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Engineering
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Remedial Investigation Work Plan

Starlite Dry Cleaners
NYSDEC #837016

Location:

331 North Main Street
Medina, New York

Prepared for:

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1.0 Introduction

LaBella Associates, D.P.C. (“LaBella”) is pleased to submit this Remedial Investigation Work Plan (RIWP) to conduct additional investigation to define the nature and extent of contamination for the former Starlite Dry Cleaners property located at 331 North Main Street, Orleans County, Village of Medina, Town of Ridgeway, New York, hereinafter referred to as “the Site”. The Site is part of the State Superfund Program as Site #837016 designated as a Class 2 site. A Site Location Map is included as Figure 1.

Information gathered from previous investigations have identified the presence of volatile organic compounds, specifically, chlorinated VOCs (CVOCs) in soil and groundwater. In addition, select semi-volatile organic compound (SVOCs) and metals have been identified at elevated concentrations on the eastern end of the Site, just outside the former building footprint. Implementation of this RIWP is designed to support existing information and fill in data gaps to identify the extent to which remediation may be warranted. The activities in this RIWP will be carried out in accordance with New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER)-10 Technical Guidance for Site Investigation and Remediation issued May 3, 2010.

2.0 Site Description and History

2.1 Site Description

The Site is located along North Main Street between the street and the NYS Barge Canal in a predominately commercial area (refer to Figure 2). The Site is comprised of one (1) approximately 0.2-acre parcel that was once improved with a one (1) story, 4,332-square foot stone building with a 3,258-square foot addition. The Site building was heavily damaged by a fire in 2004 and demolished in 2016. The Site currently remains unimproved.

The Site is surrounded by the NYS Barge Canal to the east; a vacant former car dealership/auto repair and collision shop to the south; a bank to the north; and, an auto repair facility (formerly a gas station) to the west.

2.2 Site History

The Site building was reportedly constructed with stone around 1830 and utilized as a produce warehouse. An addition to the north of the stone building was reportedly constructed around 1910 and initially was utilized as a livery and hitch barn (refer to Figure 3). Based on a Phase I Environmental Site Assessment (ESA) completed in 2006 (refer to Section 3.0), the entire structure including the addition was utilized as an automobile sales and storage facility from approximately 1927 through 1948 and as a dry cleaning facility from 1953 through 2004.

The dry cleaning operation reportedly utilized tetrachloroethylene (PCE) from 1953 until the 1990’s, when the business switched to a petroleum-based solvent. A fire heavily damaged the Site building in March 2004 and completely destroyed the dry cleaning facility. The Site building was demolished in 2016 but partial slabs were left in place to act as a cover and backfill was brought in and graded to gradually slope towards the canal. Additional information regarding the past uses of the Site is included in Section 3.0.

Although the building has been demolished, the following information has been obtained through the review of historical documentation and prior reports:

- Dry cleaning operations were primarily completed in the west-central portion of the stone building (refer to Figure 3).
- The stone building had a basement which reportedly had concrete and dirt floors.
- Floor drains were not observed within the building during the 2006 Phase I ESA. However, observations were limited due to the dilapidated nature of the building at that time.
- A boiler room on the lower level of the 1910 addition (presumed to be the eastern side of the building) was reportedly used to service dry cleaning equipment (refer to Figure 3).
- A former “mechanics pit” associated with historical automotive repair operations was previously located in the 1910 addition but had been filled with concrete by the time of the 2006 Phase I ESA. This pit was reportedly 3-feet (ft) wide and 20-ft long.
- Sanborn Fire Insurance mapping depicts various water lines extending under the Site from Main Street to the canal in the late 1800’s and early 1900’s. In addition, a sanitary sewer line is reportedly located between the Site and the canal, oriented parallel with the canal. If these utilities were still in place during automotive repair and dry cleaning operations, they could potentially act as preferential pathways to convey any subsurface impacts around the Site.

In addition to the historical information associated with the Site, the following information was identified regarding adjacent properties:

- The southern and western adjacent properties were historically utilized for automotive repair (refer to Section 3.0). Several closed NYSDEC Spill listings have been identified for these properties. In addition, a former owner of the Site reported the historical surface discharge of automotive repair wastes at the southern adjacent property (refer to Section 3.1).
- Sanborn mapping depicts a paper pail manufacturing facility adjacent to the north of the Site in the late 1800’s. Paper manufacturing operations have historically utilized potentially hazardous materials including mercury. In addition, a “press room” is depicted on Sanborn mapping extending from the northern adjacent property onto the Site at the time of paper manufacturing operations. The exact nature of pressing operations depicted on the historical mapping is unknown.
- A gasoline filling station was historically located to the southwest of the Site.

3.0 Previous Investigations

3.1 Phase I ESA – Earthworks Environmental, January 2006

A Phase I ESA report completed by Earthworks Environmental (“Earthworks”) for the Medina Historical Society in January 2006 identified several Recognized Environmental Conditions (RECs) at the Site generally associated with historical operations completed at the Site. Specifically, RECs were identified associated with the following items.

- *Suspected impairment of soil and/or groundwater quality from discharges associated with former dry cleaning operations on the Site*: The Site was reportedly used as a dry cleaning plant from approximately 1953 until 2004 when the facility was destroyed by fire. The previous owner/operator reported that perchloroethylene (aka tetrachloroethylene or PCE) was used as a solvent in dry-cleaning equipment operated on the Site from 1953 until sometime in the 1990's when the dry cleaning system was converted to a petroleum-based solvent. Spent dry cleaning filters, lint and other wastes generated by dry cleaning operations were reportedly disposed of properly and according to regulation(s) by Safety Kleen, Inc. from the 1970's to the 1990's. However, dry cleaning wastes were also generated during the period from 1953 to the 1970's, before waste disposal regulations were promulgated. As such, Earthworks identified that the potential existed for dry cleaning wastes to have been discharged onto the Site and the soil and/or groundwater quality to have been impaired.
- *Suspected impairment of soil and/or groundwater quality on the Site from discharges associated with automotive repair and collision shop operations on adjoining property to the south*: The adjoining property at 333 Main Street has a history of use as an automotive sales, service and collision repair facility from approximately 1927 to 1971. The former Site owner reported observing wastes from automotive repair operations being discarded on the ground surface at 333 Main Street on several occasions. As such, the potential exists that automotive repair wastes have migrated onto and impacted the soil and groundwater quality on the Site.
- Earthworks identified a REC associated with suspect asbestos containing materials. However, based on the demolition of the building in 2016, this REC is no longer applicable.

Based on the RECs identified, Earthworks recommended that a subsurface investigation be performed to evaluate soil and groundwater for impacts associated with the historical dry cleaning operation on Site, and for impacts associated with the historical use of the southern adjoining property as an automotive mechanical and collision repair shop, specifically due to wastes reportedly discharged to the ground surface.

3.2 Site Characterization Report – NYSDEC, October 2010

A field investigation was conducted by the NYSDEC on November 16, 2009 at the Former Starlite Dry Cleaner Site which included the advancement of five (5) direct push soil borings until refusal (5.2-ft. to 11.1-ft bgs). Two (2) of the borings (GP-4 and GP-5) were advanced at the western Site boundary, physically upgradient from the remainder of the Site. Two (2) borings (GP-2 and GP-3) were advanced at the eastern Site boundary which is physically downgradient from the rest of the Site. One (1) boring (GP-1) was advanced along the southern Site boundary adjacent to the former automotive repair and collision shop property. At the time of the investigation, the Site building was reportedly not investigated due to dangers of a potentially unstable structure. Figures 2 and 4 show the location of the borings completed during the Site characterization.

Groundwater samples were collected from the two (2) downgradient borings and analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). Groundwater was reportedly not encountered in the three (3) upgradient borings. The following summarizes exceedances in groundwater at the Site. In addition, groundwater data are summarized on attached Tables 2a and 2b.

- Groundwater in the northern boring along the eastern Site boundary (GP-2) detected two (2) compounds above regulatory standards:
    - Cis-1,2-Dichlorethene at 460 ppb (standard of 5.0 ppb)
    - Vinyl Chloride at 330 ppb (standard of 2.0 ppb)

- Groundwater in the southern boring along the eastern Site boundary (GP-3) detected nine compounds above regulatory standards:
  Chlorinated VOCs:
    - Tetrachloroethene at 34 ppb (standard of 5.0 ppb)
    - Trichloroethene at 6.6 ppb (standard of 5.0 ppb)
    - Cis-1,2-Dichlorethene at 78 ppb (standard of 5.0 ppb)
    - Vinyl chloride at 34 ppb (standard of 2.0 ppb)

  Polyaromatic Hydrocarbons (PAHs):
    - Benz(a)anthracene at 1.0 ppb (standard of 0.002 ppb)
    - Chrysene at 3.0 ppb (standard of 0.002 ppb)
    - Benzo(b)fluoranthene at 2.0 ppb (standard of 0.002 ppb)
    - Benzo(k)fluoranthene at 2.0 ppb (standard of 0.002 ppb)
    - Benzo(a)pyrene at 2.0 ppb (standard of 0.002 ppb)

  It should be noted that the groundwater samples were collected via bailers and as such, the presence of PAHs in groundwater sample GP-3 may be the result of high turbidity and not representative of concentrations of dissolved PAHs.

Soil samples were collected from each of the five (5) borings and compared with the NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective (SCO). Soil data are summarized in attached Tables 1a-1d. Exceedences of Unrestricted Use SCOs were only detected in GP-2. The following compounds were detected in GP-2 at or above Unrestricted Use SCOs:

- Lead at 275 ppm (SCO of 63 ppm)
- Mercury at 0.691 ppm (SCO of 0.18 ppm)
- Benz(a)anthracene at 2.0 ppm (SCO of 1.0 ppm)
- Benzo(b)fluoranthene at 1.0 ppm (SCO of 1.0 ppm)
- Chrysene at 1.0 ppm (SCO of 1.0 ppm)
- Benzo(k)fluoranthene at 1.0 ppm (SCO of 0.8 ppm)
- Acetone at 0.67 ppm (SCO of 0.05 ppm)
- Vinyl Chloride at 0.4 ppm (SCO of 0.02 ppm)

Based on the contaminants detected in the soil and groundwater, the NYSDEC recommended that the Site be listed on the NYS Registry of Inactive Hazardous Waste Sites and that a remedial investigation be conducted to define the nature and extent of contamination.

4.0 Objectives

The overall objective of this Remedial Investigation is to define the nature and extent of contamination at the Site in order to design a targeted Remedial Action to address Site contaminants. To complete the objective, the Remedial Investigation has been divided into tasks. Tasks and associated objectives are detailed in Section 5.0.

5.0 Scope of Work

The proposed remedial investigation field activities to be completed as part of the work plan have been separated into tasks and are presented in detail in this section.

