Provide crushed stone subbase material not less than six inches thick, roller-compacted to a level, smooth, dense surface.
 - b. Subbase for temporary roads and areas traveled by construction vehicles shall be adequate for loads and traffic served.
- B. Temporary Roads and Parking in Same Areas as Permanent Pavement:
 - 1. Provide temporary roads and parking areas adequate to support and withstand traffic and construction loads during the Project. Locate temporary roads and parking areas in same location as permanent roads and parking areas. Extend temporary roads and parking areas, within construction limits indicated, as required for construction operations.
 - 2. Coordinate elevations of temporary roads and parking areas with permanent roads and parking areas.
 - 3. Prepare subgrade, subbase, and base for temporary roads and parking areas in accordance with the Contract Documents requirements for permanent roads, drives, and parking areas.
 - 4. Where required by subgrade conditions and construction loads and traffic, provide geosynthetic separation fabric as required on compacted subgrade for subbase support and separation of subbase and subgrade materials.

5. Re-condition granular subbase of temporary roads and parking areas, including removing and properly disposing of granular material that has become intermixed with soil, re-grading, proof-rolling, compacting, and testing.

3.2 TRAFFIC CONTROLS

A. Traffic Controls:

1. Provide temporary traffic controls at intersections of temporary roads with each other and with parking areas, including intersections with other temporary roads, intersections with public roads, and intersections with permanent access roads at the Site.
2. Provide temporary warning signs on permanent roads and drives and provide temporary “STOP” AND “TRUCKS ENTERING” signs for traffic on temporary roads where required and at entrances to public roadways.
3. Comply with requirements of authorities having jurisdiction. When such authority is the DEPARTMENT or facility manager, and no requirements are indicated, comply with the standard specifications of the state department of transportation in the area of the Project

3.3 MAINTENANCE OF ROADS

A. General:

1. Maintain temporary roads and parking to continuously provide at the Site access for construction vehicles and trucks, DEPARTMENT and facility manager vehicles, deliveries for DEPARTMENT and facility manager, emergency vehicles, and parking areas for DEPARTMENT’s and facility manager’s personnel.
2. Public roads shall be passable at all times unless a road closure is allowed in writing by authority having jurisdiction.
3. When granular material of temporary roads and parking without hard surfacing become intermixed with soil or when temporary roads otherwise create a nuisance, remove intermixed granular-and-soil material and replace with clean granular material as required.
4. Provide snow and ice removal for temporary roads and parking areas.

B. Cleaning and Dust Control:

1. Cleaning: Clean paved surfaces over which construction vehicles travel.
2. Clean the following surfaces:
 - a. Roads within limits of the Project.
 - b. Permanent roads at the Site between the Site entrance and the work areas, and between the Site entrance and construction parking and staging areas.
 - c. Public roads that require sweeping and cleaning due to construction operations.

3. Dust Control:
 - a. Control dust resulting from construction activities to prevent nuisances at the Site and in nearby areas.
- C. Protection of Underground Facilities: Comply with the General Conditions, as may be modified by the Supplementary Conditions, and other requirements of the Contract Documents.

3.4 REMOVALS AND RESTORATION

- A. Removals:
 1. Remove temporary roads, drives, walks, and parking areas that are not intended for, or acceptable for, integration into permanent pavement. Return areas of temporary roads, drives, walks, and parking to pre-construction condition unless otherwise required by the Contract Documents.
 2. Remove temporary gates, fencing, and traffic controls associated with temporary roads and parking areas.
 3. Where areas of temporary roads and parking will be permanently landscaped, remove pavement, granular subbase, geosynthetic (where required by DEPARTMENT), soil, and other materials that do not comply with the Contract Documents regarding fill, subsoil, and landscaping.
 4. Remove and properly dispose of materials contaminated with oil, bitumen, and other petrochemical compounds resulting from CONTRACTOR's operations, and other substances that might impair growth of plants and lawns.
- B. Restoration:
 1. Repair or replace paving, curbs, gutters, and sidewalks affected by temporary roads and parking, and restore to required conditions in accordance with authorities having jurisdiction.
 2. Restore to pre-construction conditions existing roads, walks, and parking areas damaged by CONTRACTOR, subject to approval of the DEPARTMENT of affected roads, drives, walks, and parking areas.

+ + END OF SECTION + +

SECTION 01 57 33

SECURITY

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. This Section includes general requirements for security at the Site, including accessing the Site, securing the Work, temporary fencing, and other requirements.
2. CONTRACTOR shall safely guard all the Work, the Project, materials, equipment, and property from loss, theft, damage, and vandalism until Substantial Completion, unless otherwise agreed upon by the parties.
3. CONTRACTOR's duty includes safely guarding DEPARTMENT's property in vicinity of the Work and Project, and other private property in the vicinity of the Project from injury and loss in connection with performance of the Project.
4. Employ watchmen as required to provide required security and prevent unauthorized entry.
5. Costs for security required under this Section shall be paid by CONTRACTOR.
6. Make no claim against DEPARTMENT for damage resulting from trespass.
7. Remedy damage to property of DEPARTMENT and others arising from failure to furnish adequate security.
8. Provide temporary fencing in accordance with the Contract Documents.
9. The CONTRACTOR is solely responsible for the security of the DEPARTMENT's and CONTRACTOR's work areas, equipment, materials, and supplies provided under this contract. Furthermore, CONTRACTOR is responsible for ensuring site visitors related to this contract are escorted as necessary (to get where they are going) and do not enter contaminated areas without authorization.
10. If the CONTRACTOR furnishes an uniformed watchman or other security personnel, the CONTRACTOR shall provide that person(s) with accommodations separate from the DEPARTMENT. The DEPARTMENT will have the right of approval and rejection of the CONTRACTOR's security personnel.

1.2 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:
 - a. Temporary Fencing: Submit site plan drawings showing proposed locations and extent of temporary site security fencing and each breach

therein. Temporary fencing shall be a minimum of six feet high and constructed of chain-link fence, wood panels or other materials that will provide a secure barrier.

2. Product Data:
 - a. Temporary Fencing: Manufacturer's literature, specifications, and installation instructions for temporary site security fencing proposed.
 3. Qualifications:
 - a. Submit security firm experience and personnel resumes.
 4. Routine Submittals
 - a. Submit monthly security logs.
 - b. Submit 3 copies of the all site entrance/exit log and the watchman logs as part of the project record documents.
- B. Informational Submittals: Submit the following:
1. Employee Information: Submit to DEPARTMENT , as applicable under the supplementary conditions;
 - a. Format of employee background data.
 - b. Background data for employees to whom identification badges will be furnished.
 - c. Updated listing of personnel to whom identification badges have been issued. Submit updated listing within 24 hours of a change in the list or change in an employee's Site access status.

1.3 CONTRACTOR'S SITE ACCESS AND SECURITY PROCEDURES

- A. Comply with Section 01 55 13, Access Roads and Parking Areas.
- B. Comply with DEPARTMENT's security procedures and access restrictions at the Site throughout the Project. Comply with the following:
1. Personnel Identification:
 - a. All CONTRACTOR personnel, including Subcontractors, Suppliers, and others associated with the Project shall wear, at a visible location, at all times at the Site a durable, waterproof badge bearing CONTRACTOR's name, employer (if other than CONTRACTOR), employee's name and, as applicable, employee number.
 2. General Provisions Regarding Personnel Identification, as applicable under the Supplementary Conditions:
 - a. Prerequisites to Issuance of Personnel Identification Badges:
 - 1) Do not issue personnel identification badge until the person receiving the badge is documented by CONTRACTOR as:
 - a) Being eligible to perform work in the jurisdiction where the Project is located.
 - b) Has received all required safety instructions, training, and equipment.

- c) Is known to CONTRACTOR as being qualified to perform the Work to which the person will be assigned.
- b. Listing of Personnel to Whom Badges are Issued:
 - 1) Maintain and continuously update a listing or log of all personnel to whom personnel identification badges have been issued.
 - 2) Listing or log shall indicate each person's full name, home address, personal telephone number, employer name, and employer address and telephone number.
 - 3) Submit copy of listing or to DEPARTMENT in accordance with Article 1.2 of this Section.
- 3. Parking:
 - a. Do not park outside of designated CONTRACTOR parking area.
 - b. Prepare and maintain parking area as required.

PART 2 – PRODUCTS

2.1 TEMPORARY FENCING

- A. When security fencing or barriers are breached or temporarily removed for the Project, provide and maintain temporary security fencing equal to existing, unless otherwise specified, in manner satisfactory to DEPARTMENT.

PART 3 – EXECUTION

3.1 TEMPORARY FENCING

- A. Installation:
 - 1. Provide temporary fencing for site security so that integrity of site security is maintained throughout the Project.
 - 2. Install temporary fencing used for site security in accordance with the Contract Documents, Section 01 51 05, Temporary Utilities and Controls and fence manufacturer's instructions.
- B. Maintenance:
 - 1. Maintain temporary fencing throughout the Project.
 - 2. Repair damage to temporary fencing and replace fencing when required to preserve Site security.
- C. Removal:
 - 1. Remove temporary fencing when permanent site security fencing is in place and fully functional, or when otherwise directed or DEPARTMENT.

3.2 LOGS

- A. Site Entrance/Exit Log:
 - 1. Log shall contain signed entry and exit record for project personnel and visitors.
 - 2. Log shall record time of entry and exit and firm of the individual.
- B. Watchman Log/Activities:
 - 1. Log shall record all security checks performed by security personnel and shall contain date and time, problem notes and CONTRACTOR personnel notified of problems. Allow inspection of log by DEPARTMENT.
 - 2. Conduct three security checks during non-working hours.
- C. Site Access/Control:
 - 1. The CONTRACTOR shall be responsible for the control of all persons and vehicles entering and leaving the project site, and shall:
 - a. Require personnel to print full name and employer and sign in on entering the project site and to sign out when leaving and maintain the logs.
 - b. Maintain a log of project-related vehicles and equipment entering and leaving the work areas.
 - c. Persons not associated with the project will require the DEPARTMENT's acceptance to be admitted on site.
 - d. Maintain a log of visitors, separate from the project personnel log.
 - 2. A log of all security incidents shall be maintained and furnished to the DEPARTMENT upon request.
 - 3. The CONTRACTOR shall ensure that all warning signs are in place and temporary fences around work areas are closed and any breaks or gaps are attended immediately. The DEPARTMENT shall be informed immediately of any incident of vandalism in the work areas.
 - 4. The CONTRACTOR shall contact law enforcement officials, emergency medical care units, local fire departments and utility emergency teams to ascertain the type of response required in any emergency situation and to coordinate the responses of the various units. A standard operating procedure describing security force response to foreseeable contingencies shall be developed. The CONTRACTOR shall also prepare and update a list of emergency points of contact, telephone numbers, radio frequencies, and call signs to ensure dependable responses.
 - 5. The CONTRACTOR shall maintain a current list of authorized persons and shall submit copies of the updated list to the DEPARTMENT.

+ + END OF SECTION + +

SECTION 01 71 23

FIELD ENGINEERING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. This Section includes field engineering, surveying, and layouts by CONTRACTOR, and associated requirements.
2. CONTRACTOR shall provide field engineering services, surveying and layout services, and professional services of the types indicated for the Project, including:
 - a. Furnishing civil, structural, and other delegated professional engineering services specified or required to execute CONTRACTOR's construction methods.
 - b. Developing and making all detail surveys and measurements required for construction; including slope stakes, batter boards, and all other working lines, elevations, and cut sheets.
 - c. Providing materials required for benchmarks, control points, batter boards, grade stakes, structure and pipeline elevation stakes, and other items.
 - d. Keeping a total station; survey grade global positioning system (GPS); leveling instrument; and related surveying equipment at the Site at all times and having a skilled instrument person available when necessary for laying out the Work.
 - e. Being solely responsible for all locations, dimensions and levels. No data other than Change Order, Work Change Directive, or Field Order shall justify departure from dimensions and levels required by the Contract Documents.
 - f. Rectifying all Work improperly installed because of not maintaining, not protecting, or removing without authorization established reference points, stakes, marks, and monuments.
 - g. Providing such facilities and assistance necessary for DEPARTMENT to check lines and grade points placed by CONTRACTOR. Do not perform excavation or embankment work until all cross-sectioning necessary for determining payment quantities for Unit Price Work have been completed and accepted by DEPARTMENT.
 - h. All survey work shall be certified by a New York State Professional Land Surveyor (PLS).
 - i. PLS shall also work with contractor to develop a Quality Assurance program and necessary certification of GPS guided equipment to ensure

accuracy. The use of GPS data from equipment will not replace the required record surveys.

- B. Coordination:
 - 1. Review requirements of this and other Sections and coordinate installation of items to be installed with or before field engineering, surveying, and layout Work.

1.2 SUBMITTALS

- A. Informational Submittals: Submit the following:
 - 1. Certificates:
 - a. When requested by DEPARTMENT, submit certificate signed by professional engineer or professional surveyor, as applicable, certifying that elevations and locations of the Work comply with the Contract Documents. Explain each deviation, if any.
 - 2. Field Engineering:
 - a. Submit daily reports as indicated in this Section.
 - b. When requested by DEPARTMENT, submit documentation verifying accuracy of field engineering.
 - 3. Surveying:
 - a. Complete plan for performing survey work, submitted not less than 10 days prior to beginning survey Work.
 - b. Example of survey data to be maintained by CONTRACTOR's surveyor. Example shall have sufficient information and detail, including example instrument output, calculations and notes.
 - c. Submit raw instrument data or field data within two days after completing survey Work.
 - d. Submit certified survey in accordance with this Section.
 - 4. Qualifications Statements:
 - a. Field Engineer: Name, employer, and professional address. When requested by DEPARTMENT, submit qualifications, including resume'.
 - b. Surveyor: Name, employer, and professional address of firm, and resumes of each professional land surveyor and crew chief that will be engaged in survey Work. Submit not less than 10 days prior to beginning survey Work. During the Project, submit resume for each new registered, licensed land surveyor and crew chief employed by or retained by CONTRACTOR not less than 10 days prior to starting on the survey Work.

1.3 CONTRACTOR'S ENGINEERS

A. Qualifications of Field Engineer:

1. Employ and retain at the Site a field engineer with experience and capability of performing all field engineering tasks required of CONTRACTOR, as indicated in this Article and elsewhere in the Contract Documents.
2. CONTRACTOR's field engineer shall possess experience performing duties similar in scope and extent to those required of CONTRACTOR's field engineer on this Project. Qualifications of the CONTRACTOR's field engineer shall be subject to review and approval by the DEPARTMENT.

B. Responsibilities of Contractor's Field Engineer:

1. Daily Reports:
 - a. Prepare and maintaining daily reports of activity on the Contract. Submit reports to DEPARTMENT including the following information:
 - 1) Number of employees at the Site.
 - 2) Number employees at the Site for each Subcontractor.
 - 3) Breakdown of employees by trades.
 - 4) Major equipment and materials installed as part of the Work.
 - 5) Major construction equipment utilized.
 - 6) Location of areas in which construction was performed.
 - 7) Materials and equipment delivered to the Site or suitable, offsite storage location.
 - 8) Work performed, including field quality control and testing.
 - 9) Weather conditions.
 - 10) Safety concerns, events, and precautions taken.
 - 11) Delays encountered, extent of delay incurred, reasons for the delay, and measures that will be taken to rectify delays encountered.
 - 12) Acknowledgement of specific instructions received from DEPARTMENT.
 - b. Daily reports shall be signed and dated by responsible member of CONTRACTOR's staff, such as CONTRACTOR's project manager, field engineer, or superintendent, or foreman designated by CONTRACTOR as having authority to sign daily reports.
 - c. Submit CONTRACTOR's daily reports in accordance with Section 01 31 26, Electronic Communication Protocols, by 9:00 a.m. the next working day after the day covered in the associated report.
2. Continually inspect the Work to ensure that the quality and quantities required by the Contract Documents are provided.
3. Cooperate as required with DEPARTMENT in observing the Work and performing field inspections.
4. Check and coordinate the Work for conflicts and interferences, and immediately advise DEPARTMENT of all discrepancies of which CONTRACTOR is aware.

5. Maintain field office files and drawings, record documents, and coordinate field engineering services with Subcontractors and Suppliers as appropriate, and other prime contractors (if any).
 6. Prepare layout and coordination drawings for construction operations.
 7. Review and coordinate the Work with Shop Drawings and CONTRACTOR's other submittals approved or accepted, as applicable, by DEPARTMENT.
- C. Professionals Retained by Contractor (whether or not stationed at the Site):
1. Delegated Professional Design Services:
 - a. Where the Contract Documents require CONTRACTOR to furnish professional engineering or architecture services as delegated professional design, the provisions of the General Conditions regarding delegated professional design services, and the Contract Documents' requirements applicable to the specific delegated professional design, shall apply.
 2. Professional Services that are Not Delegated as Professional Design of the Completed Work:
 - a. Where the Contract Documents require that the CONTRACTOR retain a design professional for to carry out the CONTRACTOR's responsibilities for construction means, methods, techniques, sequences and procedures (including temporary construction that will not remain as part of the completed Work), such services shall be performed by a registered professional of the discipline required for specific service on the Project, with valid license in the same jurisdiction as the Site.
 - b. DEPARTMENT shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed by such design professionals.

1.4 CONTRACTOR'S SURVEYOR

- A. Qualifications:
1. Employ or retain the services, as needed, at the Site a surveyor with experience and capability of performing surveying and layout tasks required in the Contract Documents and as required for the Work. Surveyor qualifications will be subject to review and acceptance by the DEPARTMENT.
 2. Surveyor shall be a professional land surveyor registered and licensed in the State of New York.
- B. Responsibilities of Contractor's Surveyor:
1. Providing required surveying equipment, including transit, theodolite, or total station; level; stakes; and surveying accessories.
 2. Establishing required lines and grades for constructing all facilities, structures, pipelines, and site improvements, including outdoor electrical equipment and feeders.

3. Preparing and maintaining professional-quality, accurate, well-organized, legible notes of all measurements and calculations made while surveying and laying out the Work.
4. Prior to backfilling operations, survey, locate, and record on a copy of the Contract Documents accurate representation of buried Work and Underground Facilities provided and encountered.
5. Locate on a site plan the actual location of above-ground Work to be indicated on record documents.
6. Complying with requirements of the Contract Documents relative to surveying and related Work, including requirements of this Section's Articles 1.5 and 3.1.
7. Prepare all surveys in AutoCAD format. Coordinate version with DEPARTMENT.

1.5 RECORDS

A. Records – General:

1. Maintain at the Site a complete and accurate log of control and survey Work as such Work progresses.

B. Field Books and Records:

1. Survey data and records shall be in accordance with recognized professional surveying standards, Laws and Regulations, and prevailing standards of practice in the locality where the Site is located.

C. Initial Survey:

1. Provide topographic survey of site property and any contractor use areas, property boundary survey and utilities prior to site disturbance. Elevations will be provided for all control points.
2. Compute the coordinates of each surveyed point on the New York State Plane Coordinate System using the 1983 North American Datum. The elevations shall be on the National Geodetic Vertical Datum.

D. Site Control:

1. Provide one permanent site control monument with elevations referenced to a National Geodetic Vertical Datum (NGVD) benchmark and coordinates referenced to the New York State Plane (NAD 83) Datum. The monument locations and elevations shall meet the Federal Geodetic Control Committee Standard for second order (horizontal and vertical). Final locations will be reviewed by the DEPARTMENT for acceptability.

E. Payment Surveys:

1. Surveys required for the verification of payment quantities will be signed and sealed by the professional surveyor.

2. Compute the coordinates of each surveyed point on the New York State Plane Coordinate System using the 1983 North American Datum. The elevations shall be on the National Geodetic Vertical Datum.
- F. Certified Survey of Surface Structures:
1. Upon completion of foundation walls and major site improvements, prepare a certified survey, signed and sealed by professional surveyor, showing or indicating dimensions, locations, angles and elevations of construction and locations and elevations of Underground Facilities installed and encountered during the Work.
 2. Compute the coordinates of each surveyed point on the New York State Plane Coordinate System using the 1983 North American Datum. The elevations shall be on the National Geodetic Vertical Datum.
 3. During construction of any concrete slab, the subbase will be surveyed before installation of the concrete, and the concrete surface will be surveyed.
 4. Well locations and their corresponding elevations of the top of casing shall be surveyed in.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 SURVEYING

- A. Reference Points:
1. Refer the General Conditions, as may be modified by the Supplementary Conditions, for requirements regarding reference points.
 2. DEPARTMENT's established reference points that are damaged or destroyed by CONTRACTOR will be re-established by DEPARTMENT at CONTRACTOR's expense. DEPARTMENT may deduct from payments owed CONTRACTOR such amounts as set-offs in accordance with the Contract Documents.
 3. From DEPARTMENT-established reference points, establish lines, grades, and elevations necessary to control the Work. Obtain measurements required for executing the Work to tolerances specified in the Contract Documents.
 4. Establish, place, and replace as required, such additional stakes, markers, and other reference points necessary for control, intermediate checks, and guidance of construction operations.
- B. Surveys to Determine Quantities for Payment:
1. For each application for progress payment, perform such surveys and computations necessary to determine quantities of Work performed or placed.

Perform surveys necessary for DEPARTMENT to determine final quantities of Work in place.

2. Notify DEPARTMENT not less than 24 hours before performing survey services for determining quantities to be included in Application for Payment. Unless waived in writing by DEPARTMENT, perform quantity surveys in presence of DEPARTMENT or Resident Project Representative (if any).

C. Construction Surveying: Comply with the following:

1. Alignment Staking: Provide alignment stakes at 50-foot intervals on tangent, and at 25-foot intervals on curves.
2. Slope Staking: Provide slope staking at 50-foot intervals on tangent, and at 25-foot intervals on curves. Re-stake at every ten-foot difference in elevation.
3. Structure: Stake-out structures, including elevations, and check prior to and during construction.
4. Pipelines: Stake-out pipelines including elevations and check prior to and during construction.
5. Roads, Drives, and Paved Areas: Stake-out roadway, driveway, and paved area elevations at 50-foot intervals on tangent, and at 25-foot intervals on curves.
6. Cross-sections: Provide original, intermediate, and final staking as required, for site work other locations as necessary for quantity surveys.
7. Easement Staking: Provide easement staking at 50-foot intervals on tangent, and at 25-foot intervals on curves. Also provide wooden laths with flagging at maximum intervals of 100 feet.
8. Record Staking: Provide permanent stake at each blind flange and each utility cap provided for future connections. Stakes for record staking shall be material acceptable to DEPARTMENT.

D. Accuracy:

1. Establish CONTRACTOR's temporary survey references points for CONTRACTOR's use to not greater than second-order accuracy (e.g., 1:10000). Construction staking used as a guide for the Work shall be set at not greater than third-order accuracy (e.g., 1:5000). Basis on which such orders are established shall provide the absolute margin for error specified below.
2. Horizontal accuracy of easement staking shall be plus or minus 0.1 feet. Accuracy of other staking shall be plus or minus 0.04 feet horizontally and plus or minus 0.02 feet vertically.
3. Survey calculations shall include an error analysis sufficient to demonstrate required accuracy.

+ + END OF SECTION + +

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SECTION 01 76 50

NUISANCE CONTROLS, MANAGEMENT AND CORRECTIVE MEASURES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. This Section includes requirements for managing, controlling nuisance issues and associated corrective measures during construction. Consideration of equipment noise, vibration levels shall be part of each stage of project planning.
2. The work zones for this project are on, adjacent to or in close proximity to sensitive receptors such as schools and residential properties. The Department has zero tolerance for nuisance emissions, including fugitive dust, noise, vibration, turbidity, disruptive lighting or other situations which may give rise to complaints from the community.
3. The requirements presented in this specification supplement other nuisance monitoring requirements in the contract, e.g. air monitoring. This specification does not relieve the Contractor from other contract requirements and where there is a conflict in monitoring requirements, the more stringent action level shall be applied.
4. The Contractor is responsible for developing means and methods as well as accounting for these requirements or proposing alternate best management practices which meet the intent of these provisions (i.e., minimizing nuisance conditions which may adversely impact the public or the environment through appropriate engineering controls).

B. Performance Requirements:

1. The intent of this Section is to document and formalize the Contractor's plan for managing, controlling nuisance issues and associated corrective measures during construction per the Contract Documents.
2. The Contractor shall provide advance notification to the community of any work activities that will generate nuisances in accordance with this specification. The minimum notification period is 48 hours before noisy work is scheduled. Longer notification periods of a week or more may apply to work likely to exceed the Local regulation noise or other levels or at the start of a project.
3. The point of compliance for fugitive dust, turbidity, vibration, noise, lighting or other nuisance management issues will be at the limit of the work zone. At the point of compliance, no visible dust (or visible contrast in water clarity) is allowed. Complaints from the community will result in work stoppage until corrective measures are implemented to the satisfaction of the Department.
4. The Contractor shall provide a competent and reliable community relations liaison, who shall not be replaced without written approval of Department. The community relations liaison will be the Contractor's representative and shall interface with the Department's communications representative and the Department's Public Participation Specialist. The intent is to increase public awareness and understanding of remedial activities taking place in their community, as well as understand environmental data developed during the project.

1.2 REFERENCES

- A. 42 US Code, Chapter 65 Noise Control
- B. Local Government Noise Ordinances
- C. Turbidity - 6NYCRR 703.2 - No increase that will cause a substantial visible contrast to natural conditions.
- D. Light Trespass – In accordance with Local Ordinances
- E. Odor - TITLE 6. DEPARTMENT OF ENVIRONMENTAL CONSERVATION CHAPTER III. AIR RESOURCES SUBCHAPTER A. PREVENTION AND CONTROL OF AIR CONTAMINATION AND AIR POLLUTION - Air pollution is the presence of an air contaminant, including odor, "which unreasonably interferes with the comfortable enjoyment of life and property."
- F. Fugitive Dust - Clean Air Act - Particulate Matter (PM) Air Quality Standards.
- G. Vibration – New York State Department of Transportation Engineering Instruction 05- 045.

1.3 SUBMITTALS

- A. Nuisance Controls and Management Plan
 - 1. Plan to provide advance notification
 - 2. Nuisance monitoring plan
 - 3. Complaint resolution approach (and Summary Form)
 - 4. Issues of concern with existing and anticipated nuisances must be defined within the Nuisance Control and Management Plan, including the Contractor's resolution to complete the work of the Contract Documents
- B. The CONTRACTOR shall develop a one-page summary of general practices for nuisance management and clearly display on site. Operating hours, delivery times, truck routes, and extra considerations for works during sensitive times could also be included in the summary.
- C. Monitoring Reports
- D. Community Relations Liaison Qualifications
 - 1. The Contractor will submit resume/qualifications of their Community Relations Liaison person.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 COMMUNITY CONSULTATION

- A. Community consultation is an essential part of managing nuisances associated with the construction project. All communications shall be coordinated with the Department.
- B. Contractor shall:
 - 1. Establish good working relationships with community stakeholders such as nearby residents, the school district, and businesses
 - 2. Give and receive feedback on construction activity and performance during a project discuss the community's concerns and be proactive in complaint resolution.
 - 3. As part of a community consultation strategy, neighboring premises shall be given written notification of upcoming work activities in their vicinity. The information should outline the type and duration of works, likely nuisance impacts, and provide contact details (mobile phone number of Community Liaison Person) for feedback and/or complaints resolution.
 - 4. The minimum notification period shall be 48 hours before noisy work is scheduled. Longer notification periods of a week or more may apply to work likely to exceed the Local regulation noise or other levels or at the start of a project.
 - 5. Methods of notification for work and ongoing communication about project progress can include:
 - a. letterbox drops
 - b. meetings
 - c. individual contact
 - d. direct emails to all stakeholders.

3.2 COMPLAINT RESOLUTION

- A. The contractor shall immediately notify DEPARTMENT and respond respectfully to a complaint and implement all feasible and reasonable measures to address the issue.
- B. It is particularly important to respond when the complaint refers to disturbed sleep and/or noise that is tonal (beeping, metal-on-metal), impulsive (hammering, pile driving) or low frequency (truck engine, heavy machinery).
- C. The contractor shall have a readily accessible contact point (mobile phone number of Community Liaison Person) for managing complaints. The contractor shall call back as soon as possible, and then maintain communication about how the issue is to be resolved.
- D. The complaint management process shall be well documented, with details about the following:
 - 1. the nuisance in question
 - 2. the time of the complaint and the person making it.
 - 3. the person dealing with the complaint and planned corrective action.
 - 4. how resolution of the complaint is to be communicated to the person who made the complaint, the community and the Department.
 - 5. who shall be contacted if the complaint cannot be resolved, and
 - 6. the time taken for responses.

3.3 SCHEDULING WORK AND RESPITE PERIODS

- A. In general, the instance and duration of work expected to adversely disturb the community should be minimized. This is particularly important for night and other out- of-hours work.
- B. Scheduling work to provide respite and avoid sensitive times is a vital part of responsible nuisance management.
- C. The following are examples of sensitive times that may require special consideration:
 - 1. resident sleep periods
 - 2. shopping plaza deliveries
 - 3. school activities (e.g. outdoor classes, sporting events, exams, etc.)
- D. The contractor shall consult with affected parties, such as the examples given above, and then arrange appropriate periods of respite from work likely to disturb them. The scheduled respite times shall then be communicated to the relevant parties.
- E. On a typical weekday, more frequent respite periods shall be provided where possible, especially during very disturbing work. For example, a break of 15-20 minutes for every hour of jack-hammering may be a suitable way to manage noise impacts, if there has been appropriate communication
- F. The Contractor shall consider the option of relocating people for short periods of time, such as when high noise levels from construction occur at night and there is no other feasible or reasonable way to reduce noise levels.
- G. The contractor shall weigh the benefits of avoiding sensitive periods against the increased costs and additional time taken on the job. Explaining the various options to affected parties will help develop a fair and balanced approach.

3.4 WORK PRACTICES

- A. General:
 - 1. CONTRACTOR shall communicate nuisance reduction commitments to staff. Workers and sub-contractors shall be trained to follow nuisance management practices. Nuisance management issues shall be integrated into H&S “tail-gate” meetings.
 - 2. The CONTRACTOR shall develop a one-page summary of general practices for nuisance management and clearly display on site. Operating hours, delivery times, truck routes, and extra considerations for works during sensitive times could also be included in the summary. Workers shall be reminded about these commitments during daily “tail-gate” meetings.
 - 3. Monitoring - The contractor shall periodically check the site and local area for nuisance problems and actively manage nuisance issues before and as they arise.
- B. Noise and Vibration:
 - 1. The Contractor shall implement work practices to reduce noise complaints, particularly important at night or during sensitive times.
 - 2. General construction activities shall be carried out in the following ways:
 - a. Minimize metal-on-metal contact.
 - b. Avoid dropping items from a height.

- c. Use equipment sensibly: Turn off equipment when not in use. Throttle settings shall be reduced if possible.
 - d. Require appropriate staff conduct: Staff shall not use loud radios and/or stereos outdoors during sensitive times, such as early in the morning in a residential area. Shouting or swearing, loud talking and slamming vehicle doors should be avoided.
 - e. Public Announcement (PA) systems are not allowed.
 - f. Use noise shields/acoustic curtains around higher noise operations.
 - g. Manage truck noise: Noise from trucks is a common issue, especially near residences. Scheduling and management of truck movements is important to reduce issues associated with reverse beepers, engine noise and general off-site activity.
 - h. Plant and equipment – CONTRACTOR shall endeavor to use low-noise, low- vibration well-maintained equipment where feasible and reasonable.
 - i. Equipment Selection - Consideration of equipment noise and vibration levels shall be part of each stage of project planning and contract specification.
3. The CONTRACTOR shall evaluate different types of equipment that do the same job and compare the noise and vibration level data. Noise and vibration emission labels are often provided on equipment and can be used to assist in this process. The following items shall be considered in the evaluation; high-quality mufflers, acoustic enclosures, low-noise tool bits/blades and inquire from suppliers about lower-noise equipment.
 4. Alternative equipment - Compressors for pneumatic equipment shall be silenced, enclosed and located appropriately. Hydraulic or electrical equipment shall be considered as viable alternatives. Care must be taken with the location of any generators and supply lines when electrical equipment is proposed to be used to replace diesel or petrol engines. Impacts from noisy excavation and demolition works shall be reduced by alternative work methods.
 5. Maintenance - A key commitment for any project is to ensure that:
 - a. equipment is not operated if maintenance or repairs would eliminate or significantly reduce a characteristic of noise, vibration or other disturbance resulting from its operation’.
 - b. Equipment shall be in good working order, and where there is a fault or maintenance issue creating the disturbance, it must be dealt with before it is used.
 - c. CONTRACTOR shall regularly check the condition of mufflers, enclosures and air lines, for example, to make sure they are in good working order and that there are no gaps or leaks. An ongoing inspection and maintenance process shall be established and included in the Work Plan.
 - d. Equipment that is causing excessive nuisance impacts in a manner that is not typical for the equipment shall be removed from the site.
 6. Alternatives to traditional ‘beeper’ alarms
 7. The traditional ‘beeper’ alarms for mobile equipment can create a nuisance during projects where there is a lot of movement (such as prolonged use of scissor lifts) or if works are being conducted at night.
 8. Some examples of alternatives that are less disturbing include:
 - a. ‘Smart alarms’ that adjust their volume depending on the ambient level of noise. These are particularly useful during operations in quieter suburban areas, where other noise on the site is less, or when works take place during quieter periods such as early morning.
 - b. ‘Broadband’ or ‘quacker’ alarms. These emit a less annoying sound and are more directional. This means the sound is focused to the area of concern and is less likely to travel to noise-sensitive areas.
 - c. The use of these alternative technologies must be:

1. determined by a competent person based on an assessment of the site, its conditions and on the machines involved
2. compatible with the machines so it does not adversely affect their operation
3. accompanied by specific procedures for installation and maintenance to ensure correct operation
4. communicated to all site staff to ensure they are aware of the new alarm and how it works.
5. The requirements of relevant occupational health and safety must be complied with in all cases.

C. Site planning, barriers and layout:

1. Disturbances shall be managed by appropriately arranging site orientation and operations. These principles need to be addressed during early project stages, when there is greater flexibility to plan for nuisance management.

D. Managing disturbances from trucks/mobile equipment:

1. The site layout shall be arranged to avoid the need for truck reversing. Drive- through parking and deliveries with a one-way thoroughfare is one method that shall be investigated.
2. An area away from residential dwellings shall be selected for off-site truck parking when vehicles arrive before site opening hours. Department may require that trucks wait away from the site in a less sensitive area or other areas/options may be suggested depending on the nature of the site. For larger projects, traffic controllers can be used to direct trucks that arrive out of approved times or to instruct drivers to turn off their engines when stationary.
3. The contractor shall designate a truck route that minimizes noise impacts and clearly communicate to drivers the requirements for arrival times, vehicle movements, idling reduction and general conduct, and/or include these requirements as a condition of the sub-contract.
4. Deliveries to construction sites shall be scheduled to occur only within the allowed times. Fewer vehicles with larger loads, rather than a number of smaller vehicles, can help reduce noise impacts. Options may be limited by site access and scale, with larger sites usually providing a greater level of flexibility.
5. Other considerations, such as safety and traffic impacts, will apply when looking at truck access and routes.

E. Location of plant and equipment:

1. The Contractor shall aim to locate plant and equipment away from sensitive sites, thereby maximizing the distance from affected parties.
2. When plant and equipment needs to be located close to noise sensitive areas, restricting the hours of operation should be considered.
3. When possible, noisy fabrication work shall be done off site and transported to the site at a later date.
4. Use the site to shield sources of noise
5. Temporary barriers shall be constructed and existing site materials may be useful in this regard.
6. General principles for barriers – breaking ‘line of sight’

7. Barriers shall be used to break the 'line of sight' between the noisy works and the noise-sensitive areas (when looking towards the noise source from the location receiving the noise).
8. Barriers shall be located as close as possible to the noise source or sensitive receiver. There shall be no gaps or openings at joints in the barrier material and barriers need to be sufficiently dense. In general, material weighing at least 10 kg/m^2 should be used.
9. Barriers shall be sufficiently high and wide, as sound can carry around the structure. In cases where the affected location is in a high-rise development, barriers may not be useful, as the height will not be enough to break 'line of site' to the noise received.
10. Barriers around a noise source shall be constructed with a length at least 10 times greater than its height. For shorter barriers, it may help to bend or wrap the barrier around the equipment.
11. Acoustic sheds shall be considered for very noisy operations where it is possible to contain the plant and equipment. As with barriers, the shed shall be of sufficient density and suitable construction, with seals on doors and internal treatments to reduce noise reverberation. Ventilation and general occupational health and safety requirements also need to be considered.
12. It is important to recognize that large reflecting surfaces, such as concrete or glass walls, may increase noise levels, as the sound can 'bounce' off and be magnified. The builder/contractor shall avoid placing equipment in locations where reflected noise will increase noise exposure.
13. In most cases, vibration induced by typical construction equipment may not result in adverse effects on people or structures. Noise from the equipment typically overshadows any meaningful ground vibration effects on people. Some equipment, however, including vibratory rollers, can create high vibration levels. Because of the nature of these types of devices, the options for reducing vibration may be limited. Maximizing the distance between the source and receiver should be considered to the extent practical. Conducting work when most people are not in the area (e.g., at work) or when sensitive equipment is not operating can avoid or minimize adverse impacts.
14. In some circumstances, temporary relocation of residents during these operations may be appropriate. In the absence of measures that can physically reduce induced ground vibration, informing the public about the project and potential vibratory impacts should be performed to avoid adverse reactions from the public. The Contractor must be sensitive to the needs of the community, including testing timeframes at the schools and other nearby activities which may result in adverse reactions from the public.
15. Requiring trucks delivering and picking up at the site to reduce unnecessary engine idling.

F. Fugitive Dust:

1. Control of dust will be a high priority during remediation activities. The primary mechanism for dust control will be the use of water trucks for example with a spray bar and hose(s) or other appropriate methods for the work being performed. Only potable water will be used for dust control purposes. Proactive controls will be instituted to reduce the amount of dust generation during Site activities, including enforcement of low speed limits for vehicular traffic, decontamination of trucks leaving the remediation work areas and height limits for stockpiles, if applicable.
2. The Contractor will implement a dust control training program for all Site personnel. This training program will review the potential sources of dust, individual responsibilities, and

actions for controlling dust as described in this plan. The training will emphasize the importance of dust control to the overall success of the remedial activities and familiarize Site personnel with the air monitoring requirements and appropriate dust control procedures that must be adhered to in accordance with this plan to minimize dust generation.

3. Bulk material piles will not be created other than while gathering material to load into trucks (e.g., pulling soil into a pile for the excavator to load into trucks). If any bulk material piles are left on the site overnight (e.g., due to equipment failure, transportation delays, etc.), they will be tarped as necessary to limit wind-blown dust. All trucks being utilized for transport and disposal of excavated material at the Site are required to be fitted with solid, sliding or slot-top type covers with no gaps when fully deployed. Trucks shall be covered immediately after loading and are to remain covered throughout the transportation and disposal of excavated material. The cover must not contact the excavated material and must be installed in such a way to prevent wind from entering over the leading edge of the trailer rim.
4. Following the soil excavation, a geotextile marker barrier will be installed prior to backfilling the excavated area with clean fill material. The geotextile barrier will minimize any visible dust generation from this soil layer during backfilling activities.
5. The Contractor shall conduct operations and maintain the Site as to minimize the creation and dispersion of visible dust. Clean water, provided by the Contractor, shall be applied to the Site as necessary to prevent dust during excavation, loading/unloading, and backfilling activities. Excavation areas and on-site roadways will be kept damp, as necessary, without creating ponding or mists that travel beyond the defined boundaries of the work. The watering operations shall be sufficient to control fugitive dust. Tanker trucks will be utilized to provide and apply clean water as needed.
6. Water shall be applied in a manner to prevent runoff. As a contingency measure, the Contractor will have erosion and sedimentation controls, such as silt fencing, sediment logs, or manhole silt screens, installed as necessary to manage runoff.
7. Transfer points refer to any time material is loaded or unloaded during removal activities. For the purposes of this project, the primary transfer points of concern will be the transfer of soil material from the excavator or processing area to a waiting truck. The secondary transfer points of concern will be the unloading of the clean soil for use in backfilling of excavated areas. At all transfer points, the following guidelines will be maintained:
8. During loading of impacted soil, the material must be moist during the transfer, and the transfer shall be into an overhead truck trailer only. The material drop into the trailer must not exceed 4 feet.
9. All trucks entering and leaving the Site will adhere to the posted speed limit, which shall be no more than 8 miles per hour (mph).
10. All trucks shall adhere to the established tarping policy.
11. All trucks leaving unpaved areas to paved areas of the public ROW (i.e., sidewalk or street), whether full or empty, will be visually inspected for loose material. Stabilized construction exits (e.g., 3- to 6-inch cobblestone or rip rap placed on top of a geotextile) will be used to assist with cleaning of truck tires as the vehicles leave unpaved areas. Any loose material is to be removed and placed into the truck trailer.
12. In order to keep roadways clean and free of accumulation, the Contractor will coordinate with the Town of Islip and the local waste disposal facility for routine street sweeping during removal activities. The street sweeper must be equipped with a water spray and vacuum system to prevent fugitive dust. Street sweeping must be completed at the end of every day or as needed, but at a minimum of once a day.
13. Sidewalks and rights of way and public, where trucks will need to cross the sidewalk to enter/exit the Site, will be maintained in a "broom clean" condition at all times by using a skid steer loader (e.g., BobCat) equipped with a power broom or manual tools (e.g., push broom, shovels, etc.).

14. All trucks are to take the most efficient and direct route to the disposal facility as possible.
15. Spraying dusty wastes with water as they are unloaded.
16. Ensuring that street sweeping operations use enough water to avoid kicking up dust.

G. Turbidity:

1. Best Management Practices (BMP) are the actual practices--including the forms, procedures, charts, software references, etc.--actually used by dredgers to minimize consequences of dredging and disposal on water quality. Common BMPs include Silt Curtains, Gunterbooms, and Operational Controls.
2. Silt curtains are intended to allow suspended sediment at a dredging site to settle out of the water column in a controlled area, minimizing the area that is affected by the increased suspended sediment usually present at a dredging site. A silt curtain is an impermeable barrier. They are constructed of a flexible reinforced thermoplastic material. The upper hem has floatation material and the lower hem has ballast material. Silt curtains are most effective when used on a project where they are not opened and closed to allow equipment access to the dredging or disposal area. Silt curtains are also limited to project locations with less than 1-2 knot currents.
3. There are three fundamental controls possible with mechanical dredges:
 - a. Increase cycle time. Longer cycle time reduces the velocity of the ascending loaded bucket through the water column, which reduces potential to wash sediment from the bucket. However, limiting the velocity of the descending bucket reduces the volume of sediment that is picked up and requires more total bites to remove the project material. The majority of the sediment resuspension, for a clamshell dredge, occurs when the bucket hits the bottom.
 - b. Eliminate multiple bites. When the clamshell bucket hits the bottom, an impact wave of suspended sediment travels along the bottom away from the dredge bucket. When the clamshell bucket takes multiple bites, the bucket loses sediment as it is reopened for subsequent bites. Sediment is also released higher in the water column, as the bucket is raised, opened, and lowered.
 - c. Eliminate bottom stockpiling. Bottom stockpiling of the dredged sediment in silty sediment has a similar effect as multiple bite dredging; an increased volume of sediment is released into the water column from the operation.
4. There are three fundamental controls possible with hydraulic dredges:
 - a. Reduce cutterhead rotation speed. Reducing cutterhead rotation speed reduces the potential for side casting the excavated sediment away from the suction entrance and resuspending sediment. This measure is typically effective only on maintenance or relatively loose, fine grain sediment.
 - b. Reduce swing speed. Reducing the swing speed ensures that the dredge head does not move through the cut faster than it can hydraulically pump the sediment. Reducing swing speed reduces the volume of resuspended sediment. The goal is to swing the dredge head at a speed that allows as much of the disturbed sediment as possible to be removed with the hydraulic flow. Typical swing speeds are 5-30 feet/minute.
 - c. Eliminate bank undercutting. Dredgers should remove the sediment in maximum lifts equal to 80% or less of the cutterhead diameter.
5. There are three controls possible with dredges and barges:
 - a. Eliminate or reduce hopper overflow. Eliminating or reducing hopper overflow reduces the volume of fine material which flows from the hopper in the overflow. One caution is that this control may significantly reduce project production for hopper dredges or when hydraulic dredging into a barge.

- b. Lower hopper fill level. Lowering the hopper fill level in rough sea conditions can prevent material loss during transport.
- c. Recirculation system. Water from the hopper overflow can be recirculated to the draghead and is used to transport more material into the hopper.
- 6. Pneuma Pump. The Pneuma pump is used primarily for removal of fine-grained sediment. The Pneuma pump offers high solids concentration (up to 90%) in the dredge slurry, with minimal turbidity.
- 7. Closed or environmental bucket. Specially constructed dredging buckets designed to reduce or eliminate increased turbidity of suspended solids from entering a waterway.
- 8. Large capacity dredges. Larger than normal dredges designed to carry larger loads. This allows less traffic and fewer dumps, thereby providing less disturbance at a disposal site.
- 9. Precision Dredging. Dredging utilizing special tools and techniques to restrict the material dredged to that specifically identified. This may mean thin layers, either surficial or imbedded, or specific boundaries.

H. Disruptive Lighting:

- 1. Light Trespass. The lighting system shall be designed to effectively light the work area without spilling over to adjoining property. When, in the opinion of the Department, the lighting is disturbing adjoining property, the Contractor shall modify the lighting arrangement or add hardware to shield the light trespass.
- 2. Every effort should be made to control artificial light escaping from a site for example the fitting of diffusers/guards, ensuring there is no light overspill into neighboring properties.
- 3. All lighting shall be designed, installed, and operated to avoid glare that affects traffic on the roadway or that causes annoyance or discomfort for residences. The Contractor shall locate and aim lighting fixtures to provide the required level of illumination and uniformity in the work zone without the creation of objectionable light trespass.

I. Odor:

- 1. Proper Drainage: Standing water is a potential source of odors. The operations area will be on a surface that is sloped to facilitate drainage and prevent standing water. The grade will be maintained to prevent ponding. General spill control programs and curbing will be in place as appropriate. The material handling areas are covered by a canopy and protected from storm water if needed to control ponding of water which has been in contact with contaminated sediments.
- 2. Personnel training: Personnel will be trained in the proper use of equipment. Potential hazards and safety features will be stressed as well as handling procedures to minimize the potential production of odors, such as leaving stockpiled sediments uncovered unnecessarily.
- 3. Some of the operating procedures that can help reduce odors include:
 - a. "First-in, first-out" waste handling practices that keep waste on site only for short periods of time.
 - b. Removing all waste from loading areas by the end of each operating day so that these surfaces can be swept clean and washed down as needed.
 - c. "Good housekeeping" measures, including regular cleaning and disinfecting of surfaces if appropriate and equipment that come into contact with waste.
 - d. Water misting and/or deodorizing systems.
- 4. Below are the activities that can cause odor nuisances on-site along with Reasonable Available Control Measures & Methods to help reduce potential odors:
 - a. Movement of Transport Trucks Entering/ Exiting Site - Hauling materials in properly tarped or watertight containers to prevent odor; Limit haul trucks to 3 minutes idle time; and Applying foam suppressant such as BioSolve.
 - b. Equipment Operating On-Site - Turning off equipment that is not in active use; Limiting the

amount of equipment used at one time while on-site; and Applying foam suppressant such as BioSolve.

- c. Excavated Materials - Limiting amount of exposed areas or amount of time materials are exposed to the open atmosphere; and Applying foam suppressant such as BioSolve.
- d. Soil/Debris moved by equipment to Stockpile Areas - Limiting amount of exposed areas or amount of time materials is exposed to the open atmosphere; Turning off equipment that is not in active use; Limiting the amount of equipment used at one time while on-site; and Applying foam suppressant such as BioSolve.
- e. Stockpiles - Covering stockpiles and material after activity ceases with Poly Sheeting & securing with sandbags (or equivalent); and Applying foam suppressant such as BioSolve.
- f. Removed water prior to treatment or disposal - Setting up site drainage & preventing standing water.
- g. Work Zones (Exclusion Zone) -Performing Housekeeping; Daily cleaning up (Free of trash, garbage, & debris); Properly disposing of any odorous material; and Applying foam suppressant such as BioSolve.

3.5 CORRECTIVE MEASURES

- A. Nuisance conditions which represent a potential health and safety concern and/or migration of contaminated materials (e.g., visible dust or visible contrast from turbidity) will result in an immediate stoppage of the work.
- B. Following a work stoppage, appropriate corrective measures as determined by Department will be implemented prior to work resuming.
- C. Chronic or repeated incidents of nuisance issues will result in the disallowance of a day of compensation for site services and health and safety.
- D. A written corrective measures plan will be submitted for any work stoppage, or chronic or repeated incidents of nuisance issues, if requested by the Department.

++ END OF SECTION ++

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SECTION 01 77 23

INSPECTIONS

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
1. This Section includes requirements for the Substantial Completion, Final Completion, and any specified Warranty inspections.
 2. When CONTRACTOR considers all or part of the Work ready for its intended use, CONTRACTOR shall notify DEPARTMENT in writing that the Work specified is substantially complete. Within a reasonable time thereafter, not to exceed 30 days, DEPARTMENT and CONTRACTOR shall make an inspection of the Work, or portion thereof, to determine status of completion. A tentative certificate of Substantial Completion shall fix the date of Substantial Completion, with an attached list of items to be completed or corrected prior to final payment.
 3. Shortly before the end of the Substantial completion period an inspection will be will scheduled between the DEPARTMENT and CONTRACTOR.
- B. CONTRACTOR's project manager shall attend the inspection.
- C. Upon written notice from CONTRACTOR that the entire Work or agreed portion is complete, a final inspection will be conducted with DEPARTMENT and CONTRACTOR. DEPARTMENT will notify CONTRACTOR in writing of all particulars in which this inspection reveals that work is either accepted or incomplete or defective.
- D. After the final inspection, CONTRACTOR shall submit "final" Application for Payment in accordance with the final Application for Payment procedures, including furnishing all required Contract closeout documentation and completion of all Work except for the inspection and associated correction Work (if any). DEPARTMENT will release remaining retainage withheld for the inspection following the inspection and completion of correction Work (if any), in accordance with progress payment procedures of the Contract, except that consent of surety to final payment shall accompany the last Application for Payment.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. This Section includes requirements for Project record documents.
2. CONTRACTOR shall provide all labor, materials, equipment, and services to maintain and submit to DEPARTMENT, Project record documents in accordance with the Contract Documents.
3. Supplemental requirements to those stated in Section VIII, Article 5.19 for recording of field modifications made during construction, to be marked on a clean set of Contract documents by the Contractor (As-Built Documents) and for preparing Supplemental Record Drawings by the Surveyor to be submitted to the DEPARTMENT. The As-Built Documents and Supplemental Record Drawings shall constitute the Project Record Documents.

B. Maintenance of Record Documents:

1. Maintain in CONTRACTOR's field office, in clean, dry, legible condition, complete sets of the following record documents: Drawings, Specifications, Addenda, written amendments, Change Orders, Proposed Change Orders, field test records, construction photographs, Field Orders and written interpretations and clarifications in good order and annotated to show all changes made during construction. Contractor will be required to review with Engineer the status of all as-built documents in connection with Engineer's evaluation of an Application for Payment. All changes from the contract which are made in the work, or additional information which might be uncovered in the course of construction shall be accurately and neatly recorded as they occur by means of details and notes.
2. Provide files and racks for proper storage and easy access to record documents. File record documents in accordance with the edition of the Construction Specification Institute's *MasterFormat*TM used for organizing the Project Manual, unless otherwise accepted by ENGINEER.
3. Promptly make record documents available for observation and review upon request of DEPARTMENT. Requirements for review of record documents status as a condition precedent to progress payments in conformance with Section VIII, Article 13.
4. Maintain in Contractor's field office in clean, dry, legible condition complete sets of the following:
 - a. Drawings
 - b. Specifications
 - c. Addenda

- d. Approved Shop Drawings
 - e. Samples, Photographs
 - f. Change Orders
 - g. Other modifications to Contract Documents
 - h. Test Records
 - i. Survey Data
 - j. Field Orders
 - k. Other documents pertinent to Contractor's work
 - l. Contractor Daily Work Reports
5. Do not use record documents for any purpose other than serving as Project record. Do not remove record documents from CONTRACTOR's field office without DEPARTMENT's approval.
 6. Make documents available at all times for inspection by DEPARTMENT.

1.2 SUBMITTALS

A. Closeout Submittals: Submit the following:

1. Preliminary Record Documents:
 - a. The Contractor shall prepare As-Built Documents and the Surveyor shall prepare Supplemental Record Drawings. These documents (Project Record Documents) shall be submitted to the DEPARTMENT following substantial completion of the work (within 7 calendar days) for review and approval.
 - b. These documents shall be neat, legible and accurate.
 - c. If upon review, the documents are found to contain errors and/or omissions, they shall be returned to the Contractor and or Surveyor for corrections.
 - d. The Contractor and/or Surveyor shall complete the corrections and return the drawings to the DEPARTMENT within 10 calendar days for subsequent review.
 - e. Submit certified PDF electronic files.
 - f. Submit both printed record documents and electronic record documents, in accordance with Section 01 31 26, Electronic Communication Protocols.
 - g. Submit record documents with transmittal letter on CONTRACTOR letterhead in accordance with requirements in Section 01 33 00, Submittal Procedures.
2. Certifications:
 - a. Record documents submittal shall include certification, with original signature of official authorized to execute legal agreements on behalf of CONTRACTOR, reading as follows:

“*[Insert Contractor's corporate name]* has maintained and submitted Project record documentation in accordance with the Section 01 78 39, Project Record Documents, and other elements of Contract Documents, for the New York State Department of Environmental Conservation, City

of Rome, Oneida County, New York, Remedial Construction Project – Former Rome Cable Site. We certify that each record document submitted is complete, accurate, and legible relative to the Work performed under our Contract, and that the record documents comply with the requirements of the Contract Documents.