- *Task 1: Site Survey:* This task will consist of the completion of a survey of Site property lines and select features by a licensed surveyor. The objective of this task is to identify a precise Site extent so investigation points completed as part of subsequent tasks can be accurately placed.
- *Task 2:Soil Gas Sampling:* This task will consist of the collection of soil gas samples near Site boundaries. The objective of this task is to determine if soil gas may present an issue for on-Site and adjacent properties and whether off-site evaluation may be necessary.
- *Task 3: Surface Water and Sediment Sampling:* This task is intended to assess surface waters and sediments in the NYS Barge Canal adjacent to the Site to determine if impacts have migrated to the canal.
- *Task 4: Overburden Soil and Groundwater Evaluation:* This task will consist of the advancement of numerous soil borings and installation of overburden groundwater monitoring wells. The objective of this task is to evaluate subsurface soils and overburden groundwater for impacts, particularly to identify potential source areas and delineate the lateral and vertical extent of impacts in the overburden.
- *Task 5: Shallow Bedrock Groundwater Evaluation:* This task is designed to consist of the installation of up to four (4) shallow bedrock groundwater monitoring wells. Implementation of this task will be dependent on the results of the overburden soil and groundwater evaluation. The objective of this task will be to further delineate any groundwater impacts identified at the Site.
- *Task 6: Investigation Derived Waste:* The objective of this task is to containerize and dispose of all investigative waste in accordance with applicable regulations.

Tasks are detailed in the following sub-sections.

5.1 Phase II ESA Investigation Tasks

5.1.1 Task 1: Site Survey

Task 1 is designed to consist of the following activities:

- LaBella will conduct present owner research at the Orleans County Clerk's office.
- Following this research, LaBella will complete a field survey to locate property line evidence as well as existing features.
- Utilizing the evidence identified in the field as well as any information obtained from the County Clerk's office, LaBella will calculate the property boundary locations.
- LaBella will flag or stake the property lines once they have been calculated.
- LaBella will generate a property map stamped by a licensed surveyor which will be included in the Remedial Investigation Report.

5.1.2 Task 2: Soil Gas Sampling

One (1) soil gas sampling point will be installed on each of the northern, southern, eastern and western Site boundaries for collection of soil gas samples. Proposed sample locations are depicted on Figures 2 and 4. A total of five (5) samples will be collected which include one (1) sample per soil gas point installed and one (1) outdoor ambient air sample. In addition to the five (5) samples, quality assurance/quality control (QA/QC) samples will be collected which shall include one (1) matrix spike/matrix spike duplicate (MS/MSD), and one (1) blind duplicate. Refer to Section 7.0 for additional information regarding QA/QC.

The following methods will be utilized to collect soil gas samples:

- Sampling points will consist of 1-inch diameter PVC well screen installed using direct push technology to approximately 5-feet bgs. The actual depth will be dependent on field conditions such as groundwater depth and depth of refusal/bedrock.
- A porous, inert backfill material (e.g., glass beads or coarse sand) will be used to create a sampling zone of 1 to 2 feet in length. The soil gas sampling points will be constructed of 1-inch diameter PVC well screen connected to a riser pipe.
- The annulus of the borehole will be backfilled with glass beads or coarse sand in the sampling zone. The soil vapor probes will be sealed above the sampling zone with bentonite slurry.
- The sampling points will be sealed and finished with flush-mounted curb boxes to protect the points and prevent infiltrations of water or outdoor air.
- After installation of the probes, one (1) to three (3) volume(s) (i.e., the volume of the sample probe and tube) will be purged prior to collecting the samples to ensure samples collected are representative of sub-surface soil gas.
- Flow rates for purging will not exceed 0.2 liters per minute to minimize the ambient air infiltration during sampling.
- During purging of the sample point, a tracer gas evaluation will also be conducted in each sample point to verify the integrity of the sub-surface vapor probe seal. An appropriate tracer gas will be used (e.g., sulfur hexafluoride (SF7), helium, etc.). An enclosure will be constructed around the soil gas sampling point and sealed around the sample point casing. Subsequently, the enclosure will be enriched with the tracer gas. The purged soil gas will then be tested for the tracer gas by an appropriate meter. The sample point will be considered viable if the tracer gas is found at less than 10% concentration in purged air.
- Soil gas samples and the outdoor ambient air sample will be collected using Summa Canisters® equipped with pre-calibrated laboratory supplied flow regulators set for a sampling time of six (6) hours. The Summa Canisters® will be certified clean by the laboratory. The Summa Canister® will be connected to the soil gas sampling point via inert tubing (e.g., polyethylene, stainless steel, or Teflon®).
- The outdoor air sample will be collected from approximately 3-5-ft above the ground surface at an upwind location of the soil gas sampling points over the same approximate sampling period.
- Samples will be submitted to an analytical laboratory for analysis of the full list of VOCs by USEPA Method TO-15 with a minimum detection limit of 1µg/m^3 and 0.25 µg/m^3 for TCE and vinyl chloride, respectively.
- Soil gas sampling point locations, including elevations, will be surveyed by GPS.

5.1.3 Task 3: Surface Water and Sediment Sampling

Sediment samples and surface water samples will be collected from the NYS Barge Canal proximate to the Site which may have received any point or non-point source discharges from the Site in accordance with DER-10. The NYS Barge canal is located approximately 30-ft to the east of the eastern Site boundary. Prior to sample collection, LaBella will contact the NYS Canal Corporation and obtain any required permits.

In accordance with DER-10 Section 3.8.2.a.3, surface water and sediment analysis will include each constituent of concern for the Site as well as total organic carbon. It is proposed that two (2) sediment samples be collected from the canal and a total of two (2) surface water samples will be collected in the same location as the sediment samples. The proposed sediment and surface water sample locations are shown on Figures 2 and 4. The following methods will be used to collect samples:

- Sediments will be collected using a hand auger (or similar) and will be decontaminated between samples to prevent cross-contamination. A portion of the sample collected will be placed in a plastic bag to collect headspace readings.
- Headspace readings will be collected by thoroughly mixing the sediment in the bag and allowing it to reach ambient temperature, followed by screening the air in the bag with a PID and recording readings.
- Visual and olfactory indications of impairment will be observed during sampling.
- Surface water grab samples will be collected with dedicated bailers or via peristaltic pump.
- All samples will be placed on ice following collection and will be transported to an ELAP-certified laboratory under standard chain of custody procedures.

Surface water and sediment samples will be submitted for the following analyses:

- United States Environmental Protection Agency (USEPA) Target Compound List (TCL) and NYSDEC Commissioner Policy (CP)-51 list VOCs including tentatively identified compounds (TICS) by USEPA Method 8260;
- USEPA TCL and NYSDEC CP-51 list semi-volatile organic compounds (SVOCs) including TICs by USEPA 8270; and,
- Sediment samples only will also be analyzed for TOC by USEPA Method.

Sediment samples to be analyzed for VOCs will be collected via USEPA Method 5035.

5.1.4 Task 4: Overburden Soil and Groundwater Evaluation

This task will evaluate subsurface soil and groundwater conditions across the Site. Up to fifteen (15) overburden soil borings are anticipated to be advanced using a direct-push Geoprobe® sampling system over the course of approximately two days. Note that final boring numbers may vary based on field conditions.

Proposed soil boring locations are depicted on Figures 2 and 4; however, locations may vary based on field observations. Bedrock is anticipated to be encountered at relatively shallow depths at the Site (i.e. between 5-ft and 12-ft bgs). Based on the lack of groundwater identified in three (3) of the previous five (5) borings and the anticipation of shallow bedrock at the Site, overburden groundwater may not be encountered in all areas of the Site. As such, numerous soil borings are planned to attempt to identify any potential source areas. The following methods will be followed to complete borings:

- A Dig Safely New York stakeout will be conducted at the Site to locate any subsurface utilities in the areas where the subsurface assessment and delineation will take place.
- Borings will be advanced with a "Geoprobe" direct push sampling system. The use of direct push technology allows for rapid sampling, observation, and characterization of relatively shallow overburden soils. The Geoprobe utilizes a four-foot or five-foot macrocore sampler, with disposable polyethylene sleeves. Soil cores will be retrieved and cut from polyethylene sleeves for observation and sampling.
- Three (3) soil borings are currently anticipated to be advanced to the east of the Site (refer to Figures 2 and 4). This adjacent property appears to be owned by the State of New York and as such, LaBella assumes access to complete these borings will be granted by the NYSDEC. In addition to the subsurface soil samples discussed below, one (1) surface soil sample (i.e., 0-2-inches bgs) will be collected from each of these three (3) soil borings. These three (3) samples will be analyzed for the following parameters:
  - USEPA TCL and NYSDEC CP-51 list VOCs including TICS using USEPA Method 8260;
  - USEPA TCL and NYSDEC CP-51 SVOCs including TICs using USEPA 8270;
  - 1,4-Dioxane by USEPA Method 8260C SIM with a detection limit of 0.28 ppb;
  - PFCs by Modified USEPA Method 537 with a detection limit of 2 parts per trillion (ppt);
  - USEPA RCRA metals via USEPA Method 6010 and 7470;
  - Pesticides by USEPA Method 8081;
  - PCBs by USEPA Method 8082; and,
  - Herbicides by USEPA Method 8151.

- Based on geology at the Site, each boring implemented at the Site is anticipated to be advanced until equipment refusal is encountered.
- Drilling equipment will be decontaminated prior to use and between boring locations, using an Alconox® and potable water solution.
- Soils from borings will be continuously screened in the field for visible impairment, olfactory indications of impairment, evidence of NAPLs, and/or indication of detectable VOCs with a PID collectively referred to as "evidence of impairment." Field screening findings will be recorded in soil boring logs and included in the RI Report.
- Soil generated during soil sampling activities will be containerized in 55-gallon drums, characterized, and disposed of off-Site in accordance with applicable regulations (refer to Section 5.1.6).
- Fifteen (15) soil samples are currently anticipated to be collected and analyzed for the following parameters based on evidence of impairment:
  - Fifteen (15) samples for USEPA TCL and NYSDEC CP-51 VOCs including TICS using USEPA Method 8260
  - Fifteen (15) samples for USEPA TCL and NYSDEC CP-51 SVOCs including TICs using

    USEPA Method 8270

    - Nine (9) to ten (10) samples for Resource Conservation and Recovery Act (RCRA) metals using USEPA Method 6010 and 7470.
    - Seven (7) to eight (8) samples for PFCs using modified USEPA Method 537 with a detection limit of 3 ppb.
    - Three (3) to four (4) samples for Pesticides by USEPA Method 8081.
    - Three (3) to four (4) samples PCBs by USEPA Method 8082.
    - Three (3) to four (4) samples Herbicides by USEPA Method 8151.

- Soil samples collected for VOC analysis will be collected via USEPA Method 5035. Samples collected for PFC analysis will be done so in accordance with the procedures identified in the Quality Control Plan (Appendix 3).