[Provide signature, print name, print signing party's corporate title, and date]"

1.3 RECORDING CHANGES

A. Recording Changes – General:

1. At the start of the Project, label each record document to be submitted as, “PROJECT RECORD” using legible, printed letters. Letters on record copy of the Drawings shall be two inches high.
2. Keep record documents current consistent with the progress of the Work. Make entries on record documents within two working days of receipt of information required to record the change.
3. Do not permanently conceal the Work until required information has been recorded for Project record documents.
4. Accuracy of record documents shall be such that future searches for items shown on the record documents may rely reasonably on information obtained from DEPARTMENT-accepted record documents.
5. Marking of Entries:
 - a. Use erasable, colored pencils (not ink or indelible pencil) for marking changes, revisions, additions, and deletions to record documents.
 - b. Clearly describe the change by graphic line and make notations as required. Use straight-edge to mark straight lines. Writing shall be legible and sufficiently dark to allow scanning of record documents into legible electronic files in portable document format (“.PDF”).
 - c. Date each entry on record documents.
 - d. Indicate changes by drawing a “cloud” around the change(s) indicated.
 - e. Mark initial revisions in red. In the event of overlapping changes, use different colors for subsequent changes.

B. Drawings:

1. Record changes on copy of the Drawings. Submittal of CONTRACTOR-originated or -produced drawings as a substitute for recording changes on a copy of the Drawings is unacceptable.
2. Record changes on plans, sections, elevations, schematics, schedules, and details as required for clarity, making reference dimensions and elevations (to Project datum) for complete record documentation.
3. Record actual construction including:

- a. Installations of any kind or description known to exist within the construction area. The locations shall include dimensions to permanent features.
 - b. The location and dimensions of any changes within the design features of any kind or description known to exist within the construction area. The locations shall include dimensions to permanent features.
 - c. Correct grade or alignment of roads, structures, utilities, or project components.
 - d. Correct elevations.
 - e. Changes in details or dimensions.
 - f. The topography and grades of all drainage structures installed or affected as part of the project construction.
 - g. Additional information obtained from working drawings.
 - h. Where contract drawings or specifications allow options, only the option selected for construction shall be shown on the As-Built Documents.
 - i. Additional work ordered by the DEPARTMENT.
 - j. Depths of various elements of foundation in relation to datum.
 - k. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
 - l. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 - m. The Surveyor retained by the Contractor shall prepare Supplemental Record Drawings (see Section 01 71 23, Field Engineering). A topographic survey of the site prior to and following earthwork. The survey should, at a minimum, show ground surface elevations on the specified grid and at all grade changes and also indicate the thickness of cover layers. The survey should adequately extend beyond the limits of work to properly overlap existing conditions. Locations and elevations of all groundwater monitoring wells and survey control points.
4. Recording Changes for Schematic Layouts:
- a. In some cases, on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items are shown schematically and are not intended to portray physical layout. For such cases, the final physical arrangement shall be determined by CONTRACTOR subject to acceptance by DEPARTMENT.
 - b. Record on the Project record documents all revisions to schematics on the Drawings, including: piping schematics, ducting schematics, process and instrumentation diagrams, control and circuitry diagrams, electrical one-line diagrams, motor control center layouts, and other schematics when included in the Drawings. Show and indicate actual locations of equipment, lighting fixtures, in-place grounding system, and other pertinent data.
 - c. When dimensioned plans and dimensioned sections or elevations on the Drawings show the Work schematically, indicate on the record documents, by dimensions accurate to within one inch in the field,

centerline location of items of Work such as conduit, piping, ducts, and similar items

- 1) Clearly identify each item of the Work by accurate notations such as “cast iron drain”, “rigid electrical conduit”, “copper waterline”, and similar descriptions.
 - 2) Show by symbol or by note the vertical location of each item of the Work; for example, “embedded in slab”, “under slab”, “in ceiling plenum”, “exposed”, and similar designations. For piping not embedded, also indicate elevation dimension relative to Project elevation datum.
 - 3) Descriptions shall be sufficiently detailed to be related to the Specifications.
- d. DEPARTMENT may furnish written waiver of requirements relative to schematic layouts shown on plans, sections, and elevations when, in DEPARTMENT’s judgment, dimensioned layouts of Work shown schematically will serve no useful purpose. Do not rely on such waiver(s) being issued.
5. Supplemental Drawings:
- a. In some cases, drawings produced during construction by ENGINEER or CONTRACTOR supplement the Drawings and shall be included with Project record documents submitted by CONTRACTOR. Supplemental record drawings shall include drawings or sketches that are part of Change Orders, Work Change Directives, and Field Orders and that cannot be incorporated into the Drawings because of space limitations.
 - b. Supplemental drawings submitted with record drawings shall be integrated with the Drawings and include necessary cross-references between drawings. Supplemental record drawings shall be on sheets the same size as the Drawings.
 - c. When supplemental drawings developed by CONTRACTOR using computer-aided drafting/design (CADD) software are to be included in record drawings, submit electronic files for such drawings in accordance with Section 01 31 26, Electronic Communication Protocols, as part of record drawing submittal. Label such files, “Supplemental Record Drawings”, including with CONTRACTOR’s name, Project name, and Contract designation.
- C. Specifications and Addenda:
1. Mark each Specifications Section to record:
 - a. Manufacturer, trade name, catalog number, and Supplier of each material and equipment item actually provided.
 - b. Changes made by Addendum, Change Orders, Work Change Directives, and Field Orders.

1.4 ELECTRONIC FILES FURNISHED BY ENGINEER

- A. CADD files of the Drawings will be furnished by ENGINEER upon the following conditions:
1. CONTRACTOR shall submit to ENGINEER a letter on CONTRACTOR letterhead requesting CADD files of the Drawings and indicating specific definition(s) or description(s) of how such files will be used, and specific description of benefits to DEPARTMENT (including credit proposal, if applicable) if the request is granted.
 2. CONTRACTOR shall execute ENGINEER's standard agreement for release of electronic files and shall abide by the provisions of such agreement for release of electronic files.
 3. Layering system incorporated in CADD files shall be maintained as transmitted by ENGINEER. CADD files transmitted by ENGINEER containing cross-referenced files shall not be bound by CONTRACTOR. Drawing cross-references and paths shall be maintained. If CONTRACTOR alters layers or cross-reference files, CONTRACTOR shall restore all layers and cross-references prior to submitting record documents to ENGINEER.
 4. CONTRACTOR shall submit record drawings to ENGINEER in same CADD format that files were furnished to CONTRACTOR.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01 89 29

GREEN REMEDIATION PRACTICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Work includes, practices related to reducing waste generation; energy usage; emissions including greenhouse gases (GHGs), nitrogen oxides (NOx), sulfur oxides (SOx), particulate matter and hazardous air pollutants (HAPs); water usage; and land and ecosystem disturbance.
- B. The CONTRACTOR shall implement practices in the performance of the requirements of the Work to maximize sustainability, reduce energy and water usage, promote carbon neutrality, promote industrial materials reuse and recycling, and protect and preserve natural resources.
- C. The CONTRACTOR shall utilize concepts and techniques presented in the New York State Department of Environmental Conservation – (NYSDEC) Program Policy DER-31/Green Remediation, August 11, 2010 (revised January 20, 2011).
- D. The CONTRACTOR shall implement practices and procedures to meet the environmental performance goals of the DEPARTMENT consistent with NYSDEC Program Policy DER-31/Green Remediation. In general, such practices and procedures shall include, but are not limited to:
 - 1. Reducing direct and indirect Green House Gas (GHG) and other air emissions;
 - 2. Increasing energy efficiency and minimizing use of non-renewable energy and resources;
 - 3. Conserving and efficiently managing natural resources such as soil, water and habitat, while giving special attention to habitats for critical species (i.e., pollinators), and threatened or endangered species;
 - 4. Minimizing waste, increasing recycling, increasing reuse of materials, furnishing materials from local sources, and minimizing the disposal transport distance using local facilities;
 - 5. Maximizing the reuse of land and the recycling of on-site materials; and

6. Applying green remediation concepts, such as minimizing energy intensive operations, which, at a minimum:
 - a. Protect public health and the environment;
 - b. Address source removal and control;
 - c. Address groundwater protection and restoration, and;
 - d. Achieve the cleanup goals for the Site remediation.
- E. Specifically, CONTRACTOR shall consider inclusion of the following provisions:
 1. Beneficial reuse of materials that would otherwise be considered a waste (e.g., crushed clean concrete as base or fill).
 2. Establish support zone and storage/laydown areas to minimize the disturbance of habitats and vegetated areas outside of the work zone.
 3. Include energy saving measures in all proposed structures, facilities, and operating systems to minimize electricity and water consumption/disposal, such as using variable speed drives for motors, incorporation of appropriately selected insulation and energy saving fixtures, or using extracted groundwater to provide heating and cooling through the use of heat exchangers.
 4. Use of renewable energy and/or the purchase of renewable energy credits (RECs) or a combination of the two techniques to offset electrical usage at the site.
 5. Reduce vehicle idling. All vehicles, both on and off road (including construction equipment) shall be shut off when not in use for more than 5 minutes, consistent with 6 NYCRR Part 217 Motor Vehicle Emissions, Subpart 217-3 Idling Prohibition For Heavy Duty Vehicles.
 6. Use equipment and vehicles that reduce emissions, specifically from compression-ignition engines, and especially in urban areas.
 7. Incorporate the use of blended bio-diesel fuel for all compression-ignition powered equipment.
 8. Establish minimally invasive and well-designed traffic patterns for on-site activities to reduce impacts to land and ecosystems.

9. Use native drought resistant species for re-vegetation during site restoration.
- F. CONTRACTOR shall comply with the DEPARTMENT'S policy to utilize, as approved by the DEPARTMENT, recycled content materials, locally manufactured materials and low-emitting materials.
- G. CONTRACTOR shall ensure that the requirements related to the goals of the DEPARTMENT and as defined in the Contract Documents, are implemented to the fullest extent.
- H. SOLID WASTE MANAGEMENT
1. Develop and implement a waste management program in accordance with ASTM E1609 and as specified herein.
 2. Collection: Implement a recycling/reuse program that includes separate collection of waste materials of the following types as appropriate to the project waste and to the available recycling and reuse programs in the project area:
 - a. Land clearing debris – re-use for habitat development to the extent practicable.
 - b. Spent Activated Carbon – send to regeneration facility for reuse rather than to a landfill for disposal.
 - c. Recovered LNAPL – separate from aqueous fraction and send to a recycling facility.
 - d. Shipping containers – use bulk sized containers (i.e. drums or totes) that can be recycled or re-used for chemical deliveries.
 - e. Masonry/Asphalt – sample and re-use or recycle these materials if uncontaminated.

1.2 DEFINITIONS:

A. Green Remediation Definitions

1. Renewable Energy: Energy from a source which is not depleted when used, such as solar, wind, geothermal, biomass and biogas.
2. Locally Manufactured: manufactured within 150 miles of the work.
3. Recovered Materials: Waste materials and by-products that have been recovered from solid waste streams, but does not include materials and by-products generated from, and commonly reused within, an original manufacturing process.

4. Biobased Materials: As defined in the Farm Security and Rural Investment Act, for purposes of Federal procurement of biobased products, “biobased” means a “commercial or industrial product (other than food or feed) that is composed, in whole or in significant part, of biological products or renewable domestic agricultural materials (including plant, animal, and marine materials) or forestry materials.” Biobased materials also include fuels, chemicals, building materials, or electric power or heat produced from biomass as defined by The Biomass Research and Development Act of 2000.
5. Biobased Content: The amount of biobased carbon in the material or product as a percentage of weight (mass) of the total organic carbon in the material or product.
6. Recovered Materials: Waste materials and by-products that have been recovered from solid waste, but does not include materials and by-products generated from, and commonly reused within, an original manufacturing process.

1.3 REFERENCES

- A. NYSDEC DER-31 – Green Remediation, New York State Department of Environmental Conservation, DEC Program Policy.
- B. CP-49 – Climate Change and DEC Action, New York State Department of Environmental Conservation, DEC Policy.
- C. United States Environmental Protection Agency (USEPA):
 1. Consider USEPA Best Management Practices (BMPs) related to green remediation for the applicable program elements listed below:
 - a. Site investigation:
 - i. https://clu-in.org/greenremediation/docs/GR_Fact_Sheet_SI&EM.pdf.
 - b. Excavation and surface restoration:
 - i. https://clu-in.org/greenremediation/docs/GR_Quick_Ref_FS_exc_rest.pdf
 - c. Soil vapor extraction and air sparging technologies:
 - i. https://clu-in.org/greenremediation/docs/GR_factsheet_SVE_AS_03_2410.pdf.

- d. Pump and treat technologies:
 - i. https://clu-in.org/greenremediation/docs/GR_Fact_Sheet_P&T_12-31-2009.pdf.
 - e. Bioremediation:
 - i. https://clu-in.org/greenremediation/docs/GR_factsheet_biorem_32410.pdf.
 - f. In situ thermal technologies:
 - i. https://clu-in.org/greenremediation/docs/GR_factsheet_IST.pdf.
 - g. Landfill cover systems and associated energy production:
 - i. https://clu-in.org/greenremediation/docs/GR_factsheet_landfill_covers_and_energy.pdf.
 - h. Materials and waste management:
 - i. https://clu-in.org/greenremediation/docs/GR%20BMP%20fact%20sheet_materials&waste.pdf.
2. Consider USEPA climate resiliency fact sheets related to:
- a. Sediment cleanups:
 - i. https://www.epa.gov/sites/default/files/2019-12/documents/cr_sediment_sites_fact_sheet_update.pdf.
 - b. Containment remedies:
 - i. https://www.epa.gov/sites/default/files/2019-12/documents/cr_containment_fact_sheet_2019_update.pdf.
 - c. Groundwater treatment remedies:
 - i. https://www.epa.gov/sites/default/files/2019-12/documents/cr_groundwater_systems_fact_sheet_2019_update.pdf.

D. ITRC Green and Sustainable Remediation, A Practical Framework:

1. <https://connect.itrcweb.org/HigherLogic/System/DownloadDocumentFile.ashx?DocumentFileKey=8e842294-64ce-4e56-a80b-cd3dc1aa4af3>.
- E. ASTM – E2893-16e1: Standard Guide for Greener Cleanups:
1. <https://www.astm.org/e2893-16e01.html>.
- F. Naval Facilities Engineering Command (NAVFAC), Department of the Navy Guidance on Green and Sustainable Remediation:
1. https://www.navfac.navy.mil/content/dam/navfac/Specialty%20Centers/Engineering%20and%20Expeditionary%20Warfare%20Center/Environmental/Restoration/er_pdfs/gpr/navfacesc-ev-ug-2093-env-gsr-20120405r1.pdf.
- G. EPA Energy Smart Resources Guide:
1. https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NRML&dirEntryId=190014.
- H. Sustainable Remediation Forum (SURF):
1. <https://www.sustainableremediation.org/>.
- I. US Army Corps of Engineers – Evaluation of Consideration and Incorporation of Green and Sustainable Remediation Practices in Army Environmental Remediation:
1. <https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/2298/>.
- J. American Society of Civil Engineering – Adapting Infrastructure and Civil Engineering Practice to a Changing Climate:
1. <https://ascelibrary.org/doi/pdf/10.1061/9780784479193>

1.4 ENVIRONMENTAL GOALS

- A. The CONTRACTOR, to the extent practicable, shall:
1. Minimize the amount of waste generated from the site and maximize the use of recycling/reuse facilities for disposal of the waste to the extent practicable and as approved by the DEPARTMENT.
 2. Maximize use of energy derived from renewable resources.

3. Minimize on- and off-site fuel combustion.
4. Minimize use of water and maximize water recycling.
5. Minimize disturbance to land and ecosystems.
6. Minimize use of water for dust control and utilize sustainable dust control products.
7. Green Power Requirements
 - a. Arrange for Green Power sufficient to provide minimum [xx] percent of the project's total energy needs.
 - b. Comply with renewable energy requirements in accordance with the Center for Resource Solutions (CRS) Green-e Standard for Electricity Products.
8. Long-Term Operation and Maintenance
 - a. Green Power: Provide service contract(s) for [xxxx] years with options for annual renewal thereafter.
 - i. Comply with the Center for Resource Solutions (CRS) Green-e Standard for Electricity Products for the duration of the Contract. Comply with requirements of the CRS Green-e Annual Verification Protocol.
 - ii. Immediately notify Owner if electricity product fails to comply with Green-e certification criteria during Contract period.
 - b. On an annual basis, or at the end of the Contract period, submit:
 - i. A report that includes data on the resources used to generate the electricity consumed during the Contract or over the past year.
 - ii. Disclosure statement that lists the resources or fuel sources from which the electricity will be generated in the following year.
9. Use the Electronic Product Environmental Assessment Tool (EPEAT) to find electronic products with reduced impacts on the environment.
10. Resource Conservation and Green Materials

- a. During construction activities and associated landscape alteration activities, green building strategies such as those outlined in the USGBC LEED should be considered. LEED includes guidelines and recommendations for new construction, and existing building operations and management that fall under six categories important for reducing the environmental impact of facilities of all types:
 - i. Sustainable sites.
 - ii. Water efficiency.
 - iii. Energy and atmosphere.
 - iv. Materials and resources.
 - v. Indoor environmental quality.
 - vi. Innovation in operations.
- 11. As noted across the LEED categories, resources other than energy that can be conserved include water, raw materials for articles consumed, topsoil, paper for reports and landfill space. Conserving one resource typically conserves other resources and has other sustainability benefits. For example, recycling of construction and demolition debris or metal recovered at a munitions site will reduce consumption of landfill space and may also save energy and reduce air emissions by minimizing material transportation. Another example is the use of waste-to-energy plants for waste disposal rather than landfills in states where these plants are currently operating. This too reduces the consumption of landfill space and also results in energy production from the waste processing. Other examples of resource conservation include: treated water reuse or reinjection, the reuse of treated soil onsite, and the beneficial reuse of sediments.
- 12. The use of “green” construction and project management tools and materials such as eco-friendly concrete or the use of native plants for site restoration also advances the sustainability objectives of the project. It is important to understand that green remediation implies minimizing the entire footprint of the remediation project, which includes the environmental impacts of products and materials associated with the project. For example, eco-friendly concrete refers to concrete that is produced with a certain percentage of cement replaced by recovered cementitious materials such as fly ash, slag or glass. This type of reduced cement concrete takes a problematic substance out of the waste stream and reduces the

cumulative amount of energy associated with the production of concrete. The use of native plants for site restoration helps to conserve water and eliminate the need for potentially harmful fertilizers and pesticides.

1.5 SUBMITTALS

A. Form "A" - Summary of Green Remediation Metrics:

1. Consistent with NYSDEC Program Policy DER-31/Green Remediation requirements, the CONTRACTOR shall complete *Form A - Summary of Green Remediation Metrics*, in its entirety and sign the certification as to its accuracy.
2. The CONTRACTOR shall submit properly completed Form A to the DEPARTMENT along with the CONTRACTOR'S Application for Payment.
3. Consistent with NYSDEC's Part 248 Annual Emission Reporting requirements, CONTRACTOR is required to report annual emission for those vehicles used under Contract reporting period (even those exempt from Best Available Retrofit Technology [BART] requirements) on both the Annual Report and Vehicle Inventory forms. These forms are not intended to be cumulative lists of a Prime Contractor's fleet over time and should only reflect vehicles used during the Contract or Reporting period. Reporting forms and requirements can be accessed at <https://www.dec.ny.gov/chemical/118127.html>.
4. Submit product data for all products and equipment specified within this specification and other project specifications. As appropriate, include data presenting energy consumption ratings, air discharge ratings, bio-content analysis, and other sustainability measures indicated in this section.

B. A Green Remediation Plan submitted as a component of the CONTRACTOR's Work Plan (as required by Section X Standard Specifications: Section 01 33 00 – Submittal Procedures) that includes a description of the green remediation elements incorporated into the CONTRACTOR's approach whether required by the contract documents or independently proposed by the CONTRACTOR, including but not limited to the following:

1. Emission reduction control and policies which shall include a plan for clean diesel practices. At a minimum the plan must incorporate the first two bullets below.

- a. Reduce unnecessary idling through the use of auxiliary power units, electric equipment, and strict enforcement of idling limits.
 - b. Practice good engine maintenance to meet original standards, and properly train operators to run equipment efficiently.
 - c. Use verified diesel emission control technology ("VDEC"), including verified diesel particulate filters ("DPFs") or diesel oxidation catalysts ("DOCs").
- 2. Transportation minimization and green transportation evaluation
- 3. Recycling, reuse and waste minimization
- 4. Use of local materials and facilities
- 5. Approach to tracking emissions reductions and other green remediation metrics; and
- 6. Justification for any proposed approach that does not meet the minimum green remediation requirements and/or preferences included in the Contract Documents.

1.6 QUALITY ASSURANCE

A. Environmental Project Management and Coordination:

- 1. CONTRACTOR shall designate an employee who shall be responsible for implementation of green remediation elements; coordinate work of subcontractors and suppliers; instruct workers relating to environmental issues; ensure that green remediation metrics are collected, recorded on *Form A - Summary of Green Remediation Metrics* and submitted with the CONTRACTOR'S Application for Payment, and oversee Project environmental goals.

PART 2 – PRODUCTS

- A. Evaluate the products and materials needed for the project and identify "sustainable" materials to be used. Focused effort shall be directed to identify materials and products that are needed in large quantities that will have the largest impact on the project. For example, projects requiring a large amount of crushed stone for temporary roadway construction shall be

evaluated for sustainable solutions (e.g., recycled crushed concrete and local sources).

- B. Materials with a high carbon footprint (such as concrete, because of the manufacture of the Portland cement in the material) shall also be evaluated to identify more sustainable solutions. Green concrete shall be considered for such situations.
- C. CONTRACTOR shall use environmentally preferable products, where appropriate and as approved by the DEPARTMENT, including, but not limited to:
 - 1. Compact Fluorescent Lights (CFL) or LED.
 - 2. Reused PVC pipe.
 - 3. Environmentally friendly electronics (e.g., ENERGY STAR).
 - 4. Items composed of recovered materials such as recycled asphalt, concrete and rubble; recycled wood including mulch products; recycled metals including steel, copper, and brass; and items/products composed of recycled cardboard.
 - 5. Items constructed using renewable resources such as biomass energy (such as ethanol), hydropower, geothermal power, wind energy, and solar energy.
 - 6. Bio-based cleaning products.
 - 7. Bio-based dust control agents and dust suppressants: Products formulated to reduce or eliminate the spread of dust associated with gravel roads, dirt parking lots, open excavations, stockpiled materials or similar sources of dust. Provide minimum 85% biobased content.
 - 8. Geotextile fabrics/tarps made of recycled or recovered material.
 - 9. Hydraulic fluids that are biodegradable for operating hydraulic equipment such as excavators, bulldozers, and drill rigs.
 - 10. Phosphate-free detergents instead of organic solvents or acids to decontaminate equipment not used directly for sample collection.
 - 11. Substitute temporary silt fences with biodegradable erosion controls such as tubular devices filled with organic materials.

12. Products must be certified environmentally clean before delivery to the project site. DEPARTMENT'S approval shall be required for all products.

PART 3 - EXECUTION

A. The CONTRACTOR shall, to the extent practicable:

1. General Site Requirements:

- a. Set up an on-Site recycling program for CONTRACTOR-generated wastes.
- b. Provide all required documentation in electronic format, eliminating the need for printing, inks, paper, and mail/delivery impacts.
- c. Sequence work to minimize double-handling (e.g., direct loading of waste, direct placement of backfill, etc.) of materials.
- d. Provide locally made materials that are composed of recovered materials to the maximum amount practicable.
- e. Provide materials that generate the least amount of pollution during mining, manufacturing, transport, installation, use and disposal.
- f. Maintain office trailer heating and cooling systems at efficient set points. Utilize renewable energy for trailer power and lighting when possible. Utilize programmable or smart devices to efficiently control lights and HVAC equipment.
- g. If alternatives are available, do not use materials that contain ozone-depleting chemicals (e.g., CFCs or HCFCs) and that emit potentially harmful volatile organic compounds (VOCs).
- h. Employ construction practices that minimize the generation of excessive dust and combustion by-products.
- i. Contract shall not use or cause to be used scarce, irreplaceable and endangered resources.
- j. Reduce impact to land and ecosystems.
- k. Reuse treated wastewater for non-potable uses on site such as sanitary facilities, dust control additives, decontamination. Contain and reuse water on site, to the extent practicable, as approved by the DEPARTMENT.

- l. Ensure temporary facilities (e.g., field offices and sanitary facilities) and permanent structures (e.g., treatment plants and offices) are thoroughly and properly insulated.
- m. Design structures to take full advantage of passive solar heating and cooling.
- n. Identify onsite or nearby sources of backfill material such as crushed concrete.
- o. Incorporate green requirements into cleanup and supporting service procurements.
- p. Choose service providers with local offices, to minimize the distance of worker commutes and machinery transport.
- q. Choose equipment and product vendors with nearby production or distribution centers, to minimize delivery-related fuel use.

2. Equipment Requirements:

- a. Minimize equipment engine idling.
- b. Utilize properly sized equipment and minimize the number of mobilizations needed to deliver and remove heavy equipment. Utilize an automated coupling system for equipment, rather than a manual pin-on system for changing excavator attachments, to reduce machine operating time.
- c. Use machine models capable of performing assorted tasks, whenever feasible, to avoid field deployment of multiple types of machines. For instance, a single excavator can be equipped with a bucket for digging, a breaker for demolition or a grapple for land clearing.
- d. Incorporate electronic intelligence systems to improve productivity within and among field machines. "Smart" systems enable work managers to remotely monitor field operations via machine-to-machine communications and identify changes to be made by machinery operators accordingly.
- e. Use machines with variable-speed control technology, which automatically reduces engine speed during low workload requirements, or with pump torque control, which allows a

machine operator to change a machine's hydraulic pump torque.

- f. Use machines with repowered or newer engines that are more fuel efficient.
- g. Implement an engine idle reduction plan to avoid fuel consumption when machinery is not actively engaged. Options include manual shutdown after a specified time such as five minutes, engagement of automatic shutdown devices, or use of auxiliary power units to heat or cool machinery cabs.
- h. Minimize emissions during site work (e.g., replace or retrofit older engines or use newer efficient models or use low-sulfur fuel).
- i. Deploy direct-push technology (DPT) instead of rotary drilling rigs whenever feasible for additional subsurface sampling or for monitoring well installation. DPT can reduce drilling duration by as much as 50-60% while eliminating generation of drill cuttings or the need to dispose of drilling fluids.
- j. Employ transportation methods, such as rail, which have demonstrated low emissions.
- k. Choose trucking methods and fleets that use vehicles equipped with fuel efficiency options such as tractor trailer skirts and air tabs, as well as clean diesel technology.
- l. Practice engine maintenance in accordance with manufacturers' recommendations and properly train operators to run equipment efficiently.
- m. Perform all required equipment inspections to reduce the potential for breakdowns, hydraulic fluid spills, and other negative impacts due to lack of inspections.
- n. Use 2007 or newer on-road diesel trucks or retrofitted diesel trucks with equivalent emissions reductions that get better fuel mileage, reduce air toxics and use low sulfur fuel or alternative fuel.
- o. Identify onsite or nearby sources of topsoil, to avoid long-distance transport of clean soil. Options may include onsite manufacturing of topsoil through use of locally sourced industrial byproducts such as compost or silica-based spent foundry sands.

- p. Use solar power packs to recharge batteries in small electronic devices such as small hand tools, cell phones, laptop computers and sensors.
- q. Install a ground-mounted PV array, wind turbine or mechanical windmill to power equipment needed for long-term site monitoring or maintenance. Properly scale and configure such equipment to provide power to other remediation equipment if possible.
- r. Use high efficiency variable speed pumps for groundwater extraction and treatment plant operations.
- s. Optimize pump-and-treat systems using properly sized equipment to minimize excess extraction or energy usage.

3. Restoration and Revegetation Requirements:

- a. Revegetate backfilled areas as quickly as possible through use of a diverse mix of native grasses, shrubs, forbs and trees supporting many habitat types.
- b. Include plant species that promote colonization of bees and other pollinators.
- c. Seed or install native rather than non-native species, which typically increases the rate of plant survival and minimizes the need for irrigation and soil or plant inputs.
- d. Choose grass species requiring little or no mowing.
- e. Substitute chemical fertilizers, herbicides or pesticides with non-synthetic inputs, integrated pest management methods, and soil solarizing techniques during vegetation planting, transplanting or ongoing maintenance.
- f. Retain native, noninvasive plants for later replanting.

+ + END OF SECTION + +



Form A Summary of Green Remediation Metrics

Site Name: _____ Site Code: _____ Operable Unit: _____
Address: _____ City: _____
State: _____ Zip: _____ County: _____

Reporting Period

Contract Period From: _____ To: _____
Reporting Period From: _____ To: _____ Is this a Final Report? Yes ☐ No ☐

Contact Information

Preparer's Name: _____ Phone No.: _____
Preparer's Affiliation: _____ Company Code: _____
Contract No. _____

Materials & Waste Generation: Quantify the materials used or consumed and the management of waste generated on-site.

	Current Reporting Period (Include Units)	Total to Date (Include Units)
Materials Brought to the Site		
• Topsoil		
• Fill		
• Silt Fence		
• Silt Logs		
• Aggregate Base Course		
• Geotextile		
• Solidification Additives		
• Activated carbon		
• Other:		
• Other:		
• Other:		
• Other:		
• Other:		
• Other:		
• Other:		
Total Wastes Generated On-Site		
• Remedy Generated Waste		
• Contractor Generated Waste		
• Other:		
• Other:		
• Other:		
• Other:		
• Other:		
• Other:		
• Other:		

Provide a description of any implemented waste reduction programs appropriate for this project in the space provided on the certification page.

Recycled and Bio-Based Content in Imported Products and Materials: Quantify all materials and products imported to the site, including cost of materials/dollar values. Provide total percentages of recycled and bio-based of products and materials.

List Products and Materials Below	Total \$ Value Provided	Total Percent of Recycled Content	Total Percent of Bio-based Content

Provide additional descriptions, as necessary, in the space provided on certification page.

Solid Waste Disposal and Diversion: Quantify all solid wastes generated, and indicate whether material was disposed or diverted for recycling or reuse.

Solid Waste Material	Date	Disposed or Diverted	Volume (Ton or CY)	Disposal/Recycling Facility Name	Comments (if not diverted, state why)
TSCA Contaminated Sediment					
Non-TSCA Contaminated Sediment					
Cleared Vegetation					
Spent Granular Activated Carbon					
Monitoring Well Removal Debris					
Other:					
Other:					
Other:					
Other:					
Other:					
Other:					

Provide descriptions in the space provided on the certification page of all wastes that were redirected for recycling or reuse. Indicate full names and addresses of facilities.

Energy Usage: Quantify the amount of energy used on-site and portion of that voluntarily derived from renewable energy sources.

	Current Reporting Period (KWh)	Total to Date (KWh)
Total electricity usage		
Of that total amount, provide quantity:		
• Derived from renewable source (i.e., solar, wind)		
• Other:		

Provide descriptions in the space provided on the certification page of all reported energy use reduction programs appropriate to this project, including use of electricity derived from renewable sources.

Water Usage: Quantify the volume of water used on-site from difference sources.

	Current Reporting Period (Gallons)	Total to Date (Gallons)
Total quantity of water used on-site		
Of that total amount, provide the quantity obtained from:		
• Public potable water supply		
• Surface water		
• On-site treated groundwater		
• Reclaimed treated water		
• Collected or diverted storm water		
• Re-Injected groundwater		
• Other:		
• Other:		

Provide descriptions in the space provided on the certification page of any reported water use reduction programs applied. Please note if reused/injected groundwater is pre-treated.

Emissions: Quantify the distance traveled for delivery of supplies and removal of waste.

	Current Reporting Period (Miles)	Total to Date (Miles)
Off-site mobile fuel combustion		
Other:		

Provide descriptions in the space provided on the certification page of practices such as use of local vendors within 150 miles of the site and on-site stationary fuel use reduction programs.

Quantify the number of hours that diesel and other equipment with the potential to emit hazardous air pollutants (HAPs) or greenhouse gas (GHG) emissions was operated on-site.

	Current Reporting Period (Hours)	Total to Date (Hours)
On-site diesel excavation/construction equipment usage		
Other on-site processes generating emissions		
Other:		

Quantify the VOC emissions from active remediation systems on-site.

	Current Reporting Period (lbs VOCs emitted)	Total to Date (lbs VOCs emitted)
Operating soil remediation equipment		
Operating groundwater remediation equipment		
Other:		

Provide descriptions in the space provided on the certification page of the type of equipment used, rating, emission control devices used and other means to reduce emissions.

Land and Ecosystem: Quantify the amount of land and/or ecosystems disturbed by construction and the area of land and/or ecosystems restored to a natural condition.

	Current Reporting Period (Acres)	Total to Date (Acres)
Total land area disturbed		
Total land area restored		
Increase in area for storm water infiltration (vs pre-disturbed conditions)		
Increase in area of native species plantings (vs pre-disturbed conditions)		
Other:		

Quantify the amount of land and/or ecosystems remediated.

	Current Reporting Period (Acres)	Total to Date (Acres)
Total area of land impacted by contamination		
Total area of land remediated to unrestricted use		
Total area of land remediated to other future site use		

Additional Comments on Green Remediation Programs Implemented: *Provide descriptions in the space provided of other green remediation practices performed during the project.*

Descriptions of green remediation programs reported above (Attach additional sheet if needed)
Materials and Products Imported:
Waste Generation:

Descriptions of green remediation programs reported above (Attach additional sheet if needed)**Recycled and Bio-Based Content in Imported Products and Materials:****Solid Waste Disposal and Diversion:****Energy Use:****Water Use:****Emissions:****Land and Ecosystem:****Other:****CERTIFICATION BY CONTRACTOR**

I, _____ (**Name**) do hereby certify that I am _____ (**Title**) of the Company/Corporation herein referenced and contractor for the work described in the foregoing application for payment. According to my knowledge and belief, all items and amounts shown on the face of this application for payment are correct, all work has been performed and/or materials supplied, the foregoing is a true and correct statement of the contract account up to and including the last day of the period covered by this application.

Date_____
Contractor

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SECTION 34 78 13

PORTABLE TRUCK SCALES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install and operate a minimum of one portable truck scale.
2. Included are necessary foundation, weigh deck, load cells, control panel, anchorage systems and all appurtenances.
3. CONTRACTOR shall obtain necessary weights and measures certifications and operate scale with a certified weigh master.

1.2 REFERENCES

A. Standards referenced in this Section are listed below:

1. American Welding Society, (AWS).
 - a. AWS D1.1, Structural Welding Code.
2. National Bureau of Standards, (NBS).
3. National Electrical Code, (NEC).
4. National Electrical Manufacturers Association, (NEMA).
5. Scale Manufacturers Association, (SMA)

1.3 QUALITY ASSURANCE

A. Equipment Manufacturer's Qualifications:

1. Manufacturer shall have a minimum of five years of experience of producing substantially similar equipment and shall be able to show evidence of at least five installations in satisfactory operation for at least five years.

B. Component Supply and Compatibility:

1. Obtain all equipment included in this Section, regardless of the component manufacturer, from a single portable truck scale equipment manufacturer.
2. The portable truck scale equipment manufacturer shall review and approve or shall prepare all Shop Drawings and other submittals for all components furnished under this Section.
3. All components shall be specifically designed for portable truck weighing service and shall be integrated into the overall equipment design by the portable truck scale equipment manufacturer.

- C. Source Quality Control:
 - 1. Visual Inspection: Verify that equipment complies with these Specifications and approved Shop Drawings.
 - 2. Packing:
 - a. Inspect prior to packing to ensure that assemblies and components are complete and undamaged.
 - b. Protect machined surfaces and mating connections.
 - c. Protect bearings with a shop applied corrosion prevention coating.
 - d. Crate in a manner which will prevent damage during shipment, delivery and storage.
 - e. Identify crate contents by a packing slip fastened to the outside of the crate.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following:
 - 1. Product Data:
 - a. Manufacturer's literature, illustrations, specifications and engineering data.
 - 2. Shop Drawings:
 - b. Drawings showing fabrication methods, assembly, installation and wiring diagrams.
 - c. Setting drawings, templates, and directions for the installation of anchor bolts and other anchorages.
- B. Informational Submittals: Submit the following:
 - 1. Source Quality Control Submittals:
 - a. Submit results of required control panel shop tests.
 - 2. Site Quality Control Submittals:
 - a. Submit a written report providing the results of the required field tests.
 - b. Submit a written report of the results of each visit by a manufacturer's serviceman, including purpose and time of visit, tasks performed and results obtained.
- C. Closeout Submittals: Submit the following:
 - 1. Operation and Maintenance Manuals:
 - a. Submit complete installation, operation and maintenance manuals including test reports, maintenance data and schedules, description of operation and spare parts information.
- D. Maintenance Material Submittals: Submit the following:
 - 1. Extra Stock Materials:
 - a. Load Cell Fluid: Furnish a load cell fluid specification for the type and grade necessary to meet the requirements of the equipment if required.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the Site to ensure uninterrupted progress of the Work. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete in ample time to not delay that Work.
- B. All boxes, crates and packages shall be inspected by CONTRACTOR upon delivery to the Site. CONTRACTOR shall notify DEPARTMENT, in writing, of any loss or damage to equipment or components. Replace losses and repair damage to new condition, in accordance with manufacturer's instructions.
- C. Store materials to permit easy access for inspection and identification. Keep all material off the ground using pallets, platforms, or other supports. Protect equipment including packaged materials from corrosion and deterioration.

PART 2 - PRODUCTS

2.1 SERVICE CONDITIONS

- A. General: Equipment shall be designed to be suitable for the process and service conditions described below and in the Schedule of Service Conditions.
 - 1. Portable scale shall be of capable of weighing trucks and being certified by weights and measures.
- B. Schedule of Service Conditions:
 - 1. No. of Scales: 1 (Minimum)
 - 2. Platform Size: Determined by CONTRACTOR
 - 3. Total Capacity: Determined by CONTRACTOR
 - 4. Sectional Capacity: Determined by CONTRACTOR
 - 5. Mid-Span Capacity:
 - a. Single Axle Determined by CONTRACTOR
 - b. Tandem Axle Determined by CONTRACTOR
 - c. Tri-axle Determined by CONTRACTOR

2.2 PRODUCT AND MANUFACTURER

- A. Products and Manufacturers: Provide one of the following:
 - 1. Cardinal Scales.
 - 2. Fairbanks Scales.
 - 3. Or equal.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspection:
 - 1. Inspect and verify that structures or surfaces on which the equipment will be installed have no defects which will adversely affect installation.
 - 2. Inspect all equipment prior to installation.
 - 3. Promptly report defects which may affect the Work to the DEPARTMENT, in writing.

3.2 START-UP AND TEST

- A. Perform operating tests to demonstrate that the equipment operates properly.
- B. Make adjustments required to place equipment in proper operating condition.
- C. Submit report of test results.

3.3 MANUFACTURER'S FIELD SERVICES

- A. A factory trained representative shall be provided for installation supervision, start-up and test services and operation and maintenance personnel training services. Manufacturer's representative shall test operate the system in the presence of the DEPARTMENT and verify that the equipment conforms to requirements. Representative shall revisit the Site as often as necessary until all trouble is corrected and the installation is entirely satisfactory.
- B. All costs, including travel, lodging, meals and incidentals, shall be considered as included in CONTRACTOR'S bid price.

3.4 MANUFACTURER'S REPAIR SERVICES

- A. Provide services of factory-trained representatives of the manufacturer to maintain the scale during the contract period.

+ + END OF SECTION + +

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SECTION 01 11 13

SUMMARY OF WORK

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. This Section includes the following Articles:

<u>Article</u>	<u>Title</u>
1.1	Section Includes
1.2	Location and Description of Work
1.3	Other Construction Contracts
1.4	Work by Others
1.5	Work by OWNER
1.6	Sequence and Progress of Work
1.7	CONTRACTOR's Use of Site
1.8	Easements and Rights-of-Way
1.9	Notices to Owners and Authorities of Properties Adjacent to the Work
1.10	Salvage of Materials and Equipment
1.11	Partial Utilization by OWNER

1.2 LOCATION AND DESCRIPTION OF WORK

A. The Work is located at the Former Silver Cleaners Site located at 245 Andrews Street, City of Rochester, Monroe County, New York.

B. The Work to be performed under this Contract includes, but is not limited to, constructing the Work described below and all related appurtenances. The Work includes, but is not limited to, the following:

1. Install temporary fence and privacy screen.
2. Install erosion and sediments controls prior to any intrusive work.
3. Furnish specified temporary services and controls.
4. Furnish specified H&S controls.
5. Prepare and Implement the Community Air Monitoring Plan (CAMP).
6. Prepare and Implement the Geotechnical Monitoring Plan prior to any intrusive work.
7. Furnish decontamination pad and supporting systems prior to intrusive work.
8. Furnish Water Treatment System prior to intrusive work.
9. Furnish stockpile pad(s) as required for staging of contaminated soils if not being direct loaded.
10. Pre excavation survey.
11. Abandon wells and piezometers that fall within the source excavation area.

12. Demo building foundation and asphalt as required for source excavation.
13. Install excavation support system.
14. Complete source excavation, characterization, transport and disposal of contaminated soils.
15. Post excavation survey.
16. Install passive ISCO injection header system.
17. Install source excavation backfill.
18. Remove excavation support system.
19. Install drainage improvements.
20. Install asphalt at disturbed areas.
21. Remove decontamination pad, stockpile pad(s), and Water Treatment System.
22. Removal of Items 1 to 6.
23. As-built survey.

C. Contracting Method: The Project shall be constructed under one prime Contract.

D. Hazardous Environmental Conditions:

1. A Hazardous Environmental Condition, described in reports referenced in the Limited Site Data, will affect the Work.

1.3 OTHER CONSTRUCTION CONTRACTS

A. None.

1.4 WORK BY OTHERS

A. None.

1.5 WORK BY OWNER

A. None.

1.6 SEQUENCE AND PROGRESS OF WORK

A. Sequencing:

1. Incorporate sequencing of the Work into the Progress Schedule.
2. Sequencing Requirements:
 - a. See Section 1.2.B for the work activities and proposed sequence.

1.7 CONTRACTOR'S USE OF SITE

- A. CONTRACTOR's use of the Site shall be confined to the areas shown.
- B. Move stored materials and equipment that interfere with operations of OWNER, other contractors, and others performing work for OWNER.
- C. Limits on CONTRACTOR's use of the Site are:

1. As indicated in Section 01 14 19, Use of Site.
2. Do not use the Site for operations other than those required for the Project.

1.8 EASEMENTS AND RIGHTS-OF-WAY

A. General:

1. Easements and rights-of-way required for the permanent improvements included in the Work will be provided by DEPARTMENT.
2. Confine construction operations within OWNER's property, public rights-of-way, easements obtained by OWNER, and limits shown, and property for which CONTRACTOR has made arrangements directly with property owner(s).
3. Use care in placing construction tools, equipment, excavated materials, and materials and equipment to be incorporated into the Work to avoid damaging property and interfering with traffic.
4. Do not enter private property outside the construction limits without permission from the owner of the property.

B. On Private Property:

1. General limits of OWNER-furnished easements are shown on the Drawings.

1.9 NOTICES TO OWNERS AND AUTHORITIES OF PROPERTIES ADJACENT TO THE WORK

- A. Notify owners of adjacent property and utility owners when prosecution of the Work may affect their property, facilities, or use of property.
- B. When it is necessary to temporarily obstruct access to property, or when utility service connection will be interrupted, provide notices sufficiently in advance to enable affected persons to provide for their needs. Such notifications shall comply with Laws and Regulations and, whether delivered orally or in writing, shall include appropriate information concerning the interruption and instructions on how to limit inconvenience caused thereby.
- C. Notify utility owners and other concerned entities not less than hours prior to cutting or closing streets or other traffic areas or excavating near Underground Facilities or exposed utilities.

1.10 SALVAGE OF MATERIALS AND EQUIPMENT

- A. Existing materials and equipment removed and not shown or specified to be reused in the Work will become CONTRACTOR's property, except the following items that shall remain OWNER's property:
 1. None.
- B. Existing materials and equipment removed by CONTRACTOR shall not be reused in the Work, except for the following:

1. None.

C. Removal, Storage, Handling, Reinstallation:

1. Carefully remove in manner to prevent damage all materials and equipment shown or indicated to be salvaged and reused or to remain property of OWNER.
2. Store and protect salvaged items shown or indicated to be used in the Work.
3. Replace in-kind or with new items those items of materials and equipment damaged during removal, storage, or handling through CONTRACTOR's actions, negligence, or improper procedures.

- D. CONTRACTOR may furnish and install new items, with DEPARTMENT's approval, instead of those specified or indicated to be salvaged and reused, in which case such removed items will become CONTRACTOR's property.

1.11 PARTIAL UTILIZATION BY OWNER

- A. Prior to Substantial Completion of the entire Work under the Contract, substantially complete the Work as follows:
1. Work indicted for Milestones (if any).

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01 14 19

USE OF SITE

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. This Section includes requirements for use of the Site during the Project, and includes requirements for use of existing facilities, as applicable.
 - 2. CONTRACTOR shall provide all labor, materials, equipment, tools, and incidentals shown, specified, and required to comply with restrictions on CONTRACTOR's use of the Site and other areas.

1.2 USE OF PREMISES

- A. Limit use of premises at the Site to work areas shown or indicated on the Drawings. Do not disturb portions of the Site beyond areas of the Work.
 - 1. Access to Site, Access Roads, and Parking Areas: Refer to Section 01 55 13, Access Roads and Parking Areas.
- B. Use of Existing Buildings and Structures: Obtain DEPARTMENT's written permission for each proposed use of existing buildings and structures.
- C. Promptly repair damage to premises caused by construction operations. Upon completion of the Work, restore premises to specified condition; if condition is not specified, restore to pre-construction condition.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

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SECTION 01 31 13

PROJECT COORDINATION

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall coordinate the Work, including testing agencies whether hired by CONTRACTOR, DEPARTMENT, or others; Subcontractors, Suppliers, and others with whom coordination is necessary, in accordance with this Section, to perform the Work within the Contract Times and in accordance with the Contract Documents.

B. Coordination:

1. CONTRACTOR shall cooperate with and coordinate the Work with other contractors, utility owners, utility service companies, DEPARTMENT's and facility manager's employees working at the Site, and other entities working at the Site, in accordance with Section 01 11 13, Summary of Work.
2. CONTRACTOR will not be responsible or liable for damage unless damage is through negligence of CONTRACTOR, or Subcontractors, Supplier, or other entity employed by CONTRACTOR.
3. Attend and participate in all project coordination and progress meetings, and report on the progress of the Work and compliance with the Progress Schedule.
4. CONTRACTOR should anticipate coordinating any shoulder and/or lane closure of Andrews Street and adjacent property owner and businesses.5.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

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SECTION 01 35 44

SPILL PREVENTION CONTROL AND COUNTERMEASURES PLAN

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. This Section pertains to spill prevention control and countermeasures applicable to the Project under the provisions of 40 CFR 112 and other Laws and Regulations.
2. CONTRACTOR shall provide all labor, materials, equipment, tools, professional services (when required), and incidentals as shown, specified, and required to comply with Laws and Regulations regarding spill prevention control and countermeasures (SPCC) planning and compliance, including 40 CFR 112.
3. Single Prime Contract: CONTRACTOR shall determine whether a SPCC Plan is required. If SPCC Plan is required, CONTRACTOR shall prepare, implement, and maintain SPCC Plan as required by Laws and Regulations.

1.2 DETERMINATION OF NEED FOR SPCC PLAN FOR PROJECT

A. Determination of Need for SPCC Plan:

1. CONTRACTOR shall determine need for SPCC Plan for the Project.
2. CONTRACTOR's Professional Engineer:
 - a. If the Site will include storage of more than 10,000 gallons of oil in above-ground storage, or if the Site does not comply with oil discharge history criteria specified in 40 CFR 112, CONTRACTOR shall retain a qualified professional engineer to determine need for SPCC Plan for the Project and, if SPCC Plan is required, professional engineer shall prepare or supervise preparation of SPCC Plan for the Project.
 - b. If a professional engineer is not required to prepare the full SPCC Plan for the Project, but the SPCC Plan includes environmentally equivalent SPCC measures, or impracticality determinations, CONTRACTOR shall retain a qualified professional engineer to prepare and certify those portions of the SPCC Plan dealing with environmentally equivalent measures and impracticality determinations; the balance of the SPCC Plan may be prepared by and be self-certified by CONTRACTOR.
3. Submit to ENGINEER letter presenting results of evaluation of whether a SPCC Plan is required for the Project in accordance with Laws and Regulations.

B. SPCC Plan is required when the Project activities at the Site meet the following criteria:

1. The Site and activities thereon are not exempt from Laws and Regulations relative to SPCC planning and implementation.
 2. Oil is stored, used, transferred, or otherwise handled at the Site, unless otherwise exempted by Laws and Regulations.
 3. Maximum oil storage capacity at the Site equals or exceeds either of the following thresholds: 42,000 gallons of completely buried capacity, or 1,320 of above-ground capacity. Capacity includes total storage tank volume and operational storage volume at the Site for contractors and Subcontractors, including bulk storage tanks, containers with 55-gallon storage capacity and larger, mobile tanks located at the Site, and other containers covered by Laws and Regulations. Exempt are motive storage containers, such as those on construction equipment and vehicles. Oil includes petroleum products, fuel oil, hydraulic fluid, oil sludge, oil refuse, oil mixed with wastes other than dredged material, synthetic oil, vegetable oil, animal fats and oils, and other oils defined in Laws and Regulations.
 4. There is reasonable expectation, based on location of the Site, that oil spill would reach navigable waters of the United States or adjoining shorelines.
- C. When SPCC Plan is not required, CONTRACTOR shall ensure that conditions that preclude the need for SPCC Plan for the Project, including the activities of all contractors and Subcontractors working on the Project at the Site, are maintained throughout duration of the Project. Should changes that affect the storage, use, or handling of oil at the Site occur, reassess the need for SPCC Plan for the Project at no additional cost to DEPARTMENT and submit to ENGINEER evaluation letter regarding need for SPCC Plan.

1.3 SPCC PLAN AND IMPLEMENTATION

- A. When SPCC Plan is required, develop SPCC Plan and submit for acceptance by DEPARTMENT, with copy to ENGINEER. SPCC Plan shall be specific to the Site and the Project and shall include the following:
1. Seal or stamp, original signature, and license number of CONTRACTOR'S professional engineer, when self-certification by CONTRACTOR is not allowed by Laws and Regulations.
 2. Site plan identifying the name (or tag number) and location of each tank and container that will contain a substance regulated in 40 CFR 112 and other Laws and Regulations, including above-ground and buried tanks. Site plan shall indicate general directions of storm water runoff, including storm sewers and drainage inlets (including arrows indicating directions of flow), and storm sewer outfall locations shown and labeled.
 3. For each tank and container shown or indicated on the Site plan, include a table that lists the tank or container's name and tag number, type of oil stored therein, and maximum storage capacity. List total storage capacity of all regulated tanks and containers at the Site covered by SPCC Laws and Regulations.
 4. Predictions of direction, rate of flow, and total quantity of oil that could be discharged from the Site as result of storage tank or container failure.

5. Operating procedures that prevent oil spills, including procedures for oil handling, details of secondary containment structures at fuel and oil transfer areas, and details and descriptions of equipment to be used for oil handling, including piping.
 6. Control Structures and Secondary Containment:
 - a. Furnish details of and descriptions of control measures installed at the Site by CONTRACTOR to prevent spill from reaching navigable waters of the United States and associated shorelines, including secondary containment and diversionary structures.
 - b. For on-shore Sites, one of the following must be used, at minimum: dikes, berms, or retaining walls; curbing; culverts, gutters, or other drainage systems; weirs, booms, or other barriers; spill diversion ponds; retention ponds; or sorbent materials.
 - c. Where appropriate, the SPCC Plan shall clearly demonstrate that containment or diversionary structures or equipment are not practical.
 - d. Include brittle fracture evaluation, where required, for field-constructed above-ground storage containers undergoing repair, alteration, construction, or change in service.
 7. Plans for countermeasures to contain, clean up, and mitigate effects of oil spill that reaches navigable waters of the United States or their shorelines, including written commitment of manpower, equipment, and materials to quickly control and remove spilled oil. Include estimation of time required to contain spill after spill occurs.
 8. Contact list and telephone numbers for facility response coordinator, National Response Center, cleanup contractors, and all appropriate federal, state, and local authorities having jurisdiction to be contacted in event of spill or discharge.
 9. Program for monthly inspections of the Site by CONTRACTOR for SPCC Plan compliance. Advise DEPARTMENT in writing of each inspection not less than 72 hours in advance.
 10. Measures for Site security relative to oil storage.
 11. Procedures for safely handling mobile containers such as totes, drums, and fueling vehicles and construction equipment that remain at the Site.
 12. Procedures and schedules for periodic testing of integrity of tanks and containers, and associated piping and valves.
 13. Plans for bulk storage container compliance.
 14. Plans for personnel training and oil spill prevention briefings.
 15. For SPCC Plans that do not follow the format listed in Laws and Regulations, provide cross-reference to requirements of Laws and Regulations, including 40 CFR 112.7.
- B. Obtain acceptance of SPCC Plan by DEPARTMENT, for coordination with DEPARTMENT's Site-specific SPCC Plan, if any.
- C. SPCC Plan shall be reviewed by CONTRACTOR's professional engineer (when professional engineer is required) and DEPARTMENT every five years, as applicable. CONTRACTOR shall perform updates and revisions of the Project's

SPCC Plan as necessary and submit same in accordance with the provisions of this Section for submittal and acceptance of initial SPCC Plan.