Up to six (6) overburden groundwater monitoring wells are planned to be installed; however, field conditions (e.g., the lack of overburden groundwater) may dictate that alternative methods be utilized to assess groundwater at the Site (e.g., installation of additional bedrock monitoring wells; refer to Section 5.1.5). Overburden monitoring wells will consist of 1-inch diameter polyvinyl chloride (PVC). Wells will be constructed of 5 or 10 feet of 0.010-slot well screen connected to an appropriate length of solid PVC well riser to complete the well. The annulus will be sand packed with quartz sand to a nominal depth of 1 to 2-ft. above the screen section. A bentonite seal will be placed above the sand pack to several inches below ground surface (bgs). Wells will be finished with flush-mounted curb boxes.

Well locations will be selected based on field observations, historical features, and to provide general Site-wide coverage. Attempts will be made to locate four (4) of the proposed overburden wells near the soil gas points; however, priority will be given to areas displaying evidence of impairment when selecting well locations.

The screened sections of the wells will be placed at the depth of the worst case impacts identified within the boring. In the event that impacts are not observed, the screened section will be placed at the same depth as the nearest well or boring impacts, or at the top of any apparent confining layers.

Bedrock is anticipated to be relatively shallow (i.e., less than 12-ft. bgs) at the Site. In the event that groundwater is not encountered in the overburden, the number of overburden wells may be limited.

Groundwater samples from up to six (6) of the newly installed overburden wells will be collected and analyzed for the following list of parameters.

Samples from three (3) of the wells will be analyzed for the following:

- USEPA TCL and NYSDEC CP-51 list VOCs including TICS using USEPA Method 8260;
- USEPA TCL and NYSDEC CP-51 SVOCs including TICs using USEPA 8270;
- 1,4-Dioxane by USEPA Method 8260C SIM with a detection limit of 0.28 ppb;
- PFCs by Modified USEPA Method 537 with a detection limit of 2 parts per trillion (ppt); and,
- USEPA RCRA metals via USEPA Method 6010 and 7470.

Samples from the other three (3) of the wells will be analyzed for the following:

- USEPA TCL and NYSDEC CP-51 list VOCs including TICS using USEPA Method 8260;
- USEPA TCL and NYSDEC CP-51 SVOCs including TICs using USEPA 8270;

- 1,4-Dioxane by USEPA Method 8260C SIM with a detection limit of 0.28 ppb;
- PFCs by Modified USEPA Method 537 with a detection limit of 2 parts per trillion (ppt);
- USEPA RCRA metals via USEPA Method 6010 and 7470
- Pesticides by USEPA Method 8081;
- PCBs by USEPA Method 8082; and,
- Herbicides by USEPA Method 8151.

Groundwater sampling procedures are as follows:

- Following installation, overburden groundwater monitoring wells will be developed by purging a minimum of three (3) well volumes or until dry using a dedicated bailer or peristaltic pump (depending on well volumes). Development water will be containerized in 55-gallon drums, characterized, and disposed of off-Site in accordance with applicable regulations (refer to Section 5.1.6).
- Following development, wells will be allowed to recharge for a minimum of twenty-four (24) hours prior to sampling.
- Wells will be sampled using modified low-flow techniques (i.e., peristaltic pump). Water quality parameters including turbidity, pH, temperature, specific conductivity, dissolved oxygen, oxidation reduction potential, and depth to water will be recorded at five (5) minute intervals. Samples will be collected when the parameters have stabilized for three (3) consecutive 5-minute intervals to within the specified ranges below:

    - Water level drawdown (<0.3’)
    - Turbidity (+/- 10%, <50 NTU for metals)
    - pH (+/-0.1)
    - Temperature (+/- 3%)
    - Specific conductivity (+/- 3%)
    - Dissolved Oxygen (+/- 10%)
    - Oxidation reduction potential (+/- 10 millivolts)

One (1) MS/MSD and one (1) blind duplicate samples will be collected in addition to the proposed samples and analyzed for each analytical parameter at a rate of one (1) per twenty (20) samples and will be collected for each sample matrix. In addition, one (1) trip blank per shipment of groundwater samples will be analyzed for TCL VOCs. Samples collected for PFC analysis will be done so in accordance with the procedures identified in the Quality Control Plan (Appendix 3).

Overburden soil borings and groundwater monitoring well locations, including elevations, will be surveyed using a GPS.

5.1.5 Task 5: Shallow Bedrock Groundwater Evaluation

Due to the potential for the overburden to be unsaturated and the tendency for chlorinated VOCs to sink in groundwater and infiltrate shallow bedrock, this task includes a shallow bedrock groundwater evaluation. Up to four (4) dedicated shallow bedrock monitoring wells are anticipated to be installed. Well locations will be dependent upon the results of the overburden soil and groundwater evaluation and as such, proposed bedrock well locations have not been depicted on Figure 2. Following the receipt of overburden data, LaBella will discuss proposed bedrock well locations with the NYSDEC before implementing Task 5.

Bedrock well installation procedures are as follows:

- The borehole will be advanced through overburden soils using 4 ¼” diameter hollow-stem augers. It is anticipated that the wells will be installed in boreholes previously screened during the overburden investigation and as such, soils will not be continuously assessed. In the event that the borehole is in a new location, soil will be continuously sampled via split spoon samplers or Macrocore, continuously screened with a PID and logged as in the overburden assessment.
- Each borehole will be drilled to approximately 1-ft to 3-ft into competent bedrock. Prior to installing grout in the borehole to seal out the overburden and weathered bedrock, the augers will be left in place for up to 24-hours to allow groundwater from the top 1-ft to 3-ft of bedrock to enter the borehole. If water is present, a grab groundwater sample will be collected with a peristaltic pump at the depth interval of the open bedrock. These samples will be analyzed for USEPA TCL and NYSDEC CP-51 list VOCs (i.e., the primary contaminant of concern) and any other significant contaminants of concern identified during prior tasks. The objective of this sampling is to evaluate the top 1-ft to 3-ft of bedrock, where any impacts are most likely to accumulate but which will be effectively sealed off after the well is completed.
- After a grab sample is collected, a 4-inch diameter steel casing will be set 1 to 3-feet into the bedrock and grouted in place to seal off the overburden to prevent any vertical migration of groundwater.
- Grout will be allowed to cure for at least 24-hours prior to rock coring.
- Bedrock will be cored with an NX core barrel to a depth of approximately 10-feet into bedrock. Rock cores will be evaluated by a LaBella geologist or environmental engineer, recorded on soil boring logs and rock quality designations (RQDs) will be calculated. The wells will be finished with flush-mounted or stickup protective casings.
- Details of the rock coring procedure will be recorded on appropriate field forms. Bedrock monitoring well locations, including elevations, will be surveyed using a GPS.

Bedrock Groundwater:

Following installation, bedrock wells will be developed using a dedicated bailer or submersible pump. An effort will be made to recover all water lost during drilling. If greater than 25-gallons of drilling water are lost in any given well and development cannot recover all water lost, the wells will be left to equilibrate for a minimum of two (2) weeks. Following the two (2) weeks, wells will be developed by purging five (5) well volumes prior to sampling.

Following development, wells will be sampled using low-flow techniques. Wells will be monitored for the presence of NAPL immediately before and after well development and sampling of each well.

- Water quality parameters including turbidity, pH, temperature, specific conductivity, dissolved oxygen, oxidation reduction potential, and depth to water will be recorded at five (5) minute intervals. Samples will be collected when the parameters have stabilized for three (3) consecutive 5-minute intervals to within the specified ranges below:

  - Water level drawdown (<0.3’)
  - Turbidity (+/- 10%, <50 NTU for metals)
  - pH (+/-0.1)
  - Temperature (+/- 3%)
  - Specific conductivity (+/- 3%)
  - Dissolved Oxygen (+/- 10%)
  - Oxidation reduction potential (+/- 10 millivolts)

Groundwater samples will be sent to an ELAP-certified laboratory for analysis.

Two (2) of the bedrock groundwater samples will be analyzed for the following:

- USEPA TCL and NYSDEC CP-51 list VOCs including TICS using USEPA Method 8260;
- USEPA TCL and NYSDEC CP-51 SVOCs including TICs using USEPA 8270;
- 1,4-Dioxane by USEPA Method 8260C SIM with a detection limit of 0.28 ppb; and,
- PFCs by Modified USEPA Method 537 with a detection limit of 2 ppt.

The other two (2) bedrock groundwater samples will be analyzed for the following:

- USEPA TCL and NYSDEC CP-51 list VOCs including TICS using USEPA Method 8260;
- USEPA TCL and NYSDEC CP-51 SVOCs including TICs using USEPA 8270;
- 1,4-Dioxane by USEPA Method 8260C SIM with a detection limit of 0.28 ppb;
- PFCs by Modified USEPA Method 537 with a detection limit of 2 ppt;
- USEPA RCRA metals via USEPA Method 6010 and 7470.
- Pesticides by USEPA Method 8081;
- PCBs by USEPA Method 8082; and,
- Herbicides by USEPA Method 8151.

One (1) MS/MSD, one (1) field duplicate, and one (1) trip blank will be collected in addition to the above analysis. Samples collected for PFC analysis will be done so in accordance with the procedures identified in the Quality Control Plan (Appendix 3).

5.1.6 Task 6: Investigation Derived Waste

Investigation derived waste (i.e., drilling cuttings, drilling water, purge water, decontamination water, etc.) will be containerized in 55-gallon drums stored on-Site and disposed of following all investigation activities at a permitted facility pending waste characterization. For security purposes, the drums will be stored in a locked storage container at the Site. Drums will be labeled identifying the contents the same day the waste is generated. Based on the prior use of the facility for dry cleaning purposes, soil and groundwater generated during the Remedial Investigation is anticipated to be classified as hazardous waste and will be disposed of accordingly.

6.0 Health and Safety and Community Air Monitoring

LaBella’s Health and Safety Plan (HASP) for this project is included as Appendix 2. The NYSDOH Generic CAMP and Fugitive Dust and Particulate Monitoring will be utilized for this Work Plan and is included as Appendix 1. The CAMP will be followed during all ground intrusive work completed as part of the Remedial Investigation.

7.0 Quality Control Plan

Activities completed at the Site will be managed under LaBella’s Quality Control Plan (QCP), which is included in Appendix 3. Laboratory QA/QC sampling will include analysis of one (1) MS/MSD and one (1) blind duplicate sample for each matrix type (i.e., soil, air, and groundwater) at a rate of one (1) per twenty (20) samples or one per shipment, whichever is greater. The samples will be delivered under Chain of Custody procedures to an ELAP-certified laboratory. The laboratory will provide a NYSDEC ASP Category B Deliverables data package for all samples except the air samples analyzed via method TO-15. For the TO-15 samples, the laboratory will provide a data package using the ASP Category B format. NYSDEC EQuIS™ Electronic Data Deliverables (EDDs) will be provided by the laboratories. A Data Usability Summary Report (DUSR) will be completed for all ASP-B and ASP-B format laboratory data packages. The DUSRs will include the laboratory data summary pages showing corrections made by the data validator and each page will be initialed by the data validator. The laboratory data summary pages will be included even if no changes were made.

8.0 RI Schedule and Deliverables

The information and laboratory analytical data obtained during the RI will be included in a RI Report completed in accordance with DER-10.

Implementation of the RI Work Plan will begin within 60 days after NYSDEC approval of this work plan and the field work is anticipated to be completed within 90 days after starting. The RI Report will be submitted within 30 days of receipt of all DUSRs. An anticipated project schedule is included in Appendix 4. At a minimum the RI Report will specifically include the following items:

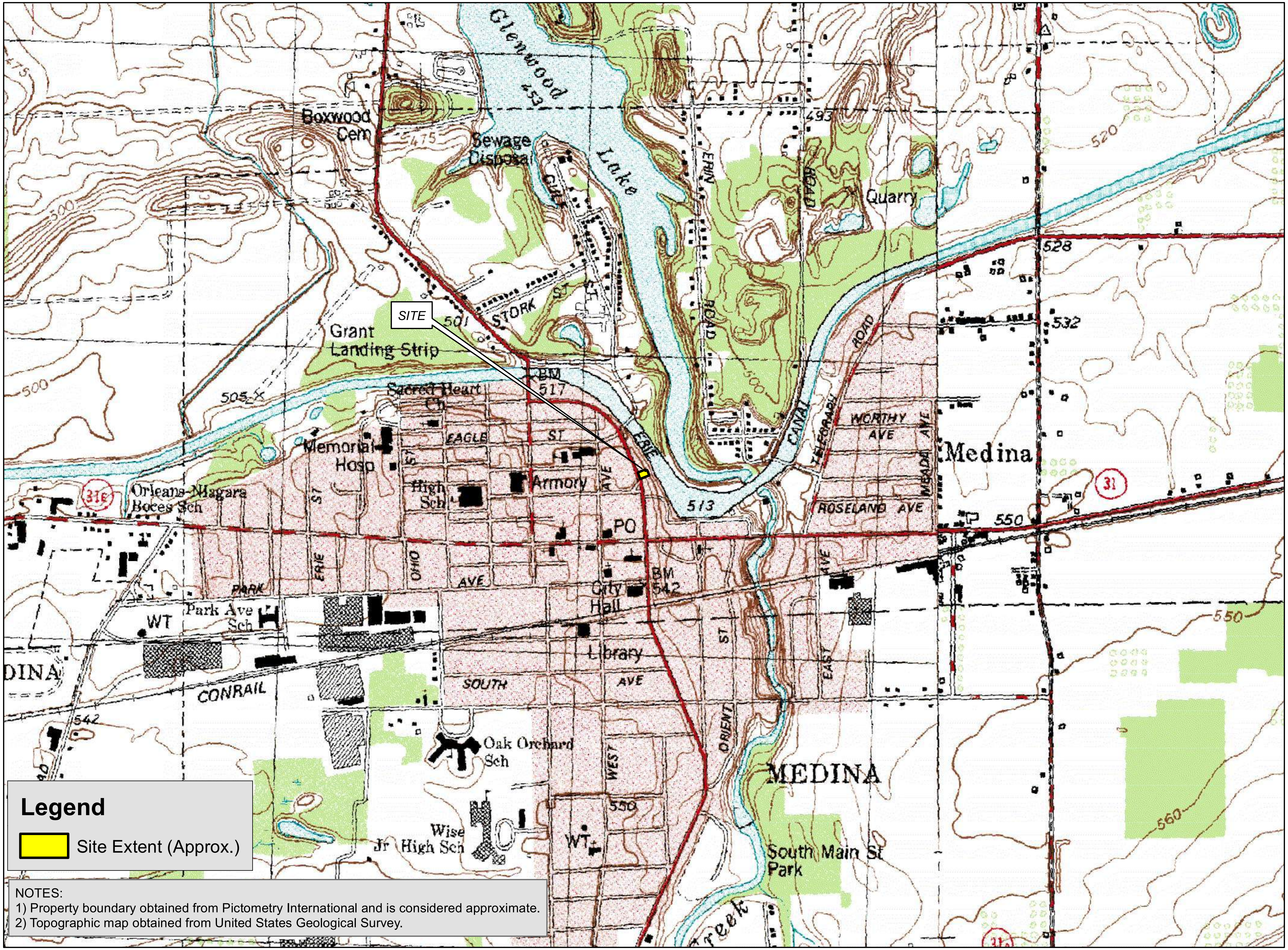
- All laboratory data (with the exception of waste characterization data) reported in NYSDEC ASP Category B format (and “ASP Category B-like” format for air samples as the NYSDEC does not have an ASP Category B format specific for air samples).
- All laboratory data (with the exception of waste characterization data) reported in NYSDEC EQuIS format EDD.
- Data Usability Summary Reports (DUSRs) completed by a third-party data validator for laboratory data (EDD will also be validated).
- Analytical data summary tables with comparison to appropriate regulatory guidance values.
- Recommendations for remedial actions for the Site, if applicable.

- Mapping including:
    - Site features
    - Investigation locations
    - Analytical results
    - Relevant historical features
    - Contaminant mapping

The above assumes that an addendum to the RI Work Plan will not be required. If an RI Work Plan addendum is required, it will be submitted within 30 days of being requested as the need is identified and it will include a revised schedule.

J:\NYSDEC\2161937 - INVESTIGATION & REMEDIATION\016 - STARLITE DRY CLEANERS CALLOUT ID 129705\Reports\RIWP\RIWP - Starlite Dry Cleaners MedinaV3.docx

Figures



Legend

🟨 Site Extent (Approx.)

NOTES:
1) Property boundary obtained from Pictometry International and is considered approximate.
2) Topographic map obtained from United States Geological Survey.

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1 inch = 1,000 feet

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CLIENT:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PROJECT:

REMEDIAL INVESTIGATION WORK PLAN
FORMER STARLITE DRY CLEANERS
NYSDEC #837016
331 MAIN STREET, MEDINA, NEW YORK

DRAWING NAME:

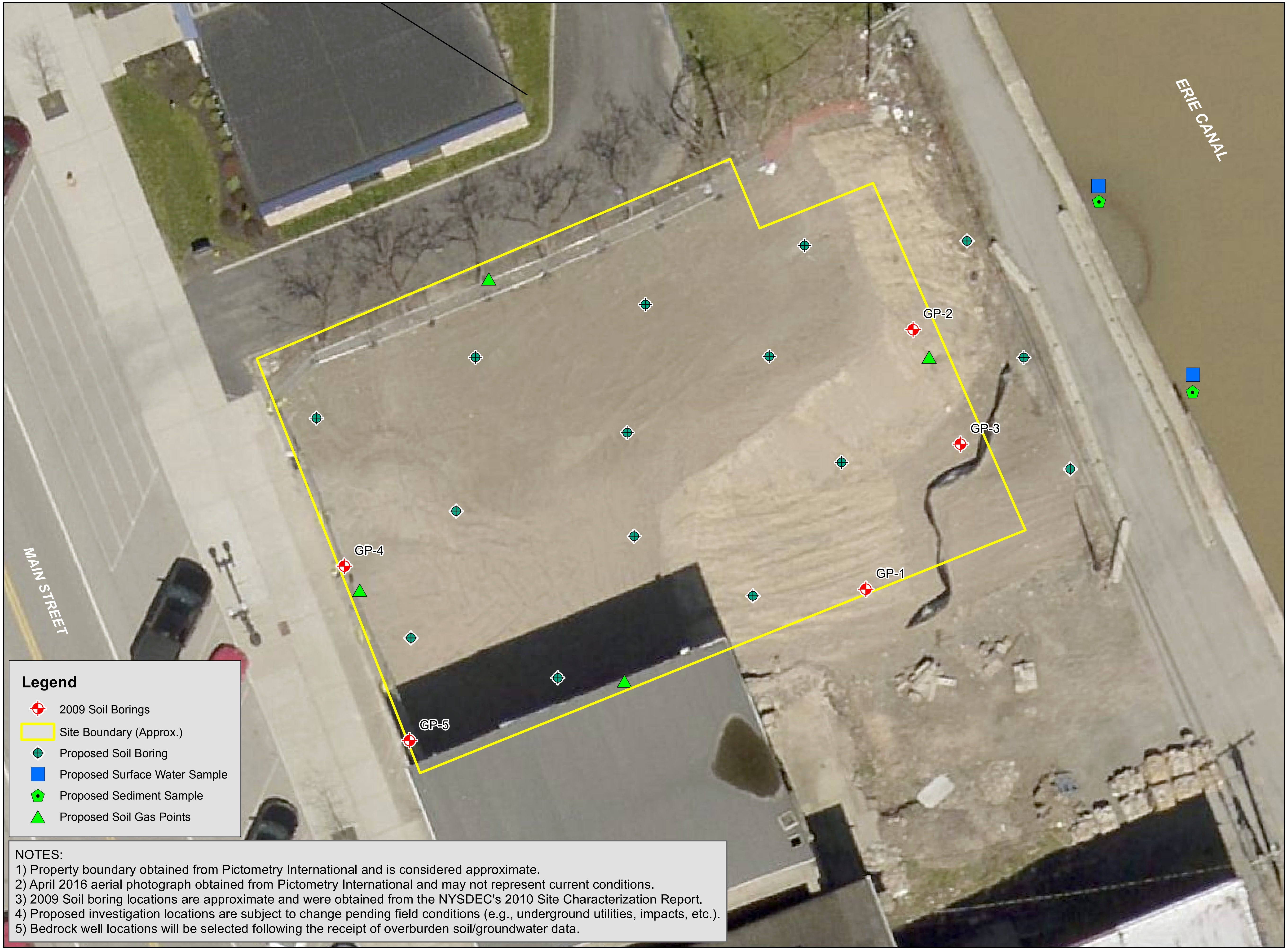
SITE LOCATION

PROJECT/DRAWING NUMBER:

2161937.016

FIGURE 1

J:\NYSDEC\2161937 - Investigation & Remediation\016 - Starlite Dry Cleaners CallOut ID 129705\Drawings\RIWP\FIGURE 1 Site Map.mxd



Legend

- ✚ 2009 Soil Borings
- ▭ Site Boundary (Approx.)
- ⊕ Proposed Soil Boring
- 🟦 Proposed Surface Water Sample
- ⬠ Proposed Sediment Sample
- ▲ Proposed Soil Gas Points

NOTES:
1) Property boundary obtained from Pictometry International and is considered approximate.
2) April 2016 aerial photograph obtained from Pictometry International and may not represent current conditions.
3) 2009 Soil boring locations are approximate and were obtained from the NYSDEC's 2010 Site Characterization Report.
4) Proposed investigation locations are subject to change pending field conditions (e.g., underground utilities, impacts, etc.).
5) Bedrock well locations will be selected following the receipt of overburden soil/groundwater data.