- D. Post a copy of accepted, certified SPCC Plan in conspicuous location at the Site and furnish copies to DEPARTMENT, other contractors, and Subcontractors as appropriate. All contractors shall comply with SPCC Plan.
- E. In event of violation of SPCC Plan or release of oils attributable to construction operations, CONTRACTOR shall:
 - 1. Immediately issue notifications in accordance with Laws and Regulations, including 40 CFR 110 and 40 CFR 112. When required by Laws and Regulations, report to National Response Center, US Environmental Protection Agency, and other authorities having jurisdiction, if any.
 - 2. Have spill clean-up performed in accordance with Laws and Regulations, the SPCC Plan, and requirements of authorities having jurisdiction.
 - 3. Pay fines and civil penalties (or responsible portion thereof) imposed on DEPARTMENT by authorities having jurisdiction, and pay costs associated with clean-up of spills.
 - 4. Should cleanup of spills attributable to CONTRACTOR be necessary, no resulting change in the Contract Price or Contract Times will be allowed. Should CONTRACTOR share responsibility for spill and cleanup with another entity, changes in Contract Price and Contract Times, if any, will be proportionate.

1.4 QUALITY ASSURANCE

- A. Qualifications:
 - 1. CONTRACTOR's Professional Engineer:
 - a. When required by Laws and Regulations, engage a licensed, registered professional engineer legally qualified to practice in the jurisdiction where the Site is located and experienced in performing engineering services of the type required.
 - b. Submit qualifications data.
 - c. Responsibilities include but are not necessarily limited to:
 - 1) Carefully reviewing Laws and Regulations relative to SPCC.
 - 2) Preparing written requests for clarifications or interpretations of criteria specified in the Contract Documents for submittal to DEPARTMENT by CONTRACTOR and obtaining from authorities having jurisdiction clarifications regarding Laws and Regulations as required.
 - 3) Preparing or supervising the preparation of letter-report evaluation of need for SPCC Plan in accordance with the Contract Documents. Evaluation shall include professional engineer's seal or stamp, registration number, and original signature.
 - 4) When SPCC Plan is required, preparing, supervising the preparation of, or reviewing the SPCC Plan (or designated portions thereof when oil storage at the Site will be 10,000 gallons or less) in

accordance with the Contract Documents. SPCC Plan (or designated portions thereof) shall include professional engineer's seal or stamp, registration number, and original signature.

- 5) Periodically re-evaluating the need for SPCC Plan and issuing findings as letter-reports with seal or stamp, license number, and signature. When SPCC Plan is required, periodically evaluating the SPCC Plan and providing recommendations for compliance with Laws and Regulations, in accordance with the Contract Documents.
- 6) Certifying that:
 - a) it is familiar with the Laws and Regulations, including 40 CFR 112, and
 - b) it has visited, examined, and is familiar with the Site, planned modifications to the Site under the Project as such modifications pertain to SPCC Laws and Regulations, and
 - c) it has performed the evaluations and prepared SPCC Plan in accordance with the Contract Documents, and
 - d) procedures for required testing and inspections have been established, and
 - e) the said evaluations and SPCC Plan are adequate for the Project, and
 - f) the said evaluations and SPECC Plan complies with Laws and Regulations, applicable industry standards, and to prevailing standards of practice.

1.5 SUBMITTALS

A. Informational Submittals: Submit the following:

1. Certifications: With each evaluation letter and SPCC Plan submittal, include certification signed by preparer of submittal that the submittal complies with the Contract Documents and Laws and Regulations. Signature on all certifications shall be original.
2. Evaluations:
 - a. Submit letter presenting results of evaluation of whether a SPCC Plan is required for the Project. Submit evaluation not later than fourteen days after the Contract Times commence running, unless longer time is allowed by DEPARTMENT.
 - b. Submit updated evaluations as required when conditions at the Site change. Submit updated evaluation not later than seven days after the conditions at the Site change, or within seven days of DEPARTMENT's request, unless longer time is allowed by DEPARTMENT.
3. SPCC Plan: When SPCC Plan is required:
 - a. Submit to DEPARTMENT within 14 days of receipt of DEPARTMENT's acceptance of evaluation submittal.
 - b. Update and resubmit the SPCC Plan, or acceptable SPCC Plan amendments, as required when conditions at the Site change. Submit updated SPCC Plan or amendments not later than seven days after the

change in conditions at the Site change giving rise to the SPCC Plan change or amendment, or within seven days of DEPARTMENT's request, unless longer time is allowed by DEPARTMENT.

4. SPPC Plan Distribution: When SPCC Plan is required, submit copies of letters transmitting SPCC Plan and amendments (if any) to contractors and Subcontractors working at the Site.
5. Qualifications Statements: CONTRACTOR's professional engineer, when requested by DEPARTMENT.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

+ + END OF SECTION + +

SECTION 01 41 24

PERMIT REQUIREMENTS

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. This Section includes general requirements relative to permitting requirements of which DEPARTMENT are aware that apply to the Project.
2. CONTRACTOR shall provide labor, materials, equipment, tools, and incidentals shown, specified, and required to obtain required permits and comply with required permits and licenses.
3. Obtain, pay for, and comply with required permits, permit fees and licenses whether or not indicated in this Section or elsewhere in the Contract Documents.

B. Coordination:

1. Contractor shall obtain local permits where applicable. Permits may include, but are not limited to: demolition permit, row work permit, traffic control permit, and hydrant connection permit.
2. Coordinate compliance with permit and license requirements with Work under other Sections and with other contractors, if any, working at the Site.
3. Coordinate with the Progress Schedule the time required to apply for and obtain required permits and licenses. Changes in Contract Times or Contract Price will not be authorized because of timing and costs associated with obtaining permits and licenses required for the Work.

C. Related Sections: In addition to permits and licenses required under this Section, obtain and comply with permits required under the following Sections:

1. Section 01 35 43.13, Environmental Procedures for Hazardous Materials.
2. Section 01 41 26, Storm Water Pollution Prevention Plan.
3. Section 02 41 00, Demolition.

1.2 SUBMITTALS

A. Informational Submittals: Submit the following:

1. Copy of each of the following permits as applicable to the Contract.
 - a. Demolition permit from the City of Rochester, Building Department.
 - b. City of Rochester right-of-way work permit.
 - c. Traffic control permit (if required).
 - d. Hydrant connection permit.
 - e. Utility abandonment permit and fees as applicable.
 - f. Sanitary Sewer Discharge Permit and discharge fees as applicable.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01 41 26

STORM WATER POLLUTION PREVENTION PLAN

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. This Section includes requirements for compliance with storm water pollution prevention plans (SWPPP) and permit(s) applicable to the Project.
2. CONTRACTOR shall meet substantive requirements of the NYS State Pollutant Discharge Elimination System (SPDES) Program and shall be responsible for providing, inspecting, and maintaining necessary materials to minimum discharge of pollutants in storm water runoff from the site. These substantive requirements are defined in the following sections.
3. Controls – General:
 - a. Prevent discharge of sediment to and erosion from the Site to surface waters, drainage routes, public streets and rights-of-way, and private property, including dewatering operations.
 - b. Prevent trash and demolition and construction debris from leaving the Site via storm water runoff.
 - c. Provide berms, dikes, and other acceptable methods of directing storm water around work areas to drainage routes.
 - d. Prior to starting the Work associated with such discharge, construction-related discharges to publicly owned conveyance or treatment systems shall be approved by owner of system to which the discharge will be directed.
4. Water Quality:
 - a. Do not cause or contribute to a violation of water quality standards, Laws, or Regulations.
 - b. Notify DEPARTMENT of revisions to the SWPPP necessary to protect receiving water quality and comply with applicable permits. Provide and implement measures to control pollutants in storm water runoff from the Site to prevent:
 - 1) Turbidity increases that will cause a substantial visible contrast to natural conditions.
 - 2) Increase in suspended, colloidal, and settleable solids that would cause sediment deposition or impair receiving water quality and use.
 - 3) Presence of residue from oil and floating substances, visible oil, and globules of grease.
5. CONTRACTOR shall pay civil penalties and other costs incurred by DEPARTMENT, including additional engineering and inspection services, associated with non-compliance with applicable permits related to storm water discharges associated with construction activity and sediment and erosion

controls associated with the Work. DEPARTMENT may deduct as set-offs such amounts from payments due CONTRACTOR.

6. Contract Price includes all material, labor, and other permits and incidental costs related to:
 - a. Prepare and maintain drawing of SWPPP controls along with the inspection log and inspection reports from SWPPP inspections.
 - b. Installing and maintaining structural and non-structural items used in complying with the SWPPP and its revisions.
 - c. Clean-up, disposal, and repairs following wet weather events or spills caused by CONTRACTOR.
 - d. Implementing and maintaining “best management practices”, as defined in applicable permits and Laws or Regulations, to comply with requirements that govern storm water discharges at the Site.
 7. Inspections of storm water, sediment, and erosion controls as specified.
- B. Documents: The following are part of the Work included under this Section:
1. Storm Water Pollution Prevention Plan (SWPPP):
 - a. Prepared by CONTRACTOR, submitted to the DEPARTMENT for review and comment, and filed with authorities having jurisdiction over storm water discharges during construction.
 2. Sediment and Erosion Control Permit:
 - a. Prepared by CONTRACTOR, submitted to the DEPARTMENT for review and comment, and filed with the authority having jurisdiction over sediment and erosion control during construction.
 3. Storm Water Certification Statement:
 - a. To be prepared by CONTRACTOR and submitted to DEPARTMENT on the form included with this Section, or on a form provided by authority having jurisdiction.
 - b. Do not perform Work at the Site until the Storm Water Certification has been submitted to and accepted by DEPARTMENT.
 4. Notice of Intent (NOI):
 - a. Prepared by CONTRACTOR and submitted to authorities having jurisdiction following DEPARTMENT’s receipt and acceptance of CONTRACTOR’s SWPPP and preliminary Progress Schedule.
 - b. NOI will be filed with authorities having jurisdiction by CONTRACTOR within ten days of DEPARTMENT’s acceptance of CONTRACTOR’s SWPPP and preliminary Progress Schedule.
 - c. Do not perform Work at Site until NOI is submitted to and acknowledged by authorities having jurisdiction.
 5. Co-permittee Agreement:
 - a. Prepared by CONTRACTOR using forms included with the SWPPP and submitted to DEPARTMENT within five days of the date the Contract Times commence running, for signature by DEPARTMENT.
 - b. CONTRACTOR will file co-permittee agreement with authorities having jurisdiction.
 - c. Do not perform Work at the Site until co-permittee agreement is submitted to authorities having jurisdiction.

6. Storm Water Inspection Report:
 - a. Prepared by DEPARTMENT using the form included with this Section, or a form provided by authority having jurisdiction.
 - b. Storm water inspection reports will be filed in a log book kept at the Site by DEPARTMENT. Copy of each report will be furnished to CONTRACTOR upon request.
 - c. Storm water inspection report will be completed for each of the following:
 - 1) Pre-construction: After placement of storm water management measures, including sediment and erosion controls, and temporary field offices and other temporary facilities, prior to starting other Work at the Site.
 - 2) During the Work: Every seven days until Notice of Termination is completed. When the Site is stabilized relative to storm water, erosion, and discharge of sediment, inspection frequency during temporary shutdowns and seasonal shutdowns is once per month until Notice of Termination is completed.
 - 3) Final: Final inspection report will be prepared prior to completion of Notice of Termination.
7. Notice of Termination (NOT):
 - a. Prepared by CONTRACTOR on the form included with storm water permit and submitted to DEPARTMENT for review and signature by DEPARTMENT.
 - b. CONTRACTOR will submit the NOT to authority having jurisdiction.
 - c. CONTRACTOR shall submit the NOT following completion of all Work that may result in pollution in storm water discharges, including landscaping Work.
 - d. Final Payment will not be made until the NOT is filed with authority having jurisdiction.

D. Coordination:

1. Coordinate requirements of this Section with requirements for earthwork, erosion control, and landscaping in the Contract Documents, applicable permit requirements, and Laws and Regulations.
2. Implement SWPPP controls and practices prior to starting other Work at the Site. Each prime contractor and Subcontractor identified in the SWPPP and SWPPP Revisions shall sign a copy of the storm water certification statement.

1.2 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with Laws and Regulations relative to environmental protection and restoration, including:
1. Storm water permit applicable to the Work and Site.
 2. State and local erosion and sediment control guidelines and requirements,
 3. State and local storm water regulations and guidance.

1.3 SUBMITTALS

- A. Informational Submittals: Submit the following:
 - 1. Submit the following, in accordance with Paragraph 1.1.C and Article 1.4 of this Section. When the Project involves Work at multiple sites, submit each of the following for each Site, as applicable:
 - a. SWPPP Revisions.
 - b. Co-permittee Agreement.
 - c. Storm Water Certification Statement.
 - d. Notice of Termination
 - 2. Approval to Discharge to Publicly-owned Treatment Works:
 - a. For storm water discharges associated with construction activity that are discharged to a publicly owned conveyance or treatment system, prior to commencing discharges, submit system owner's written approval for such discharges.
 - 3. Storm Water Site Plan Updates:
 - a. Within three days after each storm water inspection, submit updated storm water site plan.

1.4 SWPPP REVISIONS

- A. CONTRACTOR shall prepare a SWPPP Revision in accordance with the Project's storm water permit when:
 - 1. There is a significant change in design, construction, operation, or maintenance of the Project that significantly affects the potential of discharging pollutants to Waters of the United States and has not otherwise been addressed in the SWPPP.
 - 2. SWPPP proves to be ineffective relative to:
 - a. eliminating or significantly minimizing pollutants from sources identified in the SWPPP required by the Project's storm water permit, or
 - b. achieving general objectives of controlling pollutants in storm water discharges from permitted construction activity.
 - 3. Prepare and submit SWPPP Revision identifying prime contractors and Subcontractor responsible for implementing part of the SWPPP.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 INSPECTIONS AND REPAIRS

- A. Perform Site inspections and assessments as required in applicable storm water permit and this Section. Inspections and assessments shall be done by CONTRACTOR's site superintendent or project manager, together with DEPARTMENT.

B. Inspections:

1. During the Work, relative to the storm water permit, inspections of the Site shall be performed:
 - a. Pre-Construction: After SWPPP controls are provided and prior to starting other Work at the Site.
 - b. During the Work: Every seven days until Notice of Termination is completed and submitted to authority having jurisdiction. When the Site is stabilized relative to storm water, erosion, and discharge of sediment, inspection required frequency during temporary shutdowns and seasonal shutdowns is not less than once per month until Notice of Termination is completed.
 - c. Prior to CONTRACTOR submitting the Notice of Termination.
 2. During each inspection, verify sediment control practices and record the approximate degree of sediment accumulation as percentage of acceptable sediment storage volume; inspect erosion and sediment control practices and record maintenance performed; observe and record deficiencies relative to implementation of the SWPPP. DEPARTMENT will complete Storm Water Inspection Reports and CONTRACTOR shall record and submit the following.
 - a. Storm Water Site Plan: On a copy of the Site plan included in the Contract Documents or other map of the Site acceptable to DEPARTMENT, indicate extent of all disturbed areas and drainage pathways. Indicate areas expected to undergo initial disturbance or significant site work within the next fourteen days.
 - b. Indicate on storm water site plan areas of Site that have undergone temporary or permanent stabilization.
 - c. Indicate on storm water site plan all disturbed areas that have not undergone active site Work during the previous 14 days.
- C. Maintain at the Site a copy of storm water site plans from each storm water inspection and submit each storm water site plan to DEPARTMENT. DEPARTMENT will maintain at the Site a log book with a copy of each Storm Water Inspection Report.
- D. Cooperate with representatives of authorities having jurisdiction during their periodic visits to the Site, and promptly furnish information requested by authorities having jurisdiction.
- E. Perform repairs to SWPPP controls, in accordance with applicable requirements and to satisfaction of DEPARTMENT, within two days of each inspection.

3.2 ATTACHMENTS

- A. The documents listed below, following this Section's "End of Section" designation, are part of this Specifications Section. Notice of Intent (NOI) form, Co-permittee

Agreement form, and Notice of Termination (NOT) form are included with storm water permit.

1. Storm Water Inspection Report form (two pages).
2. Storm Water Permit Certification form (one page).
3. SWPPP Revision Form (one page).

+ + END OF SECTION + +

STORM WATER INSPECTION REPORT

Owner: Site: Project: Contractor:

Date of Inspection: _____

Day of Week:

S	M	T	W	T	F	S

Sheet No. _____ of _____ Sheets

If pertinent to the Operation	
Weather	
Temperature	

This inspection and maintenance form is to be used when the Work is subject to a Storm Water General Permit for Construction Activity. Inspections shall be performed not less than once every seven calendar days; for sites that are stabilized and temporarily shut down inspections may be reduced to once per month. Each erosion and sediment control measure installed on the Site is to be inspected and the Contractor must complete all required maintenance within two calendar days from the date of inspection.

- Reason for this inspection:**
- ☐ Pre-construction Site assessment
 - ☐ Seven calendar day inspection
 - ☐ Monthly inspection (when Site is stabilized and shut down)
 - ☐ Post-construction inspection prior to Notice of Termination

Key for erosion and sediment control measures to be inspected: [Use the following designations in the table below] (1) mulch, (2) seed and mulch, (3) check dams, (4) hay bale/straw bales, (5) silt fence, (6) sediment trap, (7) turbidity curtains, (8) pipe slope drains, (9) drainage structure inlet protection, (10) rolled erosion control products, (11) soil stabilizers, (12) construction entrances, (13) pipe inlet/outlet protection, (14) water diversion structures, (15) sedimentation basins, (16) cofferdams, (17) Other _____.

ID	Location	Disturbance		Measure		Remarks (Evaluate integrity of measure, describe evidence of erosion)	Approximate Sediment Accumulation (% of Depth)	Maintenance Required? (Y or N) (If Yes, Describe Below)
		Existing? (Y or N)	Next 14 Days? (Y or N)	Code #	Temp or Perm? (T, P or NA)			
1								
2								
3								
4								
5								
6								
7								
8								

ID	Location	Disturbance		Measure		Remarks (Evaluate integrity of measure, describe evidence of erosion)	Approximate Sediment Accumulation (% of Depth)	Maintenance Required? (Y or N) (If Yes, Describe Below)
		Existing? (Y or N)	Next 14 Days? (Y or N)	Code #	Temp/Perm or N/A? (T, P or NA)			
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

DESCRIPTION OF REQUIRED MAINTENANCE AND ANY EXISTING DEFICIENCIES IN THE SWPPP:
Specify for each location using row ID number.

I certify under penalty of Law that this document and all attachments were prepared under my direction or supervision in accordance with a system to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein may be punishable by Law.

Signature: _____ Prepared: _____ Copy to Contractor: _____
Resident Project Representative (Date) (Date)

Qualified Professional Name _____
(w/Firm Name, if Consultant)

STORM WATER PERMIT CERTIFICATION

Contract Number: _____ Project: _____

Owner: _____

Each Contractor and Subcontractor identified in the Storm Water Pollution Prevention Plan (SWPPP) must certify that they understand the permit conditions and their responsibilities. Every Contractor and Subcontractor performing an activity that involves soil disturbance shall sign this certification and submit it to the DEPARTMENT prior to performing the Work. This certification shall be signed by an owner, principal, president, secretary, or treasurer of the firm.

I certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP for the construction Site identified in such SWPPP as a condition of authorization to discharge storm water. I also understand that my firm and its employees and Subcontractors shall comply with the terms and conditions of Owner's general permit for storm water discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards, Laws, or Regulations.

Firm: _____

Address: _____

City: _____ State _____ Zip _____

Name (Print) Signature Date

Title

STORM WATER POLLUTION PREVENTION PLAN (SWPPP) REVISION

Owner:
Site:
Project:
Contractor:

Date of Inspection: _____

Sheet No. _____ of _____ Sheets

This form shall be used when revisions to the current Storm Water Pollution Prevention Plan (SWPPP) are required by the Storm Water General Permit for Construction Activity or the Contract Documents.

Reason for the Revision(s): Revisions were requested by State: ☐ Yes ☐ No

Describe the Revision(s) to the SWPPP: _____

I certify under penalty of Law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein may be punishable by Law.

Signature: _____ Prepared: _____ Submitted: _____

(Date)

(Date)

Copy to: ☐ Department ☐ Contractor _____

SECTION 01 41 27

EARTHMOVING PERMIT AND DUST CONTROL

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. This Section includes requirements for controlling fugitive dust emissions resulting from construction activities, including earthmoving.
2. CONTRACTOR shall obtain, pay for, and comply with permits required for earthmoving and dust control required because of dust-generating operations related to the Work, and shall develop and comply with provisions of dust control plan.
3. Provide necessary labor, materials, equipment, tools, services, and incidentals to: apply sufficient dust suppressants; properly clean all track-out areas to driveways, roadways, and highways; and provide adequate physical stabilizations of soils to comply with earthmoving permits and accepted dust control plan.
4. Control fugitive dust generation from CONTRACTOR's operations including the following:
 - a. Construction areas.
 - b. Vehicle and equipment parking areas.
 - c. Material and equipment storage areas.
 - d. Field office area(s) and staging areas.
 - e. Haul and access roadways.
 - f. Track-out areas.
 - g. Other areas where CONTRACTOR will work, store materials or equipment, or park vehicles and equipment.
5. Do not cause or allow dust-generating operations, earthmoving operations, use of property, or other operations that result in fugitive dust emissions that exceed limits prescribed by authorities having jurisdiction.
6. Pay fines and civil penalties incurred by DEPARTMENT because of CONTRACTOR's actions or violations of earthmoving permits and dust control plan. DEPARTMENT may deduct as set-offs such amounts from payments due CONTRACTOR.

1.2 SUBMITTALS

A. Informational Submittals: Submit the following:

- 1 Dust Control Plan:
 - a. Prepare and submit to DEPARTMENT in accordance with Article 1.4 of this Section. Submit within the earlier of 30 days after the Contract Times commence running or prior to commencing earth-disturbing operations at the Site.

2. Earthmoving Permit:
 - a. Submit copy of permits obtained from authorities having jurisdiction, within seven days of CONTRACTOR's receipt of such permits. Do not commence earthmoving operations at the Site until required permits are obtained and submitted to DEPARTMENT.
3. Daily Logs and Reasonably-Available Control Measures (RACM) Records:
 - a. Submit upon request of DEPARTMENT.
4. Field Quality Control Submittals:
 - a. When opacity monitoring is required, submit results not later than two days following completion of observations.

1.3 POSTING AND RECORDKEEPING

- A. Post copy of earthmoving permit and accepted dust control plan at conspicuous location at the Site.
- B. Recordkeeping:
 1. Maintain daily written log to record the actual application or implementation of reasonably-available control measures (RACM) described in the accepted dust control plan.
 2. Maintain the written log and supporting documentation at the Site and submit copies to DEPARTMENT upon request.
 3. Retain copies of dust control plan, RACM implementation records, and supporting documentations for not less than three years after Substantial Completion of the entire Project.

1.4 DUST CONTROL PLAN

- A. Prepare and submit to DEPARTMENT a dust control plan that includes the following:
 1. Names, address, office and cellular telephone numbers, and e-mail address of person(s) responsible for preparing and overseeing implementation of dust control plan. Designate one person responsible for overseeing implementation of dust control plan for the Project.
 2. Name(s), address(es), office and cellular telephone numbers, and e-mail addresses of person(s) responsible for dust generating operations.
 3. Site plan delineating total area of land surface to be disturbed. Delineate each area of phased disturbances, when applicable.
 4. Total disturbed area in acres; earthmoving and dust-generating operations and activities to be performed at the Site; actual and potential sources of fugitive dust emissions; and delivery, transportation, and storage areas for the Site, including types of materials stored and appropriate size of material stockpiles.
 5. Description of reasonably-available control measures (RACM) to be implemented during dust-generating operations at actual and potential sources of fugitive dust.

6. Description of dust suppressants to be used including product data and safety data sheets (SDS); method, frequency, and intensity of application; type, number, and capacity of application equipment; and certifications related to the suppressant's appropriate and safe use. Calcium chloride is not allowed.
7. Description of specific surface treatment(s) or RACM proposed for controlling material deposition along paved surfaces (e.g., "track-out" areas) where unpaved Site surfaces or Site access points meet paved surfaces.
8. As contingency measure, designate and include description of not less than one alternative RACM for each actual and potential fugitive dust source.
9. Dust control plan shall also comply with the criteria outline in DER-10.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FIELD QUALITY CONTROL

- A. Testing and Monitoring.
 1. Upon direction of DEPARTMENT, obtain opacity observations for visible emissions of fugitive dust.
 2. Opacity Monitoring Method:
 - a. USEPA Method 9, Visual Determination of Opacity of Emissions from Stationary Sources (Emission Measurement Technical Information Center Test Method 009).
 3. Location and Frequency of Opacity Observations:
 - a. Obtain opacity observations from not less than six locations at downwind perimeter of the Site during construction operations.
 - b. Perform opacity monitoring at frequency required by applicable earthmoving/dust control permit, unless more-frequent monitoring is required by DEPARTMENT.
 4. Qualifications: Opacity monitoring observations shall be by person trained and experienced with the opacity monitoring method specified.
 5. Prepare and submit to DEPARTMENT written report of results of opacity monitoring and observations.
 6. No additional compensation or addition to the Contract Times will be authorized for opacity observations.

+ + END OF SECTION + +

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SECTION 01 45 29.23

TESTING LABORATORY SERVICES FURNISHED BY OWNER

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. DEPARTMENT will employ and pay for an independent testing laboratory to perform specified services. Testing laboratory selected will be subject to DEPARTMENT's acceptance.
2. CONTRACTOR shall pay for:
 - a. Tests not specifically indicated in the Contract Documents as being DEPARTMENT's responsibility.
 - b. Tests made for CONTRACTOR's convenience.
 - c. Repeat tests required because of CONTRACTOR's negligence or defective Work
 - d. Tests required after failure of two or more of the same test for the same item to comply with the Contract Documents, for tests initially paid for by DEPARTMENT.
3. Testing laboratory is not authorized to approve or accept any portion of the Work or defective Work; rescind, alter, or augment requirements of Contract Documents; and perform duties of CONTRACTOR.

1.2 REFERENCES

A. Standards referenced in this Section are:

1. ASTM E329, Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
2. ISO/IEC 17025, General Requirements for the Competence of Testing and Calibration Laboratories.
3. NIST SRM, Standard Reference Materials.

1.3 QUALITY ASSURANCE

A. Qualifications:

1. Testing Laboratory:
 - a. Testing laboratory will comply with applicable requirements of ASTM E329.
 - b. Testing laboratory will be authorized to operate in the same jurisdiction as the Site. Where applicable, laboratory will be certified by the authority having jurisdiction for the types of testing required.
 - c. Testing equipment used by laboratory will be calibrated at intervals of not more than twelve months by devices of accuracy traceable to one of the following: NIST SRM, ISO/IEC 17025, certified by state or local

bureau of weights and measures, or values of natural physical constants generally accepted in the engineering and scientific community.

1.4 SUBMITTALS

- A. Informational Submittals: Testing laboratory will submit the following:
 - 1. Quality Control Submittals and Test Reports: Promptly submit to DEPARTMENT and CONTRACTOR results of testing and inspections, in accordance with Section 01 33 00, Submittal Procedures, including:
 - a. Date issued.
 - b. Project title, number, and name of the Site.
 - c. Testing laboratory name and address.
 - d. Name and signature of inspector or person obtaining samples.
 - e. Date of inspection or sampling.
 - f. Record of temperature and weather.
 - g. Date of test.
 - h. Identification of material or item tested, and associated Specifications Section.
 - i. Location in the Project.
 - j. Type of inspection or test.
 - k. Results of tests and observations regarding compliance with the Contract Documents.
 - 2. Qualifications Statements: Upon CONTRACTOR's request, testing laboratory will submit the following:
 - a. Testing Laboratory:
 - 1) Qualifications statement indicating experience and facilities for tests required under the Contract Documents.
 - 2) Copy of report of inspection of facilities during most recent NIST inspection tour. Include memorandum of remedies of deficiencies reported during inspection.
 - 3) Copy of certificate of calibration for each instrument or measuring device proposed for use, by accredited calibration agency.

1.5 TESTING LABORATORY DUTIES

- A. DEPARTMENT-hired testing laboratory will:
 - 1. Cooperate with CONTRACTOR and DEPARTMENT and provide qualified personnel promptly when notified.
 - 2. Perform required inspections, sampling, and testing of materials and methods of construction; comply with applicable reference standards and the Contract Documents; and ascertain compliance with requirements of the Contract Documents.
 - 3. Promptly advise DEPARTMENT and CONTRACTOR in writing of irregularities and deficiencies in the Work observed during performance of services.
 - 4. Submit to DEPARTMENT and CONTRACTOR written reports of inspections and tests required by the Contract Documents.

5. Perform additional tests and services as required by DEPARTMENT or DEPARTMENT to verify compliance with the Contract Documents.

1.6 CONTRACTOR'S COORDINATION WITH TESTING LABORATORY

- A. CONTRACTOR shall perform and provide the following relative to DEPARTMENT-hired testing laboratory:
 1. Provide to testing laboratory representative samples of materials to be tested, in required quantities.
 2. Provide labor and facilities:
 - a. For access to the Work to be tested, and where required, to Suppliers' operations.
 - b. For obtaining and handling samples at the Site.
 - c. For facilitating inspections and tests.
 - d. For laboratory's exclusive use for storing and curing of test samples.
 - e. Forms for preparing concrete test beams and cylinders.
 3. Notify testing laboratory and DEPARTMENT sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.
 4. Arrange with testing laboratory and pay for additional services, sampling, and testing required for CONTRACTOR's convenience.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

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SECTION 01 55 26

MAINTENANCE AND PROTECTION OF TRAFFIC

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall keep all roads, streets, and traffic ways open for passage of traffic and pedestrians during the Work, unless otherwise approved by owner of the street, traffic way, or right-of-way, as applicable.
2. Construction traffic shall access the Site only via entrance(s) indicated on the drawings.
3. Unless otherwise shown or indicated, maintenance and protection of traffic shall be in accordance New York State Department of Transportation specifications.
4. In the event a permanent lane closure (lane closure lasting more than the duration of the site operational hours) is required at Lee Road to complete the work a temporary traffic light system will be required to operate during and after normal site operational hours to provide continuous traffic controls. Required traffic controls will be installed and maintained in accordance with the requirements of the City of Rochester.
5. Unless lane closures are only temporary during the normal site working hours, temporary traffic controls and flaggers will not be acceptable.

B. Coordination:

1. Coordinate with owner of the highway or street right-of-way, as applicable, for maintenance and protection of traffic requirements.
2. Give required advance notice to fire departments, police departments, and other emergency services as applicable of proposed construction operations.
3. Give reasonable notice to owners or tenants of private property who may be affected by construction operations. Give such notice not less than five days prior to when such property will or may be affected by construction operations.
4. Coordinate with requirements of the following:
 - a. Section 01 55 13, Access Roads and Parking Areas.
 - b. Section 01 71 33, Protection of the Work and Property, regarding temporary barriers.
 - c. Section 31 23 05, Excavation and Fill, for temporary barriers at excavations.

1.2 SUBMITTALS

A. Informational Submittals: Submit the following:

1. Procedure Submittals: Detailed plan, procedures, and sequencing for maintaining and protecting traffic in accordance with the Contract Documents

and requirements of authorities having jurisdiction. Include in the submittal the following:

- a. Traffic staging plan, and construction sequencing as applicable to maintain and protect traffic.
- b. Product data, including manufacturer's catalog information and specifications, for temporary signage, temporary signals, temporary illumination devices, and other products to be utilized in maintaining and protecting traffic.
- c. Indication of number and types of personnel dedicated to maintaining and protecting traffic during construction.
- d. Indication of plan acceptance from authorities having jurisdiction.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 GENERAL PROVISIONS

- A. When required to cross, obstruct, or temporarily close a street or traffic way, provide and maintain suitable bridges, detours, or other acceptable temporary expedient for the accommodation of traffic. Closings shall be for shortest duration practical, and passage shall be restored immediately after completion of filling and temporary paving or bridging.
- B. Temporary Control Devices:
 1. Provide temporary signs, signals, barricades, flares, lights and other equipment, services, and personnel required to regulate and protect traffic and warn of hazards.
 2. Such Work shall comply with requirements of DEPARTMENT and authorities having jurisdiction at the Site.
 3. Remove temporary equipment and facilities when no longer required and restore grounds to condition indicated in the Contract Documents; if not indicated, resort to pre-construction conditions.
- C. Keep accessible for use permanent facilities such as hydrants, valves, fire alarm boxes, postal boxes, delivery service boxes, and other facilities that may require access during construction.

3.2 TRAFFIC SIGNALS AND SIGNS

- A. Provide and operate temporary traffic controls and directional signals required to direct and maintain an orderly flow of traffic in areas under CONTRACTOR's control, and areas affected by construction operations.

- B. Provide temporary traffic controls and directional signs, mounted on temporary barriers or standard posts, at the following locations:
 - 1. Each change of direction of a roadway and at each crossroad.
 - 2. Detours and areas of hazard.
 - 3. Parking areas.
 - 4. Traffic entrance to and exit from each construction area.

3.3 TRAFFIC CONTROL PERSONNEL

- A. General:
 - 1. When construction operations encroach on traffic lanes, furnish qualified and suitably equipped traffic control personnel as required for regulating traffic and in accordance with requirements of authorities having jurisdiction.
 - 2. Traffic control personnel shall use appropriate flags or mobile signs.
 - 3. Equip traffic control personnel with appropriate personal protection equipment and suitable attire.
 - 4. Attire and conduct of traffic control personnel shall be appropriate and shall not create nuisances or distractions for traffic.

3.4 FLARES AND LIGHTS

- A. During periods of low visibility provide temporary flares and lights for the following:
 - 1. To clearly delineate traffic lanes, to guide traffic, and to warn of hazardous areas.
 - 2. For use by traffic control personnel directing traffic.
- B. Provide adequate illumination of critical traffic and parking areas.

3.5 PARKING CONTROL

- A. Control CONTRACTOR-related vehicular parking at the Site to preclude interfering with: traffic and parking, access by emergency vehicles, DEPARTMENT's and facility manager's operations, and construction operations. Provide temporary parking facilities for the public, as required because of construction operations.
- B. Control parking of construction and private vehicles at the Site as follows:
 - 1. Maintain free vehicular access to and through parking areas.
 - 2. Prohibit parking on or adjacent to access roads, and in non-designated areas.
 - 3. Construction vehicles shall possess current vehicle registration.
 - 4. Private vehicles shall park only in designated areas.

3.6 HAUL ROUTES

- A. Submit proposed haul routes to DEPARTMENT and obtain approval of authorities having jurisdiction.
- B. Confine construction traffic to designated haul routes.

- C. Provide temporary traffic controls at critical areas of haul routes to expedite traffic flow, and to minimize interference with normal traffic.

3.7 REMOVAL

- A. Maintain and protect traffic until Substantial Completion and at all times thereafter when CONTRACTOR is working at the Site. Provide maintenance and protection of traffic measures at the Site until no longer required due to the progress of the Work. When no longer required, completely remove maintenance and protection of traffic measures and restore the Site to condition required by the Contract Documents or, when not indicated in the Contract Documents, to pre-construction conditions.

+ + END OF SECTION + +

SECTION 01 71 33

PROTECTION OF THE WORK AND PROPERTY

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. This Section includes general requirements for safety and protection. This Section also includes requirements for barricades and warning signals, and protection of trees and plants, existing structures, floors, roofs, installed items, and landscaping.
2. CONTRACTOR shall be responsible for taking all precautions, providing all programs, and taking all actions necessary to protect personnel health and safety, and to protect the Work and all public and private property and facilities from damage.
3. To prevent damage, injury, or loss, CONTRACTOR's actions shall include the following:
 - a. Provide measures for safety of personnel at the Site, including workers engaged in the Work, delivery personnel, testing and inspection personnel, personnel of authorities having jurisdiction, other visitors to the Site, the public, DEPARTMENT's personnel, facility manager's personnel (if different from DEPARTMENT), and Resident Project Representative (if any).
 - b. Storing apparatus, materials, supplies, and equipment in an orderly, safe manner that does not unduly interfere with progress of the Work or work of other contractors, utility owners, and owners of transportation rights-of-way.
 - c. Providing suitable storage facilities for materials and equipment subject to damage or degradation by exposure to climate, temperature, theft, breakage, or other cause.
 - d. Placing upon the Work or any part thereof only loads consistent with the safety and integrity of that portion of the Work and existing construction.
 - e. Frequently removing and disposing of refuse, rubbish, scrap materials, and debris caused by CONTRACTOR's operations so that, at all times, the Site is safe, orderly, and workmanlike in appearance.
 - f. Providing temporary barricades, fencing, and guard rails around the following: openings, scaffolding, temporary stairs and ramps, around excavations, for elevated walkways, and other areas that may present a fall-hazard or hazard to vehicles.
4. Do not, except after written consent from proper parties, enter or occupy privately-owned property or premises with personnel, tools, materials or equipment, except on lands and easements provided by DEPARTMENT.
5. CONTRACTOR has full responsibility for preserving public and private property and facilities on and adjacent to the Site. Direct or indirect damage

done by, or on account of, any act, omission, neglect, or misconduct by CONTRACTOR in executing the Work, shall be remedied by CONTRACTOR, at his expense, to condition equal to that existing before damage was done.

6. DEPARTMENT May Remedy:
 - a. Should CONTRACTOR fail to protect and safeguard property and the Work after requests from DEPARTMENT, DEPARTMENT may implement measures to protect property and the Work.
 - b. Cost of such DEPARTMENT-implemented measures shall be paid by CONTRACTOR. DEPARTMENT may deduct from payments due CONTRACTOR such amounts as set-offs in accordance with the Contract Documents.
 - c. Such right, however, shall not result in any obligation by DEPARTMENT to continuously monitor or have responsibility for protection of property and the Work, which responsibility is exclusively CONTRACTOR's.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 BARRICADES AND WARNING SIGNALS

- A. Barricades and Warning Signals – General:
 1. Where the Work is performed on or adjacent to roadway, access road or driveway, right-of-way, or public place:
 - a. Provide temporary barricades, fences, lights, warning signs, danger signals, watchmen, and take other precautionary measures for protecting persons, property, and the Work.
 - b. Use appropriately colored and reflective barricades, or paint barricades accordingly, to be visible at night.
 - c. From sunset to sunrise, provide and maintain not less than one temporary light at each barricade.
 - d. Erect sufficient barricades to keep vehicles from being driven on or into Work under construction.
 - e. Furnish watchmen in sufficient numbers to protect the Work.
 2. Provide temporary barricades to protect personnel and property for Work not in or adjacent to transportation routes and vehicular travel areas, including indoor work, in accordance with Laws and Regulations.
 3. CONTRACTOR's responsibility for maintaining temporary barricades, signs, lights, and for providing watchmen shall continue until the Work is substantially complete in accordance with the Contract Documents, unless other provision for security and protection is agreed to by the parties. After Substantial Completion, protect Work and property during periods when final Work or corrective Work is underway.

- B. Temporary Fencing: Refer to Section 01 57 33, Security.

3.2 TREE AND PLANT PROTECTION

A. Tree and Plant Protection – General:

1. Protect existing trees, shrubs, and plants on or adjacent to the Site, shown or designated to remain in place, against unnecessary cutting, breaking, damage, or skinning of trunk, branches, bark, and roots.
2. Do not store materials or equipment or park construction equipment and vehicles within foliage drip lines.
3. In areas subject to traffic, provide temporary fencing or temporary barricades to protect trees and plants.
4. Open fires are not allowed onsite.
5. Within the limits of the Work, water trees and plants that are to remain to maintain their health during construction operations.
6. Cover exposed roots with burlap and keep such burlap continuously wet. Cover exposed roots with earth as soon as possible. Protect root systems from mechanical damage and damage by erosion, flooding, runoff, and noxious materials in solution.
7. If branches or trunks are damaged, prune branches immediately and protect cut or damaged areas with emulsified asphalt compounded specifically for horticultural use, in manner acceptable to DEPARTMENT.
8. When directed by DEPARTMENT, remove and dispose of at location away from the Site damaged trees and plants that die or suffer permanent injury, and replace each damaged tree or plant with specimen of equal or better species and quality.
9. Coordinate Work in this Article with the following Specifications:
 - a. Section 31 11 00, Clearing and Grubbing.

3.3 PROTECTION OF EXISTING STRUCTURES

A. Underground Facilities:

1. Underground Facilities known to DEPARTMENT, except water, gas, sewer, electric, and communications services to individual buildings and properties, are shown. Information shown for Underground Facilities is the best available to DEPARTMENT, but is not guaranteed to be correct or complete.
2. CONTRACTOR shall explore ahead of trenching and excavating Work and shall sufficiently uncover Underground Facilities that will or may interfere with the Work to determine their location, to prevent damage to Underground Facilities, and to prevent service interruption to structures and properties served by Underground Facilities. If CONTRACTOR damages an Underground Facility, CONTRACTOR shall restore it to its pre-construction condition, in accordance with requirements of the owner of the damaged facility and the Contract Documents.

3. Necessary changes in the location of the Work may be directed by DEPARTMENT to avoid Underground Facilities not shown or indicated on the Contract Documents.
 4. If permanent relocation of an existing Underground Facilities is required and is not otherwise shown or indicated in the Contract Documents, CONTRACTOR may be directed in writing to perform the required work. When such relocation Work results in a change in the Contract Price, Contract Times, the associated Contract modification procedures and payment for such Work shall be in accordance with the Contract Documents.
- B. Surface Structures:
1. Surface structures are existing buildings, structures, and other facilities at or above ground surface, including their foundations and any extension below ground surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage routes, exposed piping and utilities, poles, exposed wires, posts, signs, markers, curbs, walks, fencing, and other facilities visible at or above ground surface.
 2. Existing surface facilities, including but not limited to guard rails, posts, guard cables, signs, poles, markers, curbs, and fencing, that are temporarily removed to facilitate the Work shall be replaced and restored to their pre-construction condition at CONTRACTOR's expense.
- C. Protection of Underground Facilities and Surface Structures:
1. CONTRACTOR shall sustain in their places and protect from direct or indirect injury all Underground Facilities and surface structures located within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure or facility.
 2. Before proceeding with the Work of sustaining and supporting such structure or facility, CONTRACTOR shall satisfy DEPARTMENT that methods and procedures to be used have been approved by party owning same.
 3. CONTRACTOR shall bear all risks attending the presence or proximity of all Underground Facilities and surface structures within or adjacent to limits of the Work, in accordance with the Contract Documents.
 4. CONTRACTOR shall be responsible for damage and expense for direct or indirect injury, caused by CONTRACTOR's activities, to structures and facilities. CONTRACTOR shall promptly repair damage caused by CONTRACTOR's activities, to the satisfaction of owner of damaged structure or facility.
 5. Protection of Underground Facilities Under Roads and Parking Areas: Provide temporary, heavy-duty steel roadway plates to protect existing manholes, handholes, valve boxes, vaults, and other Underground Facilities near to or visible at the ground surface.

3.4 PROTECTION OF FLOORS AND ROOFS

- A. Protection of Floors and Roofs – General:

1. Use proper protective covering when moving equipment, handling materials or other loads, when painting, handling mortar or grout, and when cleaning walls, ceilings, or structure contents.
2. Use metal pans to collect oil and cuttings from piping, conduits, and rod threading machines, and under metal cutting machines.
3. Do not load concrete floors less than 28 days old without written permission of DEPARTMENT. Do not load floors, roofs, or slabs in excess of design loading.
4. Do not load roofs without written permission of DEPARTMENT.
5. Restrict access to roofs, and keep CONTRACTOR personnel off existing roofs, except as required for the Work.
6. If access to roofs is required, roofing, parapets, openings, and all other construction on or adjacent to roof shall be protected with suitable plywood or other acceptable means.

3.5 PROTECTION OF INSTALLED MATERIALS, EQUIPMENT, AND LANDSCAPING

- A. Protect installed Work to prevent damage from subsequent operations. Remove protective items when no longer needed, prior to Substantial Completion of the Work.
- B. Control traffic to prevent damage to equipment, materials, and surfaces.
- C. Coverings:
 1. Provide temporary coverings to protect materials and equipment from damage.
 2. Cover projections, wall corners and jambs, sills, and soffits of openings, in areas used for traffic and for passage of materials and equipment in subsequent work.

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SECTION 02 41 00

DEMOLITION

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified and required for demolition, removal, and disposal Work.
2. The Work under this Section includes, but is not necessarily limited to:
 - a. Demolition and removal of existing materials and equipment as shown or indicated in the Contract Documents. The Work includes demolition of structural concrete, foundations, paving, curbs, sidewalks, gutters, fencing and similar existing facilities.
 - b. Demolition and removal of all Underground Facilities underneath, and above-grade piping and utilities in, the building(s) and structures shown or indicated for demolition, unless the Underground Facilities or above-grade facilities are shown or indicated as to remain.
 - c. Building utilities have been previously disconnected from the utility as part of the building demolition completed by others.
3. Demolitions and removals specified under other Sections shall comply with requirements of this Section.
4. Perform demolition Work within areas shown or indicated.
5. Pay all costs associated with transporting and, as applicable, disposing of materials and equipment resulting from demolition.

B. Coordination:

1. Review procedures under this and other Sections and coordinate the Work that will be performed with or before demolition and removals.
2. Upon Notice of Intent to Award, CONTRACTOR shall provide all necessary information needed to support variance determination(s) with NYSDOL.

C. Related Sections:

1. Section 02 51 41, Off-Site Transportation and Disposal.

1.2 QUALITY ASSURANCE

A. Qualifications:

1. Electrical Removals: Entity and personnel performing electrical removals shall be electrician legally qualified to perform electrical construction and electrical work in the jurisdiction where the Site is located.

B. Regulatory Requirements:

1. Demolition, removal, and disposal Work shall be in accordance with 29 CFR 1926.850 through 29 CFR 1926.860 (Subpart T - Demolition), and all other Laws and Regulations.
2. Comply with requirements of authorities having jurisdiction.
3. Comply with 12 NYCRR Part 56.

1.3 SUBMITTALS

A. Informational Submittals: Submit the following:

1. Procedure Submittals:
 - a. Final Demolition and Removal Plan: As part of the Remedial Action Work Plan, submit an acceptable plan for demolition and removal Work, including:
 - 1) Plan for coordinating shut-offs, capping, temporary services, and continuing utility services.
 - 2) Other proposed procedures as applicable.
 - 3) Equipment proposed for use in demolition operations.
 - 4) Recycling/disposal facility(ies) proposed, including facility owner, facility name, location, and processes. Include copy of appropriate permits and licenses, and compliance status.
 - 5) Planned demolition operating sequences.
 - 6) Detailed schedule of demolition Work in accordance with the accepted Process Schedule.
2. Notification of Intended Demolition Start: Submit in accordance with Paragraph 3.1.A of this Section.
3. Qualifications Statements:
 - a. Name and qualifications of entity performing electrical removals, including copy of licenses required by authorities having jurisdiction.
 - b. Name and qualifications of entity performing plumbing removals, including copy of licenses required by authorities having jurisdiction.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 PREPARATION

A. Notification:

1. At least 48 hours prior to commencing demolition or removal, notify DEPARTMENT in writing of planned start of demolition Work. Do not start removals without permission of DEPARTMENT.

B. Protection of Surrounding Areas and Facilities:

1. Perform demolition and removal Work in manner that prevents damage and injury to property, structures, occupants, the public, and facilities. Do not

- interfere with use of, and free and safe access to and from, structures and properties.
 - 2. Closing or obstructing of roads, drives, sidewalks, and passageways adjacent to the Work is not allowed unless indicated otherwise in the Contract Documents. Conduct the Work with minimum interference to vehicular and pedestrian traffic.
 - 3. Provide temporary barriers, lighting, sidewalk sheds, and other necessary protection.
 - 4. Repair damage to facilities that are to remain.
- C. Existing Utilities: In addition to requirements of the Division 01 Specifications, do the following:
- 1. Should uncharted or incorrectly charted Underground Facilities be encountered, CONTRACTOR shall notify the DEPARTMENT. Cooperate with utility owners in keeping adjacent services and facilities in operation.
 - 2. Sanitary Sewer: Before proceeding with demolition, locate and cap all sanitary sewer lines and service laterals discharging from the site except if CONTRACTOR intends to utilize an existing lateral for water treatment system discharge.
 - 3. Storm Water: Before proceeding with demolition, locate and cap all storm sewer lines and service laterals discharging from the site.
 - 4. Water Piping: Before proceeding with demolition, locate and cap all potable and non-potable waterlines and service laterals serving the building or structure being demolished.
 - 5. Other Utilities: Before proceeding with demolition, locate and cap as required all other utilities, such as fuel and gas; heating, ventilating, and air conditioning; electric; and communications; and service laterals serving the building or structure being demolished.
 - 6. Shutdown of utility services shall be coordinated by CONTRACTOR, assisted by DEPARTMENT as required relative to contacting utility owners.

3.2 DEMOLITION – GENERAL

- A. Locate construction equipment used for demolition Work and remove demolished materials and equipment to avoid imposing excessive loading on supporting and adjacent walls, floors, framing, facilities, and Underground Facilities.
- B. Pollution Controls:
 - 1. Use water sprinkling, temporary enclosures, and other suitable methods to limit emissions of dust and dirt to lowest practical level. Comply with Section 01 51 05, Temporary Utilities and Controls, and Laws and Regulations.
 - 2. Do not use water when water may create hazardous or objectionable conditions such as icing, flooding, or pollution.
 - 3. Clean adjacent structures, facilities, properties, and improvements of dust, dirt, and debris caused by demolition Work.
- C. Explosives:

1. Do not bring explosives to the Site or use explosives without written consent of DEPARTMENT and authorities having jurisdiction. Obtaining such written consent will not relieve CONTRACTOR of responsibility for injury or damage caused by CONTRACTOR's blasting operations.
 2. Perform blasting, when permitted, in compliance with Laws and Regulations, and blasting plan accepted by DEPARTMENT.
- D. Building or Structure Demolition:
1. Unless otherwise approved by DEPARTMENT, proceed with demolition from top of building or structure to the ground. Complete demolition Work above each floor or tier before disturbing supporting members of lower levels.
 2. Demolish concrete and masonry in small sections.
 3. Remove structural framing members and lower to ground using hoists, cranes, or other suitable methods. Do not throw or drop to the ground.
 4. Break up and remove foundations and slabs-on-grade unless otherwise shown or indicated as remaining in place.
- E. Demolition of Site Improvements:
1. Pavement, Sidewalks, Curbs, and Gutters: Demolition of asphalt or concrete pavement, sidewalks, curbs, and gutters, as applicable, shall terminate at cut edges. Edges shall be linear and have a vertical cut face.
 2. Fencing, Guardrails, and Bollards: Remove to the limits shown or indicated on the Drawings. Completely remove below-grade posts and concrete.
 3. Manholes, Vaults, Chambers, and Handholes: Remove to the limits shown or indicated on the Drawings. If existing manholes are to remain, protect manholes from damage.
 4. Underground Facilities Other than Manholes, Vaults, Chambers, and Handholes: Remove to the extent shown or indicated on the Drawings. Unless otherwise shown or indicated, cap ends of piping to remain in place in accordance with the "Mechanical Removals" Article in this Section.
 5. Landscaping: Comply with Section 33 11 00, Clearing and Grubbing.
- F. Salvage and Ownership:
1. Refer to Section 01 11 13, Summary of Work, for requirements on salvage, ownership, and handling of equipment and materials removed during demolition and removal Work.
 2. Materials and equipment to remain DEPARTMENT's property shall be carefully removed and appropriately handled by CONTRACTOR to avoid damage and invalidation of warranties in effect and shall be cleaned and stored at the Site (or other site specified in the Contract Documents) at place designated by DEPARTMENT.
- G. Finishing of Surfaces Exposed by Removals: Unless otherwise shown or indicated in the Contract Documents, surfaces of walls, floors, ceilings, and other areas exposed by removals, and that will remain as finished surfaces, shall be repaired and re-finished with materials that match existing adjacent surface, or as otherwise approved by DEPARTMENT.

3.3 STRUCTURAL REMOVALS

- A. Remove structures to lines and grades shown or indicated, unless otherwise directed by DEPARTMENT.
- B. Recycling and Reuse of Demolition Materials:
 - 1. All concrete, brick, tile, masonry, roofing materials, reinforcing steel, structural metals, miscellaneous metals, plaster, wire mesh, and other items contained in or upon building or structure to be demolished shall be removed, transported, and disposed of at a permitted facility, unless otherwise approved by DEPARTMENT.
 - 2. Do not use demolished materials as fill or backfill adjacent to structures, in pipeline trenches, or as subbase under structures or pavement.
- C. After removing concrete and masonry walls or portions thereof, slabs, and similar construction that ties in to the Work or to existing construction, neatly repair the junction point to leave exposed only finished edges and finished surfaces.
- D. Where parts of existing structures are to remain in service following demolition, remove the portions shown or indicated for removal, repair damage, and leave the building or structure in proper condition for the intended use.
 - 1. Remove concrete and masonry to the lines shown or indicated by sawing, drilling, chipping, and other suitable methods. Leave the resulting surfaces true and even, with sharp, straight corners that will result in neat joints with new construction and be satisfactory for the purpose intended.
 - 2. Do not damage reinforcing bars beyond the area of concrete and masonry removal. Do not saw-cut beyond the area to be removed.
 - 3. Reinforcing bars that are exposed at surfaces of removed concrete and masonry that will not be covered with new concrete or masonry shall be removed to 1.5 inches below the final surface. Repair the resulting hole, with repair mortar for concrete and grout for masonry, to be flush with the surface.
- E. Where equipment or material anchored to concrete or masonry are removed and anchors are not to be re-used, cut anchor flush with the surface.
- F. Jambs, sills and heads of windows, passageways, doors, or other openings (as applicable) cut-in to the Work or to existing construction shall be dressed with masonry, concrete, or metal to provide smooth, finished appearance.
- G. Where anchoring materials, including bolts, nuts, hangers, welds, and reinforcing steel, are required to attach the Work to existing construction, provide such materials under this Section, unless specified elsewhere in the Contract Documents.

3.4 MECHANICAL REMOVALS

- A. Mechanical demolition and removal Work includes dismantling and removing existing piping, ductwork, pumps, equipment, tanks, and appurtenances as shown,

indicated, and required for completion of the Work. Mechanical removals include cutting and capping as required.