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REMEDIAL INVESTIGATION WORK PLAN
FORMER STARLITE DRY CLEANERS
NYSDEC #837016
331 MAIN STREET, MEDINA, NEW YORK

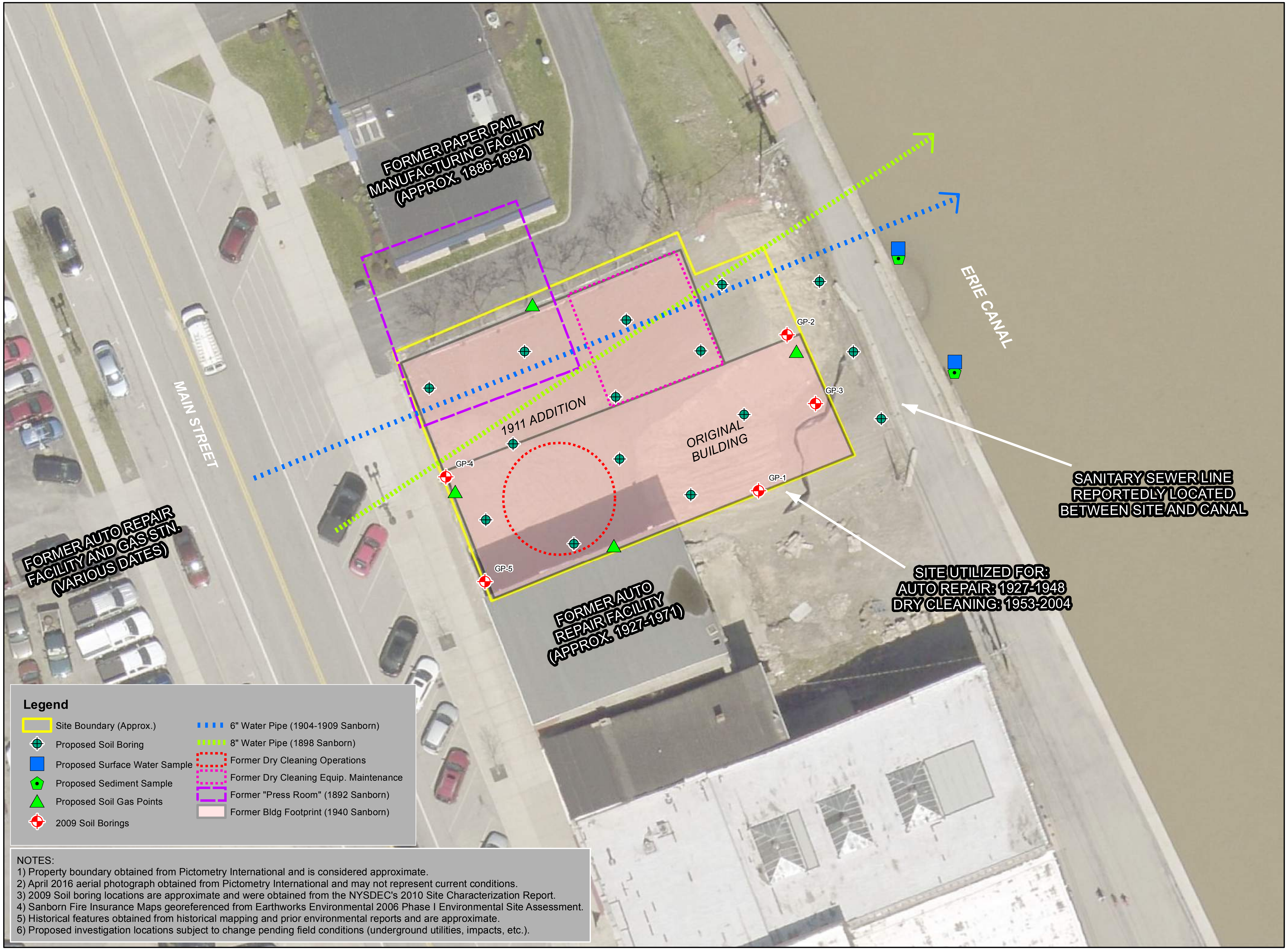
DRAWING NAME:

PROPOSED INVESTIGATION LOCATIONS

PROJECT/DRAWING NUMBER:

2161937.016

FIGURE 2



NOTES:
1) Property boundary obtained from Pictometry International and is considered approximate.
2) April 2016 aerial photograph obtained from Pictometry International and may not represent current conditions.
3) 2009 Soil boring locations are approximate and were obtained from the NYSDEC's 2010 Site Characterization Report.
4) Sanborn Fire Insurance Maps georeferenced from Earthworks Environmental 2006 Phase I Environmental Site Assessment.
5) Historical features obtained from historical mapping and prior environmental reports and are approximate.
6) Proposed investigation locations subject to change pending field conditions (underground utilities, impacts, etc.).

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CONSERVATION

PROJECT:

REMEDIAL INVESTIGATION WORK PLAN
FORMER STARLITE DRY CLEANERS
NYSDEC #837016
331 MAIN STREET, MEDINA, NEW YORK

DRAWING NAME:

HISTORICAL SITE FEATURES

PROJECT/DRAWING NUMBER:

2161937.016

FIGURE 3

J:\NYSDEC\2161937 - Investigation & Remediation\016 - Starlite Dry Cleaners CallOut ID 129705\Drawings\RIWP\FIGURE 3 HistoricalFeatures.mxd

NOTES:
1) Property boundary obtained from Pictometry International and is considered approximate.
2) Features depicted are approximate and may not represent current conditions.
3) 2009 Soil boring locations are approximate and were obtained from the NYSDEC's 2010 Site Characterization Report.
4) Proposed investigation locations subject to change pending field conditions (underground utilities, impacts, etc.).

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PROJECT:

**REMEDIAL INVESTIGATION WORK PLAN
FORMER STARLITE DRY CLEANERS
NYSDEC #837016
331 MAIN STREET, MEDINA, NEW YORK**

DRAWING NAME:

SIMPLIFIED SITE MAP

PROJECT/DRAWING NUMBER:

2161937.016

FIGURE 4

J:\NYSDEC\2161937 - Investigation & Remediation\016 - Starlite Dry Cleaners CallOut ID 129705\Drawings\RIWP\FIGURE 4 Proposed Investigation.mxd

Tables

Table 1a
Remedial Investigation Work Plan
Former Starlite Dry Cleaners - NYSDEC #837016
331 Main Street, Medina, New York

LABELLA Associates, D.P.C.

Summary of Volatile Organic Compounds in Previously Collected Soil Samples
Results in Milligrams per Kilogram (mg/Kg) or PPM

Sample ID	Soil Samples					NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Groundwater	NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Public Health: Unrestricted Use
	GP-1	GP-2	GP-3	GP-4	GP-5		
Sample Depth (bgs)	**2' - 5.6'**	**8' - 11'**	**8' - 10'**	**4' - 6'**	**4' - 6'**		
Sample Collection Date	**11/16/2009**	**11/16/2009**	**11/16/2009**	**11/16/2009**	**11/16/2009**		
Volatile Organic Compounds							
Chloromethane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	Not Listed	Not Listed
Bromomethane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	Not Listed	Not Listed
Chloroethane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	Not Listed	Not Listed
Vinyl chloride	<0.0056	*0.400* D	<0.0057	<0.0052	<0.0054	0.020	0.020
1,1-Dichloroethene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.33	0.33
Acetone	<0.011	*0.670* DB	<0.011	<0.010	<0.011	0.50	0.50
Carbon disulfide	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	2.7 [3]	100 [2]
Methylene chloride	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.50	0.50
trans-1,2-dichloroethene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.19	0.19
Methyl tert-butyl ether	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.93	0.93
1,1-Dichloroethane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.27	0.27
2-Butanone	<0.011	*0.140* DB	<0.011	<0.010	<0.011	0.12	0.12
cis-1,2-dichloroethene	<0.0056	0.110	<0.0057	<0.0052	<0.0054	0.25	0.25
Chloroform	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.37	0.37
1,1,1-Trichloroethane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.68	0.68
Carbon tetrachloride	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.76	0.76
1,2-Dichloroethane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.02	0.02
Benzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.06	0.06
Trichloroethene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.47	0.47
1,2-Dichloropropane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	700[1]	700[1]
Bromodichloromethane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	Not Listed	Not Listed
4-Methyl-2-pentanone (MIK)	<0.011	<0.065 D	<0.011	<0.010	<0.011	1.0[3]	1.0[3]
cis-1,3,-Dichloropropene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	Not Listed	Not Listed
Toluene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.7	0.7
trans-1,3,-Dichloropropene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	Not Listed	Not Listed
1,1,2-Trichloroethane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	Not Listed	Not Listed
2-Hexanone	<0.011	<0.065 D	<0.011	<0.010	<0.011	Not Listed	Not Listed
Tetrachloroethene	<0.0056	<0.032 D	0.003 J	0.001 J	<0.0054	1.3	1.3
Dibromochloromethane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	10[1]	10[1]
Chlorobenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	1.1	1.1
Ethylbenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	1	1
m,p-Xylene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	Not Listed	Not Listed
o-Xylene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	Not Listed	Not Listed
Xylene (total)	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	1.6	0.26
Styrene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	300[1]	300[1]
Bromoform	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	Not Listed	Not Listed
1,1,2,2-Tetrachloroethane	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	0.6[3]	0.6[3]
n-Propylbenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	3.9	3.9
1,3,5-Trimethylbenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	8.4	8.4
tert-Butylbenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	5.9	5.9
1,2,4-Trimethylbenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	3.6	3.6
sec-Butylbenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	11	11
n-Butylbenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	10	12
1,2-Dichlorobenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	1.1	1.1
1,3-Dichlorobenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	2.4	2.4
1,4-Dichlorobenzene	<0.0056	<0.032 D	<0.0057	<0.0052	<0.0054	1.8	1.8
1,4-Dioxane	<0.110	<0.650 D	<0.110	<0.100	<0.110	0.1	0.1
Total VOCs	None Detected	1.3200	0.0030	0.0010	None Detected	*Not Available*	*Not Available*
Total VOC TICs	0.0058 JN	0.071 JND	0.0074 JN	0.0053 JN	None Detected		
Total VOCs & VOC TICs	0.0058	1.3910	0.0104	0.0063	None Detected		

Notes:

VOC analysis by United States Environmental Protection Agency (USEPA) Method SW846 8260B.

Samples collected by NYSDEC during Site Characterization Investigation.

"<" - Indicates compound was not detected above the indicated laboratory method detection limit (MDL).

D - indicates diluted sample.

J – Compound quantitation less than the sample quantitation but greater than zero; also used to qualify tentatively identified compounds (TICs). In all cases these are estimated values.

N - Indicates presumptive evidence of a compound.

B = Compound found in method blank.

E = Estimated value; concentration exceeds the instrument calibration range.