B. Demolition and Removals of Piping, Ductwork, and Similar Items:

1. Purge piping and tanks (as applicable) of chemicals or fuel (as applicable) and make safe for removal and capping. Remove to the extent shown or indicated existing process, water, waste and vent, chemical, gas, fuel, and other piping. Remove piping to the nearest solid piping support and provide caps on ends of remaining piping. Where piping to be demolished passes through existing walls to remain, cut off and cap pipe on each side of the wall.
2. Caps, Closures, Blind Flanges, and Plugs:
 - a. Provide closure pieces, such as blind flanges and caps, where shown or required to complete the Work.
 - b. Where used in this Section, the term “cap” means the appropriate type closure for the piping or ductwork being closed, including caps, blind flanges, and other closures.
 - c. Caps shall be compatible with the piping or ductwork to which the cap is attached, fluid-tight and gastight, and appropriate for the fluid or gas conveyed in the pipe or duct.
 - d. Unless otherwise shown or indicated, caps shall be mechanically fastened, fused, or welded to pipe or duct. Plug piping with means other than specified in this Section only when so shown or indicated in the Contractor Documents or when allowed by DEPARTMENT.
3. When Underground Facilities are altered or removed, properly cut and cap piping left in place, unless otherwise shown or indicated.
4. Remove waste and vent piping, and ductwork to extent shown and cap as required. Where demolished vent piping, stacks, and ductwork passes through existing roofing, patch the roof with the same or similar materials. Completed patch shall be watertight and comply with roofing manufacturer’s recommendations.
5. Modifications to potable water piping and other plumbing and heating system work shall comply with Laws and Regulations. All portions of potable water system that have been modified or opened shall be hydrostatically tested and disinfected in accordance with the Contract Documents, and Laws and Regulations. Hydrostatically test other, normally-pressurized, plumbing piping and heating piping.

C. Equipment Demolition and Removals:

1. To the extent shown or indicated, remove existing process equipment; pumps; storage tanks; hoisting and conveying equipment; heating, ventilating, and air conditioning equipment; generators; and other equipment.
2. Where required, disassemble equipment to avoid imposing excessive loading on supporting walls, floors, framing, facilities, and Underground Facilities. Disassemble equipment as required for access through and egress from building or structure. Disassembly shall comply with Laws and Regulations. Provide required means to remove equipment from building or structure.
3. Remove control panels, operator stations, and instruments associated with equipment being removed, unless shown or indicated otherwise.

4. Remove fuel appurtenances as applicable, including fuel storage tanks. Dispose of tank contents in accordance with Laws and Regulations.
5. Remove equipment supports as applicable, anchorages, base, grout, and piping. Remove anchorage systems in accordance with the "Structural Removals" Article in this Section. Remove small-diameter piping back to header unless otherwise indicated.
6. Remove access platforms, ladders, and stairs related to equipment being removed, unless otherwise shown or indicated.

3.5 ELECTRICAL REMOVALS

- A. Electrical demolition Work includes removing existing transformers, distribution switchboards, control panels, motors, starters, conduit and raceways, cabling, poles and overhead cabling, panelboards, lighting fixtures, switches, and miscellaneous electrical equipment, as shown, specified, or required.
- B. Remove existing electrical equipment and fixtures to avoid damaging systems to remain, to keep existing systems in operation, and to maintain integrity of grounding systems.
- C. Remove or modify motor control centers and switchgear as shown or indicated. Modified openings shall be cut square and dressed smooth to dimensions required for installation of equipment.
- D. Disconnect and remove motors, control panels, and other electrical gear where shown or indicated. Motors, microprocessors and electronics, other electrical gear to be reused shall be stored in accordance with Section 01 66 00, Product Storage and Handling Requirements.
- E. Cables in conduits to be removed shall be removed back to the power source or control panel, unless otherwise shown or indicated. Verify the function of each cable before disconnecting and removing.
- F. Conduits, raceways, and cabling shall be removed where shown or indicated. Abandoned conduits concealed in floor, ceiling slabs, or in walls shall be cut flush with the slab or wall (as applicable) at point of entrance, suitably capped, and the area repaired in a flush, smooth manner acceptable to DEPARTMENT. Exposed conduits, junction boxes, other electrical appurtenances, and their supports shall be disassembled and removed. Repair all areas of the Work to prevent rusting on exposed surfaces.
- G. Conduits in Underground Facilities not scheduled for reuse shall be suitably capped watertight where each enters building or structure to remain.
- H. Where shown or indicated, remove direct burial cable. Openings in buildings for entrance of direct burial cable shall be patched with repair mortar or other material approved by DEPARTMENT for this purpose and made watertight.

- I. Existing poles and overhead cables shall be removed or abandoned as shown and specified. Existing substation(s) and poles owned by electric utility will be removed by the electric utility. Completely remove from the Site poles not owned by electric utility and shown or indicated for removal. Make necessary arrangements with electric utility for removal of utility company's transformers and metering equipment after new electrical system has been installed and energized.
- J. Lighting fixtures, wall switches, receptacles, starters, and other miscellaneous electrical equipment, not designated as remaining as DEPARTMENT's property, shall be removed and properly disposed off-Site as required.

3.6 DISPOSAL OF DEMOLITION DEBRIS

- A. Remove from the Site all debris, waste, rubbish, and material resulting from demolition operations and equipment used in demolition Work at a permitted facility.
- B. Transportation and Disposal:
 - 1. Non-hazardous Material: Properly transport and dispose of non-hazardous demolition debris at appropriate landfill or other suitable location, in accordance with Laws and Regulations. Non-hazardous material does not contain Asbestos, PCBs, Petroleum, Hazardous Waste, Radioactive Material, or other material designated as hazardous in Laws and Regulations.
 - 2. Hazardous Material: When handling and disposal of hazardous materials is included in the Work, properly transport and dispose of hazardous materials in accordance with the Contract Documents and Laws and Regulations.
- C. Submit to DEPARTMENT information required in this Section on proposed facility(ies) where demolition material will be recycled. Upon request, DEPARTMENT or DEPARTMENT, shall be allowed to visit recycling facility(ies) to verify adequacy and compliance status. During such visits, recycling facility operator shall cooperate and assist DEPARTMENT.

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SECTION 02 51 40

EXCAVATION, REMOVAL AND HANDLING OF CONTAMINATED MATERIAL

PART 1 –GENERAL

1.1 SCOPE OF WORK

- A. The contaminants of concern in soil and groundwater are semi volatile and volatile organic compounds in soils. The presence of former underground storage tanks and past site activities could also result in the presence of petroleum and petroleum byproducts.
- B. CONTRACTOR shall excavate, handle and dispose of contaminated building foundation debris and soil as shown, specified and required to complete the work. The work shall consist of disposal of building foundation demolition debris and contaminated soil.
- C. Excavation limits are depicted on the Drawings.
- D. Related Work Specified Elsewhere:
 - 1. Division 01 – General Requirements.
 - 2. Division 31 – Earthworks.
- E. All sheeting and shoring, and other work necessary to complete the required excavation work shall be conducted by the CONTRACTOR in accordance with these Specifications.
- F. Work shall follow the sequence of construction presented in the CONTRACTOR'S approved Work Plan.

1.2 SUBMITTALS

- A. Submit the following in accordance with Section 01 71 23, Field Engineering:
 - 1. Initial Site Survey
 - 2. Intermediate Site Survey
 - 3. Record Drawings
- B. Shop Drawings:
 - 1. Submit plans of open cut excavations showing side slopes and limits of the excavation at grade, as applicable, where not shown on the Drawings.

1.3 QUALITY ASSURANCE

- A. Permits and Regulations: CONTRACTOR shall perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.
- B. Design Criteria:
 - 1. Temporary sheeting and shoring systems provided by the CONTRACTOR shall be certified by a NYS Professional Engineer and submitted to the DEPARTMENT for review prior to use.
 - 2. CONTRACTOR shall be wholly responsible for installing and operating the sheeting and shoring system in accordance with the certified design.
- C. Regulatory Compliance:
 - 1. Source Area Excavation soil are assumed to be F-002 listed hazardous waste for 50% of the volume.
 - 2. A contained-in determination is being prepared and is assumed will allow 50% of the volume to be handled as non-hazardous.
 - 3. Soil management need to comply with applicable State and Federal regulations related to the handling, stockpiling, manifesting, etc. of the soils.

1.4 JOB CONDITIONS

- A. Existing Structures:
 - 1. Shown on the Drawings are certain utilities and surface and underground structures located on or adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRACTOR. CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures and utilities. They shall be supported and protected from injury by the CONTRACTOR. If they are broken or injured, they shall be restored immediately by the CONTRACTOR at no additional cost to the DEPARTMENT.
 - 2. Prior to execution of the Work, the CONTRACTOR shall check and verify governing dimensions and elevations. The CONTRACTOR and DEPARTMENT shall jointly inspect the condition of adjoining structures. Photographs and records shall be made of any prior settlement or cracking of structures, pavements, and the like, that may become the subject of possible damage claims.
- B. Existing Utilities:
 - 1. The CONTRACTOR's attention is directed to the existing utilities running throughout the work. The CONTRACTOR is required to take any and all precautions necessary to locate, support and protect these utilities during construction. All costs associated with protecting, supporting, locating,

digging test pits, etc., of all utilities or process pipelines shall be included in the prices bid for all work.

2. The locations of all utilities shown on the contract drawings are based on available information in the vicinity of the proposed work areas and are not guaranteed to be complete or accurate. The CONTRACTOR shall obtain utility markouts on all public and private properties in accordance with all local and state requirements where work under this contract is to be performed. Prior to any excavation or construction, the CONTRACTOR shall notify the DEPARTMENT, all utility companies and applicable agencies and request a markout of their lines and properties in the field in the area of the proposed work. In addition, on the project site (outside of public right-of-way), the CONTRACTOR shall provide the services of an independent utility markout service subcontractor qualified to locate and mark out all utilities in the vicinity of the work using the appropriate equipment and methods available prior to construction. The subcontractor shall survey (location/elevation) and prepare a utilities location as-built drawing for use by the CONTRACTOR in performance of the work under this contract.
3. Prior to any demolition and/or excavation, in addition to utility location and markouts performed by the CONTRACTOR, local and state required services and the independent markout service subcontractor, the CONTRACTOR shall accurately locate existing utilities by probing test holes and excavating test pits where existing underground utilities are known to exist in the vicinity of the new work and at maximum intervals of 25 feet along the route or within the area of the proposed work. The CONTRACTOR shall survey (location/elevation) and prepare an as-built drawing of all underground utilities encountered while constructing test pits and/or test hole probes for use in performance of the work under this contract. The CONTRACTOR shall backfill/restore the holes and pits and mark out the existing utilities and take extreme caution against damaging the utilities during excavation or sheeting installation.
4. Work shall include, in addition to constructing test probes/pits, excavating and backfill, temporary sheeting, compacting and site restoration.
5. Schedules for maintenance of utility markouts on public and private property shall be consistent with New York State law throughout the duration of the Contract.
6. During demolition/excavation, the CONTRACTOR shall locate each utility by hand digging methods prior to the use of mechanical excavation equipment. During demolition/excavation, if the CONTRACTOR encounters evidence of suspected unmarked utilities, such as magnetic tape or other underground markers, the CONTRACTOR shall promptly determine the location of the suspected utility, if any, before proceeding with the work. The CONTRACTOR shall cooperate with the DEPARTMENT and the utility companies involved to avoid delay or interference of service normally performed by their lines and properties.

7. The CONTRACTOR shall take extreme caution against damaging utilities during demolition, excavation, sheeting and backfilling, during construction of test probes and test pits and while performing the work required under this Contract.
8. The CONTRACTOR shall be responsible for all costs associated with pre-project construction utility survey(s)/markout(s), the construction of the test holes and test pit work, and utility as built for this project, as well as protection and hand digging operations to verify location of all utilities during construction.
9. Should uncharted or incorrectly charted piping or utilities be encountered during excavation, consult the DEPARTMENT in keeping respective services and facilities in operation. Repair damaged utilities to the satisfaction of the DEPARTMENT.
10. Do not interrupt existing utilities, except when permitted in writing by DEPARTMENT.

C. Protection of Persons and Property:

1. Barricade open excavations greater than 2 feet in depth occurring as part of this Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
2. Protect structures, utilities, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by CONTRACTOR'S operations.
3. Consult DEPARTMENT and obtain his/her approval before removing or disturbing pipes, structures, or other facilities that are encountered on the line of the excavation.
4. Structures, utilities, sidewalks, pavements and other facilities removed or disturbed shall be replaced to their original condition, unless otherwise shown, specified or directed.

D. Dust Control: CONTRACTOR shall conduct all of his/her operations and maintain the area of his/her activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust. In addition, CONTRACTOR shall be responsible for controlling dust caused by his/her operation of vehicles and equipment, clearing or for any reason whatever.

E. Odor Control: As an odor abatement measure, cover, at the end of each work day all areas of organic or odorous material which were exposed during excavation with a minimum 6-in and a maximum 24-inch deep layer of clean fill. Excavated organic or odorous material shall be immediately removed off-site and shall not be stockpiled on-site. Such material shall be properly characterized and disposed of off-site in accordance with all applicable federal, state and local regulations.

F. Roadways and Walks: Unless otherwise approved by the DEPARTMENT, excavated material and materials of construction shall be so deposited, and the Work shall be so conducted, as to leave open and free for vehicular traffic a

roadway not less than 10 feet in width. All hydrants, valves, and other facilities which may require access during construction shall be kept accessible for use. During the progress of the Work, CONTRACTOR shall maintain such roadways in satisfactory condition and the Work shall at all times be so conducted as to cause a minimum of inconvenience to the occupants of the facility and pedestrians.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 INSPECTION

- A. CONTRACTOR shall provide DEPARTMENT with sufficient time and means to examine the areas and conditions under which excavating, filling and grading are to be performed. Work shall not proceed until all unsatisfactory conditions have been corrected in a manner acceptable to the DEPARTMENT.

3.2 DEMOLITION AND EXCAVATION

- A. General:
 - 1. CONTRACTOR shall perform all demolition and excavation required to complete the Work as shown and specified. It shall include all materials such as building debris, earth, sand, clay, gravel, hardpan, boulders, organic materials, rock, rubbish and all other materials within the excavation limits.
 - 2. Excavations shall be open type, shored and braced where necessary to prevent injury to workmen and to new and existing structures or pipelines.
 - 3. All excavations shall be made in the dry.
 - 4. Temporary barricades shall be installed for all excavations greater than 2 feet in depth.
 - 5. 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 remediation shall be decontaminated in accordance with the CONTRACTOR'S Health and Safety Plan.
- B. Contaminated Materials:
 - 1. Demolition/excavation shall be made to the grades and extents shown on the Drawings. Demolition/excavation shall be performed in a manner that will limit spills and the potential for contaminated material to be mixed with uncontaminated material. A log describing visible signs of contamination encountered shall be maintained for each area of demolition and/or excavation.
 - 2. Excavation logs shall be prepared in accordance with ASTM D5434.

3. Excavation shall be accomplished by methods which preserve the undisturbed state of subgrade soils.
4. Equipment shall be satisfactory for carrying out the work in accordance with the Specifications. Earth shall not be plowed, scraped, or dug with machines so near to the finished subgrade as to result in excavation of, or disturbance of material below grade.
5. When excavation has reached final depths, the DEPARTMENT shall be notified and will inspect conditions. If materials and conditions are not satisfactory to the DEPARTMENT, the DEPARTMENT will issue instructions as to the procedures for correction of the unsatisfactory condition.
6. Documentation sampling shall be required as outlined the Section 01 45 29.13, Testing Laboratory Services Furnished by Contractor. Backfill and compaction shall not be conducted in any excavation until the limits of the excavation and the locations of the documentation samples are surveyed and are approved by the DEPARTMENT.
7. Groundwater or standing water in excavations or open basement areas must be removed, treated and properly disposed prior to the collection of documentation samples. Standing water from precipitation events in the excavation must be removed and disposed of appropriately at the CONTRACTOR'S own expense.
8. During final excavation to subgrade level, take precautions required to prevent disturbance of material.

C. Unsuitable Excavation:

1. If any over excavation occurs through error of the CONTRACTOR or for the CONTRACTOR 'S convenience, the over-excavated material shall be disposed of off-site, in accordance with all applicable federal, state and local laws and regulations, as well as the requirements of these Contract Documents. The over-excavation shall be refilled at the CONTRACTOR'S expense with concrete, select fill or other material satisfactory to the DEPARTMENT.
2. If CONTRACTOR fails to properly dewater the excavation or trench or disturbs the subgrade or otherwise fails or neglects to conduct the excavation work in a manner that provides surface of subgrade in proper condition for construction, the CONTRACTOR shall remove all disturbed material and replace it with concrete, select fill, or other approved material at his own expense. The condition of the subgrade shall meet with the approval of the DEPARTMENT before any work is placed thereon.

3.3 SHEETING, SHORING AND BRACING

- A. Refer to Section 31 23 05, Excavation and Fill.

3.4 CONTAMINATED MATERIALS STORAGE

- A. Demolition debris and excavated material shall be placed in temporary storage or taken off-site for disposal immediately after excavation. Temporary storage areas shall be located within the property line of the Site and shall be delineated by the CONTRACTOR in the approved Work Plan. Storage units shall be in good condition and constructed of materials that are compatible with the material or liquid to be stored. Each storage unit shall be clearly labeled with an identification number and a written log shall be kept to track the source of contaminated material in each unit.
- B. Storage of material outside the designated soil staging areas is prohibited without prior written approval by the DEPARTMENT.
- C. The following methods of storage are acceptable:
 - 1. Stockpiles
 - a. Demolition debris and/or excavated materials shall be stockpiled in the areas noted in the CONTRACTOR'S Work Plan. Stockpiles shall be located 10 feet or greater from property lines.
 - b. Stockpiles shall be constructed to isolate stored contaminated material from the environment. The maximum stockpile height shall be 10 feet. Each stockpile shall be labeled with an identification number identifying the material stored within the stockpile.
 - c. Diversion measures shall be employed, as depicted on the Drawings, to prevent storm water run-on and run-off.
 - d. An LLDPE geomembrane liner and cover shall be used to prevent cross-contamination of existing ground surface, precipitation from entering the stockpile and emissions and dust from escaping. The minimum thickness of the LLDPE geomembrane liner shall be 20 mils. Control measures such as wetting the stockpile surfaces shall be employed to suppress dust. Only potable water shall be used for this purpose.
 - 2. Roll-off Units
 - a. Roll-off units used to store contaminated material shall be watertight. A cover shall be placed over the units to prevent precipitation from contacting the stored material. Liquid which collects inside the units shall be removed and disposed of in accordance with all applicable federal, state and local laws and regulations.
- D. Storage and handling of hazardous waste contaminated soil must comply with all applicable NYSDEC hazardous waste regulations (6 NYCRR Part 371-376).
- E. Spillage shall be minimized and contained for later disposal in accordance with all federal, state and local regulations.

++ END OF SECTION ++

SECTION 02 51 41

OFF-SITE TRANSPORTATION AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes procedures to transport and dispose all items specified for off-site disposal.
- B. CONTRACTOR generated hazardous and non-hazardous waste shall be confined to contamination reduction or exclusion zones until transported off-site for proper disposal.
- C. Remedial work which generates hazardous waste from inactive hazardous waste disposal sites (defined at 27-1301 of the Environmental Conservation Law) are not subject to the special assessment "tax" because of the exemption found at 27-0923 (3) (c) of the Environmental Conservation Law. The CONTRACTOR remains responsible for paying any local and county taxes which might be applicable to the disposal of wastes from the remedial work.

1.2 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only:
 - 1. Code of Federal Regulations (CFR).
 - a. 40 CFR 262 Standards Applicable to Generators of Hazardous Waste
 - b. 49 CFR 172 Tables, Hazardous Material Communication Requirements, and Emergency Response Information Requirements.
 - 2. Codes, Rules, and Regulations of the State of New York (NYCRR):
 - a. 6 NYCRR Part 364 Waste Transportation Permits.
 - b. 6 NYCRR Part 372 Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities.

1.3 SUBMITTALS

- A. Transportation Plan:
 - 1. Submit six copies of a detailed Transportation Plan as part of the Remedial Action Work Plan in accordance with Section 01 33 00, Submittal Procedures.
 - 2. The Transportation Plan must be approved before materials are transported off site.
- B. Records:
 - 1. Written acceptance of waste profile from TSDF.
 - 2. Hazardous Waste Manifests.

3. Decontamination Certificates.
4. Submit written confirmation from TSDF of acceptance of waste.
5. Profile sampling results.
6. Manifests after permanent disposal.
7. Certificates of disposal for non-hazardous waste.
8. Signed bills of lading for salvaged or recycled materials.
9. An updated waste tracking summary shall be provided on a monthly basis with the CONTRACTOR's application of payment.

1.4 PERMITS AND REGULATIONS

- A. Comply with all municipal, county, state, and federal regulations regarding transportation of hazardous and non-hazardous materials. These include:
 1. Trucks used for transportation of material for disposal off site shall be permitted pursuant to 6 NYCRR Part 364.
 2. Vehicle operator possession of a commercial driver's license with hazardous materials endorsement (if applicable).
 3. Registration of vehicle as a hazardous waste carrier (if applicable).
 4. Utilization of shipping papers or hazardous waste manifest (40 CFR 262 and 6 NYCRR Part 372).
 5. Proper marking and placarding of vehicles in accordance with 49 CFR.
 6. Placement of emergency response procedures and emergency telephone numbers in vehicle, and operator familiarity with emergency response procedures.
 7. Compliance with load, height, and weight regulations.

1.5 DISPOSAL FACILITIES

- A. Facilities must have valid Federal/State permits appropriate for each type of waste and/or waste disposal facility. Permits shall remain valid during the entire project period.
- B. Facilities must be in good legal standing with no significant violations, corrective actions, or other environmental conditions that could affect satisfactory operation.
- C. The disposal facility must comply with policies adopted by the DEPARTMENT with respect to off-site disposal of waste.
- D. Prior to shipment of hazardous wastes off the site, the CONTRACTOR shall confirm by written communication from the designated TSDF that it is authorized, has the capacity, and will provide or assure that the ultimate disposal method is followed for the particular hazardous waste on the manifest.
- E. RCRA Wastes:
 1. The facility must have an RCRA Permit or RCRA Interim Status for RCRA wastes. The EPA ID number for the site is: NYD013599261.
 2. The facility must not have any significant RCRA violations or other environmental conditions that could affect its satisfactory operation:

- a. Significant violations include Class 1 RCRA violations as defined in EPA's RCRA Enforcement Response Policy dated December 1984, including but not limited to groundwater, closure, post closure, and financial violations.
 - b. Other environmental conditions include those conditions affecting the satisfactory operation of the facility and violations of state and/or federal laws other than RCRA.
 - c. Under limited circumstances, EPA Administrator may allow disposal of hazardous substances at a RCRA facility having significant RCRA violations or other environmental conditions affecting satisfactory operation, providing that the facility owner or operator has entered into a consent order or decree to correct the problems, and disposal only occurs within the facility at a new or existing unit that is in compliance with RCRA requirements.
3. Landfill disposal must be in a unit meeting applicable RCRA minimum technical requirements:
 - a. Current RCRA minimum technical requirements for land disposal include the use of a double liner system.
 - b. Under limited circumstances (low waste toxicity, mobility, and persistence), EPA may approve the use of a single-lined land disposal unit for RCRA wastes where use of such a unit adequately protects public health and the environment.

F. TSCA Wastes:

1. The facility must have a current TSCA permit.
2. The facility must not have any significant violations, corrective actions, or other environmental conditions that could affect its satisfactory operation.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Equipment supplied shall be in good repair and good working condition.
- B. Haul trucks that have visible oil or hydraulic fluid leaks will not be allowed on site.
- C. Clean up oil or hydraulic fluid spills.

2.2 TRANSPORTATION

- A. Submit a Transportation Plan as part of the Remedial Action Work Plan which includes:
 1. Type, condition, and average daily number of vehicles to be used.
 2. Travel routes and time restrictions.
 3. Decontamination methods for vehicles, equipment, and containers.
 4. Emergency response plan.
 5. A list of all shippers and their federal and state transporter ID numbers.

6. A list of proposed disposal facilities including name, address, telephone number, contact name, and Federal/state permit numbers.

PART 3 - EXECUTION

3.1 VEHICLE LOADING AND DECONTAMINATION

A. General:

1. The CONTRACTOR shall provide all equipment, personnel, and facilities necessary to load waste materials in accordance with the regulatory requirements listed herein, and in accordance with the regulations of those states through which the CONTRACTOR plans to transport materials.
2. Vehicle operators shall be trained in conformance with federal and state regulations for waste haulers (hazardous, special, and non-hazardous).
3. All vehicles hauling waste materials from the exclusion zone shall be decontaminated in the contamination reduction zone prior to leaving the site.
4. A written decontamination certification shall be provided to the DEPARTMENT for each shipment stating that:
 - a. No soil from the exclusion zone or the contamination reduction zone adheres to the vehicle (including tires and undercarriage).
 - b. The vehicles are not leaking materials or dripping liquids in any amount.
 - c. Any waste materials, debris, and contaminated materials are covered with a tarpaulin, or are otherwise completely enclosed so as not to cause or permit discharge from the vehicle during transport.

3.2 MEASUREMENT

- A. Upon entering and leaving the site, the transport vehicle shall be weighed on a certified scale under the DEPARTMENT'S supervision to determine the amount of material being removed from the site.
- B. A printed ticket with the time, date, and net weight of material being transported for disposal shall be obtained. A copy of this ticket shall be given directly to the DEPARTMENT as it is produced.
- C. Measured gross weight of the vehicle or calculated net weight of material outside the certified capacity of the scale will not be accepted by the DEPARTMENT and the CONTRACTOR shall not be reimbursed for the associated costs of material disposal above the certified capacity of scale.
- D. The CONTRACTOR shall off-load materials above the certified capacity of scale on site at no additional cost to the DEPARTMENT.

3.3 MANIFESTING

- A. Complete all required manifest forms and bill of lading forms for the DEPARTMENT for proper transportation and disposal of all materials. The

EPA ID number for the site is: NYD013599261.

- B. Comply with 40 CFR 262 in completion and submittal of the Hazardous Waste Manifests. The Hazardous Waste Manifests for the transportation and disposal of waste removed from the site shall include all information in accordance with 49 CFR 172.101.
- C. Notify the DEPARTMENT in writing a minimum of two weeks prior to the date(s) the manifests are ready to be signed.
- D. The DEPARTMENT will sign the special waste or hazardous waste manifest.
- E. Place on the manifest all information and data required by both the waste generator and transporter. The CONTRACTOR'S hazardous waste specialist shall accompany each prepared manifest with written certification that the manifest has been filled out in compliance with accordance with all EPA, DOT, and state regulations.
- F. Provide the DEPARTMENT with two fully executed copies of each shipment manifested prior to shipping wastes off site.
- G. The CONTRACTOR is responsible for proper distribution of manifests and bills of lading.

3.4 TRANSPORTATION

- A. Prior to shipment of hazardous wastes off the project area, the CONTRACTOR shall confirm by written communication from the designated transporter(s) that they are authorized to deliver the manifested waste to the designated TSDF or SWMF.
- B. The CONTRACTOR shall be responsible for obtaining permits and authorizations necessary to use the selected shipping routes. Comply with restrictions imposed by local governmental agencies regarding use of the routes.
- C. Materials shall be transported only at the times and by the routes indicated in the approved Transportation Plan, unless written permission is received from the DEPARTMENT to do otherwise.

3.5 SAMPLING

- A. Perform all sampling and analyses required by the disposal facility at no additional cost to the DEPARTMENT.
- B. Provide copies of the results to the DEPARTMENT.

3.6 REPORTING

- A. Manifests:

1. After the waste has been permanently disposed of, the Hazardous Waste Manifests shall be completed in accordance with 6 NYCRR Part 372 and submitted by the CONTRACTOR to the DEPARTMENT with a copy to be forwarded to the DEPARTMENT.
 2. In accordance with 40 CFR 262.42, generator shall contact the transporter and TSD facility to determine the status of the HTW if the manifest is not returned to the generator within 35 days of the date waste was accepted by the initial transporter.
 3. The generator shall file an exception report with EPA and NYSDEC if he has not received a completed copy of the manifest from the designated TSD facility with 45 days of the date the waste was accepted by the original transporter.
 4. The CONTRACTOR shall be responsible for providing the generator with the information needed to complete the exception report.
- B. Certificates of Disposal:
1. Provide Certificates of Disposal for all wastes shipped off site.
 2. The Certificates of Disposal shall be submitted to the DEPARTMENT within 180 days of the shipment of wastes off site.
- C. Bill of Lading:
1. Items and materials that have been recycled or salvaged shall only require a signed bill of lading or receipt of materials and quantity received.

+ + END OF SECTION + +

SECTION 31 05 19

GEOSYNTHETICS FOR EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide all labor, materials, equipment, and services required to provide and place geosynthetics as shown and specified.
- B. Related Sections:
 - 1. Section 31 23 05, Excavation and Fill.

1.2 REFERENCES

- A. Standards referenced in this Section are listed below:
 - 1. American Society for Testing and Materials, (ASTM).
 - a. ASTM D 1117, Test Methods for Non-Woven Fabrics.
 - b. ASTM D 3776, Test Methods for Mass per Unit Area (Weight) of Woven Fabric.
 - c. ASTM D 5034, Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test).

1.3 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. Geotextile manufacturer shall be a specialist in the manufacture of geotextile cushion fabric and have produced and successfully installed a minimum of five million square feet.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following:
 - 1. Product Data:
 - a. Submit geotextile manufacturer's data, specifications, installation instructions and dimensions.
- B. Informational Submittals: Submit the following:
 - 1. Certificates:
 - a. Submit an affidavit certifying that the filter fabric furnished complies with all requirements specified herein.
 - b. No fabric shall be shipped until the affidavit is submitted to the DEPARTMENT.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Each roll of geotextile delivered to the Site shall be labeled by the manufacturer identifying the manufacturer's name, product identification, lot number, roll number and roll dimensions.
- B. All rolls and packages shall be inspected by CONTRACTOR upon delivery to the Site. CONTRACTOR shall notify DEPARTMENT if any loss or damage exists to geotextile filter fabric. Replace loss and repair damage to new condition, in accordance with manufacturer's instructions.
- C. Geotextile shall be protected from ultraviolet light exposure, precipitation or other inundation, mud, dirt, dust, puncture, cutting or any other damaging or deleterious conditions. Geotextile rolls shall be shipped and stored in relatively opaque and watertight wrappings.

PART 2 - PRODUCTS

2.1 GEOTEXTILE SEPARATION AND DEMARCATION FABRIC

- A. Separation and demarcation geotextile shall be a needle punched, nonwoven fabric composed of 100 percent polyester filaments, which are formed into a stable network such that the filaments retain their relative position. The fabric shall be inert to biological degradation and naturally encountered chemicals, alkalizes, and acids. Separation and demarcation geotextile shall conform to the following:

<u>Fabric Property</u>	<u>Unit</u>	<u>Test Method</u>	<u>Minimum Value</u>
Weight	oz/yd ²	ASTM D 5261	8.0
Thickness	mils	ASTM D 5199	90
Grab Tensile Strength	lb	ASTM D 4632	220
Grab Strength Elongation	%	ASTM D 4632	50
Trapezoid Tear Strength	lb	ASTM D 4533	95
Water Permeability, "k"	cm/sec	ASTM D 4491	0.38
Water Flow Rate	gal/min/ft ²	ASTM D 4491	110

- B. Product and Manufacturer: Provide one of the following:
 - 1. Geotex 861as manufactured by Propex Geosolutions.
 - 2. Or equal.

2.2 GEOTEXTILE STABILIZATION FABRIC

- A. Stabilization geotextile shall be a woven fabric composed of heavy woven flat tape yarns, which are formed into a woven geotextile. The fabric shall be inert to biological degradation and naturally encountered chemicals, alkalizes, and acids. Stabilization geotextile shall conform to the following:

<u>Fabric Property</u>	<u>Unit</u>	<u>Test Method</u>	<u>Minimum Value</u>
Grab Tensile Strength	lb	ASTM D 4632	250
Grab Strength Elongation	%	ASTM D 4632	15
Trapezoid Tear Strength	lb	ASTM D 4533	90
CBR Puncture	lb	ASTM D 6241	750
Apparent Opening Size	US Sieve	ASTM D 4751	40
Water Flow Rate	gal/min/ft ²	ASTM D 4491	4

- B. Product and Manufacturer: Provide one of the following:
1. Geotex 250ST as manufactured by Propex Geosolutions.
 2. Or equal.

PART 3 - EXECUTION

3.1 INSPECTION

- A. CONTRACTOR shall examine the conditions under which the Work is to be installed and notify the DEPARTMENT, in writing, of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION - GENERAL

- A. All geotextiles shall be weighted with sandbags or the equivalent when required. Such sandbags shall be installed during placement and shall remain until replaced with cover material or geomembrane.
- B. CONTRACTOR shall take any necessary precautions to prevent damage to underlying layers during placement of the geotextile.
- C. During placement of geotextiles, care shall be taken not to entrap in the geotextile stone, excessive dust, or moisture that could damage the geomembrane, generate clogging, or hamper subsequent seaming.
- D. Geotextiles shall not be exposed to precipitation prior to being installed and shall not be exposed to direct sunlight for more than 15 days.
- E. Geotextiles shall be overlapped 12-inches.

3.3 GEOTEXTILE REPAIR

- A. Any holes or tears in the fabric shall be repaired as follows:
1. On slopes: A fabric patch shall be sewn into place using a double sewn lock stitch (1/4-inch to 3/4-inch apart and no closer than 1-inch from any edge).

Should any tear exceed ten percent of the width of the roll, that roll shall be removed from the slope and replaced.

2. Non-slopes: A fabric patch shall be spot-seamed in place with a minimum of 24-inches of overlap in all directions.

3.4 PLACEMENT OF COVER MATERIALS

- A. CONTRACTOR shall place all cover materials in such a manner to ensure the geotextile is not damaged; minimal slippage of the geotextile on underlying layers; and no excess tensile stresses in the geotextile.

+ + END OF SECTION + +

SECTION 31 09 13

GEOTECHNICAL INSTRUMENTATION AND MONITORING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The CONTRACTOR shall conduct activities on the Project in such a manner that damage is prevented to adjacent pipes, utilities, structures, property, and Work, and such that the ground vibrations caused by the Work are consistently maintained below the maximum levels specified by the CONTRACTOR'S independent specialist.
- B. The CONTRACTOR shall provide and install the geotechnical instrumentation required under this Section including, but not limited to, optical monitoring points and seismographs.
- C. The CONTRACTOR shall notify the DEPARTMENT before conducting any vibration producing activity and conduct appropriate monitoring at nearby structures and utilities in accordance with the plan prepared by the CONTRACTOR'S independent specialist and approved by the DEPARTMENT.
- D. The CONTRACTOR shall protect and monitor existing installed structures and utilities, including, but not limited to, existing structures and subsurface utilities.
- E. The CONTRACTOR shall coordinate work with public and private utility companies that have any aboveground, belowground, or other utility lines within or adjacent to the Site.
- F. The CONTRACTOR shall complete removal areas, installing components, and built structures associated with the Drawings, such that once installed, operations are conducted in a manner that avoids deteriorating or otherwise damaging these features.
- G. The CONTRACTOR shall contact residences and businesses to conduct a pre- and post- remedial construction survey. At minimum, the structures at 237-241 Andrews Street, 113 North Cliton Avenue, 107 North Clinton Avenue (City of Rochester Early Childhood Development) and 25 Bittner St. (Kirsten Building) will be monitored. In addition, the CONTRACTOR shall extend monitoring to additional adjacent structures based on the potential vibration that occur based on the proposed activities.

- H. The CONTRACTOR shall establish vibration monitoring locations and establish a baseline vibration profile prior to mobilizing equipment and beginning work.

1.2 RELATED SECTIONS

- A. Section 02 41 00 – Demolition.
- B. Section 31 23 05 – Excavation and Fill.

1.3 QUALITY ASSURANCE

A. Qualifications:

- 1. Geotechnical Monitoring Subcontractor:
 - a. CONTRACTOR shall employ and retain at the Site a Geotechnical Monitoring Subcontractor with experience and capability of performing all geotechnical monitoring tasks required of CONTRACTOR. Geotechnical Monitoring Subcontractor shall have a minimum of 5 years of direct construction or environmental monitoring experience, and appropriate health and safety training in accordance with Laws and Regulations.
 - b. Responsibilities include, but are not necessarily limited to, the following:
 - 1) Development of the Geotechnical Instrumentation and Monitoring Plan (Monitoring Plan).
 - 2) Photo documentation of pre- and post-remedial construction activities of existing structures and utilities.
 - 3) Installation and pre- and post-remedial construction monitoring of crack gauges at existing structures and utilities.
 - 4) Installing and removing all geotechnical instrumentation.
 - 5) Calibrating geotechnical instrumentation at frequencies recommended by the Manufacturer.
 - 6) Coordinating instrument maintenance and repairs.
 - 7) Collecting and recording instrument readings.
 - 8) Managing a database of geotechnical monitoring data at the Site.
 - 9) Preparing and submitting geotechnical monitoring reports in accordance with Article 1.5 of this Section.
 - 10) Responding to exceedances of alert or action levels during the Work.
 - 11) Notifying CONTRACTOR, DEPARTMENT and other appropriate CONTRACTOR personnel when alert or action levels are exceeded during the Work.

2. The CONTRACTOR shall retain the services of a third-party surveyor (Surveyor) licensed in New York to complete the optical monitoring of the existing structures and utilities as required by the Monitoring Plan.
- B. The Surveyor will establish and maintain site control points for surveys. Control points will be a closed-loop survey tied to the nearest monument. Site control points referenced to an arbitrary or relative vertical datum are not permitted. Site control points shall be spaced to provide repeatable references surrounding the Site, according to locations approved by DEPARTMENT.
- C. Instrument Calibration:
1. A factory calibration shall be conducted on all geotechnical instrumentation at the place of manufacture before shipment to the Site. Review calibration record for each instrument and match to serial number of instrument. Submit factory calibration records to DEPARTMENT upon request.
 2. During the Work, calibrate geotechnical instrumentation at frequencies recommended by the Manufacturer, in accordance with Manufacturer's calibration and quality assurance requirements. Document all instrument readings, field reference checks, and calibrations in a dedicated log.
 3. Preventative maintenance and repair of geotechnical instrumentation, if required, shall only be performed by qualified personnel or authorized representatives of the Manufacturer.
 4. Prepare and retain at the Site electronic or written records of all instrument calibrations, preventative maintenance, and repairs. Submit to DEPARTMENT upon request.
- D. Pre-Installation Testing:
1. Examine geotechnical instrumentation and accessories upon delivery to the Site for damage due to shipment.
 2. Verify that instruments and accessories are in working order before installing.
 3. Immediately remove from the Site, and replace at CONTRACTOR's expense, damaged or malfunctioning instruments and accessories.

1.4 PROJECT CONDITIONS

- A. Install and monitor engineering seismographs on or adjacent to existing structures and utilities within 100 feet of the active Work area for the purpose of monitoring and ensuring compliance with vibration limits specified herein.

- B. Install and monitor optical monitoring points on the existing structures and utilities to monitor structure deformation/displacement.
- C. Conduct vibration monitoring using personnel experienced in the correct placement and monitoring of engineering seismographs. Engineering seismographs shall be capable of recording vibration levels from 0.02 to 10 inches per second, at frequencies from 2 to 200 Hz.
- D. Notify DEPARTMENT immediately if any vibration monitor readings exceed the threshold or limiting values specified herein.

1.5 SUBMITTALS

- A. Informational Submittals:
 - 1. Submit daily geotechnical monitoring reports to DEPARTMENT by 9:00 a.m. the next working day after the monitoring event in accordance with this Section.
 - 2. Submit two copies of each pre- and post-remedial construction survey report to DEPARTMENT no later than 5 business days from completion of each survey event.
- B. Geotechnical Instrumentation and Monitoring Plan:
 - 1. Submit a Geotechnical Instrumentation and Monitoring Plan (Monitoring Plan) for review and approval by DEPARTMENT. Plan will define the details of the geotechnical monitoring program including locations of monitoring, frequency of monitoring, types of monitoring devices to be utilized and action plan for the monitoring and reporting of movement and vibration measurements.

1.6 MOVEMENT AND VIBRATION LIMITS

- A. Maximum vibrations at existing structures and utilities shall not exceed the threshold or limiting value, maximum peak particle velocity (PPV) established by the CONTRACTOR'S independent specialist.
- B. Maximum displacement of the existing structures and utilities shall not exceed the threshold or limiting value, established by the CONTRACTOR'S independent specialist.
- C. Actions required if threshold or limiting values are exceeded:
 - 1. If threshold limits of vibration, displacement, or deflection are exceeded, the CONTRACTOR shall notify DEPARTMENT immediately and shall submit to the DEPARTMENT, within 24 hours of the exceedance, a submittal indicating the activity causing the

exceedance and the steps the CONTRACTOR has taken and will take to prevent further exceedances of the threshold limit. Implement one or more of the following, as determined by DEPARTMENT:

- a. Increase monitoring frequency to twice daily.
 - b. Install one or more additional optical survey points in locations to be selected by DEPARTMENT.
 - c. Evaluate and, if necessary and appropriate, modify construction techniques.
2. If limiting values of vibration or movement are exceeded, all work by the CONTRACTOR in the vicinity of the exceedance shall stop until a meeting takes place between the CONTRACTOR and the DEPARTMENT to assess the causes of the exceedance. A submittal shall be prepared and submitted to the DEPARTMENT indicating what activity caused the exceedance and what steps the CONTRACTOR will take to prevent further exceedances of the limits. No work in the vicinity of the exceedance shall be restarted until the submittal is reviewed and approved by the DEPARTMENT.
 3. If any damage(s) are identified by the CONTRACTOR or DEPARTMENT, the CONTRACTOR shall prepare a submittal, for submittal to DEPARTMENT indicating a proposed means of repairing the damage(s) and preventing further damage. No work in the vicinity of the damage(s) shall be restarted until the submittal is reviewed and approved by DEPARTMENT and the approved repair is completed. No claims for schedule impacts, costs of repair(s), new equipment, or other expenses associated with the damage(s) are acceptable.

1.7 RECORD KEEPING

- A. The CONTRACTOR shall prepare a record of vibration monitoring activities. The record will include the following information:
 1. Serial number of Engineering Seismograph
 2. Location
 3. Start time, stop time, and duration of monitoring
 4. Maximum PPV for monitoring period
 5. Histograms of longitudinal, transverse, and vertical readings in units of inches per second
 6. Weather conditions
 7. Name of the responsible person in charge
 8. Signature and title of person making record entries.
- B. The CONTRACTOR shall prepare displacement monitoring reports for all excavation, demolition, and backfill activities adjacent to the existing

structures and utilities. The displacement monitoring report will include the following information for each optical monitoring point:

1. Location/designation of optical survey point
 2. Date, time and reading for each monitoring event. Include cumulative readings and change from baseline readings
 3. Current work activities
 4. Weather conditions
 5. Name of the responsible person in charge
 6. Signature and title of person making record entries.
- C. Exceedances (if any) of the alert levels and action levels. Provide the following:
1. Time, location, and instrument reading of exceedance
 2. Summary of Work being performed at time of exceedance
 3. Corrective actions taken or to be taken in response to exceedance.
- D. Provide a site plan showing approximate locations of all geotechnical instrumentation at the Site. Label each instrument with its serial number.
- E. Provide copies of these records to DEPARTMENT on a daily.
- F. Submit a final report documenting all monitoring activities within 20 days of completion of the excavation, demolition, and backfilling. This report shall consist of the following:
1. As-constructed drawings showing each monitored location point
 2. Results of vibration and deflection monitoring.
 3. Pre- and Post-Remedial Construction photographic and crack gauge monitoring.

1.8 INSTRUMENTATION

- A. Install all instruments in the presence of DEPARTMENT. Maintain access to the work area for the purpose of observing instrumentation and obtaining data. Determine the elevation and location of all instrumentation a minimum of 1 week before excavation, demolition, or other activities.
- B. The CONTRACTOR shall be responsible for all damage incurred to utilities and structures during geotechnical instrumentation installation.
- C. Protect and maintain instrumentation until the end of the Project. Any instrumentation damaged or otherwise rendered non-functional shall be repaired or replaced with a new installation at no additional cost to the DEPARTMENT. Repair or replacement work shall conform to the requirements specified herein for the respective type of geotechnical instrumentation. Structural demolition shall not resume until the new installation has been completed and accepted by the DEPARTMENT.

- D. Provide and maintain well-delineated protection devices at the surface of all instrumentation.
- E. Provide installation plans for monitoring devices.

1.9 DELIVERY, STORAGE AND HANDLING

- A. All instruments will be calibrated and in working order at the time of installation and will be verified on site by DEPARTMENT immediately before installation.
- B. All appropriate precautions for working with electricity, as indicated in the CONTRACTOR's Site-Specific Health and Safety Plan (SSHASP), will be followed at time of installation.

PART 2 - PRODUCTS

2.1 ENGINEERING SEISMOGRAPH

- A. Provide portable seismographs with triaxial geophones for the continuous monitoring of vibrations during demolition, excavation and other activities.
- B. Manufacturer: Provide products of one of the following:
 - 1. GeoSonics/Vibra-Tech, Inc.
 - 2. Instantel
 - 3. Or equal
- C. Equipment Measuring Specifications:
 - 1. Range: 0.02 to 10 inches per second.
 - 2. Resolution: 0.005 inch per second.
 - 3. Accuracy: Plus-or-minus 5 percent.
 - 4. Frequency Response Range: 2 to 200 Hertz.
 - 5. Equipment shall come complete with readout displays, data loggers, protective housings, software, and other accessories recommended by Manufacturer for the intended application.

2.2 OPTICAL SURVEY POINTS

- A. Optical survey equipment shall meet a 0.05-inch tolerance in order to ensure that any variances in movements are not due to the equipment tolerance, but rather they are due to actual movements due to excavation and backfilling activities.
- B. Optical Survey Points shall be fixed prisms, reflective targets, bolts, or an approved equivalent that will allow the points to be optically surveyed.

PART 3- EXECUTION

3.1 INSTALLATION

A. General:

1. Supply and install geotechnical instrumentation, per the Manufacturer's recommendations, in accordance with the CONTRACTOR's Monitoring Plan and Installation Plan or as directed by DEPARTMENT. Vibration monitoring locations shall be approved by DEPARTMENT.
2. Notify DEPARTMENT at least 24 hours before installing each instrument.
3. Lay out and stake individual instrument locations for approval of. Adjust locations when requested and obtain DEPARTMENT' acceptance of layout before installing. Make minor adjustments as required.

B. Engineering Seismograph:

1. Before commencing any construction activity that could cause vibration, firmly mount engineering seismographs on structures within 500 feet of the active work area to establish baseline vibration monitoring. Structures include, but are not limited to, existing on-site structures, existing water lines, roadways, and the adjacent offsite structures.
2. Use installation methods consistent with the Manufacturer's recommendations with consideration of the specific substrate of this Site.

C. Optical Monitoring Points:

1. CONTRACTOR shall have a qualified Surveyor establish a benchmark and optical survey points, at locations specified by DEPARTMENT.
2. DEPARTMENT shall be notified at least 24 hours before installing each fixed prism or approved equivalent.
3. Install optical survey points in approved locations (horizontal and vertical) and in accordance with Manufacturer's specifications.
4. The CONTRACTOR shall install optical survey points and establish baseline deflection monitoring before any significant excavation (3 feet or greater).

3.2 MONITORING

A. Engineering Seismograph Monitoring Schedule:

1. Baseline Monitoring:

- a. Perform baseline vibration monitoring, before initiating any mobilization, demolition, excavation or other activities at the Site.
 - b. Baseline monitoring shall be performed continuously between the hours of 7:00 a.m. and 5:00 p.m. over a period of not less than 5 working days.
2. Routine Monitoring: Continuously monitor vibrations, at locations shown or indicated in the Monitoring Plan, during all demolition, excavation and other activities.

3.3 DAMAGE TO INSTRUMENTATION

- A. The CONTRACTOR shall protect all instruments and appurtenant fixtures, leads, connections, and other components of instrumentation from damage due to construction operations, weather, and vandalism.
- B. If an instrument is damaged or inoperative, the CONTRACTOR shall repair or replace the damaged or inoperative instrument within 48 hours with no additional cost to DEPARTMENT. DEPARTMENT will be the sole judge of whether repair or replacement is required.

3.4 REMOVAL

- A. Completely remove geotechnical instrumentation and protective barriers when no longer required. Repair damage caused by geotechnical instrumentation and their removal and restore the Site to condition required by the Contract Documents. If restoration of damaged areas is not specified, restore to pre-construction condition.
- B. Seismographs:
 1. Remove seismographs at the end of each workday, and only after all site operations have been completed for the day.
 2. Download monitoring data from seismographs at the end of each day.
- C. Repair any damaged or disturbed surfaces to original condition unless otherwise directed by DEPARTMENT.

++ END OF SECTION ++

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SECTION 31 23 05

EXCAVATION AND FILL

PART 1 – GENERAL

1.1 DESCRIPTION

1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals required to perform all excavating, filling, and grading, and disposing of earth materials as shown, specified, and required for construction of structures, Underground Facilities, roads, and other facilities required to complete the Work.
2. Preparation of subgrade for pavement is included under this Section.
3. No classification of excavated materials will be made. Excavation includes all materials regardless of type, character, composition, moisture, or condition thereof.

1.2 REFERENCES

A. Standards referenced in this Section are:

1. ACI 522R, Pervious Concrete.
2. ANSI/AISC 360, Specification for Structural Steel for Buildings.
3. ASTM C29/C29M, Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate.
4. ASTM C33/C33M, Specification for Concrete Aggregates.
5. ASTM C94/C94M, Specification for Ready-Mixed Concrete.
6. ASTM C138/C138M, Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
7. ASTM C172, Practice for Sampling Freshly Mixed Concrete.
8. ASTM C150/C150M, Specification for Portland Cement.
9. ASTM C595/C595M, Specification for Blended Hydraulic Cements.
10. ASTM C618, Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
11. ASTM C989, Specification for Slag Cement for Use in Concrete and Mortars.
12. ASTM D422, Test Method for Particle-Size Analysis of Soils.
13. ASTM D448, Classification for Sizes of Aggregate for Road and Bridge Construction.
14. ASTM D698, Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³)).
15. ASTM D1556, Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
16. ASTM D1557, Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).
17. ASTM D2216, Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass.

18. ASTM D4253, Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
19. ASTM D4254, Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
20. ASTM D4318, Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
21. ASTM D6938, Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
22. ASTM E329, Specification for Agencies Engaged in Construction Inspection and/or Testing.

1.3 TERMINOLOGY

- A. The following words or terms are not defined but, when used in this Section, have the following meaning:
 1. “Subgrade” is the uppermost surface of native soil material unmoved from cuts; the bottom of excavation.

1.4 QUALITY ASSURANCE

- A. Qualifications:
 1. Professional Engineer:
 - a. Engage a registered professional engineer legally qualified to practice in the same jurisdiction as the Site and experienced in providing engineering services of the kind indicated.
 - b. Responsibilities include but are not necessarily limited to:
 - 1) Reviewing system performance and requirements shown or indicated in the Contract Documents.
 - 2) Preparing written requests for clarifications or interpretations of performance and requirements for submittal to DEPARTMENT by CONTRACTOR.
 - 3) Preparing or supervising the preparation of design calculations and related submittals verifying compliance of the system with the requirements of the Contract Documents.
 - 4) Signing and sealing all calculations, drawings, and submittals prepared by professional engineer.
 - 5) Certifying that:
 - a) it has performed the design of the system in accordance with the performance requirements stated in the Contract Documents, and
 - b) the said design conforms to Laws and Regulations, and to the prevailing standards of practice.
 2. CONTRACTOR’s Testing Laboratory:
 - a. Retain the services of independent testing laboratory to perform testing and determine compliance with the Contract Documents of the materials specified in this Section.

- b. Do not employ the same laboratory hired by DEPARTMENT for field quality control testing under the field quality control Article of this Section.
- c. Testing laboratory shall comply with ASTM E329.
- d. Testing laboratory shall be experienced in the types of testing required.
- e. Selection of testing laboratory is subject to DEPARTMENT's acceptance.

B. Samples and Tests:

- 1. Materials used shall be subject to examination and tests before acceptance and during the duration of this Contract at a frequency of one test per every 1,000 cubic yards of material provided and/or new material source introduced.
- 2. Any material may be tested and no materials for which laboratory tests are required shall be used by the CONTRACTOR until the CONTRACTOR has received notification of acceptance, and then only as long as its quality remains equal to that of the accepted sample.
- 3. Material rejected as the result of laboratory tests will not be resampled or retested unless otherwise directed by the DEPARTMENT.
- 4. Results of the test of any material may be compared with records of similar materials in actual service, and when such service record is unsatisfactory, use of the material will not be allowed even though the tests are satisfactory.
- 5. Testing of materials for approval shall include, but shall not be limited to, the following (all tests to be performed after screening or processing of the material).
 - a. Grain size distribution in accordance with ASTM D422, including hydrometer analysis.
 - b. Characterization in accordance with ASTM D2487.
 - c. Moisture/Density relationship in accordance with ASTM D698 (Standard Proctor).
 - d. Chemical Analysis – Chemical analysis of soil shall be performed in accordance with NYSDEC Division of Environmental Remediation (DER-10) Technical Guidance for Site Investigation and Remediation and the most recent version of the memo “Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC’s Part 375 Remedial Programs (NYSDEC, 2019 – Included as an attachment to this Section). Analysis shall include Target Compound List (TCL) Volatile Organic Compounds (VOCs); TCL Semivolatile Organic Compounds (SVOCs); TCL Pesticides; TCL Polychlorinated Biphenyls (PCBs); Target Analyte List (TAL) Metals; 1,4 Dioxane; Per- and Polyfluoroalkyl Substances (PFAS); and cyanide. Sample collection and analysis shall be in accordance with the approved Sampling and Analysis Plan. The results of the chemical analysis shall meet the requirements of the New York State Department of Environmental Conservation (NYSDEC) Unrestricted Soil Cleanup Objectives found at 6 NYCRR Part 375.
- 6. The CONTRACTOR shall assist the DEPARTMENT, as requested, in providing access to the Work, the taking and recovery of samples, the repair of the sampled areas, etc. No aspect of the CONTRACTOR’S involvement in providing assistance to the DEPARTMENT shall be construed by the

CONTRACTOR as suitable grounds for claim of hardship, delay or additional compensation.

7. The CONTRACTOR shall prequalify soils to be used for the project. The prequalification process will require that the CONTRACTOR identify suitable material for use for the project. The CONTRACTOR shall obtain prequalification samples from each source and each soil stockpile in accordance with the NYSDEC DER-10 and approved Sampling and Analysis Plan. The stockpile pre-qualification samples shall be obtained at two opposite locations to expose the core of the stockpile and allow the taking of representative samples or as approved by the DEPARTMENT. The CONTRACTOR shall have at least two samples (one for DEPARTMENT, remainder for CONTRACTOR) of material taken at each sampling location by an approved soils testing laboratory. The sampling shall be conducted in the presence of the DEPARTMENT. Each sample furnished to the DEPARTMENT shall be at least 50 pounds in weight and shall be tested by the DEPARTMENT, at his/her discretion, for conformance testing of the prequalification process. The CONTRACTOR shall have each "Contractor Sample" tested by the approved soils testing laboratory as prescribed above. The CONTRACTOR shall submit certified copies of the test results and test methods to the DEPARTMENT for review and approval. If the test results are acceptable, the CONTRACTOR may proceed with the use of the prequalified source and the prequalified stockpile material may be incorporated into the work. If the test results are not acceptable, the CONTRACTOR shall modify the proposed source as required to provide soil which satisfies the requirements of these Specifications and the CONTRACTOR shall repeat the prequalification process (using alternative material) as described above until acceptable test results are achieved. The CONTRACTOR shall not utilize unacceptable prequalification stockpiles in the prosecution of the work.

C. Regulatory Requirements:

1. Perform excavation work in compliance with requirements of authorities having jurisdiction and Laws and Regulations, including:
 - a. OSHA, 29 CFR Part 1926, Section .650 (Subpart P – Excavations).
2. Obtain required permits and approvals for excavation and fill Work, including work permits from right-of-way owners and permits from environmental authorities having jurisdiction over discharge of water from excavations.

1.5 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:
 - a. Laboratory Test Reports: Submit laboratory quality assurance test reports for material tests.
 - b. Modifications to the Work proposed due to design of sheeting, shoring, bracing, cofferdams, and similar excavation supports.
2. Samples:

- a. Submit Sample of each aggregate and soil material required under this Section. Deliver Samples to Resident Project Representative. Samples shall be of sufficient size to demonstrate the array of gradation and material types expected in the Work.
- B. Informational Submittals: Submit the following:
1. Procedure Submittals:
 - a. Excavation Plan: Prior to starting excavation operations, submit written plan to demonstrate compliance with OSHA 29 CFR Part 1926.650. As a minimum, excavation plan shall include:
 - 1) Name of CONTRACTOR's "competent person" in responsible charge of excavation and fill Work.
 - 2) Excavation method(s) and additional items to be included in the Work, as listed in Paragraph 1.5.B.2.a of this Section.
 - 3) Copies of "manufacturer's data" or other tabulated data if protective system(s) are designed on the basis of such data.
 - 4) Copies of required permits and approvals, from authorities having jurisdiction and affected utility owners, for excavation methods proposed.
 - b. Proposed compaction procedure and compaction equipment proposed for use. Where different procedures or equipment will be used for compacting different types of material or at different locations at the Site, indicate where each procedure and equipment item will be used.
 2. Excavation Support Plan and Related Information Prepared by CONTRACTOR's Professional DEPARTMENT:
 - a. CONTRACTOR and CONTRACTOR's professional engineer shall prepare the following for submittal:
 - 1) Sheet piling and bracing, or other protective system(s) required.
 - 2) Dewatering system.
 - 3) Cofferdams.
 - 4) Underpinning.
 - b. Drawings and calculations shall be prepared by professional engineer qualified in the specialty involved. DEPARTMENT's review and acceptance of submittal does not imply approval by DEPARTMENT of the associated Work. CONTRACTOR shall be solely responsible for designing, installing, operating and maintaining the system(s) required to satisfactorily perform all necessary sheet piling, bracing, protection, underpinning, and dewatering.
 - c. The excavation support system shall be used to support the face of an excavation and to prevent movement of soil, underground utilities, roads, and adjacent foundations. The excavation support system shall be assumed to be removed at the completion of the source excavation and backfill activities to prevent the excavation support system from being a hydraulic barrier to future In-Situ Chemical Oxidation.
 3. Delivery Tickets:
 - a. Copy of delivery ticket for each load of aggregate and borrow material delivered to the Site. Each delivery ticket shall indicate project and

contract by name and number, date, material type, department of transportation item number when applicable, and quantity delivered.

4. Quality Assurance Test Results Submittals:
 - a. Submit results of quality assurance testing performed by in accordance with Paragraph 1.4.B of this Section, unless included as part of another submittal under this Section. Submit results for the following quality assurance testing:
 - 1) Tests on borrow fill material.
 - 2) Optimum moisture – maximum dry density curve for each type of fill material.
5. Field Quality Control Submittals:
 - a. Submit results of testing and inspection performed in accordance with the field quality control Article in Part 3 of this Section, including:
 - 1) Field density testing.
 - 2) Tests of actual unconfined compressive strength or bearing tests of each stratum.
6. Qualifications Statements:
 - a. Professional Engineer.
 - b. Quality Assurance Testing laboratory. Submit name and qualifications of testing laboratory to be employed, and qualifications of testing laboratory's personnel that will perform quality assurance testing required in this Section.
 - c. Field Quality Control Testing Laboratory: Names and qualifications of testing laboratory employed, and qualifications of testing laboratory's personnel that will perform field quality control testing as required under this Section.

1.6 SITE CONDITIONS

- A. Subsurface Information: The Supplementary Conditions indicate information available relative to subsurface conditions at the Site. Such information and data is not intended as a representation or warranty of continuity of conditions between soil borings or test pits, nor of groundwater levels at dates and times other than date and time when measured, nor that purpose of obtaining the information and data were appropriate for use by CONTRACTOR. DEPARTMENT will not be responsible for interpretations or conclusions drawn therefrom by CONTRACTOR.
- B. Soil borings and other exploratory operations may be made by CONTRACTOR, at no additional cost to DEPARTMENT. Coordinate CONTRACTOR-performed test borings and other exploratory operations with DEPARTMENT and utility owners as appropriate. Perform such explorations without disrupting or otherwise adversely affecting operations of DEPARTMENT or utility owners. Comply with Laws and Regulations relative to required notifications.
- C. Existing Structures:
 1. The Contract Documents show or indicate certain structures and Underground Facilities adjacent to the Work. Such information was

obtained from existing records and is not guaranteed to be correct or complete. CONTRACTOR shall explore ahead of the excavation to determine the exact location of all existing structures and Underground Facilities. Existing structures and Underground Facilities shall be supported and protected from damage by CONTRACTOR. Immediately repair and restore existing structures and Underground Facilities damaged by CONTRACTOR without additional cost to DEPARTMENT.

2. Movement or operation of construction equipment over Underground Facilities shall be at CONTRACTOR's sole risk and only after CONTRACTOR has prepared and submitted to DEPARTMENT and utility owners (as applicable), and received acceptance therefrom, a plan describing CONTRACTOR's analysis of the loads to be imparted and CONTRACTOR's proposed measures to protect structures and Underground Facilities during the Project.
3. Coordinate with utility owners for shut-off of services in active piping and conduits. When required by utility owner, DEPARTMENT will assist CONTRACTOR with utility owner notifications. Completely remove buried piping and conduits indicated for removal and not otherwise indicated as being abandoned or to remain in place.
4. In general, service lines and laterals to individual houses and businesses are not shown; however, CONTRACTOR shall assume that a service exists for each utility owner to each house, business, and property.
5. Do not interrupt existing utilities serving facilities occupied and used by DEPARTMENT or others, except when such interruption is indicated in the Contract Documents or when allowed in writing by DEPARTMENT after acceptable temporary utility services are provided by CONTRACTOR for the affected structure or property.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Subbase Course:

1. Material shall be well-graded, crushed aggregate. Material shall conform to be Item 304, Type 4 in accordance with NYSDOT.

B. General Fill:

1. Material shall be free of: rock and gravel larger than three inches in any dimension, debris, waste, frozen materials, organic material, and other deleterious matter.
2. Fill shall have a liquid limit not greater than 45, and plasticity index not greater than 25.
3. Previously-excavated materials complying with the Contract Documents requirements for general fill may be used for general fill.
4. When on-site materials are found unsuitable for use as general fill, provide select fill or approved off-Site general fill materials. Prior to using off-Site

material as general fill, furnish submittal for and obtain DEPARTMENT's approval of the material proposed for use.

C. Gravel and Pipe Bedding:

1. Material shall be well-graded, crushed aggregate. Material shall be Item 703.04 Size 1A gravel in accordance with NYSDOT.
2. The material may be manufactured as a recycled aggregate product provided the material meets the specified gradation.

2.2 SOURCE QUALITY CONTROL

- A. Perform quality assurance testing, and submit results to DEPARTMENT, in accordance with the 'Quality Assurance' Article in Part 1 of this Section.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Provide DEPARTMENT with sufficient notice and with means to examine areas and conditions under which excavating, filling, and grading will be performed. DEPARTMENT will advise CONTRACTOR in writing when DEPARTMENT is aware of conditions that may be detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.2 TEST PITS

A. General:

1. In advance of the construction, excavate, make observations and measurements, and fill test pits to determine conditions or location of the existing Underground Facilities and structures. Perform all work required in connection with excavating, stockpiling, maintaining, sheeting, shoring, filling, and replacing pavement for test pits. CONTRACTOR shall be responsible for the definite location of each existing Underground Facility involved within the area of excavation for the Work. Exercise care during such location work to avoid damaging and disrupting the affected Underground Facility or structure. CONTRACTOR shall be responsible for repairing, at his expense, damage to Underground Facility or structure caused during the Work.

B. Payment for Test Pits:

1. All payment for test pits shown or indicated in the Contract Documents will be part of the lump sum Contract Price.
2. Separate payment will not be made for test pits made by CONTRACTOR for CONTRACTOR's own use.

3.3 PREPARATION

- A. Site Preparation:
 - 1. Clear areas to be occupied by permanent construction of all trees, brush, roots, stumps, logs, wood and other materials and debris. Clean and strip vegetation, sod, topsoil, and organic matter from subgrades where fills will be placed, and from areas where structures will be constructed. Remove from the Site and properly dispose of all waste materials.
 - 2. Burning is not allowed at the Site.
- B. Use of Explosives:
 - 1. Use of explosives is not allowed.
- C. Dust Control:
 - 1. Control objectionable dust caused by CONTRACTOR's operation of vehicles and equipment, clearing, and other actions. To minimize airborne dust, apply water or use other methods subject to DEPARTMENT's acceptance and approval of authorities having jurisdiction.
- D. Maintenance and Protection of Traffic:
 - 1. Keep all streets and traffic ways open for passage of traffic and pedestrians during the Project, unless otherwise approved by owner of the street, traffic way, or right-of-way, as applicable. Construction traffic shall access the Site only via entrance(s) indicated in Design Drawings.
 - 2. When required to cross, obstruct, or temporarily close a street or traffic way, provide and maintain suitable bridges, detours, and other acceptable temporary expedients to accommodate traffic. Closings of street or traffic way shall be for shortest time practical, and passage shall be restored immediately after completion of fill and temporary paving or bridging.
 - 3. Give required advance notice to fire department, police department, and other emergency services as applicable of proposed construction operations.
 - 4. Give reasonable notice to owners or tenants of private property who may be affected by construction operations. Give such notice not less than five days prior to construction that will affect the property.
 - 5. Hydrants, valves, fire alarm boxes, postal boxes and delivery service boxes, and other facilities that may require access during construction shall be kept accessible for use.
 - 6. Provide temporary signage, signals, barricades, flares, lights and other equipment, service, and personnel required to regulate and protect traffic and warn of hazards. Such Work shall comply with requirements of owner of right-of-way and authorities having jurisdiction at the Site. Remove temporary equipment and facilities when no longer required, and restore grounds to original or to specified conditions, as applicable.
- E. Pre-Excavation Soil Sampling:
 - 1. Pre-Excavation Soil Sampling shall be sampled, analyzed and reported after building demolition and prior to the installation of the source area excavation support and start of excavation to allow the adjustment of any excavation limits as determined by the sampling results.

2. The pre-excavation sampling shall consist of 21 borings with a total estimated footage of 950 feet.
3. 63 soil samples will be obtained with up to 3 duplicate samples for analysis. Analysis will consist of 66 - VOC (SW-846 8260), 66 - SVOC (SW-846 8270C or D), 7 - Metals TCL-22 (SW 846 6010), 6 - 1,4 Dioxane (8270C) with low level SIM, and 6 -PFAS (Method 8327). Bidder shall determine necessary turnaround time for the planned progression of work and schedule to allow data completion and review prior start of shoring and excavation activities.

3.4 DEWATERING

A. Dewatering – General:

1. Provide and maintain adequate drainage and dewatering equipment to remove and dispose of all surface water and ground water entering excavations, or other parts of the Work and work areas. Keep each excavation dry during excavation, subgrade preparation, and continually thereafter until the structure to be built therein is acceptable to DEPARTMENT and backfilling operations are completed and acceptable to DEPARTMENT.
2. Keep all working areas at the Site free of surface water at all times. Provide temporary drainage ditches and temporary dikes and provide required temporary pumping and other work necessary for diverting or removing rainfall and all other accumulations of surface water from excavations and fill areas. Perform diversion and removal of surface water in manner that prevents accumulation of water behind permanent or temporary structures and at any other locations in the construction area where such accumulations may be detrimental.
3. Water used for working or processing, resulting from dewatering operations, or containing oils or sediments that will reduce the quality of the surface water or groundwater downstream of the point of discharge, shall not be directly discharged. Divert such waters through temporary settling basin or filter before discharging to surface water, groundwater, or drainage routes.
4. CONTRACTOR shall be responsible for condition of piping, conduits, and channels used for drainage and such piping, conduits, and channels shall be clean and free of sediment.
5. Remove water from excavations as fast as water collects.
6. Treat collected groundwater and surface waters entering excavation in accordance with Section 44 00 05, Water Treatment.

B. Temporary Dewatering System:

1. CONTRACTOR shall design, provide, and operate dewatering system to include sufficient trenches, sumps, pumps, hose, piping, well points, deep wells, and similar facilities, necessary to depress and maintain groundwater level 2-feet below the base of each excavation during all stages of construction operations.
2. Design and operate dewatering system to avoid settlement and damage to existing structures and Underground Facilities.

3. Groundwater table shall be lowered in advance of excavation for a sufficient period of time to allow dewatering of fine grain soils.
4. Maintain groundwater level at excavations two feet below lowest subgrade excavation until the structure has sufficient strength and weight to withstand horizontal and vertical soil and water pressures from natural groundwater.
5. Operate dewatering system continuously, 24 hours per day, seven days per week. Provide standby pumping facilities and personnel to maintain the continued effectiveness of the system. Do not discontinue dewatering operations without first obtaining DEPARTMENT's acceptance for such discontinuation.
6. If, in DEPARTMENT's opinion, the water levels are not being lowered or maintained as required, provide additional or alternate temporary dewatering devices as necessary, at no additional cost to DEPARTMENT.
7. Locate elements of temporary dewatering system to allow continuous dewatering operation without interfering with the Work to the extent practicable.
8. Where portions of dewatering system are located in the area of permanent construction, submit to and obtain DEPARTMENT's acceptance of details of proposed methods of constructing the Work at such location. Control of ground water shall continue until the permanent construction provides sufficient dead load to withstand hydrostatic uplift of the normal groundwater, until concrete has attained sufficient strength to withstand earth and hydrostatic loads, and until waterproofing Work is completed.
9. Perform pumping of water from excavations in a manner that prevents carrying away of unsolidified concrete materials, and that avoids damaging the subgrade.
10. Before discontinuing dewatering operations or permanently allowing rise of groundwater level, prepare computations to demonstrate that structures affected by the water level rise are protected by fill or other means to sustain uplift. Use a safety factor of 1.25 when preparing such calculations.

C. Disposal of Water Removed by Dewatering System:

1. CONTRACTOR's dewatering system shall discharge to the groundwater treatment system (see Section 44 00 05), in accordance with Laws and Regulations.
2. Convey water from excavations in closed conduits. Do not use trench excavations as temporary drainage ditches.
3. Dispose of water removed from excavations in a manner that does not endanger health and safety, property, the Work, and other portions of the Project.
4. Dispose of water in manner that causes no inconvenience to DEPARTMENT, others involved in the Project, and adjacent and downstream properties.

3.5 EXCAVATION

- A. Perform all excavation required to complete the Work as shown, specified, and required. Excavations shall include removing and handling of earth, sand, clay,

gravel, hardpan, soft, weathered or decomposed rock, pavements, rubbish, and other materials within the excavation limits.

B. Excavation Protection:

1. Provide excavation protection system(s) in accordance with Laws and Regulations to prevent injury to persons and property, including Underground Facilities.
2. Excavation Less Than Five Feet Deep: Excavations in stable rock or in soil conditions where there is no potential for a cave-in may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.
3. Excavations Greater Than Five Feet Deep: Excavations in stable rock may be made with vertical sides. Under all other conditions, excavations shall be sloped and benched, shielded, or shored and braced.
4. Provide and maintain excavation protection system(s) in accordance with submittals accepted by DEPARTMENT and required under Paragraph 1.5.B of this Section.

C. Maintain excavations in dry condition in accordance with “Dewatering” Article in Part 3 of this Section.

D. Elevation of bottom of footings shown is approximate. DEPARTMENT may direct such minor changes in dimensions and elevations as may be required to secure a satisfactory footing.

E. When excavations are made below required grades without written order of DEPARTMENT, fill such excavations with compacted select fill material, as directed by DEPARTMENT, at CONTRACTOR’s expense.

F. Extend excavations sufficiently on each side of structures, footings, and similar construction to allow setting of forms, installation of shoring and bracing, and the safe sloping of banks, as necessary.

G. Coordination of Confirmation Sampling:

1. CONTRACTOR shall assist and coordinate with the DEPARTMENT on the collection of samples at the locations of decontamination pads, material stockpiles, and the construction entrance.
2. CONTRACTOR shall assume that excavations will be maintained in an open condition to assist in and allow for the collection of confirmation samples by the DEPARTMENT. The excavation shall remain open until analytical results are received on an expedited basis. The DEPARTMENT will then, based on sample results, direct the CONTRACTOR if the excavation can be backfilled or additional excavation is required. This process will be repeated as necessary until acceptable confirmation samples are obtained.

H. Subgrades – General:

1. Subgrades shall be firm, dense, and thoroughly compacted and consolidated; shall be free from mud, muck, and other soft or unsuitable materials; and

shall remain firm and intact under all construction operations. Subgrades that are otherwise solid but become soft or mucky on top due to construction operations shall be reinforced with Select Fill. Finished elevation of stabilized subgrades shall not be above subgrade elevations shown.

2. If, in DEPARTMENT's opinion, subgrade becomes softened or mucky because of construction delays, failure to dewater properly, or other cause within CONTRACTOR's control, subgrade shall be excavated to firm material, trimmed, and backfilled with select fill material at CONTRACTOR's expense.

I. Proofrolling Subgrades:

1. Prior to placing fill or constructing pavements or slabs, proofroll the subgrade surface with sufficient proofrolling apparatus. Before starting proofrolling, submit to and obtain acceptance from DEPARTMENT of proofrolling apparatus and procedure to be used.
2. Proofrolling operations shall be made in the presence of DEPARTMENT. Notify DEPARTMENT at least 24 hours in advance of start of proofrolling operations.
3. Subgrades displaying pronounced elasticity or deformation, deflection, cracking, or rutting shall be stabilized as directed by DEPARTMENT. Unsuitable materials shall be undercut to the depth directed by DEPARTMENT and replaced with select fill material. Other suitable stabilization methods may be directed by DEPARTMENT.

J. Excavated Materials to be Used as Fill:

1. Stockpile excavated materials that are acceptable for use as fill.
2. As excavation proceeds, keep stockpiles of excavated materials suitable for use as fill separate from unsuitable materials and waste materials.
3. Place, grade, and shape stockpiles for proper drainage.
4. Locate and retain soil materials away from edge of excavations.
5. Dispose of excess soil material and waste materials as specified in this Section.
6. Stockpiled excavated soils for use as select fill or general fill shall be tested and classified by laboratory as on-Site select fill or on-Site general fill. Perform required quality assurance testing for material verification on stockpiled materials as soon as possible to demonstrate compliance of excavated materials with the Contract Documents.

3.6 UNAUTHORIZED EXCAVATION

- A. All excavations outside lines and grades shown or indicated and that are not approved by DEPARTMENT, together with removing and disposing of the associated material, shall be at CONTRACTOR's expense. Fill unauthorized excavations with properly-compacted select fill material at CONTRACTOR's expense.

3.7 EROSION AND SEDIMENT CONTROLS

- A. Provide temporary erosion and sediment controls in accordance with Section 01 51 05, Temporary Utilities and Controls. When applicable, also comply with requirements of the erosion and sediment control plan approved by authorities having jurisdiction.

3.8 SHEETING, SHORING, AND BRACING

A. General:

- 1. Design and provide sheeting, shoring, bracing, cofferdams, and similar excavation supports as shown, specified, and required for the Work.
- 2. Clearances and types of temporary sheeting, shoring, bracing, and similar excavation supports, insofar as they may affect the finished character of the Work and the design of sheeting to be left in place, will be subject to the DEPARTMENT's approval; but CONTRACTOR is responsible for adequacy of all sheeting, shoring, bracing, cofferdams, and similar excavation supports.
- 3. Materials:
 - a. Previously-used materials shall be in good condition and shall not be damaged or excessively pitted. All steel or wood sheeting designated to remain in place shall be new. New or used sheeting may be used for temporary sheeting, shoring, and bracing.
 - b. All steel work for sheeting, shoring, bracing, cofferdams and other excavation supports, shall be in accordance with ANSI/AISC 360, except that field welding will be allowed.
 - c. Provide permanent steel sheet piling or pressure-creosoted timber sheet piling where subsequent removal of sheet piling might allow lateral movement of soil under adjacent structures
- 4. As excavation progresses, carry down shoring, bracing, cofferdams, and similar excavation supports to required elevation at bottom of excavation.
- 5. Comply with Laws and Regulations regarding sheeting, shoring, bracing, cofferdams, and similar excavation supports.
- 6. Maintain sheeting, shoring, bracing, bracing, and other excavation supports in excavations regardless of time period excavations will be open.
- 7. Unless otherwise shown, specified, or directed, remove materials used for temporary construction when the Work is completed. Perform such removal in manner not injurious to the structures and Underground Facility, their appearance, and adjacent construction.

B. Sheeting Left in Place:

- 1. Materials: Steel sheeting shown or indicated to be left in place shall consist of rolled sections of continuous interlocking type. Steel sheeting material designated to be left in place shall be new. Type and design of the sheeting and bracing shall comply with the above requirements for steel work for all sheeting and bracing.
- 2. Installation:
 - a. Steel sheeting to be left in place shall be driven straight to lines and grades as shown, indicated, or directed. Piles shall penetrate into firm materials with secure interlocking throughout pile's entire length.

Damaged piling having faulty alignment shall be pulled and replaced by new piling.

- b. Type of guide structure used and method of driving steel sheeting to be left in place shall be determined by CONTRACTOR's professional engineer. Jetting is not allowed.
 3. Cut off at elevations shown, indicated, or directed by DEPARTMENT sheeting left in place and remove cut off pilings from the Site.
 4. Clean wales, braces, and all other items to be embedded in the permanent structure and ensure that concrete surrounding the embedded element is sound and free of air pockets and harmful inclusions. Provisions shall include the cutting of holes in the webs and flanges of wale and bracing members, and welding of steel diaphragm waterstops perpendicular to the centerline of brace ends that are to be embedded.
 5. Subsequent to removing the inside face forms, and when removal of bracing is allowed, cut back steel at least two inches inside the wall face and patch opening with concrete repair mortar. Concrete shall be thoroughly worked beneath wales and braces, around stiffeners, and at other place where voids may be formed.
 6. Portions of sheeting or soldier piles and breast boards that are in contact with structure foundation concrete shall be left in place, together with wales and bracing members that are cast into foundation or superstructure concrete.
- C. Removal of Sheeting and Bracing:
1. Remove sheeting and bracing from excavations, unless otherwise directed by DEPARTMENT in writing. Perform removal to avoid damaging the Work and adjacent construction. Removal shall be equal on both sides of excavation to ensure no unequal loads on structures and Underground Facilities.
 2. Defer removal of sheeting and bracing, where removal may cause soil to come into contact with concrete, until the following conditions are satisfied:
 - a. Concrete has cured for not less than seven days.
 - b. Wall and floor framing, up to and including grade level floors, is in place.

3.9 TRENCH SHIELDS

- A. Excavation of earth material below bottom of trench shield shall not exceed the limits established in Laws and Regulations.
- B. When using a shield for installing piping:
 1. Portions of trench shield extending below the mid-diameter of an installed, rigid pipe, such as prestressed concrete pipe and other types of rigid pipe, shall be raised above the pipe's mid-diameter elevation prior to moving the shield along the trench for further construction.
 2. Bottom of shield shall not at any time extend below mid-diameter of installed pipe that is flexible or has flexing capability, such as steel, ductile iron, PVC, CPVC, polyethylene, and other pipe that has flexing capability.

- C. When using a shield for installing structures, bottom of the shield shall not extend below the top of the bedding for the structures.
- D. When removing the shield or moving the shield ahead, exercise extreme care to prevent moving piping, structures, and other Underground Facilities, and prevent disturbance of bedding material for piping, structures, and other Underground Facilities. When piping, structures, or Underground Facilities are disturbed, remove and reinstall the disturbed items in accordance with the Contract Documents.

3.10 FILL AND COMPACTION – GENERAL PROVISIONS

- A. Provide and compact all fill required for the finished grades as shown and as specified in this Section.
- B. Place fill in excavations as promptly as progress of the Work allows, but not until completing the following:
 - 1. DEPARTMENT's authorization after observation of construction below finish grade, including dampproofing, waterproofing, perimeter insulation, and similar Work.
 - 2. Inspection, testing, approval, and recording of locations of Underground Facilities.
 - 3. Removal of concrete formwork.
 - 4. Removal of shoring and bracing, and filling of voids with satisfactory materials.
 - 5. Removal of trash and debris.
 - 6. Permanent or temporary horizontal bracing is in place on horizontally-supported walls.
- C. Fill that includes organic materials or other unacceptable material shall be removed and replaced with approved fill material in accordance with the Contract Documents.
- D. Placement – General:
 - 1. Place fill to the grades shown or indicated. Bring up evenly on all sides fill around structures and Underground Facilities.
 - 2. Fill areas shall be undercut and proof-rolled as directed by DEPARTMENT.
 - 3. Place fill materials at moisture content and density as specified in Table 31 23 05-A of this Section and this Article's requirements on compaction density. Furnish and use equipment capable of adding measured amounts of water to the fill materials to bring fill materials to a condition within required moisture content range. Furnish and use equipment capable of discing, aerating, and mixing the fill materials to ensure reasonable uniformity of moisture content throughout the fill materials, and to reduce moisture content of borrow materials by air drying, when necessary. When subgrade or lift of fill materials requires moisture-conditioning before compaction, fill material shall be sufficiently mixed or worked on the

subgrade to ensure uniform moisture content throughout the lift of material to be compacted. Materials at moisture content in excess of specified limit shall be dried by aeration or stockpiled for drying.

4. Perform compaction with equipment suitable for the type of fill material placed. Select and use equipment capable of providing the minimum density required in the Contract Documents. Use light compaction equipment, with equipment gross weight not exceeding 7,000 pounds within horizontal distance of ten feet from the wall of completed, below-grade structures. Furnish and use equipment capable of compacting in restricted areas next to structures and around piping and Underground Facilities. Effectiveness of the equipment selected by CONTRACTOR shall be tested at start of compacted fill Work by constructing a small section of fill within the area where fill will be placed. If tests on the test section of fill indicate that required compaction is not obtained, do one or more of the following: increase the amount of coverages, decrease the lift thicknesses, or use different compactor equipment.
 5. Place fill materials in horizontal, loose lifts, not exceeding specified uncompacted thickness. Place fill in a manner ensuring uniform lift thickness after placing. Mechanically compact each lift, by not less than two complete coverages of the compactor. One coverage is defined as the conditions reached when all portions of the fill lift have been subjected to the direct contact of compactor's compacting surface. Compaction of fill materials by inundation with water is unacceptable.
 6. Do not place fill materials when standing water is present on surface of the area where fill will be placed. Do not compact fill when standing water is present on the fill to be compacted. Do not place or compact fill in a frozen condition or on top of frozen material. Fill containing organic materials or other unacceptable material previously described shall be removed and replaced prior to compaction.
 7. If required densities are not obtained because of improper control of placement or compaction procedures, or because of inadequate or improperly-functioning compaction equipment, CONTRACTOR shall perform all work required to provide the required densities. Such work shall include, at no additional cost to DEPARTMENT, complete removal of unacceptable fill areas and replacement and re-compaction until acceptable fill is provided.
 8. Repair, at CONTRACTOR's expense, observed or measured settlement. Make repairs and replacements as required within 30 days after being so advised by DEPARTMENT.
- E. Fill Against Concrete:
1. Placing fill against concrete below finished grade is not allowed until the concrete has attained its specified strength, as determined by duration of concrete curing and testing of field-cured concrete cylinders.
 2. Elevation of fill placed against concrete walls shall not differ by more than two feet on each side of walls, unless walls are adequately braced or all floor framing is in place up to and including grade level slabs.

3. Backfill structural foundation units as soon as practicable, in accordance with this Section, after concrete has gained sufficient strength to avoid damage, to avoid ponding of surface water and accumulation of debris.
 4. Where fill is placed against waterproofed surface, exercise care that waterproofing material is not damaged.
- F. Fill in Electrical Ductbank Trenches:
1. Provide general fill for full depth of electrical ductbank trench, below and above electrical ductbank. Where one ductbank passes beneath another pipe or ductbank, provide select fill to the elevation of the bottom of upper ductbank or pipe, as applicable.
 2. Placing and compacting fill in electrical ductbank trenches shall comply with requirements of Paragraph "G. Fill in Pipe Trenches", of this Article.
- G. Fill in Pipe Trenches:
1. Place pipe bedding material in pipe trenches in horizontal layers, and thoroughly compact each layer before the next layer is placed.
 2. Piping Installed in Fills Above Pre-construction Grade:
 - a. Prior to installing piping, place the fill in accordance with the Contract Documents until the fill reaches a minimum elevation of two feet higher than the top of piping to be installed. Excavate the trench; install the piping and backfill. Subsequently provide the remainder of the fill required for the Work.
 3. Piping trenches may be backfilled prior to testing of piping, unless nature of the test requires observation of pipe during testing. Do not construct building or structure over piping until piping has been successfully tested and passed.
 4. Pipe Bedding: Pipe bedding material shall be as follows:
 - a. Install PVC, CPVC, HDPE, and FRP piping on a layer of sand. Sand shall extend to 12 inches above top of pipe and to the trenchwalls on each side of the pipe.
 - b. Unless otherwise shown, install other types of piping on not less than six-inch layer of aggregate pipe bedding material. Aggregate pipe bedding material shall extend 12 inches above top of the pipe.
 5. Placing and Compacting Pipe Trench Fill: Unless otherwise shown, placement and compaction of pipe trench fill materials shall comply with the following:
 - a. Pipe bedding material shall be spread, and the surface graded to provide a uniform and continuous support beneath piping at all points between bell holes or pipe joints. Slight disturbance of installed pipe bedding material surface during withdrawal of pipe slings or other lifting tackle is acceptable.
 - b. After each pipe's bedding material has been graded, and the piping has been aligned, joined in accordance with the Contract Documents, and placed in final position on bedding material, provide and compact sufficient pipe trench fill material under and around each side of the pipe and back of the bell or end thereof to hold piping in proper position and maintain alignment during subsequent pipe jointing and

embedment operations. Deposit and compact pipe trench fill material uniformly and simultaneously on each side of piping to prevent lateral displacement of piping. Place and compact pipe trench fill material to an elevation 12 inches above top of pipe, unless otherwise shown or specified.

- c. Each layer of pipe trench fill material shall be compacted by at least two complete coverages of all portions of surface of each lift using appropriate compaction equipment.
- d. Method of compaction and compaction equipment used shall be appropriate for material to be compacted and shall not transmit damaging shocks to the piping.

H. Compaction Density Requirements:

- 1. Compaction required for all types of fills shall be in accordance with Table 31 23 05-A of this Section. Moisten material or aerate the material as necessary to provide the moisture content that will facilitate obtaining the required compaction.

**TABLE 31 23 05-A
REQUIRED MINIMUM DENSITY**

Material	Percent Compaction (ASTM D698)	Uncompacted Lift (inches)
General Fill		
More than five feet below final grade	100	8
Less than five feet below final grade	95	8
Select Fill		
Below concrete slabs or mats	100	8
Below pavement and sidewalks	100	12
Behind concrete walls	95	8

- 2. Fill shall be wetted and thoroughly mixed to achieve optimum moisture content plus-or-minus three percent, with the following exceptions:
 - a. On-site clayey soils: Optimum to plus three percent.
- 3. Replace natural, undisturbed soils or compacted soil subsequently disturbed or removed by construction operations with materials compacted as indicated in Table 31 23 05-A of this Section.
- 4. Field quality control testing for density; to verify that specified density was obtained, will be performed during each day of compaction Work. Responsibility for field quality control testing is specified in the "Field Quality Control" Article in Part 3 of this Section.
- 5. When field quality control testing indicates unsatisfactory compaction, provide additional compaction necessary to obtain the specified compaction. Perform additional compaction Work at no additional cost to DEPARTMENT until specified compaction is obtained. Such work includes complete removal of unacceptable (as determined by DEPARTMENT) fill areas and replacement and re-compaction until acceptable fill is provided in accordance with the Contract Documents.

- I. Replacement of Unacceptable Excavated Materials: In cases where over-excavation to replace unacceptable soil materials is required, backfill the excavation to required subgrade with select fill material and thoroughly compact in accordance with Table 31 23 05-A and the associated “Compaction Density Requirements” in this Article. Slope the sides of excavation in accordance with the maximum inclinations specified for each structure location.

3.11 GRADING

- A. General:
 1. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas.
 2. Smooth subgrade surfaces within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding. Finish surfaces free of irregular surface changes, and shall comply with the following:
 1. Grassed Areas or Areas Covered with Gravel, Stone, Wood Chips, or Other Special Cover: Finish areas to receive topsoil or special cover to within not more than one inch above or below the required subgrade elevations.
 2. Sidewalks: Shape surface of areas under sidewalks to line, grade, and cross section, with finish surface not more than one inch above or below the required subgrade elevation.
 3. Pavements: Shape surface of areas under pavement to line, grade, and cross section, with finish surface not more than 1/2-inch above or below the required subgrade elevation.
- C. Grading Surface of Fill Under Concrete Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2-inch when tested with a ten foot straight edge.
- D. Compaction:
 1. After grading, compact subgrade surfaces to the depth and percentage of maximum density for each area classification.

3.12 CRUSHED STONE

- A. General:
 1. Place crushed stone, in layers of specified thickness.
 2. After completing filling and grading, shape and compact crushed stone to an even, firm foundation in accordance with this Section. Remove unsuitable subgrade materials, including soft materials, boulders, vegetation, and loose stones, and replace with compacted fill material as directed by DEPARTMENT.

B. Grade Control:

1. During construction, maintain lines and grades including crown and cross-slope of crushed stone.

C. Placing of Crushed Stone:

1. Place crushed stone on prepared subgrade in layers of uniform thickness, in accordance with indicated cross-section and thickness. Maintain optimum moisture content for compacting crushed stone material during placing operations.
2. Compaction and Grade Control: Comply with compaction requirements for excavation and fill in this Section, and the following requirements:
 - a. Continue compaction until there is no movement of the course ahead of the roller.
 - b. After compaction of top lift of pavement subbase, provide and uniformly spread pipe bedding material and screenings compacted, on the surface, and sweep using gang-dragged broom, followed by compaction.
 - c. After rolling, check for grade with a line not less than 40 feet in length; depression over 1/2-inch deep shall be filled to satisfaction of DEPARTMENT.
3. After completing compaction, other than that necessary for bringing material for the next course, do not haul or drive over the crushed stone.
4. Do not install pavement subbase in excess of 500 feet in length without compacting to prevent softening of the subgrade.
5. If crushed stone material becomes churned up into or mixed with the subgrade material, remove the mixed material and replace with clean, compacted crushed stone.

3.13 DISPOSAL OF EXCAVATED MATERIALS

A. General:

1. CONTRACTOR shall haul away material removed from excavations that does not comply with requirements for fill or is in excess of the quantity required for fill.
2. Disposal of materials shall be in compliance with Laws and Regulations, at no additional cost to DEPARTMENT.
3. Soils from the source area excavations shall be considered F-listed waste, characterized and managed to a permitted disposal facility accordingly.
4. Contaminated soils not in the source area shall be characterized to determine if the material meets the F-listed waste or non-hazardous waste characteristics and disposed of accordingly at a permitted disposal facility.

B. Related Sections:

1. Section 02 51 40, Excavation, Removal and Handling of Contaminated Material.
2. Section 02 52 41, Off-site Transportation and Disposal.
3. Section 44 00 05, Water Treatment.

3.14 TEMPORARY BARRIERS

- A. Provide temporary barrier surrounding excavations and excavation work areas to provide temporary protection to persons and property. Barrier shall have openings only at vehicular, equipment, and worker access points.
- B. Minimum Material Requirements for Temporary Barriers:
 - 1. Temporary barrier shall not be less snow fence-type fencing, four feet high.
 - 2. Fence shall be constructed of vertical hardwood slats measuring not less than 1.5 inches by 1/4-inch interwoven with strands of horizontal wire or shall be of equivalent plastic construction.
 - 3. Posts:
 - a. Posts shall be steel, either “U”-, “Y”-, “T”-shaped, or channel section.
 - b. Posts shall have a nominal weight of not less than 1/3-pound per linear foot, exclusive of the anchor.
 - c. Posts shall have tapered anchors weighing not less than 0.67 pounds, each firmly attached by means of welding, riveting or clamping.
 - d. Posts shall have corrugations, knobs, notches, or studs placed and constructed to engage a substantial number of fence line wire in the proper position.
 - e. Provide each post with sufficient quantity of galvanized wire fasteners or clamps, of not less than 0.120-inch diameter, for attaching fence wire to post.

3.15 FIELD QUALITY CONTROL

- A. Site Tests: Employ a testing laboratory to perform field quality control testing.
 - 1. Testing Laboratory Scope:
 - a. Perform field moisture content and density tests to ensure that the specified compaction of fill materials has been obtained.
 - b. Tests of actual unconfined compressive strength or bearing tests on each stratum.
 - c. Report results of each test to DEPARTMENT and CONTRACTOR.
 - 2. Required Material Tests:
 - a. Compaction: Comply with ASTM D1556 and ASTM D698, as applicable.
 - 3. Authority and Duties of Testing Laboratory:
 - a. Technicians representing the testing laboratory shall inspect the materials in the field, perform testing, and report findings to DEPARTMENT and CONTRACTOR. When materials furnished or the Work performed does not comply with the Contract Documents, technician will direct attention of DEPARTMENT and CONTRACTOR to such failure.
 - b. Technician will not act as foreman or perform other duties for CONTRACTOR. Work will be checked as it progresses, but failure to detect defective Work or non-complying materials shall not in any way prevent later rejection when defect is discovered, nor shall it obligate DEPARTMENT for Substantial Completion or final acceptance.

Technicians are not authorized to revoke, alter, relax, enlarge, or release requirements of the Contract Documents, or to approve or accept any portion of the Work.

4. Responsibilities and Duties of CONTRACTOR:
 - a. Use of testing laboratory shall in no way relieve CONTRACTOR of the responsibility to provide materials and Work in full compliance with the Contract Documents.
 - b. To facilitate testing laboratory, CONTRACTOR shall advise testing laboratory at least two days in advance of filling operations to allow for completion of field quality control testing and for assignment of personnel.
 - c. It shall be CONTRACTOR's responsibility to accomplish the specified compaction for fill and other earthwork. CONTRACTOR shall control construction operations by confirmation tests to verify and confirm that CONTRACTOR has complied, and is complying at all times, with the Contract Documents relative to compaction, control.
 - d. CONTRACTOR shall demonstrate adequacy of compaction equipment and procedures before exceeding one or more of the following quantities of earthwork. Each test location shall include tests for each layer, type, or class of fill to finish grade.
 - 1) 200 linear feet of trench fill.
 - 2) 10 cubic yards of select fill.
 - 3) 100 cubic yards of general fill.
 - 4) 50 cubic yards of subbase material.
5. Testing laboratory will inspect and indicate acceptable subgrades and fill layers before construction work is performed thereon. Testing of subgrades and fill layers shall be taken as follows:
 - a. Trenches for Structures, and Underground Facilities (including buried ductbanks):
 - 1) In Open Fields: Two locations every 1,000 linear feet.
 - 2) Along Dirt or Gravel Roads or Off Traveled Right-of-Way: Two locations every 500 linear feet.
 - 3) Crossing Paved Roads: Two locations along each crossing.
 - 4) Under Pavement Cuts or Within Two Feet of Pavement Edges: One location every 400 linear feet.
 - b. Footing Subgrade: For each stratum of soil on which footings will be placed, perform not less than one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to DEPARTMENT.
 - c. For Select Fill: On 30-foot intervals on all sides of the structure for every compacted lift, but not less than one per lift on each side of the structure for structures less than 60 feet long on a side.
 - d. For General Fill: One per 1,000 square feet on every compacted lift.
 - e. Subbase Material: One per 1,000 square feet on every compacted lift.
6. Periodic compliance tests will be made by DEPARTMENT to verify that compaction is complying with the requirements specified, at no cost to CONTRACTOR. CONTRACTOR shall remove the overburden above the

level at which DEPARTMENT wishes to test and shall fill and re-compact the excavation after testing is complete.

7. If testing laboratory reports or inspections indicate subgrade, fills, or bedding compaction below specified density, CONTRACTOR shall remove unacceptable materials as necessary and replace with specified materials and provide additional compaction at CONTRACTOR's expense until subgrades, bedding, and fill are acceptable. Costs for retesting of subgrade, fills, or bedding materials that did not originally comply with specified density shall be paid by CONTRACTOR.

+ + END OF SECTION + +

Appendix 1 – Sampling for 1,4 Dioxane and Per-Polyfluoroalkyl Substances
(PFAS) under DEC's Part 375 Remedial Program

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Sampling for 1,4-Dioxane and Per- and Polyfluoroalkyl Substances (PFAS) Under DEC's Part 375 Remedial Programs

Objective

The Department of Environmental Conservation (DEC) is requiring sampling of all environmental media and subsequent analysis for the emerging contaminants 1,4-Dioxane and PFAS as part of all remedial programs implemented under 6 NYCRR Part 375, as further described in the guidance below.

Sample Planning

The number of samples required for emerging contaminant analyses is to be the same number of samples where "full TAL/TCL sampling" would typically be required in an investigation or remedial action compliance program.

Upon a new site being brought into any program (e.g., SSF, BCP), PFAS and 1,4-dioxane will be incorporated into the investigation of potentially affected media, including soil, groundwater, surface water, and sediment as an addition to the standard "full TAL/TCL sampling." Biota sampling may be necessary based upon the potential for biota to be affected as determined pursuant to a Fish and Wildlife Impact analysis. Soil vapor sampling for PFAS and 1,4-dioxane is not required.

Upon an emerging contaminant being identified as a contaminant of concern (COC) for a site, those compounds must be assessed as part of the remedy selection process in accordance with Part 375 and DER-10 and included as part of the monitoring program upon entering the site management phase.

Soil imported to a site for use in a soil cap, soil cover, or as backfill must be sampled for 1,4-dioxane and PFAS contamination in general conformance with DER-10, section 5.4(e). Assessment of the soil data will be made on a site-specific basis to determine appropriateness for use.

The work plan should explicitly describe analysis and reporting requirements, including laboratory analytical procedures for modified methods discussed below.

Analysis and Reporting

Labs should provide a full category B deliverable, and a DUSR should be prepared by an independent 3rd party data validator. QA/QC samples should be collected as required in DER-10, Section 2.3(c). The electronic data submission should meet the requirements provided at:

<https://www.dec.ny.gov/chemical/62440.html>.

PFAS analysis and reporting: DEC has developed a *PFAS Analyte List* (below) for remedial programs. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any compounds, the DEC project manager, in consultation with the DEC remedial program chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site.

Currently, ELAP does not offer certification for PFAS compounds in matrices other than finished drinking water. However, laboratories analyzing environmental samples (e.g., soil, sediments, and groundwater) are required by DER to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537 or ISO 25101.

Modified EPA Method 537 is the preferred method to use for environmental samples due to its ability to achieve very low detection limits. Reporting limits for PFAS in groundwater and soil are to be 2 ng/L (ppt) and 1 ug/kg (ppb), respectively. If contract labs or work plans submitted by responsible parties indicate that they are not able to achieve these reporting limits for the entire list of 21 PFAS, site-specific decisions will need to be made by the DEC project manager in consultation with the DEC remedial program chemist. Note: Reporting limits for PFOA and PFOS in groundwater should not exceed 2 ng/L.

Additional laboratory methods for analysis of PFAS may be warranted at a site. These methods include Synthetic Precipitation Leaching Procedure (SPLP) by EPA Method 1312 and Total Oxidizable Precursor Assay (TOP Assay).

SPLP is a technique for determining the potential for chemicals in soil to leach to groundwater and may be helpful in determining the need for addressing PFAS-containing soils or other solid material as part of the remedy. SPLP sampling need not be considered if there are no elevated PFAS levels in groundwater. If elevated levels of PFAS are detected in water, and PFAS are also seen in soil, then an SPLP test should be considered to better understand the relationship between the PFAS in the two media.

The TOP Assay can assist in determining the potential PFAS risk at a site. For example, some polyfluoroalkyl substances may transform to form perfluoroalkyl substances, resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from the site. To conceptualize the amount and type of oxidizable perfluoroalkyl substances which could be liberated in the environment, a "TOP Assay" analysis can be performed, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized.

PFAS-containing materials can be made up of per- and polyfluoroalkyl substances that are not analyzable by routine analytical methodology (LC-MS/MS). The TOP assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by current analytical methodology. Please note that analysis of highly contaminated samples, such as those from an AFFF site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances. Please consult with a DEC remedial program chemist for assistance interpreting the results.

1,4-Dioxane analysis and reporting: The reporting limit for 1,4-dioxane in groundwater should be no higher than 0.35 µg/L (ppb) and no higher than 0.1 mg/kg (ppm) in soil. Although ELAP offers certification for both EPA Method 8260 SIM and EPA Method 8270 SIM in waters, DER is advising the use of Method 8270 SIM because it provides a more robust extraction procedure, uses a larger sample volume, and is less vulnerable to interference from chlorinated solvents. The analysis currently performed for SVOCs in soil is adequate for evaluation of 1,4-dioxane in soil, which already has an established SCO.

Refinement of sample analyses

As with other contaminants that are analyzed for at a site, the emerging contaminant analyte list may be refined for future sampling events based on investigative findings. Initially, however, sampling using this PFAS Analyte List and 1,4-dioxane is needed to understand the nature of contamination.

PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluorooctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6



NEW YORK
STATE OF
OPPORTUNITY

**Department of
Environmental
Conservation**

SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

Under NYSDEC's Part 375 Remedial Programs

DRAFT June 2022



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ERRATA SHEET for

**SAMPLING, ANALYSIS, AND ASSESSMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES
(PFAS) Under NYSDEC's Part 375 Remedial Programs Issued January 17, 2020**

Citation and Page Number	Current Text	Corrected Text	Date
Title of Appendix I, page 32	Appendix H	Appendix I	2/25/2020
Document Cover, page 1	Guidelines for Sampling and Analysis of PFAS	Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs	9/15/2020
Routine Analysis, page 9	"However, laboratories analyzing environmental samples...PFOA and PFOS in drinking water by EPA Method 537, 537.1 or ISO 25101."	"However, laboratories analyzing environmental samples...PFOA and PFOS in drinking water by EPA Method 537, 537.1, ISO 25101, or Method 533."	9/15/2020
Additional Analysis, page 9, new paragraph regarding soil parameters	None	"In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (EPA Method 9060), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils."	9/15/2020
Data Assessment and Application to Site Cleanup Page 10	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Target levels for cleanup of PFAS in other media, including biota and sediment, have not yet been established by the DEC.	Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Water Sample Results Page 10	PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water (...) If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water (...) If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.	9/15/2020
Soil Sample Results, page 10	“The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase.”	“Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values. “ [Interim SCO Table] “PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP. As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference: https://www.nj.gov/dep/srp/guidance/rs/daf.pdf. ”	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Testing for Imported Soil Page 11	Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the PFAS Analyte List (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs. If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable. PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.	9/15/2020

Citation and Page Number	Current Text	Corrected Text	Date
Footnotes	None	¹ TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances. ² The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the soil cleanup objective for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).	9/15/2020
Additional Analysis, page 9	In cases... soil parameters, such as Total Organic Carbon (EPA Method 9060), soil...	In cases... soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil...	1/8/2021
Appendix A, General Guidelines, fourth bullet	List the ELAP-approved lab(s) to be used for analysis of samples	List the ELAP- certified lab(s) to be used for analysis of samples	1/8/2021
Appendix E, Laboratory Analysis and Containers	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101.	Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101	1/8/2021
Water Sample Results Page 9	“In addition, further assessment of water may be warranted if either of the following screening levels are met: a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L”	Deleted	6/15/2021

Citation and Page Number	Current Text	Corrected Text	Date
Routine Analysis, Page XX	Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP)... criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids).	Deleted	5/31/2022
Analysis and Reporting, Page XX	As of October 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.	Deleted	5/31/2022
Routine Analysis, Page XX	LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media.	EPA Method 1633 is the procedure to use for environmental samples.	
Soil Sample Results, Page XX	Soil cleanup objectives for PFOA and PFOS will be proposed in an upcoming revision to 6 NYCRR Part 375-6	Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6	
Appendix A	"Include in the text... LC-MS/MS for PFAS using methodologies based on EPA Method 537.1"	"Include in the text EPA Method 1633"	
Appendix A	"Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537, 537.1, EPA Method 533, or ISO 25101"	Deleted	
Appendix B	"Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1"	"Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633"	

Citation and Page Number	Current Text	Corrected Text	Date
Appendix C	“Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1”	“Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633”	
Appendix D	“Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1”	“Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633”	
Appendix G		Updated to include all forty PFAS analytes in EPA Method 533	
Appendix H		Deleted	
Appendix I	Appendix I	Appendix H	
Appendix H	“These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report.”	“These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER).”	
Appendix H	“The holding time is 14 days...”	“The holding time is 28 days...”	
Appendix H, Initial Calibration	“The initial calibration should contain a minimum of five standards for linear fit...”	“The initial calibration should contain a minimum of six standards for linear fit...”	
Appendix H, Initial Calibration	Linear fit calibration curves should have an R ² value greater than 0.990.	Deleted	
Appendix H, Initial Calibration Verification	Initial Calibration Verification Section	Deleted	
Appendix H	secondary Ion Monitoring Section	Deleted	
Appendix H	Branched and Linear Isomers Section	Deleted	

Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis, reporting, and assessment of PFAS, DER has developed this document which summarizes currently accepted procedures and updates previous DER technical guidance pertaining to PFAS.

Applicability

All work plans submitted to DEC pursuant to one of the remedial programs under Part 375 shall include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day per site or one per twenty samples, whichever is more frequent.

Analysis and Reporting

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical

procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third party data validator. Electronic data submissions should meet the requirements provided at: <https://www.dec.ny.gov/chemical/62440.html>.

DER has developed a *PFAS Analyte List* (Appendix G) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

EPA Method 1633 is the procedure to use for environmental samples. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist. Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay).

In cases where site-specific cleanup objectives for PFOA and PFOS are to be assessed, soil parameters, such as Total Organic Carbon (Lloyd Kahn), soil pH (EPA Method 9045), clay content (percent), and cation exchange capacity (EPA Method 9081), should be included in the analysis to help evaluate factors affecting the leachability of PFAS in site soils.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.¹

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

¹ TOP Assay analysis of highly contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

Data Assessment and Application to Site Cleanup

Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFOA and PFOS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10. Preliminary target levels for cleanup of PFOA and PFOS in other media, including biota and sediment, have not yet been established by the DEC.

Water Sample Results

PFOA and PFOS should be further assessed and considered as potential contaminants of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt) and is determined to be attributable to the site, either by a comparison of upgradient and downgradient levels, or the presence of soil source areas, as defined below.

If PFOA and/or PFOS are identified as contaminants of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

Soil cleanup objectives for PFOA and PFOS have been proposed in an upcoming revision to 6 NYCRR Part 375-6. Until SCOs are in effect, the following are to be used as guidance values:

Guidance Values for Anticipated Site Use	PFOA (ppb)	PFOS (ppb)
Unrestricted	0.66	0.88
Residential	6.6	8.8
Restricted Residential	33	44
Commercial	500	440
Industrial	600	440
Protection of Groundwater ²	1.1	3.7

PFOA and PFOS results for soil are to be compared against the guidance values listed above. These guidance values are to be used in determining whether PFOA and PFOS are contaminants of concern for the site and for determining remedial action objectives and cleanup requirements. Site-specific remedial objectives for protection of groundwater can also be presented for evaluation by DEC. Development of site-specific remedial objectives for protection of groundwater will require analysis of additional soil parameters relating to leachability. These additional analyses can include any or all the parameters listed above (soil pH, cation exchange capacity, etc.) and/or use of SPLP.