NA = Not Applicable or Not Available

PPM = Parts Per Million = mg/kg

Highlighted type indicates that the constituent was detected at a concentration above the NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Public Health: Unrestricted Use

Italicized type indicates a concentration above the NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Groundwater.

[1] Indicates no Part 375 value for indicated compound; NYSDEC CP-51 SSCO Protection of Ecological Resources value shown

[2] Indicates no Part 375 value for indicated compound; NYSDEC CP-51 SSCO Residential value shown

[3] Indicates no Part 375 value for indicated compound; NYSDEC CP-51 SSCO Protection of Groundwater value shown

Table 1b
Remedial Investigation Work Plan
Former Starlite Dry Cleaners - NYSDEC #837016
331 Main Street, Medina, New York

Summary of Detected Semi-Volatile Organic Compounds in Previously Collected Soil Samples
Results in Milligrams per Kilogram (mg/Kg) or PPM

Sample ID	Soil Samples					NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Groundwater	NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Public Health: Unrestricted Use
	GP-1	GP-2	GP-3	GP-4	GP-5		
Sample Depth (bgs)	**2' - 5.6'**	**8' - 11'**	**8' - 10'**	**4' - 6'**	**4' - 6'**		
Sample Collection Date	**11/16/2009**	**11/16/2009**	**11/16/2009**	**11/16/2009**	**11/16/2009**		
Semi-Volatile Organic Compounds							
Phenanthrene	<0.0370	2.000 JD	<0.380	<0.340	<0.360	1,000	100
Anthracene	<0.0370	0.600 JD	<0.380	<0.340	<0.360	1,000	100
Fluoranthene	<0.0370	3.000 JD	<0.380	<0.340	<0.360	1,000	100
Pyrene	<0.0370	3.000 JD	<0.380	<0.340	<0.360	1,000	100
Benz(a)anthracene	<0.0370	*2.000* JD	<0.380	<0.340	<0.360	1	1
Chrysene	<0.0370	*1.000* JD	<0.380	<0.340	<0.360	1	1
Bis(2-ethylhexyl)phthalate	0.080 JB	<4.300 D	0.100 JB	0.080 JB	0.1 JB	435[3]	239 [1]
Benzo(b)fluoranthene	<0.0370	1.000 JD	<0.380	<0.340	<0.360	1.7	1
Benzo(k)fluoranthene	<0.0370	1.000 JD	<0.380	<0.340	<0.360	1.7	0.8
Total SVOCs	0.080	13.600	0.100	0.080	0.1	*Not Available*	*Not Available*
Total SVOC TICs	11.145 JNB	530.200 JND	5.861 JN	4.587 JN	5.083 JN		
Total SVOCs & SVOC TICs	11.225	543.800	5.961	4.667	5.173		

Notes:

SVOC analysis by United States Environmental Protection Agency (USEPA) Method SW846 8270.

Samples collected by NYSDEC during Site Characterization Investigation.

"<" - Indicates compound was not detected above the indicated laboratory method detection limit (MDL).

D - indicates diluted sample.

J – Compound quantitation less than the sample quantitation but greater than zero; also used to qualify tentatively identified compounds (TICs). In all cases these are estimated values.

N - Indicates presumptive evidence of a compound.

B = Compound found in method blank.

E = Estimated value; concentration exceeds the instrument calibration range.

NA = Not Applicable or Not Available

PPM = Parts Per Million = mg/kg

Highlighted type indicates that the constituent was detected at a concentration above the NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Public Health: Unrestricted Use

Italicized type indicates a concentration above the NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Groundwater.

Underlined values indicate exceedence of appropriate NYSDEC SSCO (see below).

[1] Indicates no Part 375 value for indicated compound; NYSDEC CP-51 SSCO Protection of Ecological Resources value shown

[2] Indicates no Part 375 value for indicated compound; NYSDEC CP-51 SSCO Residential value shown

[3] Indicates no Part 375 value for indicated compound; NYSDEC CP-51 SSCO Protection of Groundwater value shown

Table 1c
Remedial Investigation Work Plan
Former Starlite Dry Cleaners - NYSDEC #837016
331 Main Street, Medina, New York

Summary of RCRA Metals in Previously Collected Soil Samples
Results in Milligrams per Kilogram (mg/Kg) or PPM

Sample ID	Soil Samples					NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Groundwater (ppm)	NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Public Health: Unrestricted Use (ppm)
	GP-1	GP-2	GP-3	GP-4	GP-5		
Sample Depth (bgs)	**2' - 5.6'**	**8' - 11'**	**8' - 10'**	**4' - 6'**	**4' - 6'**		
Sample Collection Date	**11/16/2009**	**11/16/2009**	**11/16/2009**	**11/16/2009**	**11/16/2009**		
RCRA Metals							
Arsenic	3.67 J	4.99 J	4.50 J	10.8 J	5.16 J	16	13
Barium	30.8 B	88.4	18.7 B	14.8 B	16.1 B	820	350
Cadmium	<1.12	<1.30	<1.15	<1.04	<1.08	7.5	2.5
Chromium	5.54	13.0	9.00	13.6	11.3	Not Listed	30
Lead	14.6	275	2.94	<0.623	<0.647	450	63
Mercury	<0.0560	0.691	<0.0573	<0.0519	<0.0539	0.73	0.18
Selenium	<1.12	<1.30	2.45 JB	<1.04	<1.08	4	3.9
Silver	<2.24	<2.59	<2.29	<2.08	<2.16	8.3	2.0

Notes:

RCRA Metals analysis by United States Environmental Protection Agency (USEPA) SW846 Methods 6010 (TAL Metals) and 7471 (Mercury)

Samples collected by NYSDEC during Site Characterization Investigation.

"<" - Indicates compound was not detected above the indicated laboratory method detection limit (MDL).

D - indicates diluted sample.

J – Compound quantitation less than the sample quantitation but greater than zero; also used to qualify tentatively identified compounds (TICs). In all cases these are estimated values.

N - Indicates presumptive evidence of a compound.

B = Compound found in method blank.

E = Estimated value; concentration exceeds the instrument calibration range.

Highlighted type indicates that the constituent was detected at a concentration above the NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Public Health: Unrestricted Use

Italicized type indicates a concentration above the NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Groundwater.

PPM = Parts per Million

Table 1d
Remedial Investigation Work Plan
Former Starlite Dry Cleaners - NYSDEC #837016
331 Main Street, Medina, New York

Summary of Polychlorinated Biphenyls (PCBs) in Previously Collected Soil Samples
Results in Milligrams per Kilogram (mg/Kg) or PPM

Sample ID	**Soil Samples**					**NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Groundwater (ppm)**	**NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Public Health: Unrestricted Use (ppm)**
	GP-1	**GP-2**	**GP-3**	**GP-4**	**GP-5**		
Sample Depth (bgs)	**2' - 5.6'**	**8' - 11'**	**8' - 10'**	**4' - 6'**	**4' - 6'**		
Sample Collection Date	**11/16/2009**	**11/16/2009**	**11/16/2009**	**11/16/2009**	**11/16/2009**		
PCBs							
Aroclor 1016	<0.037	<0.043	<0.038	<0.034	<0.036	N/A	N/A
Aroclor 1221	<0.037	<0.043	<0.038	<0.034	<0.036	N/A	N/A
Aroclor 1232	<0.037	<0.043	<0.038	<0.034	<0.036	N/A	N/A
Aroclor 1242	<0.037	<0.043	<0.038	<0.034	<0.036	N/A	N/A
Aroclor 1248	<0.037	<0.043	<0.038	<0.034	<0.036	N/A	N/A
Aroclor 1254	<0.037	<0.043	<0.038	<0.034	<0.036	N/A	N/A
Aroclor 1260	<0.037	<0.043	<0.038	<0.034	<0.036	N/A	N/A
Total PCBs	None Detected	None Detected	None Detected	None Detected	None Detected	3.2	0.1

Notes:

PCB analysis by United States Environmental Protection Agency (USEPA) Method SW846 8082.

Samples collected by NYSDEC during Site Characterization Investigation.

Highlighted type indicates that the constituent was detected at a concentration above the Part 375-6 Protection of Public Health: Unrestricted Use.

Italicized type indicates a concentration above the NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives for the Protection of Groundwater.

PPM = Parts per Million

Table 2a
Remedial Investigation Work Plan
Former Starlite Dry Cleaners - NYSDEC #837016
331 Main Street, Medina, New York

LABELLA
Associates, D.P.C.

Summary of Detected Volatile Organic Compounds in Previously Collected Groundwater Samples
Results in Micrograms per Liter (ug/L) or PPB

Sample ID	Groundwater Samples				NYSDEC Part 703 Groundwater Standards and TOGS 1.1.1 Guidance Values
	GP-2		GP-3		
Sample Collection Date	**11/16/2009**		**11/16/2009**		
Volatile Organic Compounds					
Vinyl chloride	330	D	34		2
cis-1,2-dichloroethene	460	D	78		5
Trichloroethene	<100	D	6.6		5
Tetrachloroethene	<100	D	34		5
Total VOCs	790		153		*Not Available*
Total VOC TICs	None Detected		None Detected		
Total VOCs & VOC TICs	790		153		

Notes:

VOC analysis by United States Environmental Protection Agency (USEPA) Method SW846 8260B.

Samples collected by NYSDEC during Site Characterization Investigation.

"<" - Indicates compound was not detected above the indicated laboratory method detection limit (MDL).

D - indicates diluted sample.

J – Compound quantitation less than the sample quantitation but greater than zero; also used to qualify tentatively identified compounds (TICs). In all cases these are estimated values.

N - Indicates presumptive evidence of a compound.

B = Compound found in method blank.

E = Estimated value; concentration exceeds the instrument calibration range.

PPB = Parts Per Billion = ug/L

NA = Not Applicable or Not Available

Highlighted type indicates that the constituent was detected at a concentration above the NYSDEC Part 703 Groundwater Standards or TOGS 1.1.1.

Table 2b
Remedial Investigation Work Plan
Former Starlite Dry Cleaners - NYSDEC #837016
331 Main Street, Medina, New York

LABELLA
Associates, D.P.C.

Summary of Detected Semi-Volatile Organic Compounds in Previously Collected Groundwater Samples
Results in Micrograms per Liter (ug/L) or PPB

Sample ID	Groundwater Samples				NYSDEC Part 703 Groundwater Standards
	GP-2		GP-3		
Sample Collection Date	**11/16/2009**		**11/16/2009**		
Semi-Volatile Organic Compounds					
Phenanthrene	<10		6	J	50
Fluoranthene	<10		6	J	50
Pyrene	<10		5	J	50
Benz(a)anthracene	<10		1	J	0.002
Chrysene	<10		3	J	0.002
Bis(2-ethylhexyl)phthalate	3	JB	4	JB	5
Benzo(b)fluoranthene	<10		2	J	0.002
Benzo(k)fluoranthene	<10		2	J	0.002
Benzo(a)pyrene	<10		2	J	0.002
Total SVOCs	3		31.0		*Not Available*
Total SVOC TICs	201.6	JN	524	JN	
Total SVOCs & SVOC TICs	204.6		555.0		

Notes:

SVOC analysis by United States Environmental Protection Agency (USEPA) Method SW846 8270.

Samples collected by NYSDEC during Site Characterization Investigation.

"<" - Indicates compound was not detected above the indicated laboratory method detection limit (MDL).

D - indicates diluted sample.

J – Compound quantitation less than the sample quantitation but greater than zero; also used to qualify tentatively identified compounds (TICs). In all cases these are estimated values.

N - Indicates presumptive evidence of a compound.

B = Compound found in method blank.

E = Estimated value; concentration exceeds the instrument calibration range.

PPB = Parts Per Billion = ug/L

NA = Not Applicable or Not Available

Highlighted type indicates that the constituent was detected at a concentration above the NYSDEC Part 703 Groundwater Standards or TOGS 1.1.1.

Appendix 1: Community Air Monitoring Plan

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

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

December 2009

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

Appendix 1B
Fugitive Dust and Particulate Monitoring

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

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

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

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

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

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

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

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

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

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

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

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

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

Appendix 2: Health & Safety Plan

LABELLA
Associates, D.P.C.
Engineering
Architecture
Environmental
Planning

Site Health and Safety Plan

Starlite Dry Cleaners
NYSDEC #837016

Location:

331 North Main Street
Medina, New York

Prepared for:

Ms. Gail A. Dieter
NYS Department of Environmental Conservation
Division of Environmental Remediation
Bureau E, Section C
625 Broadway, 12th Floor
Albany, New York 12233-7017

LaBella Project No. 2161937.016
May 2017

Relationships. Resources. Results.

Site Health and Safety Plan

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Albany, New York 12233-7017

LaBella Project No. 2161937.016

May 2017

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SITE HEALTH AND SAFETY PLAN

Project Title: Starlite Dry Cleaners

Project Number: 2161937.016

Project Location (Site): 331 North Main Street, NY

Environmental Director: Gregory Senecal, CHMM

Site Safety Manager: Richard Rote, CIH

Site Contact: TBD

Site Control Provided By: LaBella Associates, D.P.C.

Project Manager: Jennifer Gillen

Plan Review Date: TBD

Plan Approval Date: TBD

Plan Approved By: ______________________________
Mr. Richard Rote, CIH

Site Conditions: 0.2-acre commercial land
CVOC and SVOCs in GW
Metals, VOCs, and SVOCs in Soil

Site Environmental Information Provided By:

- Phase I ESA by Earthworks Environmental dated January 2006
- Site Characterization Report by NYSDEC dated October 2010

Air Monitoring Provided By: LaBella Associates, D.P.C.

Site Control Provided By: Contractor(s) TBD

EMERGENCY CONTACTS

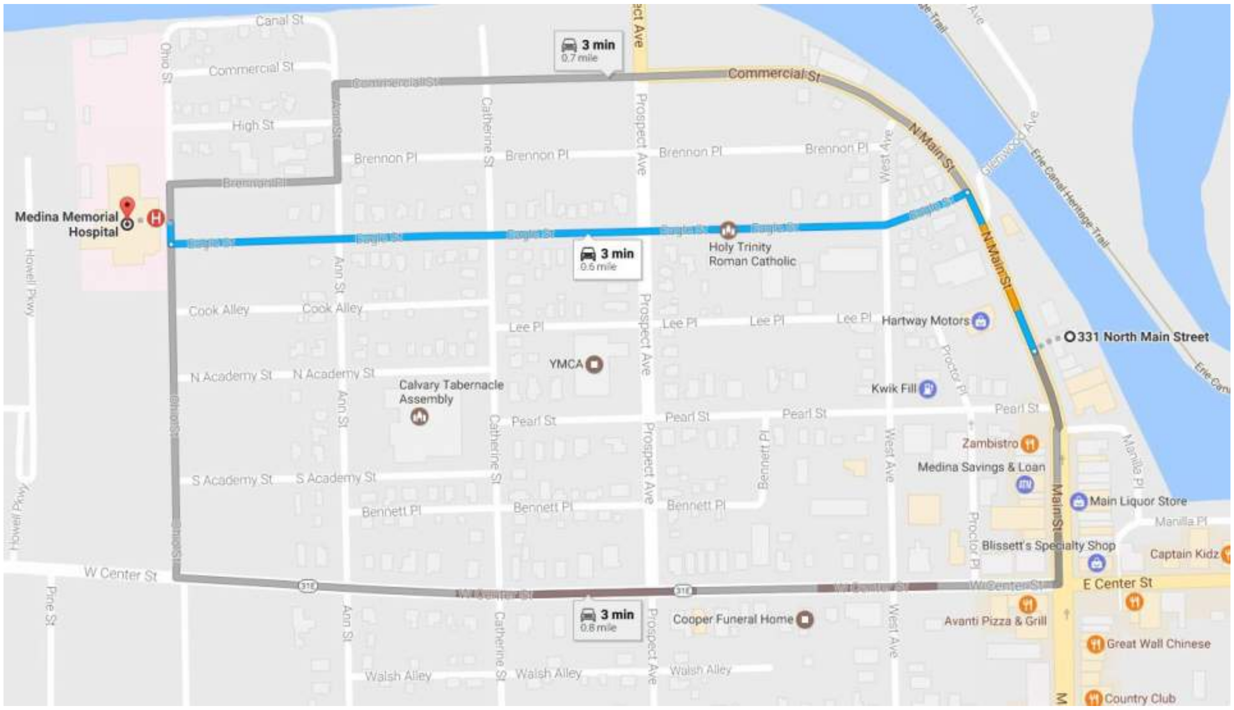
	Name	**Phone Number**
Ambulance:	As Per Emergency Service	911
Hospital Emergency:	Medina Memorial Hospital	585-798-2000
Poison Control Center:	Finger Lakes Poison Control	585-273-4621
Police (local, state):	Medina Police Department	911
Fire Department:	Medina Fire Department	911
Site Contact:	Gail Dieter, NYSDEC	518-402-9813
Project Manager	Jennifer Gillen, LaBella	585-295-6648
Site Safety Manager:	Richard Rote, LaBella	585-414-8891

MAP AND DIRECTIONS TO THE MEDICAL FACILITY
HIGHLAND HOSPITAL

Address: 200 Ohio Street, Medina, NY 14103

1. Exit the Site heading North on North Main Street, 0.1 mi
2. Turn left onto Eagle Street, 0.5 mi
3. Turn right onto Ohio Street, 62 ft
4. Arrive at hospital on left.

Total travel distance: 0.6 miles
Approximate travel time: 3 minutes



1.0 Introduction

The purpose of this Health and Safety Plan (HASP) it to provide guidelines for responding to potential health and safety issues that may be encountered during the field activities relating to the implementation of investigation activities at the property addressed as 331 North Main Street, Orleans County, Village of Medina, Town of Ridgeway, New York (the Site). This HASP only reflects the policies of LaBella Associates D.P.C. The requirements of this HASP are applicable to all approved LaBella personnel at the work site. The provisions of the HASP were developed in general accordance with 29 CFR 1910 and 29 CFR 1926 and do not replace or supersede any regulatory requirements of the USEPA, NYSDEC, OSHA or any other regulatory body.

2.0 Responsibilities

This HASP presents guidelines to minimize the risk of injury to project personnel, and to provide rapid response in the event of injury. The HASP is applicable only to activities of approved LaBella personnel and their authorized visitors. The Project Manager shall implement the provisions of this HASP for the duration of the project. It is the responsibility of LaBella employees to follow the requirements of this HASP, and all applicable company safety procedures.

3.0 Activities Covered

The activities covered under this HASP are limited to the following:

- ☐ Management of environmental investigation
- ☐ Environmental Monitoring
- ☐ Collection of samples
- ☐ Management of excavated soil and fill.

4.0 Work Area Access and Site Control

The contractor(s) will have primary responsibility for work area access and site control.

5.0 Potential Health and Safety Hazards

This section lists some potential health and safety hazards that project personnel may encounter at the project site and some actions to be implemented by approved personnel to control and reduce the associated risk to health and safety. This is not intended to be a complete listing of any and all potential health and safety hazards. New or different hazards may be encountered as site environmental and site work conditions change. The suggested actions to be taken under this plan are not to be substituted for good judgment on the part of project personnel. At all times, the Site personnel has responsibility for site safety and his or her instructions must be followed.

5.1 Hazards Due to Heavy Machinery

Potential Hazard:
Heavy machinery including trucks, excavators, backhoes, etc will be in operation at the site. The presence of such equipment presents the danger of being struck or crushed. Use caution when working near heavy machinery.

Protective Action:
Make sure that operators are aware of your activities, and heed operator’s instructions and warnings. Wear bright colored clothing and walk safe distances from heavy equipment. A hard hat, safety glasses and steel toe shoes are required.

5.2 Excavation Hazards

Potential Hazard:
Excavations and trenches can collapse, causing injury or death. Edges of excavations can be unstable and collapse. Toxic and asphyxiant gases can accumulate in confined spaces and trenches. Tasks that require working within the excavation will require air monitoring in the breathing zone (refer to Section 9.0).

Excavations left open create a fall hazard which can cause injury or death.

Protective Action:
Personnel must receive approval from the Project Manager to enter an excavation for any reason, and may require additional training. Subsequently, approved personnel are to receive authorization for entry from the Site personnel. Approved personnel are not to enter excavations over 4 feet in depth unless excavations are adequately sloped, shored or otherwise protected. Additional personal protective equipment may be required based on the air monitoring.

Personnel should exercise caution near all excavations at the site as it is expected that excavation sidewalls will be unstable.

Fencing and/or barriers accompanied by “no trespassing” signs should be placed around all excavations when left open for any period of time when work is not being conducted.

5.3 Cuts, Punctures and Other Injuries

Potential Hazard:
In any excavation or construction~~,~~ work site there is the potential for the presence of sharp or jagged edges on rock, metal materials, and other sharp objects. Serious cuts and punctures can result in loss of blood and infection.

Protective Action:
Serious injuries are to be reported immediately to the Project Manager. The Project Manager is responsible for making First Aid supplies available at the work site to treat minor injuries. Do not move seriously injured workers. All injuries requiring treatment are to be reported to the Project Manager.

5.4 Injury Due to Exposure of Chemical Hazards

Potential Hazards:
Volatile organic vapors from petroleum products, chlorinated solvents or other chemicals may be encountered during excavation activities at the project work site. Inhalation of high concentrations of organic vapors can cause headache, stupor, drowsiness, confusion and other health effects. Skin contact can cause irritation, chemical burn, or dermatitis.