As the understanding of PFAS transport improves, DEC welcomes proposals for site-specific remedial objectives for protection of groundwater. DEC will expect that those may be dependent on additional factors including soil pH, aqueous pH, % organic carbon, % Sand/Silt/Clay, soil cations: K, Ca, Mg, Na, Fe, Al, cation exchange capacity, and anion exchange capacity. Site-specific remedial objectives should also consider the dilution attenuation factor (DAF). The NJDEP publication on DAF can be used as a reference:

<https://www.nj.gov/dep/srp/guidance/rs/daf.pdf>.

² The movement of PFAS in the environment is being aggressively researched at this time; that research will eventually result in more accurate models for the behaviors of these chemicals. In the meantime, DEC has calculated the guidance value for the protection of groundwater using the same procedure used for all other chemicals, as described in Section 7.7 of the Technical Support Document (http://www.dec.ny.gov/docs/remediation_hudson_pdf/techsuppdoc.pdf).

Testing for Imported Soil

Testing for PFAS should be included any time a full TAL/TCL analyte list is required. Results for PFOA and PFOS should be compared to the applicable guidance values. If PFOA or PFOS is detected in any sample at or above the guidance values then the source of backfill should be rejected, unless a site-specific exemption is provided by DER based on SPLP testing, for example. If the concentrations of PFOA and PFOS in leachate are at or above 10 ppt (the Maximum Contaminant Levels established for drinking water by the New York State Department of Health), then the soil is not acceptable.

PFOA, PFOS and 1,4-dioxane are all considered semi-volatile compounds, so composite samples are appropriate for these compounds when sampling in accordance with DER-10, Table 5.4(e)10. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
 - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP certified lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an “Analytical Methods/Quality Assurance Summary Table” specifying:
 - Matrix type
 - Number or frequency of samples to be collected per matrix
 - Number of field and trip blanks per matrix
 - Analytical parameters to be measured per matrix
 - Analytical methods to be used per matrix with minimum reporting limits
 - Number and type of matrix spike and matrix spike duplicate samples to be collected
 - Number and type of duplicate samples to be collected
 - Sample preservation to be used per analytical method and sample matrix
 - Sample container volume and type to be used per analytical method and sample matrix
 - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by EPA Method 1633
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
 - Reporting Limits should be less than or equal to:
 - Aqueous – 2 ng/L (ppt)
 - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
- Include detailed sampling procedures
 - Precautions to be taken
 - Pump and equipment types
 - Decontamination procedures
 - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per site for each matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^\circ$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^\circ$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using EPA Method 1633.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^\circ$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank per day per site and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by EPA Method 537, 537.1, 533, or ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., washroom sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at $4 \pm 2^\circ$ Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank per day per site and a minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers.
- A field reagent blank (FRB) should be collected at a rate of one per 20 samples. The lab will provide a FRB bottle containing PFAS free water and one empty FRB bottle. In the field, pour the water from the one bottle into the empty FRB bottle and label appropriately.
- Request appropriate data deliverable (Category B) and an electronic data deliverable
- For sampling events where multiple private wells (homes or sites) are to be sampled per day, it is acceptable to collect QC samples at a rate of one per 20 across multiple sites or days.

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the latest guidelines developed by the Division of Fish and Wildlife (DFW) entitled “General Fish Handling Procedures for Contaminant Analysis” (Ver. 8).

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

**NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

- A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:
1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).
 2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.
 3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.
- B. The following data are required on each **Fish Collection Record** form:
1. Project and Site Name.
 2. DEC Region.
 3. All personnel (and affiliation) involved in the collection.
 4. Method of collection (gill net, hook and line, etc.)
 5. Preservation Method.
- C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:
1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.
 2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.
 3. Date collected.
 4. Sample location (waterway and nearest prominent identifiable landmark).
 5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.
 2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.
 3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.
 4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate "Age" column.
 5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.
 6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.
 7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.
- E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish's tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with

the same information.

- F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.
- G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.
- H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:
 - No materials containing Teflon.
 - No Post-it notes.
 - No ice packs; only water ice or dry ice.
 - Any gloves worn must be powder free nitrile.
 - No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
 - No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
 - Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
 - Wash hands after handling any food containers or packages as these may contain PFCs.
 - Keep pre-wrapped food containers and wrappers isolated from fish handling.
 - Wear clothing washed at least six times since purchase.
 - Wear clothing washed without fabric softener.
 - Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with “fluor” in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.
- I. All fish must be kept at a temperature <45° F (<8° C) immediately following data processing. As soon as possible, freeze at -20° C ± 5° C. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.
- J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.
- K. A recommended equipment list is at the end of this document.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

page _____ of _____

Project and Site Name _____ DEC Region _____

Collections made by (include all crew) _____

Sampling Method: ☐ Electrofishing ☐ Gill netting ☐ Trap netting ☐ Trawling ☐ Seining ☐ Angling ☐ Other _____

Preservation Method: ☐ Freezing ☐ Other _____ Notes (SWFDB survey number): _____

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ()	WEIGHT ()	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION CHAIN OF CUSTODY

I, _____, of _____ collected the
(Print Name) (Print Business Address)

following on _____, 20____ from _____
(Date) (Water Body)

in the vicinity of _____
(Landmark, Village, Road, etc.)

Town of _____, in _____ County.

Item(s) _____

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on _____, 20____.

Signature

Date

I, _____, received the above mentioned sample(s) on the date specified and assigned identification number(s) _____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

Signature

Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelopes, approximately 2" x 3.5", if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonic acids	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluoropentanesulfonic acid	PFPeS	2706-91-4
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorononanesulfonic acid	PFNS	68259-12-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
	Perfluorododecanesulfonic acid	PFDoS	79780-39-5
Perfluoroalkyl carboxylic acids	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUnA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTeDA	376-06-7
	Perfluorohexadecanoic acid	PFHxDA	67905-19-5
Per- and Polyfluoroether carboxylic acids	Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
	4,8-Dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
	Perfluoro-3-methoxypropanoic acid	PFMPA	377-73-1
	Perfluoro-4-methoxybutanoic acid	PFMBA	863090-89-5
	Nonafluoro-3,6-dioxaheptanoic acid	NFDHA	151772-58-6
Fluorotelomer sulfonic acids	4:2 Fluorotelomer sulfonic acid	4:2-FTS	757124-72-4
	6:2 Fluorotelomer sulfonic acid	6:2-FTS	27619-97-2
	8:2 Fluorotelomer sulfonic acid	8:2-FTS	39108-34-4
Fluorotelomer carboxylic acids	3:3 Fluorotelomer carboxylic acid	3:3 FTCA	356-02-5
	5:3 Fluorotelomer carboxylic acid	5:3 FTCA	914637-49-3
	7:3 Fluorotelomer carboxylic acid	7:3 FTCA	812-70-4
Perfluorooctane sulfonamides	Perfluorooctane sulfonamide	PFOSA	754-91-6
	N-methylperfluorooctane sulfonamide	NMeFOSA	31506-32-8
	N-ethylperfluorooctane sulfonamide	NEtFOSA	4151-50-2
Perfluorooctane sulfonamidoacetic acids	N-methylperfluorooctane sulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethylperfluorooctane sulfonamidoacetic acid	N-EtFOSAA	2991-50-6
Perfluorooctane sulfonamide ethanols	N-methylperfluorooctane sulfonamidoethanol	MeFOSE	24448-09-7
	N-ethylperfluorooctane sulfonamidoethanol	EtFOSE	1691-99-2

Group	Chemical Name	Abbreviation	CAS Number
Ether sulfonic acids	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (F-53B Major)	9CI-PF3ONS	756426-58-1
	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (F-53B Minor)	11CI-PF3OUdS	763051-92-9
	Perfluoro(2-ethoxyethane) sulfonic acid	PFEESA	113507-82-7

DRAFT

Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS using EPA Method 1633 for projects within the Division of Environmental Remediation (DER). Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Barbarossa, at dana.barbarossa@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 28 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6°C upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of six standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

Peak Integrations

Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

SECTION 32 12 00

FLEXIBLE PAVING

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install flexible, hot-mix, hot-laid, asphalt concrete pavement.
 - 2. The Work includes:
 - a. Preparation such as sawcutting, milling where shown or indicated, cleaning, and other preparation for installing flexible pavements.
 - b. Providing asphalt concrete paving materials.
 - c. Providing tack coat material.
 - d. Providing pavement markings where shown or indicated.
 - e. Providing quality controls and testing.
- B. Coordination:
 - 1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before flexible paving Work.
- C. Related Sections:
 - 1. Section 31 23 05, Excavation and Fill.

1.2 REFERENCES

- A. Standards referenced in this Section are:
 - 1. AASHTO M320, Specification for Performance-Graded Asphalt Binder.
 - 2. AASHTO MP1a, Specification for Performance-Graded Asphalt Binder.
 - 3. AI MS-2, Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types.
 - 4. ASTM C1371, Test Method for Determination of Emittance of Materials Near Room Temperature Using Portable Emissometers.
 - 5. ASTM C1549, Test Method for Determination of Solar Reflectance Near Ambient Temperature Using a Portable Solar Reflectometer.
 - 6. ASTM D242/D242M, Specification for Mineral Filler For Bituminous Paving Mixtures.
 - 7. ASTM D692/D692M, Standard Specification for Coarse Aggregate for Bituminous Paving Mixtures.
 - 8. ASTM D946/D946M, Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction.
 - 9. ASTM D977, Specification for Emulsified Asphalt.
 - 10. ASTM D1073, Specification for Fine Aggregate for Bituminous Paving Mixtures.

11. ASTM D1188, Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples.
12. ASTM D2726, Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures.
13. ASTM D2950, Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
14. ASTM D3549, Test Method for Thickness or Height of Compacted Bituminous Paving Mixture Specimens.
15. ASTM D6690, Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
16. ASTM E329, Specification for Agencies Engaged in Construction Inspection and/or Testing.
17. ASTM E408, Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques.
18. ASTM E1918, Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field.
19. ASTM E1980, Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces
20. FS TT-P-115, Paint, Traffic, Highway, White and Yellow.
21. USGBC LEED-NC, Reference Guide, For New Construction and Major Renovation.

1.3 QUALITY ASSURANCE

A. Qualifications:

1. Asphalt Concrete Production Facility:
 - a. Production facility for asphalt concrete, tack coat materials, and other bitumastic materials shall be certified by the New York State Department of Transportation for furnishing such materials for New York State highways.
2. CONTRACTOR's Testing Laboratory:
 - a. Retain the services of independent testing laboratory to perform testing and determine compliance with the Contract Documents of the materials provided under this Section.
 - b. Testing laboratory shall comply with ASTM E329 and requirements of Section 01 45 29.13, Testing Laboratory Services Furnished by Contractor.
 - c. Testing laboratory shall be experienced in the types of testing required.
 - d. Selection of testing laboratory is subject to DEPARTMENT's acceptance.

B. Regulatory Requirements:

1. Reference Specifications and Details:
 - a. Comply with applicable requirements of New York State Department of Transportation Standard Specifications and Standard Details.
2. Obtain required highway and street rights-of-way work permits.
3. Jurisdiction:

- a. Paved areas to be constructed are jurisdiction of New York State Department of Transportation Standard Specifications and Standard Details.
- C. Quality Assurance Testing:
 - 1. Quality assurance testing is in addition to source quality control testing, when required, and field quality control testing required under Article 3.4 of this Section.
 - 2. Materials used in the Work may require testing and retesting, as directed by DEPARTMENT, during the Project. Allow free access to material stockpiles and facilities at all times. Tests not specifically indicated to be performed at OWNER's expense, including retesting of rejected materials and installed Work, shall be performed at CONTRACTOR's expense.
 - 3. CONTRACTOR's Quality Assurance Testing Laboratory Scope:
 - a. Use of testing laboratory shall not relieve CONTRACTOR of responsibility for providing materials and the Work in compliance with the Contract Documents.
 - b. Quality assurance testing laboratory shall perform the following, unless evidence of material compliance with reference specifications indicated in Paragraph 1.3.B of this Section, is submitted to DEPARTMENT by CONTRACTOR and asphalt concrete production facility:
 - 1) Test in accordance with reference specifications indicated in Article 1.3 of this Section. In lieu of quality assurance testing, submit evidence and certification of material compliance with reference specifications. When evidence of conformance submitted is not acceptable to DEPARTMENT, perform quality assurance testing.
 - c. To facilitate testing services, CONTRACTOR shall:
 - 1) Secure and deliver to testing laboratory and DEPARTMENT (when requested by DEPARTMENT) representative Samples of materials that CONTRACTOR proposes to furnish and that are required to be tested.
 - 2) Furnish such labor as is necessary to obtain and handle Samples at the Site or at asphalt concrete production facility and other material sources.
 - 3) Advise testing laboratory and DEPARTMENT sufficiently in advance of operations to allow for completion of quality assurance tests and for the assignment of personnel.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following:
 - 1. Shop Drawings:
 - a. Submit the proposed asphalt concrete mix design for each asphalt concrete material, and other bituminous materials, required under this Section, providing complete data on materials, including location in the Work, source, material content and percentages, temperatures and all other pertinent data. Indicate proportion of bituminous material from reclaimed asphalt pavement.

- b. Proposed gradation for each aggregate to be used in flexible paving. Submit gradation test results for the same material furnished on a previous project. Indicate the proportion of reclaimed asphalt pavement.
- c. In lieu of the information required under Paragraphs 1.4.A.1.a and 1.4.A.1.b, above, submit certificates of compliance with the reference specifications indicated in Article 1.3 of this Section, for each for the following:
 - 1) Each mix design required.
 - 2) Bituminous materials required.
 - 3) Aggregates to be used in flexible paving, from each material source and each required gradation.
 - 4) Density of uncompacted asphalt concrete material.
 - 5) Density of previously-compacted, previously-tested asphalt concrete material.
 - 6) Density and voids analysis for each asphalt concrete material test specimen.
 - 7) Evidence of asphalt concrete plant inspection and compliance with the reference specifications indicated in Article 1.3 of this Section.
 - 8) Proportion of reclaimed asphalt pavement in bituminous materials and aggregate.

B. Informational Submittals: Submit the following:

- 1. Quality Assurance Test Data Submittals and Source Quality Control Submittals:
 - a. Submit for quality assurance tests and source quality control tests required.
- 2. Delivery Tickets:
 - a. Submit copy of delivery ticket for each load of asphalt concrete, tack coat materials, and other materials obtained from asphalt concrete production facility, signed by CONTRACTOR
- 3. Field Quality Control Submittals:
 - a. Submit results of required field quality control testing.
- 4. Qualifications:
 - a. Asphalt concrete production facility, when required by DEPARTMENT.
 - b. CONTRACTOR's testing laboratory, when required by DEPARTMENT.

1.5 SITE CONDITIONS

A. Weather Limitations:

- 1. Temperature:
 - a. For base course and binder course paving lifts equal to or greater than two inches thickness, atmospheric temperature shall be 40 degrees F and rising.
 - b. For surface course paving or other pavement courses in lifts less than two inches thick, temperature of surface on which pavement is to be placed shall be 50 degrees F or greater.
- 2. Prohibitions:

- a. Do not place flexible paving materials when weather is foggy or during precipitation.
- b. Do not place flexible paving materials when the base on which the material will be placed contains moisture in excess of optimum.
- c. Place flexible paving materials only when DEPARTMENT concurs that weather conditions are suitable.

PART 2 – PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. System Description:
 - 1. Provide subbase course of the thickness shown or indicated, in accordance with Section 31 23 05, Excavation and Fill.
 - 2. Flexible Pavement Courses:
 - a. Provide the flexible pavement courses indicated below.
 - b. Asphalt Pavement:
 - 1) Base Course: 3 inches compacted thickness.
 - 2) Surface Course (Top Course): 1 inches compacted thickness.
 - 3. Reclaimed Asphalt Pavement (RAP): Incorporate RAP in the asphalt mix design in accordance with NYSDOT specifications.

2.2 ASPHALT CONCRETE MIXES

- A. Asphalt Concrete Mixtures: Provide the following materials designed and manufactured in accordance with reference specifications indicated in Article 1.3 of this Section:
 - 1. Base Course: NYSDOT Item No. 403.118902, Asphalt Concrete – Type 1 Base Course.
 - 2. Surface Course (Top Course): NYSDOT Item No. 403.198202, Asphalt Concrete – Type 7 F2 Top Course.
 - 3. RAP modified mixes in accordance with NYSDOT specifications.

2.3 BITUMINOUS MATERIALS

- A. Bituminous Materials for Asphalt Concrete:
 - 1. Bituminous materials for asphalt concrete shall comply with the reference specifications indicated in Article 1.3 of this Section, for the asphalt concrete mixes specified.
- B. Tack Coat:
 - 1. Tack coat shall be emulsified asphalt.
 - 2. Provide NYSDOT Item. No. 407.0101, Tack Coat, in accordance with reference specifications indicated in Article 1.3 of this Section.
- C. Crack Sealant:

1. Provide in accordance with reference specifications indicated in Article 1.3 of this Section.

2.4 AGGREGATES IN FLEXIBLE PAVEMENTS

- A. Aggregates for Asphalt Concrete – General:
 1. Aggregate materials used in flexible pavement shall be in accordance with the reference specifications indicated in Article 1.3 of this Section, for the asphalt concrete mix designs indicated.
- B. Reclaimed Asphalt Pavement (RAP):
 1. Processed material obtained by milling or full depth removal of existing asphalt concrete pavement may be used as aggregate in asphalt concrete base course and binder course.
 2. Maximum proportion of RAP in the asphalt concrete provided shall comply with requirements of the reference specifications indicated in Article 1.3 of this Section.
 3. When RAP is used, comply with Contract Documents requirements for the applicable asphalt concrete course mix design, bituminous materials, and aggregates.

2.5 SOURCE QUALITY CONTROL

- A. Tests: Obtain and test samples in accordance with AI MS-2. Testing is responsibility of CONTRACTOR or asphalt concrete production facility. Submit results to DEPARTMENT.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine the subbase and base on which flexible paving will be installed. Notify DEPARTMENT in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.
- B. Do not place materials on subgrades, or subbase that is muddy or has water thereon.

3.2 PREPARATION

- A. Preparation: Before starting installation of flexible paving, perform the following:
 1. Grade Control: Establish and maintain throughout flexible paving installation the required lines and grades, including crown and cross-slope for each asphalt concrete course during construction operations.
 2. Prepare subgrade and provide subbase for flexible pavement in accordance with Section 31 23 05, Excavation and Fill. Before installing flexible

pavement, obtain DEPARTMENT's concurrence that subgrade and subbase are suitable for installing flexible pavement.

3. Coordinate placement of flexible pavement with the Work included under Section 32 16 13, Concrete Curbs, Gutters and Sidewalks, and Work including drainage structures, manholes, valve boxes, and similar items.
4. Provide appropriate maintenance and protection of traffic measures during placement of pavement.

B. Milling:

1. Perform milling of existing pavement where shown or indicated.
2. "Milling" consists of the milling, shaping, and removing portions of existing surfaces by cold milling process and subsequent cleaning.
3. Milling Equipment:
 - a. Milling machines shall be power-operated, self-propelled machines capable of removing the desired thickness of existing surfaces. Machines shall have sufficient power, traction, and stability to accurately maintain depth of cut and slope. Machines shall produce a finished profile and cross slope to within 1/4 inch of that required and shall produce uniform surface texture free of gouges and ridges greater than 3/8-inch deep.
 - b. Machines shall be equipped with a means to control dust and other particulate matter created by the cutting action.
 - c. Provide equipment that removes milled material as quickly as the rate of milling.
 - d. Use vacuum trucks, street sweepers or power brooms to clean milled surfaces.
4. Milling Operations:
 - a. Perform milling so that, when final course of pavement is placed, required elevations and grades are provided. Where required, establish a taut reference string line to control line and grade of milling.
 - b. Minimize the time between milling and placement of pavement over milled surface.
 - c. Areas not accessible to the milling machine, such as around or adjacent to drainage structures, manholes, curbs, and transverse joints on structures, may be removed by a small milling machine, handwork or other method acceptable to DEPARTMENT.
 - d. Remove milled material as soon as it is milled. Remove fines and other material prior to opening milled area to traffic. Control objectionable dust emissions. When traffic has been allowed into milled area or when more than 48 hours have elapsed since milling, clean the milled area again prior to applying tack coat.
 - e. Maintain drainage to drainage inlets and other drainage structures in a manner acceptable to DEPARTMENT.
 - f. Properly dispose of milled material at a location away from the Site.

C. Surface Preparation:

1. Repair surface defects in existing pavement to provide uniform surface to receive new pavement.

2. Provide crack sealant to completely fill cracks more than 1/16-inch wide in areas shown or indicated on the Drawings.
3. Clean existing surfaces over which asphalt concrete pavement will be installed, by removing from the surface foreign material, excess asphalt concrete, excess joint sealant, and crack filler, and other undesirable matter.
4. Provide tack coat as indicated in Article 3.3 of this Section.

3.3 INSTALLATION OF FLEXIBLE PAVING

A. General:

1. Provide final pavement surfaces of uniform texture, at required grades and cross-sections.
2. Construct roadways to the lines, grades, and typical sections shown or indicated.

B. Installation of Asphalt Concrete:

1. Asphalt concrete mixture shall be transported to the site of paving and placed as soon as possible after mixing.
2. Placement of each asphalt concrete course shall be completed over the full width of the section under construction during each day's paving operations.
3. Spread and finish asphalt concrete courses by means of self-propelled mechanical spreading and finishing equipment. Compacted thickness of layers placed shall not exceed 150 percent of specified thickness unless approved in writing by DEPARTMENT.
4. Compaction:
 - a. Rollers:
 - 1) Use sufficient rolling equipment to satisfactorily compact and finish the quantity of asphalt concrete placed. There shall be not less than two rollers on the Project at all times. When acceptable to DEPARTMENT, one of the rollers may be a pneumatic-tire roller.
 - 2) During rolling operations, roller speed shall not exceed three miles per hour. When sufficient number of rollers is not available, reduce the quantity of asphalt concrete placed to accommodate the available rollers' speed.
 - 3) Required rollers shall be at the Site, in acceptable operating condition, prior to placing of asphalt concrete.
 - 4) Use of vibratory rollers in lieu of steel-wheeled rollers is acceptable, however when thickness of asphalt concrete is one-inch or less, rolling shall be in the static mode.
 - b. Rolling of initially-placed asphalt concrete material, or breakdown rolling, shall begin as soon as the asphalt concrete mixture will bear the roller without undue displacement.
 - c. Rolling shall be longitudinal, overlapping on successive trips by not less than one-half roller rear wheel width, and not more than three-quarters of roller rear wheel width. Alternate trips of the roller shall be of slightly different lengths.
 - d. At all times, roller motion shall be slow enough to avoid displacing the asphalt concrete.

- e. Operate rollers continuously from breakdown of laid asphalt concrete through finish rolling.
- f. Perform finish rolling using a steel-wheeled roller or a vibratory steel-wheel roller operating in the static mode.
- g. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.
- h. At each location not accessible to roller, thoroughly compact asphalt concrete with tampers and finish, where necessary, with a hot smoothing iron to provide uniform, smooth layer over the entire area so compacted.
- 5. Each compacted asphalt concrete course shall be within plus or minus 1/4-inch of the indicated thickness.
- 6. Placement of Adjacent Strips of New Asphalt Concrete:
 - a. When more than one width of asphalt concrete material will be placed, a six-inch wide strip of asphalt concrete adjacent to the area on which the future material is to be placed shall not be rolled until such future material is placed.
 - b. Do not leave the unrolled strip unrolled for more than two hours after placement, unless the six-inch unrolled strip is first heated with a joint heater.
 - c. After the first strip or width of asphalt concrete is compacted, place, finish, and compact the second width or strip as required for the first width, except that rolling shall be extended to include the six-inch strip of the first width not previously compacted.
- C. Construction Joints:
 - 1. Construction joints shall be made in such a manner as to ensure a neat junction, thorough compaction, and bond throughout.
 - 2. Provide a transverse joint extending over the full width of the strip being laid and at right angles to its centerline at end of each workday and at other times when the placement of hot-mix asphalt concrete will be suspended for a period of time that will allow asphalt concrete mixture to chill.
 - 3. Thoroughly compact by rolling the forward end of a freshly laid strip of asphalt concrete before the asphalt concrete mixture becomes chilled. When the Work is resumed, the end shall be cut vertically for the full depth of the layer.
- D. Joining of Pavements:
 - 1. When pavement is to join existing or previously-laid pavement, the existing or previously-laid pavement shall be neatly and carefully edged to allow for overlapping and feathering of the subsequent course of asphalt concrete material.
 - 2. Where new pavement is to meet existing pavement, the existing pavement shall be sawcut and notched.
 - 3. Where new pavement will meet existing asphalt pavement, remove existing pavement 12 inches onto undisturbed existing pavement course at edges where new pavement will meet existing pavement.
 - 4. Tack Coat:
 - a. Provide tack coat material at the following locations:

- 1) At edges where new pavement will connect to existing or previously-installed pavement.
 - 2) On surface of existing or previously-installed pavement course over which new pavement will be installed, prior to placement of the subsequent pavement course. Tack coat may be deleted when a succeeding layer of asphalt pavement is being applied over a freshly-placed asphalt pavement course that has been subjected to very little or no traffic, with approval of DEPARTMENT
 - 3) Where new pavement will abut curbing, concrete gutters, drainage structures and frames, manhole cover frames, valve boxes, and similar items.
- b. Tack Coat Installation: Install tack coat immediately prior to installing pavement. Place pavement while tack coat is wet. Apply tack coat in accordance with reference specification indicated in Article 1.3 of this Section.
- E. Curing:
1. Do not allow traffic onto pavement until directed by DEPARTMENT. Traffic will not be allowed on new asphalt concrete pavement until surface temperature is less than 140 degrees F.
 2. Hold construction traffic on new pavement to a minimum as acceptable to DEPARTMENT.
- F. Asphalt Concrete Curbs: Provide extruded asphalt curbs of the height and profile indicated on the Drawings.
- G. Defective Pavement Work:
1. When directed by DEPARTMENT, remove and replace defective flexible paving Work. Cut out such areas of defective pavement and fill with fresh asphalt concrete materials, compacted to required density.

3.4 FIELD QUALITY CONTROL

- A. Site Tests:
1. Responsibility:
 - a. OWNER's field quality control testing laboratory will:
 - 1) Perform field density tests to verify that required compaction of asphalt materials has been obtained.
 - 2) Test the proposed materials for compliance with the Contract Documents, as directed by DEPARTMENT.
 - 3) Submit reports of all test results to DEPARTMENT and CONTRACTOR.
 - b. Authority Field Quality Control Testing Laboratory:
 - 1) Technicians representing the testing laboratory will inspect materials at the Site and perform required testing. When the materials furnished or Work performed do not comply with the Contract Documents, field quality control testing laboratory technician shall direct the attention of DEPARTMENT and CONTRACTOR to such non-compliance.

- 2) Testing laboratory personnel shall not act as foreman or perform other duties for CONTRACTOR. The Work will be checked as it progresses, but failure to detect defective Work shall not in any way prevent the later rejection of such defective Work when defect is discovered. Failure to detect defective Work as it occurs does not obligate DEPARTMENT to final acceptance. Testing laboratory personnel are not authorized to revoke, alter, relax, enlarge, or release requirements of the Contract Documents, nor to approve or accept any portion of the Work.
2. Asphalt Concrete Mix Temperature: Measure temperature at time of placement, record, and submit to DEPARTMENT.
3. Surface Smoothness:
 - a. Test finished surface of each flexible paving course for smoothness, using a ten-foot straightedge applied parallel to and at right angles to centerline of paved areas.
 - b. Check surfaced areas at intervals as directed by DEPARTMENT.
 - c. Surfaces will be acceptable relative to smoothness when measurements are equal to or less than the following:
 - 1) Base Course: 3/8-inch vertical in ten feet horizontal.
 - 2) Binder Course: 3/8-inch vertical in ten feet horizontal.
 - 3) Surface Course (Wearing Course): 1/4-inch vertical in ten feet horizontal.
 - 4) Crowned Surfaces:
 - 5) Test crowned surfaces with a crown template, centered and at right angles to the crown.
 - 6) Surfaces will be acceptable when variance is equal to or less than 1/4-inch from the template.
 - d. Elevation: Finished surface of pavement shall be within plus or minus 1/2-inch of elevations shown or indicated.
4. Density:
 - a. Test Method: ASTM D2950 nuclear method; test one sample every 1,000 square yards of pavement. Test for each asphalt concrete course installed.
 - b. In addition, when directed by DEPARTMENT, compare density of in-place flexible paving materials against laboratory specimen or certificates on same asphalt pavement mixture, using nuclear density device.
 - c. Criteria for Acceptance: Density of in-place asphalt pavement material shall be not less than 90 percent of the recorded laboratory specimen or certificate density. Density shall be not greater than 98 percent.

3.5 ADJUSTING

A. Frames and Covers:

1. Set frames of drainage structures, manholes, valve boxes, and similar items to final grade. Adjust frames of existing structures and frames furnished under other Sections. Frames shall be substantially similar elevation to finished surface course of pavement.

2. Replace covers and gratings of existing structures immediately following adjusting associated frames. Install covers and gratings of structures provided under the Project as quickly as possible.
3. Where there is a delay between adjusting of frames and installation of surface course, provide temporary bituminous material around perimeter of each frame to smooth vehicle access over the frame. Maintain and repair temporary bituminous material as required until placement of surface course. Remove temporary bituminous material before installing surface course.

B. Pavement Adjustment:

1. Repair or replace in manner acceptable to DEPARTMENT areas of pavement that are observed to pond or collect water.

3.6 CLEANING

- A. Cleaning: After completing the paving operations, clean surfaces of excess or spilled bituminous materials, excess asphalt concrete, and foreign matter.

3.7 PROTECTION

- A. Protect finished pavement until pavement has become properly hardened and cool.
- B. Cover openings of drainage structures, manholes, valve boxes, and similar items in the paved area until permanent coverings are provided.

+ + END OF SECTION + +

SECTION 32 31 00

FENCING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, tools, equipment, and incidentals as shown, specified, and required to furnish and install fencing.
2. Extent of fencing is shown or indicated.
3. Types of materials required under this Section include:
 - a. Aluminum-coated, steel chain link fabric.
 - b. Galvanized steel framework.
 - c. Barbed wire.
4. Substitutions: Structural shapes of satisfactory sections and equal strengths may be substituted upon DEPARTMENT's approval of CONTRACTOR's substitution request.

1.2 REFERENCES

A. Standards referenced in this Section are:

1. ASTM A53, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
2. ASTM A90/A90M, Test Method for Weight [Mass] of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
3. ASTM A123, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
4. ASTM A153/A153M, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
5. ASTM A428/A428M, Test Method for Weight [Mass] of Coating on Aluminum-Coated Iron or Steel Articles.
6. ASTM A491, Specification for Aluminum-Coated Steel Chain-Link Fence Fabric.
7. ASTM A780, Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
8. ASTM A817, Specification for Metallic-Coated Steel Wire for Chain-Link Fence Fabric.
9. ASTM A1011/A1011M, Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
10. ASTM B6, Specification for Zinc.
11. ASTM D412, Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers—Tension.
12. ASTM D746, Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.

13. ASTM D792, Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
14. ASTM D1499, Practice for Filtered Open-Flame Carbon-Arc Exposures of Plastics.
15. ASTM D2240, Test Method for Rubber Property—Durometer Hardness.
16. ASTM F552, Terminology Relating to Chain Link Fencing.
17. ASTM F567, Practice for Installation of Chain-Link Fence.
18. ASTM F626, Specification for Fence Fittings.
19. ASTM A653, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
20. ASTM F668, Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric.
21. ASTM F1043, Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.
22. ASTM F1083, Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures.
23. IEEE 81, Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System Part 1: Normal Measurements.
24. UL 467, Grounding and Bonding Equipment.

1.3 TERMINOLOGY

- A. The following words or terms are not defined but, when used in this Section, have the following meaning.
 1. “Knuckling” describes the type of selvage obtained by interlocking adjacent pairs of wire ends and then bending the wire ends back into a closed loop.
 2. “Fencing” describes an assembly of metal components, including wire chain-link fabric fastened to top, bottom, and intermediate horizontal rails and to vertical line posts, corner posts and terminal posts. This assembly includes all auxiliary components, fittings, fasteners, and other accessories, all with specified protective coatings.
- B. Terminology used in this Section and not defined in this Article will be construed in accordance with the terminology used in CLF 2445 and ASTM F552.

1.4 QUALITY ASSURANCE

- A. Qualifications:
 1. Erector/Installer:
 - a. Engage a single erector that is skilled and trained, and possesses successful and documented experience installing fencing, and employs only workers with specific skill and successful experience in the type of Work required.
 - b. Erector shall be acceptable to fencing manufacturer,
 - c. Submit name and qualifications of erector with the following information for a minimum of three successful projects:
 - 1) Names and telephone numbers of owner and architect or engineer responsible for project.

- 2) Approximate fencing contract amount.
- 3) Quantity of fencing installed.

B. Component Supply and Compatibility:

1. Provide fencing as complete system with all hardware, appurtenances, and other components produced by a single manufacturer, including custom erection accessories, fittings, clamps, and fastenings as required for complete system.
2. Provide electrical components, devices and accessories from a single manufacturer regularly engaged in manufacturing such items, acceptable to, and coordinated by, fencing manufacturer.

C. Regulatory Requirements:

1. Comply with Laws and Regulations, including:
 - a. Americans with Disabilities Act of 1990 (Public Law 101-336), Appendix A of 28 CFR 36, Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG).

1.5 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:
 - a. Drawings at scale of 1/4-inch equal to one foot of typical fence assembly, identifying all materials, dimensions, sizes, weights, and finishes of rails, posts, braces, supports and other fencing components. Show fence heights, and locations of gates. Show gate swing, or other operation, hardware, and accessories. Include plans, elevations, and sections, with required installation and operating clearances, and details of post anchorage, attachments, and bracing.
 - b. List of all hardware, fasteners, and accessories.
2. Product Data:
 - a. Copies of manufacturer's technical product information, and specifications for all fencing components, including auxiliary system components.
 - b. Data substantiating that materials proposed comply with the following:
 - 1) Physical properties of PVC protective coating, in compliance with ASTM D1499.
 - 2) Weight of aluminum coating on wire fabrications, in compliance with ASTM A428.
 - 3).Weight of zinc coating on pipe fabrications, in compliance with ASTM A90.
3. Samples: DEPARTMENT's review will be for color and texture only. Compliance with other requirements is CONTRACTOR's responsibility. Submit the following:
 - a. Each fencing component, fastener, post, rail, support, chain-link fabric type, and other auxiliary and miscellaneous items labeled with identification of proposed use and location.

- b. Sample of each chain-link fabric material, six inches square; and framework members, and typical accessories, each approximately six inches long.
 - c. Full range of manufacturer's standard and custom color Samples.
- B. Informational Submittals: Submit the following:
 - 1. Certifications:
 - a. Submit shipping list for materials used, endorsed with manufacturer's voucher, signed by authorized employee of manufacturer, certifying that material used in fencing complies with the Contract Documents and with the approved submittals.
 - 2. Design Data: Submit with the Shop Drawings:
 - a. All structural calculations verifying that all system components comply with requirements of authorities having jurisdiction at the Site.
 - b. When proposing fencing framework or other structural components that varies from the Contract Documents, submit fabricator's structural calculations for design of proposed fencing. Structural analysis shall verify that all system components including supports, fasteners, fittings, and connections comply with the Contract Documents and requirements of authorities having jurisdiction at the Site.
 - 3. Manufacturer's Instructions:
 - a. Manufacturer's installation instructions.
 - 4. Qualifications Statements:
 - a. Erector.
- C. Closeout Submittals: Submit the following:
 - 1. Warranty documentation.
 - 2. Keys: Submit specified number of keys for locksets, padlocks, and control stations.
- D. Maintenance Material Submittals: Submit the following:
 - 1. Extra Stock Materials:
 - a. Furnish extra stock materials from same manufactured lot as materials installed.
 - b. Provide minimum of five percent excess over required amount of fencing components. Pack in cartons and store at the Site where directed by OWNER.
 - c. Do not provide partial containers or packages of materials. Round-up quantities to furnish only complete, unopened, and undamaged containers and packages.
 - d. Submit quantities of each system component required for the Work, based on actual purchase order to manufacturer for materials to be used for this Project, with calculations substantiating quantity of extra stock materials furnished.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery of Materials:

1. Packaging and Marking: Comply with CLFMI CLF 2445.
 2. Deliver materials in manufacturer's original, unopened packaging with all factory-applied tags, labels, and other identifying information intact, legible, and accurately representing material on approved submittals.
- B. Storage of Materials:
1. Store all materials under weatherproof cover, off the ground and away from other construction activities.
 2. Do not store material in a manner that would create a humidity chamber. Provide for free movement of air under protective cover and between components of the fencing.
- C. Handling of Materials:
1. Handle material in manner that is in compliance with manufacturer's recommendations and that avoids damaging coatings.

1.7 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities unless allowed:
1. under the following conditions, only after providing temporary utility services according to requirements indicated.
 - a. Notify DEPARTMENT not less than ten days in advance of proposed utility interruptions.
 - b. Do not proceed with utility interruptions without DEPARTMENT's written permission.
- B. Obtain measurements at the Site to verify layout information and dimensions for fencing in relation to reference points provided by OWNER or indicated in the Contract Documents.

PART 2 – PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. Design Considerations:
1. Verify size of framing members shown or indicated in the Contract Documents. Where structural analysis indicates the need, provide additional members, or increased member size, thickness, or weight.
 2. Modifications may be made only as necessary to meet Site conditions to ensure proper fitting and support of the Work and only upon submittal of Shop Drawings and receipt of approval by DEPARTMENT.

2.2 MATERIALS

- A. General:
1. Tube sizes specified are nominal outside dimension.
 2. Roll-formed section sizes are nominal outside dimensions.
 3. Wire gages shall conform to American Steel and Wire Company gage.

4. Heat-form arcs and chords before applying protective coatings to metal.
 5. Sizes specified are given for uncoated metal. Protective coatings are in addition to specified metal dimensions, gages, and sizes.
 6. Provide weights of zinc and aluminum coatings on wire and pipe fabrications in accordance with CLFMI CLF 2445.
 7. Provide thickness of PVC coating on wire and pipe fabrications in accordance with CLFMI CLF 2445.
- B. Chain-Link Fence Fabric:
1. One-piece fabric widths, for fencing 12 feet and less in height, complying with CLFMI CLF 2445.
 2. Wire mesh shall be woven throughout in form of approximately uniform square mesh with parallel sides and horizontal and vertical diagonals of approximately-uniform dimensions, of size and gage specified and in compliance with ASTM A817, Type 1, cold-drawn carbon steel wire with minimum breaking strength of 2,170 pounds and coated with aluminized finish, as specified. Fabric shall be as recommended by CLFMI for heavy industrial usage.
 3. Provide fence fabric imprinted with manufacturer's trade name, country of origin, core wire gage, and finished outside diameter gage.
 4. Provide fabric knuckled to eliminate exposure of sharp edges.
 5. Fabric Gage: Provide the following:
 - a. No. 6-gage wires.
 6. Mesh Size: Provide the following:
 - a. Two-inch mesh.

2.3 FRAMEWORK

- A. General: The following table presents actual OD and equivalent nominal NPS size and trade size of round members:

Actual OD (inches)	NPS Size (inches)	Trade Size (inches)
1.315	1.0	1-3/8
1.660	1.25	1-5/8
1.900	1.5	2
2.375	2.0	2.5
2.875	2.5	3
3.500	3.0	3.5
4.000	3.5	4
6.625	6.0	6-5/8
8.625	8.0	8-5/8

- B. Pipe shall be commercial grade, plain-end steel pipe with standard-weight walls. Steel strip used for manufacture of pipe shall comply with ASTM F1083, Schedule 40 pipe with minimum yield strength of 25,000 psi and protected with zinc, as specified.
- C. Fittings: Comply with ASTM F626.

- D. End, Corner, and Pull Posts: Provide end, corner, and pull posts of following minimum sizes:
 - 1. Up to six feet fabric height:
 - a. 2.375 inches OD pipe weighing 3.65 pounds per linear foot.
- E. Line Posts: Provide line posts of following minimum sizes and weights:
 - 1. Up to six feet fabric height:
 - a. 1.90 inches OD pipe weighing 2.72 pounds per linear foot.
- F. Top Rail: Provide top rails, unless otherwise shown or indicated, conforming to the following:
 - 1. 1.900 inch OD pipe weighing 2.72 pounds per linear foot.
 - 2. Provide in manufacturer's longest lengths, with expansion-type coupling 0.051-inch thick rail sleeves, approximately seven inches long, for each joint.
 - 3. Provide means for attaching top rail securely to each corner, pull, and end post.
- G. Roll-Formed Steel: Provide rolled steel shapes produced from structural-quality steel conforming to ASTM A1011, Grade 45, with minimum yield strength of 45,000 pounds psi. Protective coating system shall conform to ASTM F1043, as specified.
- H. Post Brace Assembly: Provide bracing assemblies at end posts, and at both sides of corner and pull posts, with horizontal brace located at mid-height of fabric.
 - 1. Use 1.900-inch OD pipe weighing 2.72 pounds per linear foot for horizontal brace and 3/8-inch diameter rod with turnbuckle for diagonal truss.

2.4 AUXILIARY FENCING MATERIALS AND ACCESSORIES

- A. Wire Ties:
 - 1. For tying fabric to line posts, use nine-gage, aluminum alloy 1100-H4.
 - 2. For tying fabric to rails and braces, use nine-gage, aluminum alloy 1100-H4.
 - 3. For tying fabric to tension wire, use 11-gage, aluminum alloy 1100-H4.
- B. Tension Wire: Provide tension wire consisting of aluminized, seven-gage, coiled spring steel wire coated with 0.40-ounces of aluminum per square foot of wire surface, minimum, in compliance with ASTM F1664.
 - 1. Locate at bottom of fabric only.
- D. Post Caps: Pressed steel, wrought iron, or cast aluminum alloy, designed as weather-tight closure cap, for tubular posts. Provide one cap for each post unless equal protection is afforded by combination post-top cap and barbed wire supporting arm, where barbed wire is required.
 - 1. Provide caps with openings to allow through-passage of top rail.
 - 2. Provide cone-type caps for terminal posts and loop-type caps for line posts.

- E. Stretcher Bars: One-piece lengths equal to full height of fabric, with minimum cross-section of 3/16-inch by 3/4-inch. Provide one stretcher bar for each end-post, and two for each corner- and pull-post, except where fabric is integrally woven into the post.
- F. Stretcher Bar Bands: Pressed steel, galvanized, 0.078-inch to 0.108-inch thick depending on post diameter, spaced not greater than 15 inches on centers to secure stretcher bars to end-, corner-, and pull-posts.
 - 1. Bands may also be used with special fittings for securing rails to end-, corner-, and pull-posts.
- G. Truss Rods: Steel rods, 3/8-inch diameter, merchant quality with turnbuckle.
- H. Drive anchors for line posts as shown and specified on the drawings.
- I. Concrete: Provide 4,000 psi concrete.

2.5 FENCE GROUNDING

- A. Conductors: Bare, solid wire for No. 6-gage and smaller, stranded wire for No. 4-gage and larger.
 - 1. Material Above Finished Grade: Copper.
 - 2. Material On or Below Finished Grade: Copper.
 - 3. Bonding Jumpers: Braided copper tape, one inch wide, woven of No. 30-gage bare copper wire, terminated with copper ferrules.
- B. Connectors and Ground Rods: As listed in UL 467.
 - 1. Connectors for Below-Grade Use: Exothermic welded type.
 - 2. Ground Rods: Copper-clad steel.
 - a. Size: 5/8-inch by eight feet.

2.6 FINISHING

- A. Chain-Link Fence Fabric:
 - 1. Aluminized finish with not less than 0.40 ounces aluminum per square foot, complying with ASTM A491, Class II.
- B. Framework and Appurtenances: Provide the following finishes for steel framework, auxiliary system components, and miscellaneous accessories:
 - 1. Galvanizing: Zinc for galvanizing shall be of High Grade or Special High Grade conforming to ASTM B6 with maximum aluminum content of 0.01 percent. Galvanize metal using hot-dip process in accordance with the following:
 - a. Structural Iron and Steel Shapes: ASTM A123
 - b. Rolled-Form Sheet Steel: ASTM A653
 - c. Hardware and Accessories: ASTM A153
 - d. Fittings: ASTM F626
 - e. Pipe: ASTM A53

2. Provide minimum weights of zinc as follows:
 - a. Pipe: 1.8-ounces of zinc per square foot. Apply Type A coating both inside and outside according to ASTM F1043, as determined by ASTM A90.
 - b. Rolled-Form Sheet Steel: 4.0-ounces of zinc per square foot of surface area.
 - c. Hardware and Accessories: Zinc weights in compliance with Table 1 of ASTM A153.
- C. Welded Joints:
1. Repair zinc coatings at welded joints by applying zinc-rich paint per ASTM A780.

2.7 SOURCE QUALITY CONTROL

- A. Fabrication Tolerances:
1. Fabric, posts, rails, and other supports shall be straight or uniformly curved to provide the profiles shown, to dimensional tolerance of 1/16-inch in 10 feet without warp or rack in the finished Work.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine conditions under which the Work will be erected and notify DEPARTMENT in writing of conditions detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions are corrected.

3.2 ERECTION

- A. Comply with CLFMI Step-by-Step Installation Guide and ASTM F567. Do not begin installation and erection of fencing until final grading is completed.
- B. Excavation: Drill holes of diameters specified, for post footings in firm, undisturbed or compacted soil.
1. For posts set in cast-in-place concrete, provide hole diameters dug or drilled a minimum of four times the largest cross section of post.
 - a. Unless otherwise shown or indicated, excavate hole depths approximately three inches lower than bottom of post, with bottom of posts set not less than two feet below the surface of finished grade when in firm, undisturbed soil, plus an additional three inches for each foot increase in the fence height over four feet.
 2. Spread soil from excavations uniformly adjacent to fence line, or on adjacent areas of the Site, as directed by DEPARTMENT.
 3. When solid rock is encountered at ground surface, drill into rock at least 12 inches for line-posts and at least 1.5 feet for end-, pull-, and corner-posts.

Drill hole at least one inch greater diameter than largest dimension of post to be placed.

- a. If solid rock is below soil overburden, drill to full depth required, except penetration into rock need not exceed the minimum depths specified above for rock encountered at ground surface.

C. Setting Posts: Remove loose and foreign materials from sides and bottoms of holes and moisten soil prior to placing concrete.

1. Center and align posts in holes 3-inches above bottom of excavation.
2. Posts shall be set in concrete footings, except as otherwise shown or specified. Place concrete around posts in continuous pour and vibrate or tamp for consolidation. Check each post for vertical and top alignment and hold in position during placement and finishing operations.
3. Extend concrete to two inches above ground surface, or to two inches below ground surface if cover of sod, bituminous asphalt paving, or other material is shown or indicated to conceal concrete. Crown to shed water away from posts.
4. Keep exposed concrete surfaces moist for at least seven days after placement, or cure with membrane curing materials, or other acceptable curing method.

D. Concrete Strength: Allow concrete to attain at least 75 percent of its minimum 28-day compressive strength, but in no case sooner than seven days after placement, before installing rails, tension wires, barbed wire, or chain-link fabric.

1. Do not stretch and tension fabric and wires until concrete has attained its full design strength.

E. Posts and Rails:

1. Line Posts: Set posts in cast-in-place concrete footings as specified, spaced not more than ten feet on centers. Provide caps on top of each post to exclude moisture and to receive top rail, unless equal protection is afforded by combination post-top cap and barbed wire supporting arm, where barbed wire is required.
2. Top Rails: Run rail continuously through post caps or extension arms, bending to radius for curved runs. Provide expansion couplings as recommended by fencing manufacturer to form continuous rail between terminal posts.
3. Brace Assemblies: Install braces so posts are plumb when diagonal rod are under proper tension. Install brace assemblies at end-posts and at both sides of corner- and pull-post panels. Diagonal bracing shall run from center of first line-post to bottom of terminal-post.

F. Chain-Link Fabric:

1. Install fabric on security side of fence, and anchor to framework so that fabric remains in tension after pulling force is released. Fasten to terminal posts with tension bars threaded through mesh and secured with tension bands at maximum intervals of 14 inches.

2. Tie to line-posts and top and bottom rails with tie wires spaced at maximum 12 inches on posts and two feet on rails.
 3. Connect tension bars to posts and frames by means of adjustable bolts and bands spaced not more than 14 inches apart.
 4. Leave approximately two inches between finish ground surface and bottom selvage, except where bottom of fabric extends into concrete.
 5. Join roll of chain-link fabric by weaving a single picket into the ends of roll to form continuous mesh.
- G. Tension Wire:
1. Stretch tension wire taut and free of sag, from end to end of each stretch of fence and position at a height that will enable the wire to be fastened to chain-link fabric by securing within the top 12 inches of chain-link fabric.
 2. Fasten bottom tension wire within bottom six inches of chain-link fabric.
 3. Tie tension wire to each post with not less than six-gage galvanized wire.
- H. Stretcher Bars: Thread through or clamp to fabric four inches on centers, and secure to posts with metal bands spaced 15 inches on centers.
- I. Tie Wires: Use U-shaped wires conforming to diameter of pipe. Clasp pipe and fabric firmly with ends twisted at least two full turns. Bend ends of wire to minimize hazard to persons and clothing.
- J. Fasteners: Install nuts for tension band and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

3.3 ADJUSTMENT AND CLEANING

- A. Repair coatings damaged in the shop or at the Site by recoating with manufacturer's recommended repair compound, applied in accordance with manufacturer's directions. Repair hot-dip galvanized coatings in accordance with ASTM A780.
- B. Repair and replace broken or bent components.

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SECTION 33 05 05

BURIED PIPING INSTALLATION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to install and test all buried piping, fittings, and specials. The Work includes the following:
 - a. All types and sizes of buried piping, except where buried piping installations are specified under other Sections.
 - b. Unless otherwise shown or specified, this Section includes all buried piping Work required, beginning at the outside face of structures or structure foundations, including piping beneath structures, and extending away from structures.
 - c. Work on or affecting existing buried piping.
- B. Coordination:
 - 1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before buried piping Work.
 - 2. Coordinate with appropriate piping Sections of Division 40, Process Integration.
- C. Related Sections:
 - 1. Section 31 05 05, Excavation and Fill.

1.2 REFERENCES

- A. Standards referenced in this Section are:
 - 1. ASME Boiler and Pressure Vessel Code.
 - 2. ASME B31.3, Process Piping.
 - 3. American Society for Non-Destructive Testing (ASNT), ASNT-TC-1A, Recommended Practice, Personnel Qualification, and Certification in Non-destructive Testing.
 - 4. ASTM B32, Specification for Solder Metal.
 - 5. ASTM C12, Practice for Installing Vitrified Clay Pipe Lines.
 - 6. ASTM C425, Specification for Compression Joints for Vitrified Clay Pipe and Fittings.
 - 7. ASTM C828, Test Method for Low-Pressure Air Test of Vitrified Clay Pipe Lines.
 - 8. ASTM C924, Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Test Method.
 - 9. ASTM D2321, Practice for Underground Installation of Thermoplastic Pipe for Sewers and other Gravity-Flow Applications.

10. ASTM D2774, Practice for Underground Installation of Thermoplastic Pressure Piping.
11. ASTM D4174, Practice for Cleaning, Flushing and Purification of Petroleum Fluid Hydraulic Systems.
12. ASTM F1417, Test Method for Installation Acceptance of Plastic Gravity Sewer Lines using Low-Pressure Air.
13. ASTM F2164, Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure.
14. ANSI/AWWA C105, Polyethylene Encasement for Ductile-Iron Pipe Systems.
15. ANSI/AWWA C111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
16. ANSI/AWWA C206, Field Welding of Steel Water Pipe.
17. ANSI/AWWA C600, Installation of Ductile-Iron Water Mains and Their Appurtenances.
18. ANSI/AWWA C603, Installation of Asbestos-Cement Pressure Pipe.
19. ANSI/AWWA C605, Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
20. ANSI/AWWA C606, Grooved and Shouldered Joints.
21. ANSI/AWWA C651, Disinfecting Water Mains.
22. AWWA M9, Concrete Pressure Pipe.
23. AWWA M11, Steel Water Pipe - A Guide for Design and Installation.
24. AWWA M23, PVC Pipe - Design and Installation.
25. AWWA M41, Ductile-Iron Pipe and Fittings.
26. AWWA M45, Fiberglass Pipe Design.
27. AWWA M55, PE Pipe - Design and Installation.
28. ASCE 37, Design and Construction of Sanitary and Storm Sewers.
29. American Concrete Pipe Association, Concrete Pipe Handbook.
30. Chlorine Institute, Inc., Piping Systems for Dry Chlorine, Pamphlet No. 6.
31. NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements:
 1. Comply with requirements and recommendations of authorities having jurisdiction over the Work, including.
 - a. City of Rochester.
 2. Obtain required permits for Work in roads, rights-of-way, railroads, and other areas of the Work.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following:
 1. Shop Drawings:
 - a. Details of piping, specials, joints, harnessing and thrust blocks, and connections to piping, structures, equipment, and appurtenances.
 2. Product Data:
 - a. Manufacturer's literature and specifications, as applicable, for products

- specified in this Section.
3. Testing Procedures:
 - a. Submit proposed testing procedures, methods, apparatus, and sequencing. Obtain DEPARTMENT's approval prior to commencing testing.
- B. Informational Submittals: Submit the following:
1. Certificates:
 - a. Certificate signed by manufacturer of each product certifying that product conforms to applicable referenced standards.
 2. Field Quality Control Submittals:
 - a. Results of each specified field quality control test.
- C. Closeout Submittals: Submit the following:
1. Record Documentation:
 - a. Maintain accurate and up-to-date record documents showing modifications made in the field, in accordance with approved submittals, and other Contract modifications relative to buried piping Work. Submittal shall show actual location of all piping Work and appurtenances at same scale as the Drawings.
 - b. Show piping with elevations referenced to Project datum and dimensions from permanent structures. For each horizontal bend in piping, include dimensions to at least three permanent structures, when possible. For straight runs of piping provide offset dimensions as required to document piping location.
 - c. Include profile drawings with buried piping record documents when the Contract Documents include piping profile drawings.
 - d. Conform to Section 01 78 39, Project Record Documents.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
1. Deliver materials to the Site to ensure uninterrupted progress of the Work.
 2. Upon delivery inspect pipe and appurtenances for cracking, gouging, chipping, denting, and other damage and immediately remove from Site and replace with acceptable material.
- B. Storage:
1. Store materials to allow convenient access for inspection and identification. Store material off ground using pallets, platforms, or other supports. Protect packaged materials from corrosion and deterioration.
 2. Pipe and fittings other than PVC and CPVC may be stored outdoors without cover. Cover PVC and CPVC pipe and fittings stored outdoors.
- C. Handling:
1. Handle pipe, fittings, specials, and accessories carefully in accordance with pipe manufacturer's recommendations. Do not drop or roll material off trucks. Do not drop, roll or skid piping.
 2. Avoid unnecessary handling of pipe.

3. Keep pipe interiors free from dirt and foreign matter.
4. Protect interior linings and exterior coatings of pipe and fittings from damage.
Replace pipe and fittings with damaged lining regardless of cause of damage.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Piping materials are specified in the Buried Piping Schedule at end of this Section. Piping materials shall conform to Specifications for each type of pipe and piping appurtenances in applicable Sections of Division 40, Process Integration.
- B. General:
 1. Pipe Markings:
 - a. Manufacturer shall cast or paint on each length of pipe and each fitting pipe material, diameter, and pressure or thickness class.

2.2 BURIED PIPING IDENTIFICATION

- A. Polyethylene Underground Warning Tape for Metallic Pipelines:
 1. Tracer tape shall be of inert, acid- and alkali-resistant, polyethylene, four mils thick, six inches wide, suitable for direct burial. Tape shall be capable of stretching to twice its original length.
 2. Message shall read, "CAUTION, i.e., "POTABLE WATER", "SANITARY SEWER", "CHLORINE GAS", or other service as appropriate, as indicated in the Buried Pipe Schedule at the end of this Section PIPE BURIED BELOW", with bold letters approximately two inches high. Messages shall be printed at maximum intervals of two feet. Tape shall be standard colors utilized in UFPO coding.
 3. Manufacturer: Provide products of one of the following:
 - a. Brady Corporation
 - b. Seton Identification Products
 - c. Marking Services, Inc.
 - d. Or equal.
- B. Detectable Underground Warning Tape for Non-Metallic Pipelines:
 1. Tape shall be of inert, acid- and alkali-resistant, polyethylene, five mils thick, six inches wide, with aluminum backing, and have 15,000 psi tensile strength and 80 percent elongation capability. Tape shall be suitable for direct burial.
 2. Message shall read, "CAUTION, i.e., "POTABLE WATER", "SANITARY SEWER", "CHLORINE GAS", or other appropriate service, as indicated in the Buried Pipe Schedule at the end of this Section PIPE BURIED BELOW" with bold letters approximately two inches high. Messages shall be printed at maximum intervals of two feet. Tape shall be standard colors utilized in UFPO coding.
 3. Manufacturer: Provide products of one of the following:
 - a. Brady Corporation

- b. Seton Identification Products
- c. Marking Services, Inc.
- d. Or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Install piping as shown, specified, and as recommended by pipe and fittings manufacturer.
2. In event of conflict between manufacturer's recommendations and the Contract Documents, request interpretation from DEPARTMENT before proceeding.
3. DEPARTMENT will observe excavations and bedding prior to laying pipe by CONTRACTOR. Notify DEPARTMENT in advance of excavating, bedding, pipe laying, and backfilling operations.
4. Minimum cover over buried piping shall be 4 feet, unless otherwise shown or approved by DEPARTMENT.
5. Earthwork is specified in Section 31 23 05, Excavation and Fill.
6. Excavation in excess of that required or shown, and that is not authorized by DEPARTMENT shall be filled at CONTRACTOR's expense with granular material furnished, placed, and compacted in accordance with Section 31 05 16, Aggregates for Earthwork.
7. Comply with NFPA 24 for "Outside Protection", where applicable to water piping systems used for fire protection.

B. Separation of Sewers and Potable Water Piping:

1. Horizontal Separation:
 - a. Where possible, existing and proposed potable water mains and service lines, and sanitary, combined, and storm sewers shall be separated horizontally by clear distance of at least ten feet.
 - b. If local conditions preclude the specified clear horizontal separation, installation will be allowed if potable water main is in separate trench or on undistributed earth shelf on one side of sewer and with bottom of potable water main at least 18 inches above top of sewer.
 - c. Exception:
 - 1) Where it is not possible to provide minimum horizontal separation described above, construct potable water main of cement-lined ductile iron pipe with restrained push-on joint or restrained mechanical joint pipe complying with public water supply design standards of authority having jurisdiction. Hydrostatically test water main and sewer as specified in this Section prior to backfilling. Hydrostatic test pressure at crossing shall be at least 150 psi.
2. Vertical Separation:
 - a. Provide minimum vertical distance of 18 inches between outside of potable water main and outside of sewer when sewer crosses over potable water main.

- b. Center a section of potable water main pipe at least 17.5 feet long over sewer so that sewer joints are equidistant from potable water main joints.
- c. Provide adequate structural support where potable water main crosses under sewer. At minimum, provide compacted select backfill for ten feet on each side of crossing.
- d. Exceptions:
 - 1) Where it is not possible to provide minimum vertical separation described above, construct potable water main of cement-lined ductile iron pipe with restrained push-on joint or restrained mechanical joint pipe. Hydrostatically test water main and sewer as specified in this Section, prior to backfilling. Hydrostatic test pressure at crossing shall be at least 150 psi.
 - 2) Encase either potable water main or sewer in watertight carrier pipe extending ten feet on each side of crossing, measured perpendicular to potable water main.

C. Plugs:

- 1. Temporarily plug installed pipe at end of each day of work or other interruption of pipe installation to prevent entry of animals, liquids, and persons into pipe, and entrance or insertion of deleterious materials into pipe.
- 2. Install standard plugs in bells at dead ends, tees, and crosses. Cap spigot and plain ends.
- 3. Fully secure and block plugs, caps, and bulkheads installed for testing to withstand specified test pressure.
- 4. Where plugging is required for phasing of the Work or subsequent connection of piping, install watertight, permanent type plugs, caps, or bulkhead acceptable to DEPARTMENT.

D. Bedding Pipe: Bed pipe as specified and in accordance with details on the Drawings.

- 1. Trench excavation and backfill, and bedding materials shall conform to Section 31 23 05, Excavation and Fill, as applicable.
- 2. Where DEPARTMENT deems existing bedding material unsuitable, remove and replace existing bedding with approved granular material furnished, placed, and compacted in accordance with Section 31 05 16, Aggregates for Earthwork. Payment for additional excavation and providing granular material will be made under the unit price payment items in the Contract.
- 3. Where pipe is installed in rock excavation, provide minimum of three inches of granular bedding material underneath pipe smaller than four-inch nominal diameter, and minimum of six inches of granular bedding material underneath pipes four-inch nominal diameter and larger.
- 4. Excavate trenches below bottom of pipe by amount shown and indicated in the Contract Documents. Remove loose and unsuitable material from bottom of trench.
- 5. Carefully and thoroughly compact pipe bedding with hand held pneumatic compactors.
- 6. Do not lay pipe until DEPARTMENT approves bedding condition.
- 7. Do not bring pipe into position until preceding length of pipe has been bedded and secured in its final position.

E. Laying Pipe:

1. Conform to manufacturer's instructions and requirements of standards and manuals listed below, as applicable:
 - a. Thermoplastic Pipe: ASTM D2321, ASTM D2774, ANSI/AWWA C605, AWWA M23, AWWA M45, AWWA, M55.
 - b. Sanitary and Storm Sewers: ASCE 37.
2. Install pipe accurately to line and grade shown and indicated in the Contract Documents, unless otherwise approved by DEPARTMENT. Remove and reinstall pipes that are not installed correctly.
3. Slope piping uniformly between elevations shown.
4. Keep groundwater level in trench at least 12 inches below bottom of pipe before laying pipe. Do not lay pipe in water. Maintain dry trench conditions until jointing and backfilling are complete. Keep clean and protect interiors of pipe, fittings, valves, and appurtenances.
5. Start laying pipe at lowest point and proceed towards higher elevations, unless otherwise approved by DEPARTMENT.
6. Place bell and spigot-type pipe so that bells face the direction of laying, unless otherwise approved by DEPARTMENT.
7. Place concrete pipe containing elliptical reinforcement with minor axis of reinforcement in vertical position.
8. Excavate around joints in bedding and lay pipe so that pipe barrel bears uniformly on trench bottom.
9. Deflections at joints shall not exceed 75 percent of amount allowed by pipe manufacturer, unless otherwise approved by DEPARTMENT.
10. For PVC and CPVC piping with solvent welded joints, 2.5-inch diameter and smaller, and copper tubing, snake piping in trench to compensate for thermal expansion and contraction.
11. Carefully examine pipe, fittings, valves, and specials for cracks, damage, and other defects while suspended above trench before installation. Immediately remove defective materials from the Site and replace with acceptable products.
12. Inspect interior of all pipe, fittings, valves, and specials and completely remove all dirt, gravel, sand, debris, and other foreign material from pipe interior and joint recesses before pipe and appurtenances are moved into excavation. Bell and spigot-type mating surfaces shall be thoroughly wire brushed, and wiped clean and dry immediately before pipe is laid.
13. Field cut pipe, where required, with machine specially designed for cutting the type of pipe being installed. Make cuts carefully, without damage to pipe, coating or lining, and with smooth end at right angles to axis of pipe. Cut ends on push-on joint type pipe shall be tapered and sharp edges filed off smooth. Do not flame-cut pipe.
14. Do not place blocking under pipe, unless specifically approved by DEPARTMENT for special conditions.
15. Touch up protective coatings in manner satisfactory to DEPARTMENT prior to backfilling.
16. Notify DEPARTMENT in advance of backfilling operations.
17. On steep slopes, take measures acceptable to DEPARTMENT to prevent movement of pipe during installation.

18. Thrust Restraint: Where required, provide thrust restraint conforming to Article 3.3 of this Section.
19. Exercise care to avoid flotation when installing pipe in cast-in-place concrete, and in locations with high groundwater.

F. Jointing Pipe:

1. Thermoplastic Pipe Joints:

a. Solvent Cement Welded Joints:

- 1) Bevel pipe ends and remove all burrs before making joints. Clean pipe and fittings thoroughly. Do not attempt to make solvent cement joints if temperature is below 40 degrees F. Do not make solvent cement welded joints in wet conditions.
- 2) Use solvent cement supplied or recommended by pipe manufacturer.
- 3) Apply joint primer and solvent cement and assemble joints in accordance with recommendations and instructions of manufacturer of joint materials and pipe manufacturer.
- 4) Take appropriate safety precautions when using joint primers and solvent cements. Allow air to circulate freely through pipelines to allow solvent vapors to escape. Slowly admit water when flushing or filling pipelines to prevent compression of gases within pipes.

b. Bell and Spigot Joints:

- 1) Bevel pipe ends, remove all burrs, and provide a reference mark at correct distance from pipe end before making joints.
- 2) Clean spigot end and bell thoroughly before making the joint. Insert O-ring gasket while ensuring that gasket is properly oriented. Lubricate spigot with manufacturer's recommended lubricant. Do not lubricate bell and O-ring. Insert spigot end of pipe carefully into bell until reference mark on spigot is flush with bell.

2. HDPE Pipe Joints:

a. Bell and Spigot Joints:

- 1) Remove all burrs and provide reference mark at correct distance from pipe end. Place mark such that no more than 1/2-inch of machined spigot surface will be visible outside of bell after pipe has been joined.
- 2) Clean spigot end and bell thoroughly with soap and water before positioning gasket.
- 3) Lubricate spigot groove with manufacturer's recommended lubricant. Thoroughly clean gasket and place in spigot groove starting at bottom, ensuring that gasket fins face backwards toward pipe.
- 4) Thoroughly lubricate gasket with pipe manufacturer's recommended lubricant and equalize stretch in gasket by running screwdriver under gasket around its entire circumference three times. Reposition gasket in groove after stretching.
- 5) Thoroughly clean and lubricate receiving bell. Align pipe as straight as possible and insert spigot end of pipe carefully into bell until reference mark on spigot is flush with bell.
- 6) If mechanical means are used to insert spigot end, protect with wood the end of pipe being pushed, to ensure even distribution of pressure.

- G. Backfilling:
 - 1. Conform to applicable requirements of Section 31 23 05, Excavation and Fill.
 - 2. Place backfill as Work progresses. Backfill by hand and use power tampers until pipe is covered by at least one foot of backfill.
- H. Closures:
 - 1. Provide closure pieces shown or required to complete the Work.

3.2 TRACER TAPE INSTALLATION

- A. Polyethylene Underground Warning Tape for Metallic Pipelines:
 - 1. Provide polyethylene tracer tape for buried metallic piping, which includes pipe that is steel, ductile iron, cast iron, concrete, copper, and corrugated metal.
 - 2. Provide tracer tape 12 to 18 inches below finished grade, above and parallel to buried pipe.
 - 3. For pipelines buried eight feet or greater below finished grade, provide second line of magnetic tracer tape 2.5 feet above crown of buried pipe, aligned along pipe centerline.
 - 4. Tape shall be spread flat with message side up before backfilling.
- B. Detectable Underground Warning Tape for Non-Metallic Pipelines:
 - 1. Provide polyethylene tracer tape with aluminum backing for buried, non-metallic piping, which includes pipe that is PVC, CPVC, polyethylene, HDPE, FRP, ABS, and vitrified clay.
 - 2. Provide magnetic tracer tape 12 to 18 inches below finished grade, above and parallel to buried pipe.
 - 3. For pipelines buried eight feet or greater below finished grade, provide second line of magnetic tracer tape 2.5 feet above crown of buried pipe, aligned along the pipe centerline.
 - 4. Tape shall be spread flat with message side up before backfilling.

3.3 WORK AFFECTING EXISTING PIPING

- A. Location of Existing Underground Facilities:
 - 1. Locations of existing Underground Facilities shown on the Drawings should be considered approximate.
 - 2. Determine the true location of existing Underground Facilities to which connections are to be made, crossed, and that could be disturbed, and determine location of Underground Facilities that could be disturbed during excavation and backfilling operations, or that may be affected by the Work.
- B. Work on Existing Pipelines or Underground Facilities:
 - 1. Cut or tap piping or Underground Facilities as shown or required with machines specifically designed for cutting or tapping pipelines or Underground Facilities, as applicable.
 - 2. Install temporary plugs to prevent entry of mud, dirt, water, and debris into pipe.

3. Provide necessary adapters, sleeves, fittings, pipe, and appurtenances required to complete the Work.

3.4 FIELD QUALITY CONTROL

A. General:

1. Test all piping, except as exempted in the Buried Piping Schedule in this Section.
2. When authorities having jurisdiction are to witness tests, notify DEPARTMENT and authorities having jurisdiction in writing at least 48 hours in advance of testing.
3. Conduct all tests in presence of DEPARTMENT.
4. Remove or protect pipeline-mounted devices that could be damaged by testing.
5. Provide all apparatus and services required for testing, including:
 - a. Test pumps, compressors, hoses, calibrated gages, meters, test containers, valves, fittings, and temporary pumping systems required to maintain OWNER's operations.
 - b. Temporary bulkheads, bracing, blocking, and thrust restraints.
6. Provide air if an air test is required, power if pumping is required, and gases if gases are required.
7. Unless otherwise specified, CONTRACTOR will provide fluid required for hydrostatic testing. CONTRACTOR shall provide means to convey fluid for hydrostatic testing into piping being tested. CONTRACTOR shall provide fluid for other types of testing required.
8. Repair observed leaks and repair pipe that fails to meet acceptance criteria. Retest after repair.
9. Unless otherwise specified, testing shall include existing piping systems that connect with new piping system. Test existing pipe to nearest valve. Piping not installed by CONTRACTOR and that fails the test shall be repaired upon authorization of OWNER. Unless otherwise included in the Work, repair of existing piping or Underground Facilities will be paid as extra Work.

B. Test Schedule:

1. Refer to the Buried Piping Schedule in this Section for type of test required and required test pressure.
2. Unless otherwise specified, required test pressures are at lowest elevation of pipeline segment being tested.
3. For piping not listed in Buried Piping Schedule in this Section:
 - a. Hydrostatically test pipe that will convey liquid at a pressure greater than five psig. Provide process air pipe test for pipe that will convey air or gas under pressure or vacuum, except chlorine gas, which requires separate test.
 - b. Use exfiltration testing, low-pressure air testing, or vacuum testing for other piping.
 - c. Disinfect for bacteriological testing piping that conveys potable water.
4. Test Pressure:
 - a. Use test pressures listed in Buried Piping Schedule in this Section.

- b. If test pressure is not listed in Buried Piping Schedule, or if test is required for piping not listed in the Buried Piping Schedule, test pressure will be determined by DEPARTMENT based on maximum anticipated sustained operating pressure and methods described in applicable ANSI/AWWA manual or standard that applies to the piping system.

C. Hydrostatic Testing:

1. Preparation for Testing:

- a. For thermoplastic pipe and fiberglass pipe, follow procedures described in Section 7 of ANSI/AWWA Standard C605.
- b. For HDPE pipe, follow procedures described in ASTM F2164. Test duration, including time to pressurize, time for initial expansion, time at test pressure, and time to depressurize, shall not exceed eight hours. If re-testing of a test section or pipeline is required, at least eight hours shall elapse between tests.
- c. For steel pipe, follow procedures described in ANSI/AWWA Manual M11. Wetting period is not required for pipe that is not cement-lined.
- d. For other piping follow procedures described in ANSI/AWWA Manual M9, except that minimum wetting period required immediately prior to testing for asbestos cement pipe shall be 24 hours rather than the 48 hours prescribed for concrete pipe. Wetting period is not required for pipe that is not cement mortar-lined.
- e. Prior to testing, ensure that adequate thrust protection is in place and joints are properly installed.

2. Test Procedure:

- a. Fill pipeline slowly to minimize air entrapment and surge pressures. Fill rate shall not exceed one foot of pipe length per second in pipe being tested.
- b. Expel air from pipe as required. Obtain approval of DEPARTMENT prior to tapping pipe for expelling air.
- c. Examine exposed joints and valves, and make repairs to eliminate visible leakage.
- d. After specified wetting period, add fluid as required to pressurize line to required test pressure. Maintain test pressure for a stabilization period of ten minutes before beginning test.
- e. HDPE Pipe: After filling pipeline, gradually pressurize pipe to test pressure and maintain required test pressure for three hours for pipe to expand. During expansion, add fluid to maintain required test pressure. Begin timed test period after expansion period and other requirements are met.
- f. Timed test period shall not begin until after pipe has been filled, exposed to required wetting period, air has been expelled, and pressure stabilized.
- g. Timed Test Period: After stabilization period, maintain test pressure for at least two hours. During timed testing period, add fluid as required to maintain pressure within five psig of required test pressure. For HDPE pipe, after three hour expansion phase, reduce test pressure by ten psig and do not add liquid. Test pressure shall then remain steady for one hour, indicating no leakage.

- h. Pump from test container to maintain test pressure. Measure volume of fluid pumped from test container and record on test report. Record pressure at test pump at 15 minute intervals for duration of test.
3. Allowable Leakage Rates: Leakage is defined as the quantity of fluid supplied to pipe segment being tested to maintain pressure within five psi of test pressure during timed test period. Allowable leakage rates for piping are:

D. Exfiltration Testing:

1. Plug and bulkhead ends and lateral connections of pipe segment to be tested and admit fluid until the pipe is full. Admit fluid slowly to minimize air entrapment. Groundwater level shall be below the pipe during exfiltration test.
2. Before measuring leakage, allow fluid to wet pipe interior for the following period:
 - a. Concrete Pipe: 48 hours.
 - b. Cement Mortar-lined Pipe: 24 hours.
 - c. Asbestos-cement Pipe: 24 hours.
 - d. Other Pipe: Wetting period not required.
3. Maintain hydrostatic head during test to equal an elevation two feet above present and future maximum groundwater elevation at pipe segment tested. DEPARTMENT will determine test water surface elevation for each pipe segment.
4. Provide minimum hydrostatic head during test of two feet above crown of upstream end of pipe segment tested.
5. Add fluid from test container or from metered supply as required to maintain test water level within three inches of test head throughout the test.
6. Test duration shall be at least two hours.
7. Allowable Leakage Rates:
 - a. Leakage is defined as the quantity of fluid that must be supplied to pipe segment tested to maintain hydrostatic head within three inches of test head during the test after pipe has been filled and exposed to required wetting period, plus quantity required to refill to original head at end of test.
 - b. Leakage shall not exceed that allowed by authority having jurisdiction.

D. Sewer Testing with Low Pressure Air:

1. Plug and bulkhead ends and lateral connections of pipe segment to be tested.
2. Required test pressure shall be increased by an amount equal to the elevation of groundwater above invert of lowest point of pipe segment being tested.
3. Test in accordance with requirements of authority having jurisdiction.
4. If there are no Laws and Regulations covering the test, use test procedures described in the following standards:
 - a. Thermoplastic and HDPE Pipe: ASTM F1417.

3.5 SCHEDULES

- A. Schedules listed below, following the “End of Section” designation, are part of this Specification section.
 - 1. Table 33 05 05-A, Buried Piping Schedule.

+ + END OF SECTION + +

TABLE 33 05 05-A, BURIED PIPING SCHEDULE

Service	Diameter (inch)	Material	Interior Lining	Exterior Coating	Pressure Class/ Thickness	Joint	Test	Remarks
ST	12"	PE	NA	NA	N-12	BS	NR	

The following abbreviations are used in the Buried Piping Schedule.

A. Service Abbreviations

Service	Abbrev		Service	Abbrev.
Sanitary Sewer	SAN		Wastewater	WW
Storm Sewer	ST		Overflow	OF
Combined Sewer	CS		Centrate	CEN
Sanitary Force Main	SFM		Filtrate	FILT
Raw Water	RW		Scum	SCUM
Potable Water	PW		Primary Sludge	PS
City Water	CW		Return Activated Sludge	RAS
Non-Potable Water	NPW		Waste Activate Sludge	WAS
Plant Effluent Water	PEW		Thickened Sludge	TS
Spray Water	SPW		Mixed Sludge	MS
Backwash Water	BW		Digested Sludge	DS
Hot Water Supply	HWS		Chlorine Solution	CLS
Hot Water Return	HWR		Sodium Hydroxide	NAOH
Influent	INF		Sodium Hypochlorite	NAOCL
Effluent	EFF		Polymer Solution	POLYS
Drain	DR		Alum	AL
Process Air	PA		Hydraulic Fluid	HF
Instrument Air	IA		Fuel Oil	FO
Digester Gas	DIG		Lube Oil	LO
Chlorine Gas	CLG			

B. Material Abbreviations

Material	Abbrev		Material	Abbrev.
Ductile Iron	DI		Polyvinyl Chloride	PVC
Cast Iron	CI		Chlorinated Polyvinyl Chloride	CPVC
Carbon Steel	CS		Polyethylene	PE
Stainless Steel	SS		High Density Polyethylene	HDPE
Copper	C		Fiberglass Reinforced Plastic	FRP
Corrugated Metal Pipe	CMP		Acrylonitrile Butadiene Styrene	ABS
Reinforced Concrete Pipe	RCP		Vitrified Clay	VC
Prestressed Concrete Cylinder Pipe	PCCP			
Non-Prestressed Concrete Cylinder Pipe	CCP			
Steel Cylinder Pipe	SCP			

C. Lining/Coating Abbreviations

Lining	Abbrev		Coating	Abbrev.
Cement Mortar Lined	CL		Asphaltic Coated	AC
Glass Lined	GL		Polyethylene Wrapped	PEW
Ceramic Epoxy	CE		Painted	P
Fusion Bonded Epoxy Lined	FBEL		Fusion Bonded Epoxy Coated	FBEC
Plastic Lined	PL		Insulated	I
			Galvanized	Galv

D. Joint Abbreviations

Joint Type	Abbrev		Joint Type	Abbrev.
Bell and Spigot	BS		Butt Weld	BW
Restrained Bell and Spigot	RBS		Lap Weld	LW
Push-on Joint	POJ		Butt Fusion Weld	BFW
Restrained Push-on Joint	RPOJ		Solvent Weld	SW
Mechanical Joint	MJ		Sleeve-type Flexible Coupling	SLFC
Restrained Mech. Joint	RMJ		Split Flexible Coupling	SPFC
Soldered	Sd		Plasticized PVC Coupling	PPVC
Brazed	Bz		Grooved or Shouldered End Coupling	GSEC
Threaded	Thd		Flanged	Flg

Compression Sleeve Coupling	CSC		Compression Flange Adapter	CFA

E. Test Abbreviations

Test	Abbrev		Test	Abbrev.
Hydrostatic Test (test pressure in psig)	HYD ()		Process Air Pipe Test (test pressure in psig)	PA ()
Exfiltration	EX		Chlorine Pipe Test	CL
Low-pressure Air Sewer Test	AIR		Disinfection and Bacteriological Testing	DBT
Vacuum Test	VAC		Examination of Welds	EW
Vertical Deflection	VD		No Test Required	NR
Televised Inspection	TV			

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SECTION 33 29 00

WELL ABANDONMENT

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide labor, materials, utilities, transportation, tools, supplies, equipment and appurtenances required to complete the abandonment of wells as shown and specified.
 - 2. The Work includes the abandonment of the following:
 - a. Monitoring wells.
- B. Existing conditions:
 - 1. Refer to the Limited Site Specific Data Drawings for location and size of existing monitoring wells.
- C. Permits:
 - 1. CONTRACTOR shall obtain permits from authorities having jurisdiction prior to commencement of the Work.
 - 2. Where a permit to permit is required, the DEPARTMENT will complete and submit the Notice of Intent (NOI) to the authority having jurisdiction.

1.2 REFERENCES

- A. Standards referenced in this Section are listed below:
 - 1. American Welding Society, (AWS).
 - 2. New York State Department of Environmental Conservation, (NYSDEC), GW-MW-10/96, "1996 Groundwater Monitoring Well Decommissioning Procedures."

1.3 QUALITY ASSURANCE

- A. The Work shall comply with the Rules and Regulations as defined under the applicable requirements of governing authorities having jurisdiction, including but not limited to, the New York State Department of Environmental Conservation.
- B. The well driller shall be a licensed well driller in the State of New York.
- C. Records: The records and logs described in Article 1.4, below, shall be reviewed to ensure the quality of the well abandonment prior to acceptance of the Work by the DEPARTMENT.

- D. The DEPARTMENT shall observe the abandonment of the well. CONTRACTOR shall cooperate with the DEPARTMENT in this observation, which shall include, but not be limited to, observing abandonment operations and reviewing the daily drillers report.
- E. Welding performed shall be high quality and per American Welding Society Standards.
- F. Products used in the Work, specified under this specification, shall be produced by manufacturers regularly engaged in the production of such items that have a successful history of product acceptability, as interpreted by the DEPARTMENT. Equipment or materials of less quality or of inferior design to that specified will not be accepted.

1.4 SUBMITTALS

- A. Action Submittals: Submit the following:
 - 1. Shop Drawings: Submit the following prior to well abandonment operations:
 - a. Cement grout mix design.
 - b. Backfill material design and calculated required volume.
 - c. Method of casing removal.
 - d. Method of surface seal grout and material placement.
 - e. Method of backfill grout and material and material placement.
- B. Informational Submittals: Submit the following:
 - 1. A Daily Driller's Report shall be kept at the Site for review by the DEPARTMENT, and at the conclusion of well abandonment, two neat, legible copies of the reports shall be submitted to the DEPARTMENT. The report shall contain, but not be limited to, the following information for each day's activity:
 - a. Number of crew on the Site and name of superintendent for each shift.
 - b. Description of equipment on-site and equipment used.
 - c. Number of hours on the job.
 - d. Number of hours of abandonment operations.
 - e. Number of hours of shutdown
 - f. Description of abandonment activities conducted, including amounts of material used and chronological log of activities.
 - g. Emergency phone numbers of personnel involved in well abandonment.
 - 2. Within seven days after completion of abandonment, submit two copies of complete and accurate Daily Driller's Reports to the DEPARTMENT.
 - 3. If CONTRACTOR requests changes to these Specifications, CONTRACTOR shall submit in writing the requested changes to the DEPARTMENT prior to implementation of the change. DEPARTMENT will review the request and notify CONTRACTOR in writing of his decision.

4. Within thirty days of well abandonment, the well abandonment completion report shall be submitted by CONTRACTOR to the authority having jurisdiction and the DEPARTMENT.

PART 2 - PRODUCTS

2.1 SURFACE SEAL

- A. Cement/Bentonite Slurries: A mixture with the ratio of three to five pounds of high yield bentonite powder for each 94 pound sack of Portland Cement, Type 1 or Type 2, and 6.5 gallons of water from a known, safe and uncontaminated source. Accelerator shall be limited to one to two percent by weight, if used.

2.2 BACKFILL MATERIAL

- A. High Solids Bentonite Grout (Powder Slurry with greater than 15 percent solids): A mixture with the ratio of 50 pounds of dry powder to 16 gallons of water from a known, safe and uncontaminated source.

PART 3 - EXECUTION

3.1 ABANDONMENT

- A. General: Well abandonment shall consist of the following:
 1. Remove casing and/or perforate casing its full length.
 2. Placing the appropriate backfill material into the well to a depth of 2 to 3-feet below the ground surface.
 3. Removing, at a minimum, the top 2 to 3-foot section of the well casing.
 4. Placing a surface seal to the ground surface.
- B. Backfilling:
 1. Backfilling shall be performed using a tremie pipe.
 2. CONTRACTOR shall measure and record the amount of backfill material placed in the well to the specified depth below the ground surface and compare this volume with the estimated volume. This information shall be presented to the DEPARTMENT for approval prior to casing removal. If the placed volume of backfill material is appreciably less than the estimated volume this will be evidence that bridging may have occurred, and CONTRACTOR shall remove backfill material to the depth of bridging, eliminate the bridging, and then place backfill material to the desired depth.
- C. Casing Removal:
 1. After approval of backfilling by DEPARTMENT, CONTRACTOR shall remove the uppermost section of casing to the depth specified. The method of removing this casing shall be selected by CONTRACTOR.

D. Placement of Cement Grout Seal:

1. A cement grout seal shall be placed between from 2 feet to the specified depth below the ground surface. The cement grout shall be allowed to set a minimum of 16 hours prior to backfilling native material above the seal.

3.2 CLOSE-OUT PROCEDURES

A. Backfilling of Native Material:

1. Once the cement grout seal has set, native material shall be backfilled above the seal to existing grade.

B. CONTRACTOR shall remove all debris and excess materials and return the Site to original condition.

Well ID	Total Depth of Well (feet)
IW-1	13.0
OBW-1	30.0
OBW-2	33.0
OBW-3	28.0
PZ-1	10.0
PZ-2	13.5
PZ-6	11.0
PZ-7	14.0
PZ-8	14.0
PZ-9	13.0

- C. In the case where wells are located in the source area excavation and do not extend to the depth of the excavation, the wells can be removed as part of the excavation and will not require formal abandonment.

++ END OF SECTION ++

SECTION 33 44 13

DRAINAGE STRUCTURES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install all precast and masonry drainage structures, including drain inlets, catch basins, headwalls and similar structures.
- B. General:
 - 1. Structures shall conform in shape, size, dimensions, materials, and other respects to the details shown or as directed by the DEPARTMENT.
 - 2. Cast iron frames, grates and covers shall be the standard frame and grate or cover, unless otherwise shown.
 - 3. All concrete shall be Class "A" and shall conform to the requirements specified by NYSDOT.
 - 4. Inverts shall be as shown and shall conform accurately to the size and elevation of the adjoining pipes.
- C. Related Sections:
 - 1. Division 31, Applicable Sections on Earthwork.

1.2 QUALITY ASSURANCE

- A. Standards referenced in this Section are listed below:
 - 1. American Society for Testing and Materials, (ASTM).
 - a. ASTM C 32, Specification for Sewer and Manhole Brick (Made from Clay or Shale).
 - b. ASTM C 139, Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
 - c. ASTM C 140, Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
 - d. ASTM C 207, Specification for Hydrated Lime For Masonry Purposes.
 - e. ASTM C 478, Specification for Precast Reinforced Concrete Manhole Sections.
 - 2. New York State Department of Transportation (NYSDOT).

1.3 SUBMITTALS

- A. Action Submittals: Submit the following:
 - 1. Shop Drawings:
 - a. Submit drawings showing design and construction of all precast concrete.

2. Samples:
 - a. Submit for approval samples of brick, block, gaskets and accessories, if any, for the structures.

PART 2 - PRODUCTS

2.1 PRECAST PRODUCTS

- A. Where shown or otherwise approved by DEPARTMENT, precast concrete shall be used for items such as area drains, catch basins, splash pads, etc. Layout and details shall be as shown and specified. Design shall be adequate to withstand all loads imposed, including earth pressure, vehicle loads and construction loading.
- B. Precast concrete sections shall conform to ASTM C 478, where applicable.
- C. Where precast structures are made up of various precast components such as base sections, riser sections and top sections, the joint between sections shall be the tongue and groove type.

2.2 MISCELLANEOUS METALS

- A. Metal frames, covers, grates, troughs and similar required items shall be provided as shown and specified.

PART 3 - EXECUTION

3.1 LAYING MASONRY

- A. Brick shall be satisfactorily wet when being laid and each brick shall be laid in mortar so as to form full bed, end and side joints in one operation. The joints shall not be wider than 3/8-inch, except when the bricks are laid radially, in which case the narrowest part of the joint shall not exceed 1/4-inch.
- B. For concrete block, the vertical keyways shall be completely filled with mortar.
- C. Each layer of brick for the grading ring shall be laid in a full bed of mortar and shall be thoroughly bonded.

3.2 GRADING RINGS

- A. Grading rings or brick stacks shall be used for all precast and masonry structures, where required. They shall be constructed on the top slab on which the frame will be placed. The height of the stack shall be such as is necessary to bring the frame to the proper grade, but in no case greater than 12-inches.

3.3 PRECAST ITEMS

- A. Precast products shall be placed on a concrete or crushed stone bed, set at the proper grade and carefully leveled and aligned.
- B. Backfill shall be carried up evenly on all sides of the structures to prevent overturning forces.

3.4 PIPE JOINT IN STRUCTURE BASE

- A. An approved joint shall be provided between each pipe entering and exiting the structure. Joint may be accomplished by the installation in the structure base of the bell end of a short pipe or by other means subject to approval of DEPARTMENT.
- B. Pipes shall not protrude inside the structure, but shall be cut in an approved manner to be flush with the inside wall of the structure.

+ + END OF SECTION + +

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SECTION 40 05 31

THERMOPLASTIC PROCESS PIPE

PART 1 – GENERAL

1.1 DESCRIPTION

- A. Scope:
 - 1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install thermoplastic piping and fittings.
 - 2. Extent of piping is shown and shall be in accordance with piping schedules in Section 33 05 05, Buried Piping Installation.
- B. Coordination:
 - 1. Review installation procedures under this and other Sections and coordinate installation of items to be installed with or before thermoplastic piping Work.
- C. Related Sections:
 - 1. Section 33 05 05, Buried Piping Installation.

1.2 REFERENCES

- A. Standards referenced in this Section are:
 - 1. AASHTO, Standard Specifications for Highway Bridges.
 - 2. ASTM F2306, Standard Specification for 12" to 60" (300 to 1500 mm) Annular Corrugated Profile-Wall.
 - 3. Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications.
 - 4. ASTM D2321, Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications.
 - 5. ASTM F477, Standard Specifications for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
 - 6. ASTM D3212, Standard Specification for Joints for Drain and Sewer Plastic Pipe Using Flexible Elastomeric Joints.
 - 7. ASTM F2487, Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Corrugated High Density Polyethylene Pipelines.
 - 8. ASTM F2648/F2648M-07, Standard Specification for 2" to 60" (50 to 1500 mm) Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications.
 - 9. ASTM F1417, Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
 - 10. ASTM F2510, Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Corrugated High Density Polyethylene Drainage Pipes.

11. AASHTO M252, Standard Specifications for Corrugated Polyethylene Pipe, 3” to 10” (75 to 250 mm).
12. AASHTO M294, Standard Specification for Corrugated Polyethylene Pipe, 12” to 60” (300 to 1500 mm).
13. AASHTO LRFD Bridge Design Specification, Section 12: Buried Structures & Tunnel Liners.
14. AASHTO Section 30, Construction Standard, Thermoplastic Pipe.
15. CSA B182.8, Storm Sewer and Drainage Pipe and Fittings Polyethylene.

1.3 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Shall have a minimum of five years experience producing thermoplastic pipe and fittings substantively similar to the materials specified, and shall be able to submit documentation of satisfactory service in at least five completed installations in operation for at least five years each.
2. Installer:
 - a. Engage a single pipe installer who shall be responsible for all thermoplastic pipe Work, and who shall employ only tradesmen with specific skills and experience in the type of Work required.
 - b. Installer shall have a minimum of five years experience installing thermoplastic pipe and fittings substantively similar to the materials specified and substantively similar to or larger than the scope of thermoplastic piping Work on the Project, and shall be able to submit documentation of satisfactory experience in at least five completed installations in operation for at least five years each.

B. Component Supply and Compatibility:

1. Obtain all materials included in this Section, regardless of component Supplier, from a single thermoplastic pipe Supplier. All pipe of each material type shall be furnished by the same manufacturer.
2. Thermoplastic pipe Supplier shall review and approve to prepare all Shop Drawings and other submittals for all materials furnished under this Section.
3. Materials shall be suitable for specified service conditions and shall be integrated into overall assembly by thermoplastic pipe Supplier.

1.4 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:
 - a. Submit piping layout Shop Drawings in accordance with Section 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation.
2. Product Data:
 - a. Submit product data on pipe, fittings, gaskets, hardware, and appurtenances sufficient to demonstrate compliance with the Contract Documents.

B. Informational Submittals: Submit the following:

1. Certificates:
 - a. Submit manufacturer's certificate of compliance standards referenced in this Section.
2. Source Quality Control Submittals:
 - a. When requested by DEPARTMENT, submit results of source quality control tests.
3. Qualifications Statements:
 - a. Submit qualifications of manufacturer when requested by DEPARTMENT.
 - b. Submit qualifications of installer when requested by DEPARTMENT.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 33 05 05, Buried Piping Installation, and Section 40 05 05, Exposed Piping Installation.

PART 2 – PRODUCTS

2.1 SERVICE CONDITIONS

- A. General:
 1. Pipe materials shall be suitable for services intended. Refer to piping schedules in Section 33 05 05, Buried Piping Installation.
 2. Pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, and other defects. Unless otherwise shown or indicated, pipe shall be uniform in color, opacity, density, and other physical properties.
 3. Buried pipe shall be capable of withstanding external live load, including impact, equal to AASHTO H-20 loading, with cover shown or indicated on the Drawings.

2.2 POLYETHYLENE (PE) DRAINAGE PIPE

- A. Buried PVC Gravity Sewer Pipe.
 1. Manufacturers: Provide products of one of the following:
 - a. Advanced Drainage System, N-12
 - b. Or equal.
 2. Material:
 - a. Pipe shall comply with ASTM F2306.
 3. Joints:
 - a. Provide watertight bell and spigot joint. Joint shall meet or exceed ASTM F2487.
 - b. Provide elastomeric gaskets complying with ASTM F477 and ASTM D3212.

2.3 IDENTIFICATION

- A. Pipe material identification requirements are in Section 33 05 05, Buried Piping Installation.

2.4 SOURCE QUALITY CONTROL

- A. Shop Tests:
 - 1. Pipe manufacturer shall maintain continuous quality control program.
 - 2. Where applicable and when requested by DEPARTMENT, submit results of source quality control tests specified in reference standards.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect pipe materials for defects in material and workmanship. Verify compatibility of pipe and fittings.

3.2 INSTALLATION

- A. For buried piping installation, refer to Section 33 05 05, Buried Piping Installation.

+ + END OF SECTION + +

SECTION 44 00 05

WATER TREATMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to collect, contain and dispose, or design, furnish, install, check, calibrate, test document start-up and place in satisfactory operation, operate, dismantle, and remove one water treatment system. The Work included herein shall be performed by the CONTRACTOR as required to design, place the system in operation and to operate the system throughout the Work to achieve the specified water quality and continuously achieve compliance with all permit and Specification requirements for collection and remediation of waters from the following sources:
 - a. Contaminated surface water.
 - b. Stormwater.
 - c. Decontamination wash water.
 - d. Dewatering water from source area excavation.
 - e. Water from the containment pad areas.
 - f. All other surface waters at the Site.
2. Items to be provided under this Section shall include, but are not limited to, the following:
 - a. Water recovery trenches, pumps, piping, tankage and all other necessary equipment.
 - b. Maintenance tools, supplies and spare parts.
 - c. All power, sanitary sewer and other utilities required.
3. The CONTRACTOR shall perform treatment of contaminated water on site. Treated water is anticipated to be discharge to the sanitary sewer as operated by the Monroe County Pure Water (MCPW). Additional items furnished under this Section for the treatment shall include, but are not limited to, the following:
 - a. Treatment system controls.
 - b. Treatment system, consisting of equalization tankage(s), mechanical separators (i.e. hydrocyclones), sediment filters, organically modified clay filters or oil water separator, air strippers (if VOC loading warrants need), liquid and/or vapor phase granular activated carbon (GAC) canisters, and storage tanks for equalizing treated effluent prior to discharge. System component and design will be the responsibility of the CONTRACTOR. Note that any tanks utilized to store water are considers to be Hazardous Waste Storage Tanks and therefore shall comply with applicable RCRA requirements.

- c. Characterization and appropriate disposal of all sediment and oils collected in the sediment filters. These wastes shall be assumed to be F002-listed hazardous wastes.
 - d. Characterization and appropriate disposal of all other wastes generated during water treatment such as GAC, bag filters, etc. These wastes shall be assumed to be F002 listed hazardous waste.
- 4. Water collection and treatment system shall be operational, all permits and approvals shall be secured, and all required submittals shall be approved prior to the start of any intrusive work on site that may cause runoff and/or precipitation to contact contaminated soils or other materials. The water collection and treatment shall continue on all contaminated precipitation, runoff, groundwater, dewatering water, and other potential sources of contaminated waters until which time the contamination source has been removed and treated or otherwise prevented from contact with precipitation or runoff.
- 5. CONTRACTOR is responsible for obtaining all permits, approvals, payment of fees and coordination for on-site treatment of stormwater and surface water, connection and discharge to the municipal sewer system. The CONTRACTOR shall pay for all discharge fees associated with the MCPW sewer discharge permission.

B. Coordination:

- 1. Confirm discharge requirements and applicable fees imposed by MCPW for discharge to the Sanitary Sewer and/or hauling to a MCPW wastewater receiving station (if hauling). CONTRACTOR shall assume the following:
 - a. Complete any necessary required supplements to the application for discharge permission.
 - b. Comply with discharge requirements and limits established by MCPW. See Appendix 1 which includes limits provided by MCPW in the attached Sewer Ordinance.
 - c. Discharge rate not to exceed 10 GPM to the Sanitary Sewer unless specific approval is granted. Discharge rates to be confirmed with MCPW.
 - d. Any and all permitting and discharge fees.
 - e. Provide conveyance piping and systems required to connect to the Sanitary Sewer in a manner to ensure no conflicts in the existing public right of way.
- 2. Review treatment procedures under other Sections and coordinate Work with this Section.
- 3. Review data on contaminated water characteristics as provided in documents referenced in Section IV Article 5.
- 4. CONTRACTOR shall coordinate collection and treatment of contaminated water to allow sufficient time as required by the duration of additional excavation and treatment of contaminated soils to the applicable standards.

C. Related Sections:

- 1. Section 01 41 26, Stormwater Pollution Prevention Plan.

2. Section 01 45 29.13, Testing Laboratory Services Furnished by CONTRACTOR.
3. Section 02 51 41, Off-Site Transportation and Disposal.
4. Section 31 23 05, Excavation and Fill.

1.2 QUALITY ASSURANCE

- A. Qualifications: The CONTRACTOR shall be experienced in the use of GAC and organic clay for water treatment, and shall provide the following information detailing experience of previous systems and remediation projects:
 1. Provide project description and references of a minimum of five similar water treatment systems performed by the CONTRACTOR utilizing organically modified clay filters and GAC.
 2. Provide documented experience of at least one year of experience in the set-up and operation of similar equipment and systems.
 3. Provide information regarding any violations of regulations or standards at previous projects. Include information on corrective measures taken, fines imposed, etc.
- B. On-Site Treatment System Work Plan: The CONTRACTOR shall prepare a Work Plan for the proposed Work and submit the plan to the DEPARTMENT within two weeks of the authorization to proceed. The Work Plan shall include the following:
 1. Treatment System Design:
 - a. A process flow diagram and calculations showing material and energy balances, contact times, water treatment rate and theoretical emissions.
 - b. Process control instrumentation and instrumentation diagrams.
 - c. System piloting plan.
 - d. Effluent monitoring plan.
 - e. CONTRACTOR'S utility requirements and proposed arrangements with utility authorities.
 2. Treatment schedule:
 - a. Provide a detailed description of the proposed schedule for mobilization, setup, start-up, operation and demobilization of the water treatment system.
 3. Regulatory Compliance:
 - a. Comply with State and Federal Regulations related to management of the collected groundwater from the source area excavation as an F002-listed waste.
 - b. Prepare a Preparedness and Prevention Plan and Contingency Plan for the Water Treatment System and system operation.
 - c. Comply with regulatory requirements for the management of the water as a hazardous waste and system components as hazardous waste storage facilities prior to discharge to the POTW as required under the Clean Water Act.
- C. On-Site Treatment system: The CONTRACTOR shall be solely responsible for the process design, sizing and operation of the water recovery and treatment

system. The CONTRACTOR shall provide all necessary equipment, personnel and supplies necessary to ensure proper and continuous operation of the treatment system.

- D. Effluent Standards: The CONTRACTOR shall design, install and operate the water treatment system after start-up to meet the effluent quality standards as required by the MCPW and at the frequency presented in section 1.2.E.2 .
- E. Compliance Sampling Plan: The CONTRACTOR shall prepare a compliance sampling plan to ensure all treated effluent complies with the effluent quality specified, but shall not be limited to the following:
 - 1. Sampling shall be performed on influent and treated effluent.
 - 2. Sampling shall consist of collection of grab samples at a minimum frequency of once every three-million gallons discharged, or a minimum of every 14 calendar days, whichever is less.
 - 3. Sampling shall be performed in accordance with the test methods identified in the effluent standards.
 - 4. CONTRACTOR'S laboratory shall submit all test results, chain-of-custody forms and all other documents directly to the DEPARTMENT for review and approval. CONTRACTOR shall not discharge treated water until test results have been approved by the DEPARTMENT.
 - 5. CONTRACTOR shall retreat all water not meeting effluent standards at no additional cost to the DEPARTMENT.
- F. Regulatory Agencies: The CONTRACTOR shall comply with the applicable provisions of all regulatory agencies including, but not limited to, the following:
 - 1. State and local building codes and ordinances.
 - 2. New York State Department of Environmental Conservation (NYSDEC).
 - 3. United States Environmental Protection Agency (USEPA).
 - 4. United States Occupational Health and Safety Administration (OSHA).
 - 5. Underwriter's Laboratories, Inc. (UL).
 - 6. Any successors to the agencies listed above.
- G. Reference Standards: CONTRACTOR shall comply with the applicable provisions and recommendations of the following, except where otherwise shown or specified:
 - 1. American National Standards Institute (ANSI).
 - 2. American Society of Mechanical Engineers (ASME).
 - 3. American Society for Testing and Materials (ASTM).
 - 4. Institute of Electrical and Electronics Engineers (IEEE).
 - 5. National Electric Code (NEC).
 - 6. National Electric Manufacturers Association (NEMA).
 - 7. United States Occupational Health and Safety Administration (OSHA).
 - 8. Society of the Plastics Industry (SPI).

1.3 SUBMITTALS

- A. Qualifications: The CONTRACTOR shall submit statement of qualifications as defined in Paragraph 1.2.A.
- B. Shop Drawings: The CONTRACTOR shall submit the following for approval:
 - 1. Work Plan shall be submitted for review and approved by the DEPARTMENT prior to startup of the water treatment system.
 - 2. Application package to MCPW as required to obtain discharge approval.
 - 3. Submit sufficient information, literature, detailed specifications and drawings to show general arrangement, dimensions, make, style, speed, size, type, horsepower, service factors, efficiency, materials used, design features, internal construction, weights and all other information required by the DEPARTMENT for review of all water treatment equipment. No water treatment equipment will be accepted by the DEPARTMENT, nor installation allowed until such review has been completed and approval granted by the DEPARTMENT.
- C. Test Reports: The CONTRACTOR shall coordinate all verification testing with the laboratory. The laboratory shall submit the results of all verification testing directly to the DEPARTMENT for review and approval.
- D. Permits: The CONTRACTOR shall obtain and submit copies of all permits, registrations and approvals required by regulatory agencies to operate the water treatment system and discharge to the sanitary sewer.
- E. OSHA: The CONTRACTOR shall submit a separate statement that the equipment complies with all current regulations promulgated by the Occupational Health and Safety Administration. The CONTRACTOR shall be solely responsible for all of the CONTRACTOR'S on-site workers and personnel health and safety as required by 29 CFR 1910.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 SETUP

- A. Provide on-site water treatment equipment and accessories in accordance with the approved shop drawings and the manufacturer's instructions.
- B. Perform all on-site work in accordance with all local, State and Federal regulations and requirements.
- C. The CONTRACTOR shall obtain all required local, State and Federal permits prior to operation of the on-site water treatment system.

3.2 TESTING AND ACCEPTANCE

- A. On-Site Treatment System checkout:
1. Following completion of setup of the water treatment system, the CONTRACTOR shall notify the DEPARTMENT, in writing, of his readiness to begin system checkout, and schedule a system checkout date agreed to by the DEPARTMENT.
 2. The CONTRACTOR shall continuously operate the system for a system checkout period of four hours during normal working hours.
 3. During the system checkout operating period, the CONTRACTOR shall demonstrate satisfactory operation of the equipment to the DEPARTMENT.
 4. It shall be the CONTRACTOR's responsibility to record results of the system checkout, effect whatever remedial action is required and arrange for reinspection to review the remedial action taken, at no additional cost to the DEPARTMENT.
 5. Completion of the above does not relieve the CONTRACTOR from guarantees specified elsewhere in this Section.
 6. All labor, electric energy, fuels and other materials required for operation of the water treatment system shall be furnished by the CONTRACTOR.
- B. On-Site Treatment System Operation:
1. Unless otherwise directed by the DEPARTMENT, the CONTRACTOR shall operate the water treatment system until all specified waters have been successfully treated. All sumps located in the soil treatment and stockpile pads shall be maintained in a continuously dewatered condition.
 2. Following completion of setup of the water treatment system and after the CONTRACTOR mutually agree that the system is ready for operation, the CONTRACTOR shall operate and maintain the system until all waters specified are treated to the required effluent standards and successful treatment is confirmed by verification testing.
 3. During full scale system operation, the CONTRACTOR shall notify the DEPARTMENT immediately of significant operational problems encountered during the course of operating the water treatment system.

3.3 DISMANTLING AND DEMOBILIZATION

- A. Upon verification by the DEPARTMENT, the CONTRACTOR shall dismantle, decontaminate and remove all water treatment equipment and restore disturbed areas to original condition or as shown and specified.

+ + END OF SECTION + +

APPENDIX 1

Monroe County Pure Water – Specialty Short Term Discharge Permit

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Department of Environmental Services

Monroe County, New York

Adam J. Bello
County Executive

Michael J. Garland, P.E.
Director

RE: Specialty Short Term Discharge Permit

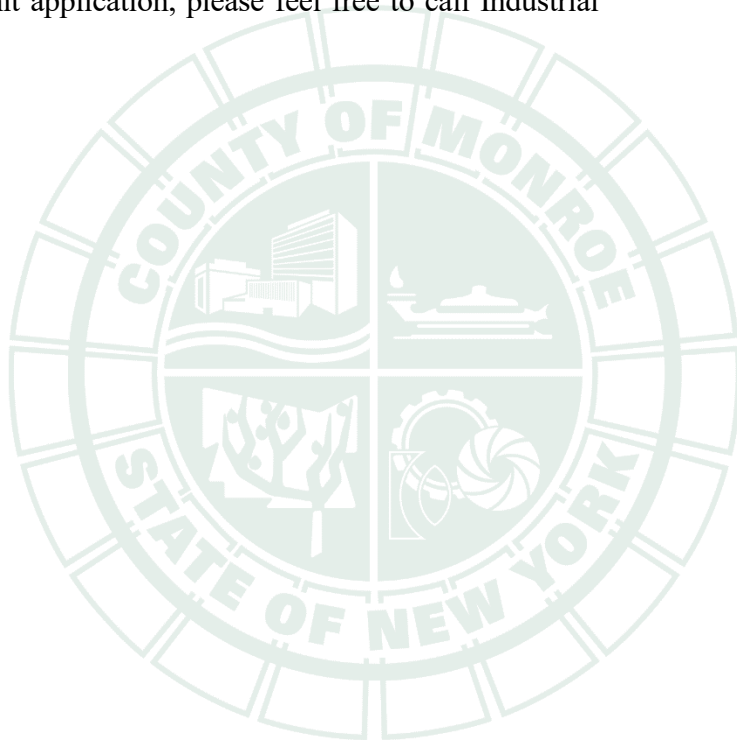
Enclosed is an application for a Short Term Discharge Permit. Be advised this Permit is a legal document. Please provide all requested information accurately. An officer of the company must sign the permit or appoint a duly authorized representative. The letter of appointment must be included with the permit package.

Monroe County Pure Waters, under Section 57 of the Worker's Compensation Law and Section 220 – Subdivision 8 of the Disability Benefits Law, is required to have on file proof that your company has workers compensation and disability benefits for your employees. A form from your insurance carrier stating such coverage will thus be required before your permit can be processed.

A check for the permit fee of \$125.00 should be made payable to the Director of Finance, County of Monroe. All copies of the application, the form from your insurance carrier, and the check should be mailed to the following address:

Monroe County Department of Environmental Services
Industrial Waste Control
145 Paul Road, Bldg. 1
Rochester, New York 14624

Should you have any questions regarding the permit application, please feel free to call Industrial Waste Control at (585) 753-7600, Option #4.



SPECIALTY SHORT TERM DISCHARGE PERMIT

APPLICATION PROCEDURE

- 1) The applicant must submit a letter requesting permission to discharge and a completed permit application. The letter must contain the information listed in item #2 below.
- 2) The following information is required before considering a request for discharge:
 - a) Contractor or environmental representative name
 - b) Contact person name, office phone #, cell phone #, fax #, email
 - c) Site name, address
 - d) Description of site work and history of site. Site history should include current and past businesses and activities or products produced.
 - e) Former/current contents of underground storage tanks and/or material spilled and/or history of site contaminants.
 - f) Quantity of wastewater to be discharged
 - g) Method of treatment (if applicable)
 - h) Method of discharge (direct to sewer, pumped, gravity, hauled)
 - i) Method to control solids discharge (if applicable)
 - j) Expected date of discharge
 - k) Project duration
- 3) Monroe County Pure Waters, under Section 57 of the Worker's Compensation Law and Section 220 - Subdivision 8 of the Disability Benefits Law, is required to have on file proof that your company has worker's compensation and disability benefits for your employees. A form from your insurance carrier stating such coverage will thus be required before your permit can be processed.
- 4) A check, for the initial permit fee of \$125.00, should be made payable to the Director of Finance, County of Monroe. The request to discharge letter, the application, the insurance form and the check should be mailed to:

Monroe County Department of Environmental Services
Industrial Waste Control
145 Paul Road, Bldg. 1
Rochester, New York 14624

As an alternative - the request to discharge letter, the completed application and the insurance form may be faxed to (585) 324-1213. The check may be given to the inspector at time of field inspection.

- 5) Monroe County will schedule an inspection of the site upon receipt of the above listed material.
- 6) Please call the Industrial Waste office at (585) 753-7600, Option #4, for additional information.

GENERAL REQUIRMENTS AND PETROLEUM IMPACTED WATER RULES AND REGULATIONS

1) A Specialty Short Term Discharge Permit is required for discharges to the Monroe County Sewer System or Wastewater Treatment Plant respectively. The permit fee is \$125.00 (payable to the Director of Finance, County of Monroe).

2) The following conditions shall apply to this permit:

a) Required analytical testing of wastewater shall be submitted to this office for review and approval prior to discharge. Required analytical testing will be based on site specific contaminants, site history and the Monroe County Sewer Use Law. Analytical testing will be developed from the permit application. Any sample data collected and submitted prior to the permit application may not be acceptable for approval by the County.

b) The Monroe County limit for the summation of all Volatile Organic Compounds and Semi Volatile Organic Compounds (total VOC's) is 2.13 mg/l. Detection levels must be at or less than 10 ug/l. Any detection level above 10 ug/l will be treated as a measured concentration. For petroleum impacted water the analytical shall include purgeable halocarbons, aromatics, and polynuclear aromatic hydrocarbons depending on the site contaminants.

c) Required testing includes, but is not limited to:

(1) Gasoline impacted water – Purgeable Aromatics; and Methyl Tertiary Butyl Ether (MTBE) - monitoring only. Limit not applicable at this time.

(2) Diesel or Fuel Oil impacted water – Polynuclear Aromatic Hydrocarbons.

d) The applicant must identify a suitable sanitary sewer discharge point. Monroe County will confirm the discharge point in the City of Rochester and the Towns of Gates, Chili and Ogden. Should the applicant be working in a location NOT described above, it will be the applicant's responsibility to contact the applicable Town and/or Village for similar service. The Town/Village of Webster, and Honeoye Falls are NOT part of the Monroe County Sewer System.

e) A maximum of 10 gpm discharge rate is permitted. Approval must be received from the appropriate agency (noted above) to exceed this rate.

f) Monroe County will conduct a field inspection of the site and issue a permit pending the completion and/or submission of all required information.



SPECIALTY SHORT TERM DISCHARGE PERMIT

County of Monroe Pure Waters District No. _____ ST- Permit No: _____

Fee: \$125.00 Expires: _____

FirmName _____

Address _____

Type of Business or Service _____

I. The above-named applicant is permitted to discharge wastes into the Monroe County Pure Waters Sewer system or Tributary thereto as applied for by an application dated _____ and verified by the applicant except the Director of Pure Waters requires the following terms and conditions to govern the permitted discharge:

A. _____

B. _____

C. _____

II. The applicant further agrees to:

1. Accept and abide by all provisions of the Sewer Use Law of Monroe County and of all pertinent rules or regulations now in force or shall be adopted in the future.

2. Notify the Director of Pure Waters in writing of any revision to the plant sewer system or any change in industrial wastes discharge to the public sewers as listed in the application. The latter encompasses either (1) an increase or decrease in average daily volume or strength of wastes listed in the application or (2) new wastes that were not listed in the application.

3. Furnish the Director of Pure Waters upon request any additional information related to the installation or use of sewer or drain for which this permit is sought.

4. Operate and maintain any waste pretreatment facilities, as may be required as a condition of the acceptance into the public sewer of the industrial wastes involved, in an efficient manner at all times, and at no expense to the County.

5. Cooperate with the Director of Pure Waters or his representatives in their inspecting, sampling, and study of wastes, or the facilities provided for pretreatment.

6. Notify the Director of Pure Waters immediately of any accident, negligence, breakdown of pretreatment equipment, or other occurrence that occasions discharge to the public sewers of any wastes or process waters not covered by this permit.

Applicant's Name (please print) _____

Applicant's Signature _____ Date _____

Applicant's Title _____ Phone _____

Emergency Contact _____ Phone _____

Renewal Approved by: _____ Issued this ____ day of _____ 20 ____.

Michael J. Garland, P.E.
Director of Environmental Services-Pure Waters
Monroe County

Appendix E

Community Air Monitoring Plan/Community and Environmental Protection Plan



Community Air Monitoring Plan/Community and Environmental Protection Plan

**Former Silver Cleaners Site #828186
Rochester, New York
Work Assignment # D009804-22**

December 22, 2022

Community Air Monitoring Plan/Community and Environmental Protection Plan

Former Silver Cleaners Site #828186

Rochester, New York

Work Assignment # D009804-22

December 22, 2022

Prepared By:

Arcadis of New York, Inc.
855 Route 146, Suite 210
Clifton Park
New York 12065
Phone: 518 250 7300
Fax: 518 371 2757

Prepared For:

New York State Department of
Environmental Conservation
625 Broadway
Albany
New York 12233

Our Ref:

30085744

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Figure 2 Site Map

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Attachment 1 NYSDOH Generic CAMP

Acronyms and Abbreviations

Arcadis	Arcadis of New York, Inc.
ACM	Asbestos Containing Materials
CAMP	Community Air Monitoring Plan
CEPP	Community and Environmental Protection Plan
cf	cubic feet
COC	Constituent of Concern
GES	Groundwater & Environmental Services
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU	Operable Unit
ppm	parts per million
RD	Remedial Design
ROW	Right of Way
TSDF	Treatment, Storage, and Disposal Facility
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
µg/m ³	micrograms per cubic meter

1 Introduction

This Community Air Monitoring Plan/Community and Environmental Protection Plan (CAMP/CEPP) has been prepared to support the implementation of remedial activities for the Former Silver Cleaners site (Site #828186), located at 245 Andrews Street in the City of Rochester, Monroe County, New York. Details related to the remedial activities are presented in the Remedial Design Report (RD Report).

The purpose of this CAMP/CEPP is to describe the monitoring activities that will be conducted to monitor for potential airborne releases of constituents of concern (COCs) during the implementation of remedial activities. This CAMP/CEPP specifies the air emission action levels, air monitoring procedures, monitoring schedule and data collection and reporting to be performed during remedial construction. This plan is to be implemented during the building demolition, remedial construction, and any future intrusive work that may occur as part of site remedial activities.

This CAMP/CEPP has been prepared in accordance with 2010 New York State Department of Environmental Conservation (NYSDEC) DER-10: Technical Guidance for Site Investigation and Remediation. The purpose of this CAMP/CEPP is to present a summary of the site monitoring and work practices that will be completed to address potential short-term impacts to the surrounding community and/or environmental resources. Additional details regarding site monitoring and work practices referenced in this CAMP/CEPP are presented in the Remedial Design Work Plan.

Section 2 of this CAMP/CEPP summarizes the monitoring to be conducted during remedial construction activities, and Section 3 describes site management and controls.

1.1 Project Responsibilities

Responsibilities of the NYSDEC (Owner or Client), Arcadis or their subcontractor (Engineer), and Groundwater and Environmental Services, Inc. [GES] or their subcontractor (Contractor), as they relate to the implementation of this CAMP/CEPP, are as follows:

- NYSDEC (Owner or Client) – Primary responsibility is to coordinate with Arcadis and GES (as necessary) to implement the required work activities in conformance with the Remedial Design. NYSDEC is responsible for administration of the work required and specified within the Contract Documents as well as contracting with Arcadis and GES.
- Arcadis (Engineer) – Responsibility is to provide staff to observe, monitor, and direct implementation of the remedial activities. Arcadis will coordinate with GES to implement the required work activities in conformance with the Remedial Design. Arcadis is responsible for verifying that community air monitoring is implemented prior to conducting intrusive site activities. Arcadis will also subcontract with a firm to complete a pre-construction structural evaluation of buildings immediately adjacent to the site and a different firm to act as a third party asbestos monitor during building demolition activities.
- GES (Contractor) – Primary responsibility is to complete remedial activities as presented in the Remedial Design. GES is responsible for performing community air monitoring in accordance with this CAMP/CEPP and implementing controls to address community air monitoring exceedances or odors, if necessary. GES or their subcontractor will conduct vibration monitoring during the demolition and excavation activities. GES is also responsible for conducting and implementing the general site management practices and controls described in Section 3.

Specifically, Arcadis will be responsible for the following:

- Conducting a pre-construction assessment of buildings immediately adjacent to the site before start of any building demolition and/or remedial construction activities.
- Asbestos containing material (ACM) third-party air monitoring during the building demolition activities.

Specifically, GES will be responsible for the following:

- Providing all labor, materials, and equipment necessary to implement the community air monitoring program specified herein.
- Confirming that all corrective measures associated with the community air monitoring program (including the control of dust, vapors and odors) are performed in accordance with this CAMP/CEPP.
- GES' subcontractor will conduct vibration and static survey monitoring during the remedial construction activities.

1.2 Site Location and Description

The site is located in downtown Rochester, New York (Figure 1) and consists of three contiguous parcels totaling 0.30-acres. The site consists of a one-story vacant commercial building and an asphalt parking lot which is currently used as a permit only parking lot. The site is bordered to the north by Andrews Street, to the east by North Clinton Avenue and a triangle-shaped parcel owned by the City of Rochester. Bordering to the west of the site, 237-241 Andrews Street consists of a basement with utilities and storage, a first floor with businesses, and second and third floors with residential units. Bordering to the south of the site; 113 North Clinton Avenue (also known as Elk Place), 107 North Clinton Avenue and a parking lot. 113 North Clinton Avenue consists of a basement with a utility room and storage, and residential apartment units on the first through fifth floors. 107 North Clinton Avenue is owned by the Rochester City School District (RCSD) (RCSD School No. 90) and consists of a basement (utilities and storage) and two floors of classrooms as well as a parking lot (Figure 2). Site topography is generally flat with approximate elevations of 530 to 526.4 feet above mean sea level (AMSL).

1.3 Previous Investigations

In 2012, Ravi Engineering & Land Surveying, P.C. (RE&LS) completed a Phase I ESA of the site for D4 Discovery and the City of Rochester through Rochester's Brownfield Assistance Program (BAP) (RE&LS 2012). The Phase I ESA identified the following recognized environmental conditions (RECs) related to former operations at the site:

- Two 1,000-gallon gasoline USTs and one (or two) 500-gallon USTs were utilized by several former service stations;
- A potential petroleum release to site soils and/or groundwater;
- The site building was occupied by a dry-cleaning business known to have used PCE; and
- A potential PCE release to site soils and/or groundwater.

In 2012, Leader Professional Services Inc. (Leader) and RE&LS completed a Confirmatory Phase II ESA (Leader 2013) to confirm whether contaminants related to the above RECs had impacted the subsurface. The Phase II ESA included performing a geophysical survey to locate former USTs and advancing soil borings to evaluate whether there were impacts to soil and groundwater. The geophysical survey identified electromagnetic anomalies indicative of buried metal objects. A total of five soil borings were advanced to refusal at depths

ranging from 2 to 13.8 feet below ground surface (bgs). Four of the locations were advanced in the building and one was advanced east of the building near assumed locations of former USTs (Leader 2013).

Soil sample analytical results from borings advanced below the building slab (SB-1 at 7 feet bgs and SB-4 at 8 feet bgs) were less than unrestricted use soil cleanup objectives (SCOs). Analytical results from soil boring SB-5 at 8 feet bgs indicated that ethylbenzene (1.3 parts per million [ppm]), o-xylene (2.6 ppm), and m,p-xylene (5.9 ppm), near the former UST area exceeded Part 375 unrestricted use SCOs. Soil samples were not collected from SB-2 or SB-3 for laboratory analysis. Analytical results for PCE concentrations in groundwater samples GW-1, collected from SB-1 at 7.5 feet bgs (7,890 micrograms/L [$\mu\text{g/L}$]) and GW-2, collected from SB-4 at 13.2 feet bgs (88,500 $\mu\text{g/L}$), exceeded the New York State Class GA Groundwater Standard (Class GA Standard) of 5 $\mu\text{g/L}$ listed in the New York State Division of Water Technical and Operation Guidance Series (TOGS) version No.

1.1.1. Analytical results from groundwater sample GW-5 at 13.3 feet bgs collected in soil boring SB-5 exceeded the respective Class GA Standards for ethylbenzene (1,040 $\mu\text{g/L}$), methylcyclohexane (826 $\mu\text{g/L}$), toluene (309 $\mu\text{g/L}$), naphthalene (699 $\mu\text{g/L}$), 1,2,4-trimethylbenzene (1,650 $\mu\text{g/L}$), 1,3,5-trimethylbenzene (630 $\mu\text{g/L}$), o-xylene (1,250 $\mu\text{g/L}$), and m,p-xylene (3,450 $\mu\text{g/L}$). Based on the concentration of PCE in groundwater noted above, SB-4 is considered a potential PCE source area and further investigations were conducted during the RI (as detailed below) to delineate PCE groundwater concentrations.

A Remedial Investigation (RI) was completed in 2020, a summary of which is provided in the following subsection.

1.4 Remedial Investigation Activities and Conclusions

The scope of work for the RI was designed to further evaluate the nature and extent of PCE and petroleum related compounds in soil and groundwater at the site; and the potential for soil vapor intrusion into adjacent properties as a result of former site operations. The scope of work included the following:

- Preliminary review of historical documents and an initial site walk;
- Asbestos containing material (ACM) survey;
- Geophysical survey;
- Soil boring advancement and soil sampling;
- Test pit excavation;
- Underground storage tank removal;
- Overburden piezometer and monitoring well and bedrock monitoring well installation;
- Well development and hydraulic conductivity testing;
- Groundwater and sump water sampling; and
- Offsite soil vapor sampling.

Through the completion of the above activities, the nature and extent of constituents of potential concern (COPCs) were identified during the RI, with the exception of COPC in the deep overburden and bedrock groundwater downgradient of the site. However, the source and migration of COPCs, and exposure pathways have been identified through the development of a CSM and, given the data gaps mentioned below, the results from the RI investigation provide sufficient data to evaluate potential site (i.e., source area) remedies. Results of the RI conducted at the site are described below.

- The data indicates that there was a historical release of chlorinated solvents (PCE and TCE) into the sand and fill material either beneath the site building slab, near the south edge of the site building, and/or just

outside the site building's south wall. Data also indicates a historical release of petroleum related constituents (BTEX, 1,2,4-trimethylbenzene, and naphthalene) to the shallow overburden in the vicinity of the former service station.

- Concentrations of primary COPCs are greatest near the south side of the site building in the deep and shallow overburden groundwater and are shown to decrease hydraulically downgradient of the PCE source area. PCE and TCE appear to have migrated through the silty sand and dense till and into bedrock.
- Concentrations of BTEX, 1,2,4-trimethylbenzene, and naphthalene are greatest in shallow overburden groundwater beneath and adjacent to the former service station area. Low concentrations of BTEX are present in the deep overburden indicating that the dense till is acting as a semi-confining layer.
- Overburden materials are generally composed of urban fill overlying glacial outwash sediments (sand and silt) (9-16' bgs) which overlies a dense glacial till (densely packed sand, silt, and gravel), followed by a thin layer of silty sand (between 26-34' bgs), and then bedrock (dolomite). The top of bedrock ranges from 27 to 34.3 feet bgs.
- Concentrations of PCE in shallow and deep overburden groundwater indicate that residual separate-phase product is likely present, although it was not observed in groundwater or soil during the RI or previous investigations.
- VOCs in shallow and deep overburden have migrated north following groundwater flow.
- The vertical and horizontal extent of PCE and TCE in the bedrock is not fully delineated as analytical results from groundwater collected in bedrock well (BRW-2) showed PCE concentrations greater than the respective Class GA Standard.
- The extent of dissolved-phase COPCs in the overburden is not fully delineated as groundwater from the farthest sample locations downgradient (north of) and to the west of the site contain chlorinated solvent COPCs at concentrations greater than Class GA Standards. However, PCE was detected at lower concentrations compared to the onsite concentrations. Other sources of VOCs in the groundwater from historical use (historical gas station) and other nearby contaminated sites could also be contributing to these concentrations.
- PCBs and pesticides were not detected and no metals of concern were detected above respective soil and groundwater standards during the RI. Only three soil samples contained SVOCs detected at concentrations greater than applicable SCOs. There were no detections of PFAS greater than the USEPA health-based criteria for drinking water. As such, SVOCs, PCBs, pesticides, PFAS, and metals are not considered COPCs for soil or groundwater.
- VOCs are present in the indoor air and sub-slab vapor at the properties adjacent to the site (237-241 Andrews Street and 113 North Clinton Avenue).

Potential exposure pathways at the site primarily exist for those who could come in contact with groundwater, sump water, and or subsurface soil. Construction and utility workers could be exposed to subsurface soils during excavations via dermal contact, incidental ingestion, and inhalation of vapors and soil particulates. Complete groundwater and sump water exposure pathways for construction and utility workers include dermal contact, incidental ingestion, and inhalation of vapors. There is a complete exposure pathway via soil vapor intrusion and inhalation of indoor air in the adjacent properties in the absence of engineering controls.

1.5 Record of Decision

The NYSDEC issued a Record of Decision (ROD) in June 2020 that presents the remedy for the site. The elements of the selected remedy are as follows:

- Demolition of the on-site building;
- Excavation and off-site disposal of contaminant source areas, with soil concentrations greater than the protection of groundwater soil cleanup objectives (PGWSCOs);
- Implementation of in-situ chemical treatment, whereby a chemical oxidant is injected into the subsurface to destroy site-related contaminant;
- Installation of site cover where the upper two feet of exposed surface soil exceeds the respective PGWSCOs;
- Mitigation of soil vapor intrusion in any future site buildings;
- Imposition of an institutional control in the form of an environmental easement; and
- Preparation and implementation of a Site Management Plan.

This Remedy will achieve the remediation goals for the site by excavation of source area soil and the treatment of groundwater and soil below the groundwater table using in-situ chemical treatment.

1.6 Potential Air Emissions Related to Remedial Activities

As defined in the New York State Department of Health (NYSDOH) Generic CAMP (included as Attachment 1), intrusive remedial activities to be performed at the site have the potential to generate localized impacts to air quality. Remedial components that have the potential to generate air emissions include, but may not be limited to, the following:

- Building demolition;
- Excavation of source area soil;
- Backfilling;
- Material handling (e.g., separation of listed hazardous waste from non-hazardous waste, stockpiling waste materials, loading waste materials for transport to the off-site treatment/disposal facility); and
- Other ancillary intrusive activities.

1.7 Air/Odor Emission Control Measures

Emission control measures to be utilized by GES during material excavation/removal and handling activities are described in the following subsections.

Air emissions control and fugitive dust suppression measures will be implemented by GES concurrently with the activities identified above (as needed) to limit the potential for organic vapor and dust emissions from the site. Air emissions associated with excavation/removal, backfilling, material handling and stockpiling, other intrusive activities, and certain non-intrusive activities, such as mobilization, transportation and restoration activities, will be controlled as described below. The following vapor and dust control measures may be used during these activities, depending upon specific circumstances, visual observations, and air monitoring results:

- Water/BioSolve® spray;

- Polyethylene sheeting (e.g., for covering excavation faces, material stockpiles);
- Minimizing excavation surface area to be exposed at any given time;
- Vapor suppression / Rusmar® foam; and
- Piiian Odor Neutralizing Mist System.

GES is required to mobilize BioSolve® (or approved equivalent) and Rusmar® (or approved equivalent) vapor-suppressant foam (including application equipment) to the remediation work area prior to initiating intrusive activities. GES must maintain an adequate supply of such materials for the duration of intrusive activities. GES shall apply the BioSolve® solution using a pressure washer. If required, a dedicated Contractor worker shall be available for application of BioSolve® solution. Additionally, GES shall install an odor Neutralizing Mist System (by Piiian or similar) and supply all odor neutralizing agents. Alternate odor suppressant methods (e.g., sprays, odor suppressant foams) that are capable of suppressing site related odors may be proposed by GES for review and approval by NYSDEC and Arcadis.

2 Site Monitoring

This section presents a summary of the monitoring to be conducted during implementation of the remedial activities to evaluate potential short-term impacts to the surrounding community.

2.1 Community Air Monitoring Procedures

The community air monitoring program is intended to be a discrete program that will be operated in conjunction with the Exclusion Zone (i.e., work zone) air monitoring program. GES will conduct real-time community air monitoring throughout the remedial construction. Monitoring will be conducted at representative locations at the perimeter of the exclusion zone for volatile organic compounds (VOCs) and total suspended particulates (particulates). However, particulate monitoring will not be performed during precipitation events. Additional information regarding the monitoring locations, equipment, and action levels is presented below.

Community air monitoring will be conducted by the GES during intrusive and/or potential dust-generating activities (e.g., soil excavation, backfilling, material handling, drilling, and building demolition activities). Detailed requirements for air monitoring procedures are presented herein and Specification Section 01 76 50, Nuisance Controls, Management and Corrective Measures. Air monitoring procedures will be completed in accordance with the May 2010 New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan and generally consist of monitoring for volatile organic compounds (VOCs) and particulates (PM10) at multiple locations to establish site background conditions and to evaluate air quality at the perimeter of the active work areas.

Exceedances of VOC and/or particulate action levels will require emission controls and/or dust-suppression measures. Control measures to be implemented by the GES are presented in Specification Section 01 51 05, Temporary Controls. Additionally, the CAMP/CEPP includes community notification procedures to be conducted if air monitoring action levels continue to be exceeded after implementation of emission controls.

2.1.1 Monitoring Location Selection and Deployment

VOCs and particulate monitoring station locations will be determined daily based on data from the on-site meteorological monitoring station and the nature of the anticipated remediation activities. An upwind location for both VOCs and particulate monitoring will be selected at the start of each workday. Three downwind (based on predominant wind direction) locations for both VOCs and particulate monitoring will also be selected. The VOCs and particulate monitoring stations will be deployed each day before the start of work activities. If wind direction shifts radically during the workday and for an extended period of time, such that the upwind location and downwind locations no longer fall within acceptable guidelines ($\pm 60^\circ$ compass change from the original wind direction), the monitoring stations will be relocated so that the upwind and downwind locations are maintained. Air monitoring location changes will be documented in a field logbook.

2.1.2 Volatile Organic Compounds Monitoring

Real-time monitoring for VOCs will be conducted during remedial activities. As required by the NYSDOH Generic CAMP, VOCs will be monitored continuously during all intrusive and/or potential dust-generating activities (e.g., installation of erosion and sediment control measures, building demolition, excavation/removal, backfilling, soil mixing/stabilization, material handling activities) using instrumentation equipped with electronic data-logging capabilities. A real-time VOC monitor (RAE MiniRAE 3000 or equivalent), equipped with a photoionization

detector and calibrated to 100 parts per million (ppm) isobutylene, will be used to monitor for VOCs. All average concentrations (calculated for continuous 15-minute increments [e.g., 08:00 to 08:15, 08:15 to 08:30]) and any instantaneous readings taken to facilitate activity decisions will be recorded using an electronic data logger and/or in the field logbook.

2.1.3 Total Suspended Particulate (Particulate) Monitoring

Real-time monitoring for particulates will be conducted during remedial activities at the former VOC site. As required by the NYSDOH Generic CAMP, real-time airborne particulate monitoring will be conducted continuously during all intrusive and/or potential dust generating activities (e.g., installation of erosion and sediment control measures, building demolition, excavation/removal, backfilling, and material handling activities) using instrumentation equipped with electronic data-logging capabilities. A real-time particulate monitor (TSI 8530 DustTrak II or equivalent) will be used for particulate monitoring. All average concentrations (calculated for continuous 15-minute increments [e.g., 08:00 to 08:15, 08:15 to 08:30]) and any instantaneous readings taken to assess appropriate course of action will be recorded using an electronic data logger and/or in the field logbook.

Fugitive dust migration will be visually assessed during all work activities, and reasonable dust suppression techniques will be used during any site activities that may generate fugitive dust (Section 1.6).

Particulate concentrations will be monitored continuously at the perimeter of the work area during all demolition activities in accordance with the New York State Department of Conservation, Technical Guidance for Site Investigation and Remediation (DER-10) Appendix B1. 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) will be used for the particulate monitoring. The equipment will be equipped with an audible alarm to indicate exceedance of the action levels summarized below.

2.1.4 Action Levels

The action levels provided below are to be used to initiate corrective actions, if necessary, based on real-time monitoring. Each piece of monitoring equipment will have alarm capabilities (audible and/or visual) to indicate exceedances of the action levels specified below.

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

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

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Depending upon the nature of contamination, chemical-specific colorimetric tubes of sufficient sensitivity may be necessary for comparing the exposure point concentrations with appropriate pre-determined response levels (response

actions should also be predetermined). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.

- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m³, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m³ or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

2.1.4.2 Volatile Organic Compound Action Levels

As outlined in the NYSDOH Generic CAMP, if the ambient air concentration for total VOCs exceeds 5 ppm above background (i.e., upwind location) for the 15-minute average, work activities will be temporarily halted while monitoring continues. If the total VOCs concentrations readily decrease (through observation of instantaneous readings) below 5 ppm above background, then work activities can resume with continuous monitoring.

If the ambient air concentrations for total VOCs persist at levels in excess of 5 ppm above background but less than 25 ppm above background, work activities will be halted, the source of the elevated VOCs concentrations identified, corrective actions undertaken to reduce or abate the emissions, and air monitoring will be continued. Once these actions have been implemented, work activities can resume provided the following two conditions are met:

- The 15-minute average VOCs concentrations remain below 5 ppm above background.
- The VOCs level 200 feet downwind of the monitoring location or half the distance to the nearest potential receptor or residential/commercial structure (whichever is less but in no case less than 20 feet) is below 5 ppm over background for the 15-minute average.

If the ambient air concentrations for total VOCs exceed 25 ppm above background, the work activities must cease, and emissions control measures must be implemented.

All 15-minute average readings will be recorded and be available for review by the New York State Department of Environmental Conservation (NYSDEC) or the NYS Department of Health (DOH). Instantaneous readings, if any, used for decision purposes will also be recorded.

2.1.4.3 Particulate Action Levels

As required by NYSDOH Generic CAMP, if the average ambient air particulate concentration (calculated for continuous 15-minute increments as specified above) at any one (or more) of the downwind perimeter locations exceeds 100 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) above the average background concentration (calculated for continuous 15-minute increments as specified above), or if airborne dust is visually observed leaving the work area, then dust suppression measures will be implemented, and air monitoring will continue. Work activities may continue following the implementation of dust suppression measures provided that the average ambient air particulate concentration does not exceed 150 $\mu\text{g}/\text{m}^3$ above the average background concentration and no visible dust is migrating from the work area.

If, after implementation of dust suppression measures, the downwind average ambient air particulate concentration is greater than 150 $\mu\text{g}/\text{m}^3$ above the average background concentration, work activities must be stopped and re-evaluated. Work activities may resume only if dust suppression measures and other corrective

actions are successful in reducing the downwind average ambient air particulate concentration to less than 150 µg/m³ above the average background concentration and if no visible dust is observed leaving the site. The particulate concentrations will be recorded in accordance with Section 2.1.3 above.

All particulate monitoring measurements readings will be recorded and made available for NYSDEC and NYSDOH review.

2.1.5 Meteorological Monitoring

Meteorological monitoring will be conducted continuously at the sites using a portable meteorological monitoring system. The meteorological monitoring system will be deployed at a location in accordance with siting criteria established by the United States Environmental Protection Agency (USEPA) and the New York State Department of Environmental Conservation (NYSDEC) for meteorological monitoring systems (*Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV – Meteorological Measurements*, as revised August 1989; and New York State Air Guide-19 – “Oversight of Private Air Monitoring Networks,” dated June 1989). Use of these guidelines enables the meteorological monitoring system to provide representative observations of the local meteorological conditions. A digital meteorological monitoring system (Wireless Vantage Pro2 by Davis Instruments or equivalent) will be used to collect the meteorological data. At a minimum, the meteorological monitoring system will monitor wind speed, wind direction, relative humidity and ambient temperature. The meteorological monitoring system will be equipped with electronic data-logging capabilities.

Calibration of the VOCs, particulate, and meteorological monitoring instrumentation will be conducted in accordance with each of the equipment manufacturer’s calibration and quality assurance requirements. The VOC and particulate monitors will be calibrated daily (at a minimum), and calibrations will be recorded in the field logbook.

2.1.6 Reporting

GES shall prepare a weekly (or more frequent if requested by NYSDEC and/or NYSDOH) summary of the 15-minute average community air monitoring results (for VOCs and particulates). The summary shall also include, but not be limited to, a description of community air monitoring exceedances (if any), work activities associated with the exceedances, and corrective actions implemented to address the exceedance. The weekly summary will be submitted in an electronic format to the following:

Table 1 – CAMP/CEPP Contact List

Name	Affiliation	Contact Information
James Kruegler	NYSDEC	T: 518.402.8068 James.kruegler@dec.ny.gov
Angela Martin	NYSDOH	T: 518.402.7860 bee@health.ny.gov
Mark Flusche	Arcadis	T: 518-205-7322 mark.flusche@arcadis.com

2.2 Odor Monitoring

During working hours, GES shall perform periodic walks around the perimeter of the work area to monitor for VOC-related odors in accordance with the CAMP/CEPP. The perimeter checks will be performed more frequently, as necessary, depending on the work being performed. If VOC-related odors are noticed along the perimeter of the work area, work will continue, and odor, vapor, and dust suppression techniques employed to abate emissions, in accordance with Specification Section 01 51 05, Temporary Utilities and Controls and Section 01 76 50, Nuisance Controls, Management and Corrective Measures. Additionally, construction techniques will be evaluated and modified, if necessary and appropriate, and more frequent checks of the work area perimeter for VOC-related odors will be performed. If VOC-related odors continue to be noticed at the perimeter of the work area, work will be stopped while activities are re-evaluated and the NYSDEC and NYSDOH will be notified. The source or cause of the VOC-related odors will be identified and additional modifications of construction techniques or additional methods to abate emissions will be implemented. Work will resume provided the measures are successful at abating the odors noticed along the work area perimeter.

Detailed requirements of odor monitoring are presented in this CAMP/CEPP.

2.3 Structural and Geotechnical Monitoring

During intrusive work (i.e., building demolition, shoring system installation, excavation, backfill and shoring system removal), GES or their subcontractor will conduct structural monitoring of the buildings on the properties listed below:

- 237-241 Andrews Street;
- 113 North Clinton Avenue (also known as Elk Place); and
- 107 North Clinton Avenue (City of Rochester School District Early Childhood Development).

Structural monitoring will consist of vibration and optical survey monitoring of structures immediately adjacent to the site and remedial areas. Details for geotechnical instrumentation, installation, and monitoring (including notification and action levels) are presented in Specification Section 31 09 13, Geotechnical Instrumentation and Monitoring.

GES shall contract with a subcontractor to conduct pre- and post-construction structural surveys as well as vibration monitoring during intrusive work at the locations listed above.

Arcadis, or their subcontractor, will conduct a pre-construction assessment of these structures prior to any demolition and remedial construction activities. The pre-construction assessment survey will include, but not be limited to, visual inspection and photographic documentation of the existing conditions of the listed structures. The DEC will obtain access to the structures for completion of this pre-construction assessment survey.

3 Site Management and Controls

This section presents a summary of site management practices and controls that will be implemented to minimize potential short-term impacts to the surrounding community during remedial activities.

3.1 Site Security

Public access to the Site and work areas will be restricted during the remedial activities, to the extent practicable. Details regarding site security and project signage are presented on the Design Drawings and in Specification Sections 01 57 33, Security.

3.2 Erosion, Sediment, and Turbidity Controls

Erosion control measures (e.g., silt fence and straw bales) will be provided, installed, and maintained by the GES to prevent off-site migration of turbid stormwater runoff and the silting and muddying of existing stormwater drainage systems. Details regarding locations and types of controls are presented on the Design Drawings and in Specification Sections 01 41 26, Storm Water Pollution Prevention Plan and Permit and Section 01 51 05, Temporary Utilities and Controls.

Erosion control measures will be installed and maintained in accordance with the latest edition of the NYSDEC New York State Standards and Specifications for Erosion and Sediment Control. At a minimum, GES will inspect erosion control measures daily and after storm events. Inspection results will be summarized in weekly inspection reports. Report requirements are provided in Specification Section 01 41 26, Storm Water Pollution Prevention Plan and Permit.

In general, GES will take all precautions to prevent, or reduce to a minimum, any damage to surface water or stormwater drainage systems from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials within or adjacent to existing and new drainage systems. GES and its subcontractors are prohibited from the following:

- Dumping spoil material into any drainage way, storm sewer, or unspecified locations;
- Pumping silt-laden water from within the excavation area into any drainage way, storm sewer, or unspecified locations;
- Damaging vegetation beyond the extent necessary for remedial construction; and
- Disposing of trees, brush, and other debris in any drainage way, or unspecified locations.

Following completion of the remedial activities, GES will restore disturbed surfaces as indicated in the Remedial Design, or as approved by NYSDEC and Arcadis.

3.3 Waste Management

In general, waste materials generated during implementation of the remedial activities will be managed based on the results of the waste characterization sampling or listed waste determination. GES will be responsible for the following activities, in accordance with the Remedial Design:

- Contracting with a waste disposal vendor;
- Acting as the “Generator” for material resulting from the remediation activities for off-site treatment and/or disposal of the waste;
- Coordinating with potential disposal facilities to verify waste characterization analytical requirements prior to the collection of waste characterization samples;
- Collecting waste characterization samples, coordinating lab analysis, and preparing waste profiles for off-site treatment/disposal of solid and liquid wastes to be generated as part of the remediation activities;
- Obtaining a permit to discharge treated groundwater to the City sewer system;
- Reviewing and signing waste manifests/bills of lading for shipments of waste materials generated by the remediation activities;
- Maintaining an on-site project log containing waste manifests/bill of lading for wastes generated by the remediation activities;
- Subcontracting and coordinating with waste haulers and waste disposal vendors for treatment/disposal of non-hazardous solid and liquid wastes to be generated as part of the remediation activities; and
- Coordinating with waste haulers and waste disposal vendors to facilitate off-site transport of conditionally exempt material waste streams.

3.3.1 Solid Waste

A portion of waste will be transported to a NYS-approved and permitted Treatment, Storage, and Disposal Facility (TSDF) facility for treatment and disposal in accordance with the Remedial Design. Excavated soil and solid waste not requiring TSDF treatment will be transported off-site to a NYS-approved non-hazardous or hazardous waste (for listed hazardous wastes) solid waste disposal facility.

3.3.2 Liquid Waste

All construction-related waters generated during remedial activities (i.e., decontamination water, water from excavation dewatering, and water removed from material staging areas) will be collected and discharged to the City of Rochester sewer system following receipt of a permit from the City. Details for water treatment and discharge are presented in Specification Section 44 00 05, Water Treatment.

3.3.3 Non-Aqueous Phase Liquid

Free-phase non-aqueous phase liquid (NAPL) encountered during excavation/material dewatering activities will be collected (if in sufficient quantities to be recovered), placed in appropriate containers (e.g., 55-gallon drums), and staged on-site for characterization by the GES prior to off-site disposal at an NYS-approved (or selected) facility. Following characterization, the GES will coordinate with the off-site disposal facility for the transportation and disposal of the containerized NAPL.

3.4 Transportation Controls

This section presents minimum transporter requirements to be followed during loading and transportation of solid and liquid non-hazardous and hazardous wastes generated by the remedial activities at the Site. The term

“transporter” means the transporter of any waste materials and GES if/when the transporter is subcontracted to GES.

The transporter will provide all necessary supervision, labor, training, permits, hazardous waste manifests (when required), PPE, tools, equipment, materials, and all items incidental and necessary to transport solid waste between individual work areas on-site (i.e., removal area and/or temporary support areas) and from the Site to the permitted disposal facilities.

The transporter shall comply with the following minimum requirements:

- Any truck found to be unacceptable by Arcadis will be rejected, and the cost for any rejected truck shall be incurred by the transporter. If NYSDEC on-site personnel find any trucks to be unacceptable, NYSDEC should notify GES, which, in turn, shall notify the truck driver.
- The transporter shall adhere to the following rules while at the Site (including transportation between the removal area and/or temporary support areas), in transit from the Site to the waste disposal facility, and at the waste disposal facility:
 - Prior to entry to the Site, truck drivers shall stage trucks only in areas designated by GES. While staged, truck engines shall be shut off. Trucks shall not idle for more than 5 minutes.
 - Truck drivers shall announce their arrival at the Site to GES.
 - Truck drivers are generally restricted to their trucks and designated waiting areas. Drivers are not permitted to access the Site without permission from GES, or Arcadis.
 - Transporters must supply and wear hard hats, safety glasses, safety shoes, long pants (jogging pants or warm-up pants are not permitted), and gloves, at a minimum, at all times when outside the truck cab for personal protection. Transporters are responsible for supplying any other protective equipment necessary for completing their tasks in a safe manner.
 - Transporters shall line the entire waste transport container (dump truck box, dump trailer, roll-off waste container, etc.) that will be used to haul hazardous solid waste, conditionally exempt VOC site remediation waste, or non-hazardous waste (e.g., to top of the side boards) with 6-mil thick polyethylene sheeting. Certain waste transport containers used to haul construction and demolition (C&D) debris may also need to be lined as indicated above. All waste transport containers shall have a watertight tailgate with a gasket between the box and tailgate, and tailgates shall be secured with locking turnbuckles. If free liquids are observed to be leaking from the container of the truck once loaded, the truck cannot leave the loading area.
 - All trucks are subject to inspection by Arcadis upon arrival at the Site. If trucks are not clean (as determined by Arcadis), they will be rejected. Cleaning of trucks is not permitted at the Site.
 - All trucks shall be equipped with working audible and visual backup signals.
 - When waste transport containers are being loaded, and when directed by the GES, the engine shall be shut off. The engine may be restarted, and the truck driven away only after the “all clear” direction is provided to the driver by the loading equipment operator or by a site representative.
 - No waste transport container shall be loaded above the sideboards and no waste shall be permitted to spill out of the waste transport container. Before trucks leave the loading areas, the exterior of the waste hauling portion of the vehicle and tires shall be cleaned (by the GES’ site workers) to remove any residual waste.
 - GES’ site workers shall reposition the cover bars over the waste material. Drivers shall not walk over waste material.

- Before leaving the loading area, drivers shall cover truck loads with a solid fabric (i.e., vinyl, reinforced polyethylene) that extends over the entire load and is secured to resist wind forces at highway speeds.
- Drivers shall obey all traffic signs and notices (obey the posted speed limit) and comply with weight restrictions.
- Drivers and operators shall obey rules posted on the Site and contained in any of the site-specific Health and Safety Plans used at the Site by GES.
- Drivers and operators shall report any accidents to GES and cooperate with any subsequent accident investigation.
- No children under 16 years of age shall be allowed at the Site.
- No passengers are allowed in the active work area(s) or loading area(s).
- Truck driver's operators shall slow down and use extra caution during inclement weather (i.e., rain, fog, snow).
- Truck driver's operators shall use extra caution around blind corners (watch for pedestrians and construction equipment).
- Smoking, eating, and/or drinking is not permitted within the active work area(s) or loading area(s), but may be permitted in designated areas of the Support Zone.

After disposal of waste, the transporter is responsible for properly decontaminating the waste hauling portion of the vehicle.

A transportation work plan shall be prepared in accordance with Section 02 51 41, Off-Site Transportation and Disposal.

Final trucking routes will be approved by NYSDEC and/or Arcadis prior to use.

3.5 Decontamination

GES will decontaminate (as necessary) all personnel and equipment that comes into contact with excavated or impacted materials prior to leaving the work areas to prevent the tracking of soil off-site (including vehicles transporting clean fill to the Site), in accordance with Specification Section 02 51 40, Excavation, Removal and Handling of Contaminated Material. Decontamination will occur within the constructed decontamination area(s) as appropriate based on the work being performed. At a minimum, GES will perform decontamination activities until no visible soil, sediment, debris, or stains are present on the equipment surfaces (to the satisfaction of Arcadis, and/or NYSDEC).

Project equipment (including, but not limited to, removal equipment, trucks, pumps, and hand tools) that comes in contact with excavated or impacted materials will be decontaminated prior to using the equipment to handle clean material and/or equipment being removed from the Site. Any visible soils, sediments, or other debris will be promptly removed and disposed of in a manner consistent with the materials excavated.

4 Exclusion Zone Vapor Emission Response Plan

The Vapor Emission Response Plan, to be prepared by GES, will be implemented for contractor worker safety following an exceedance of the 15-minute average VOCs concentration of 5.0 ppm (above background) within the Exclusion Zone. GES will initiate engineering controls for employee safety.

If an exceedance of the 15-minute average VOCs concentration of 5.0 ppm (above background) is measured at the perimeter of the Exclusion Zone, all excavation activities will be stopped, and the following action will be taken:

- Continue total VOCs monitoring within the Exclusion Zone and at the perimeter of the Exclusion Zone. If the total VOCs level drops below 5.0 ppm (above background) then excavation activities can resume with the addition of engineering controls or modifications to the excavation process to minimize VOCs emissions. However if the VOCs level persists above 5.0 ppm within the Exclusion Zone, based on continual observance of the total volatile organic analyzer, then GES will immediately implement engineering controls such as misting the area with a vapor suppression solution of BioSolve®, covering the excavation, and backfilling, as needed, to reduce emissions and at the same time should notify Arcadis.
- If after the implementation of additional engineering controls, the total VOCs levels drop below 5.0 ppm (above background) within the Exclusion Zone and at the perimeter of the Exclusion Zone, then the excavation activity can resume provided process and work activities were adjusted to reduce emission levels.
- If the total VOCs levels continue to be greater than 5.0 ppm (above background) at the perimeter of the Exclusion Zone, then all site activities must be discontinued. When the work is shut down NYSDEC and NYSDOH shall be notified and the downwind community air monitoring (conducted by GES in consultation with the NYSDEC representative) will continue to be conducted to ensure that the emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission response Plan (Section 4.0).

Primary engineering controls that may be implemented to reduce emission levels include:

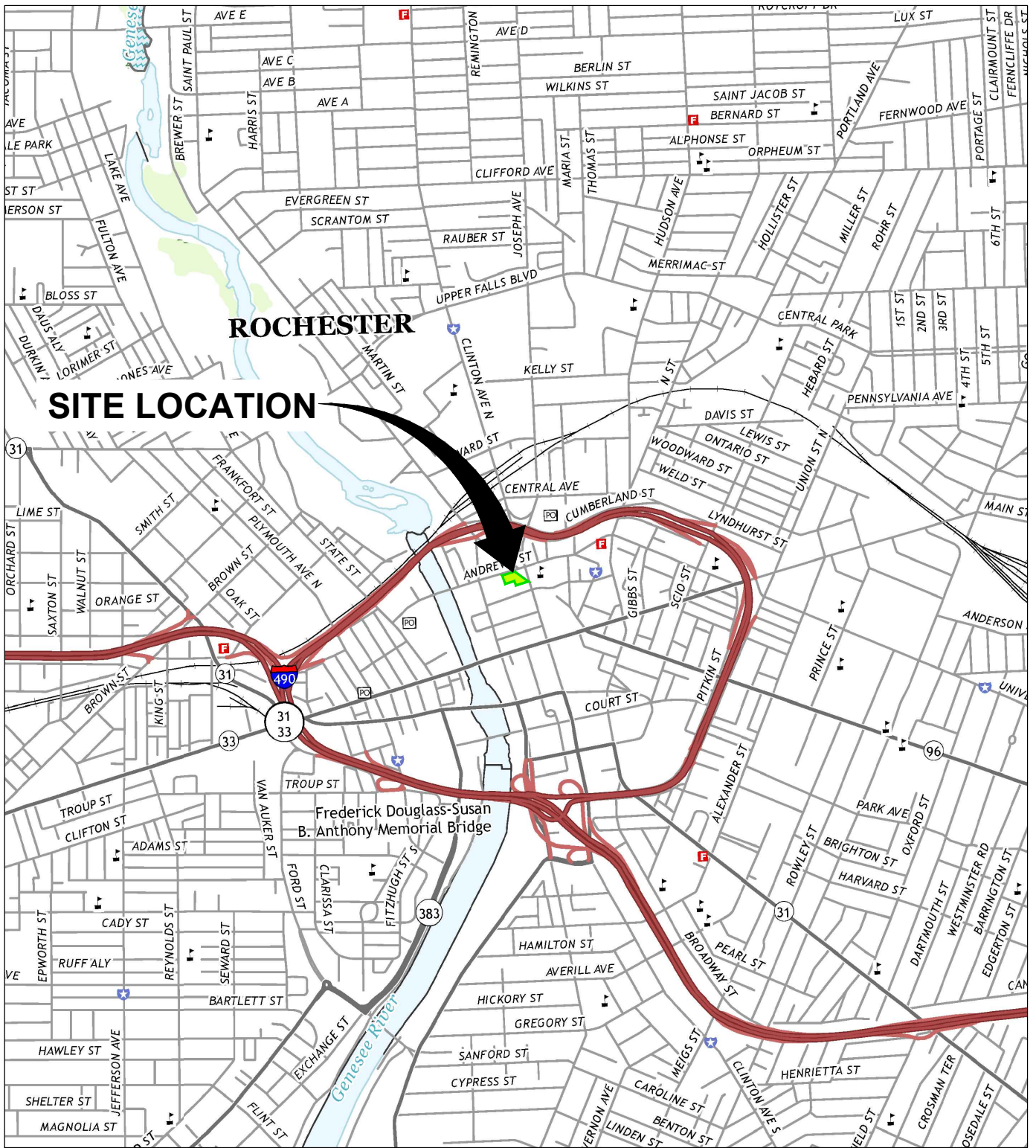
- Due to the proximity of receptors and levels of contamination that will be exposed, suppression chemicals, water, and other techniques to control dust and VOCs should be implemented proactively.
- Adding a vapor suppression solution of BioSolve® to impacted media (application in excavated areas will be a light mist as to avoid increasing solubility of wastes leading to increased groundwater contamination).
- Limiting excavation size and the surface area of exposed soil.
- Utilize tarping, covers or other enclosure systems to limit emissions. Systems may also employ a negative pressure/filtration system as necessary to reduce the emissions.

5 Major Vapor Emission Response Plan

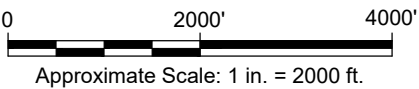
If after the cessation of the work activities and implementation of engineering controls, total VOCs levels exceed 5.0 ppm (above background) at the perimeter of the Exclusion Zone, then the following action will be immediately taken:

- Cover the excavation with polyethylene sheeting or clean soil.
- Notify individuals on the CAMP/CEPP contact list provide in Table 1 and City of Rochester Police Department at 911.
- Continue real-time VOCs monitoring at the upwind, downwind and nearest receptor until VOCs level drop below 5.0 ppm.
- If total VOCs levels persist above the 5.0 ppm (above background), Arcadis and NYSDEC will consult with each other and the emergency response agencies to determine the appropriate actions to be implemented. NYSDEC, in consultation with NYSDOH, has ultimate authority during major vapor emission emergencies. The NYSDEC must approve any action to continue work following such an event.

Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., ROCHESTER EAST & WEST, NEW YORK, 2016.



NEW YORK

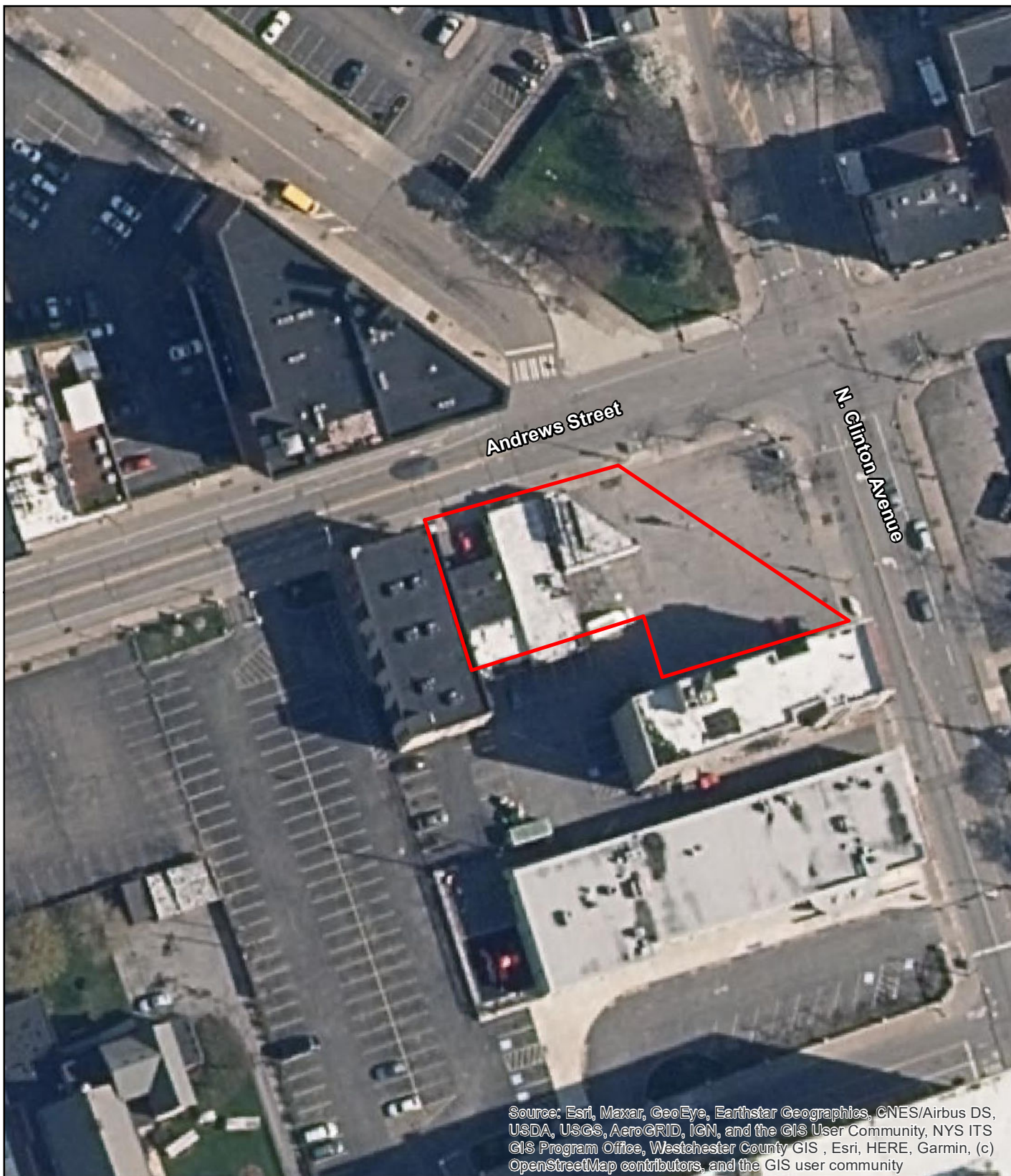
NEW YORK STATE DEPT. OF ENVIRONMENTAL CONSERVATION
FORMER SILVER CLEANERS SITE #828186
ROCHESTER, NEW YORK

SITE LOCATION MAP



FIGURE

1



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, NYS ITS GIS Program Office, Westchester County GIS, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

0 20 40 80 120 160 Feet



Legend

 Approximate Site Boundary

New York State Department of Environmental Conservation
Former Silver Cleaners Site # 828186
Rochester, New York

SITE MAP



FIGURE

2

Attachment 1

NYSDOH Generic CAMP

Appendix 1A

New York State Department of Health Generic Community Air Monitoring Plan

Overview

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

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

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

Community Air Monitoring Plan

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

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

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

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

VOC Monitoring, Response Levels, and Actions

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

December 2009

Appendix 1B

Fugitive Dust and Particulate Monitoring

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

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

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

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

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

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

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

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

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