Protective Action:
The presence of organic vapors may be detected by their odor and by monitoring instrumentation. Approved employees will not work in environments where hazardous concentrations of organic vapors are present. Air monitoring (refer to Section 9.0) of the work area will be performed at least every 60 minutes or more often using a Photoionization Detector (PID). Personnel are to leave the work area whenever PID measurements of ambient air exceed 25 ppm consistently for a 5 minute period. In the event that sustained total volatile organic compound (VOC) readings of 25 ppm is encountered personnel should upgrade personal protective equipment to Level C (refer to Section 8.0) and an Exclusion Zone should be established around the work area to limit and monitor access to this area (refer to Section 6.0).

5.5 Injuries Due to Extreme Hot or Cold Weather Conditions

Potential Hazards:
Extreme hot weather conditions can cause heat exhaustion, heat stress and heat stroke or extreme cold weather conditions can cause hypothermia.

Protective Action:
Precaution measures should be taken such as dress appropriately for the weather conditions and drink plenty of fluid. If personnel should suffer from any of the above conditions, proper techniques should be taken to cool down or heat up the body and taken to the nearest hospital if needed.

5.6 Water Dangers

Potential Hazards:
Surface water and sediment samples are planned to be collected from the nearby Erie Canal, with the sampling personnel located on land. Based on the proximity to the Canal, there is the potential for personnel to fall into the Canal and drown.

Protective Action:
If a railing is not present between the sampling personnel and the open water, at least one (1) of the following actions should be taken:

- At least two (2) people should be present (i.e., a primary and secondary sampler) and have at last one (1) lifebuoy with a buoyant safety line at least 90-feet in length; or,
- Sampling personnel should be wearing appropriate personnel floatation devices (i.e., a United States Coast Guard-approved life jacket). Prior to and after each use the floatation devices should be inspected for any damage or defects which could affect their strength and/or buoyancy; or,
- Sampling personnel should be properly tethered to a structure or railing which will more than adequately support the weight of sampling personnel.

6.0 Work Zones

In the event that conditions warrant establishing various work zones (i.e., based on hazards - Section 5.4), the following work zones should be established:

Exclusion Zone (EZ):
The EZ will be established in the immediate vicinity and adjacent downwind direction of site activities that elevate breathing zone VOC concentrations to unacceptable levels based on field screening. These site activities include contaminated soil excavation and soil sampling activities. If access to the site is required to accommodate non-project related personnel then an EZ will be established by constructing a barrier around the work area (yellow caution tape and/or construction fencing). The EZ barrier shall encompass the work area and any equipment staging/soil staging areas necessary to perform the associated work. The contractor(s) will be responsible for establishing the EZ and limiting access to approved personnel. Depending on the condition for establishing the EZ, access to the EZ may require adequate PPE (e.g., Level C).

Contaminant Reduction Zone (CRZ):
The CRZ will be the area where personnel entering the EZ will don proper PPE prior to entering the EZ and the area where PPE may be removed. The CRZ will also be the area where decontamination of equipment and personnel will be conducted as necessary.

7.0 Decontamination Procedures

Upon leaving the work area, approved personnel shall decontaminate footwear as needed. Under normal work conditions, detailed personal decontamination procedures will not be necessary. Work clothing may become contaminated in the event of an unexpected splash or spill or contact with a contaminated substance. Minor splashes on clothing and footwear can be rinsed with clean water. Heavily contaminated clothing should be removed if it cannot be rinsed with water. Personnel assigned to this project should be prepared with a change of clothing whenever on site.

Personnel will use the contractor’s disposal container for disposal of PPE.

8.0 Personal Protective Equipment

Generally, site conditions at this work site require level of protection of Level D or modified Level D. However, air monitoring will be conducted to determine if up-grading to Level C PPE is required (refer to Section 9.0). Descriptions of the typical safety equipment associated with Level D and Level C are provided below:

Level D:
Hard hat, safety glasses, rubber nitrile sampling gloves, steel toe construction grade boots, etc.

Level C:
Level D PPE and full or ½-face respirator and tyvek suit (if necessary). [*Note: Organic vapor cartridges are to be changed after each 8-hours of use or more frequently.*]

9.0 Air Monitoring

According to 29 CFR 1910.120(h), air monitoring shall be used to identify and quantify airborne levels of hazardous substances and health hazards in order to determine the appropriate level of employee protection required for personnel working onsite. Air monitoring will consist at a minimum of the procedures described below. Site perimeter and community air monitoring and appropriate response actions will be implemented as described in the New York State Department of Health (NYSDOH) Generic Community Air Monitoring guidance.

The Air Monitor will utilize a photoionization Detector (PID) to screen the ambient air in the work areas for total Volatile Organic Compounds (VOCs) and a DustTrak tm Model 8520 aerosol monitor or equivalent for measuring particulates. Air monitoring of the work areas and EZ, if established, will be performed at least every 60 minutes or more often using a PID, and the DustTrak meter.

If sustained PID readings of greater than 25 ppm are recorded in the breathing zone in the work area or EZ, work should be temporarily ceased and personnel are to leave the work area until satisfactory readings are obtained, the source of vapors identified and addressed through corrective actions or approved personnel may re-enter the work areas wearing at a minimum a ½ face respirator with organic vapor cartridges for an 8-hour duration (i.e., upgrade to Level C PPE). Organic vapor cartridges are to be changed after each 8-hours of use or more frequently, if necessary.

If PID readings are sustained, in the work area, at levels above 50 ppm for a 5 minute average, work will be stopped immediately until safe levels of VOCs are encountered or additional PPE will be required (i.e., Level B).

If dust concentrations exceed the upwind concentration by 150 $\mu g/m^3$ (0.15 mg/m^3) consistently for a 10 minute period within the work area or at the downwind location, then LaBella personnel may not re-enter the work area until dust concentrations in the work area decrease below 150 $\mu g/m^3$ (0.15 mg/m^3), which may be accomplished by the construction manager implementing dust control or suppression measures.

10.0 Emergency Action Plan

In the event of an emergency, employees are to turn off and shut down all powered equipment and leave the work areas immediately. Employees are to walk or drive out of the Site as quickly as possible and wait at the assigned 'safe area'. Follow the instructions of the Site personnel.

Employees are not authorized or trained to provide rescue and medical efforts. Rescue and medical efforts will be provided by local authorities.

11.0 Medical Surveillance

Medical surveillance will be provided to all employees who are injured due to overexposure from an emergency incident involving hazardous substances at this site.

12.0 Employee Training

Personnel who are not familiar with this site plan will receive training on its entire content and organization before working at the Site.

Individuals involved with the investigation must be 40-hour OSHA HAZWOPER trained with current 8-hour refresher certification.

Table 1
Exposure Limits and Recognition Qualities

Compound	PEL-TWA (ppm)(b)(d)	TLV-TWA (ppm)(c)(d)	STEL (ppm)(b)	LEL (%)(e)	UEL (%)(f)	IDLH (ppm)(g)(d)	Odor	Odor Threshold (ppm)	Ionization Potential
Acetone	750	500	NA	2.15	13.2	20,000	Sweet	4.58	9.69
Anthracene	.2	.2	NA	NA	NA	NA	Faint aromatic	NA	NA
Benzene	1	0.5	5	1.3	7.9	3000	Pleasant	8.65	9.24
Benzo (a) pyrene (coal tar pitch volatiles)	0.2	0.1	NA	NA	NA	700	NA	NA	NA
Benzo (a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (b) Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo (k) Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	NA	NA	NA	NA	NA	NA	NA	10.88
Carbon Disulfide	20	1	NA	1.3	50	500	Odorless or strong garlic type	.096	10.07
Chlorobenzene	75	10	NA	1.3	9.6	2,400	Faint almond	0.741	9.07
Chloroform	50	2	NA	NA	NA	1,000	ethereal odor	11.7	11.42
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethylene	200	200	NA	9.7	12.8	400	Acrid	NA	9.65
1,2-Dichlorobenzene	50	25	NA	2.2	9.2		Pleasant		9.07
Ethyl Alcohol	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100	100	NA	1.0	6.7	2,000	Ether	2.3	8.76
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropyl Alcohol	400	200	500	2.0	12.7	2,000	Rubbing alcohol	3	10.10
Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	500	50	NA	12	23	5,000	Chloroform-like	10.2	11.35
Naphthalene	10, Skin	10	NA	0.9	5.9	250	Moth Balls	0.3	8.12
n-propylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphoric Acid	1	1	3	NA	NA	10,000	NA	NA	NA
Polychlorinated Biphenyl	NA	NA	NA	NA	NA	NA	NA	NA	NA
Potassium Hydroxide	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Isopropylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethane	NA	NA	NA	NA	NA	NA	Sweet	NA	NA
Toluene	100	100	NA	0.9	9.5	2,000	Sweet	2.1	8.82
Trichloroethylene	100	50	NA	8	12.5	1,000	Chloroform	1.36	9.45
1,2,4-Trimethylbenzene	NA	25	NA	0.9	6.4	NA	Distinct	2.4	NA
1,3,5-Trimethylbenzene	NA	25	NA	NA	NA	NA	Distinct	2.4	NA
Vinyl Chloride	1	1	NA	NA	NA	NA	NA	NA	NA
Xylenes (o,m,p)	100	100	NA	1	7	1,000	Sweet	1.1	8.56
Metals									
Arsenic	0.01	0.2	NA	NA	NA	100, Ca	NA	NA	NA
Cadmium	0.2	0.5	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	1	0.5	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.05	0.15	NA	NA	NA	700	NA	NA	NA
Mercury	0.05	0.05	NA	NA	NA	28	NA	NA	NA
Selenium	0.2	0.02	NA	NA	NA	Unknown	NA	NA	NA

(a) Skin = Skin Absorption
(b) OSHA-PEL Permissible Exposure Limit (flame weighted average, 8-hour): NIOSH Guide, June 1990
(c) ACGIH – 8 hour time weighted average from Threshold Limit Values and Biological Exposure Indices for 2003.
(d) Metal compounds in mg/m3
(e) Lower Exposure Limit (%)
(f) Upper Exposure Limit (%)
(g) Immediately Dangerous to Life or Health Level: NIOSH Guide, June 1990.

Notes:
1. All values are given in parts per million (PPM) unless otherwise indicated.
2. Ca = Possible Human Carcinogen, no IDLH information.

Appendix 3: Quality Control Plan

LABELLA
Associates, D.P.C.
Engineering
Architecture
Environmental
Planning

Quality Control (QC) Program

Starlite Dry Cleaners
NYSDEC #837016

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Prepared for:

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LaBella Project No. 2161937.016
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1.0 Introduction

LaBella's Quality Control (QC) Program is an integral part of its approach to environmental investigations. By maintaining a rigorous QC program, our firm is able to provide accurate and reliable data. QC also provides safe working conditions for all on-Site workers.

The QC program contains procedures which allow for the proper collection and evaluation of data and documents that QC procedures have been followed during field investigations. The QC program presents the methodology and measurement procedures used in collecting quality field data. This methodology includes the proper use of equipment, documentation of sample collection, and sample handling procedures.

Procedures used in the firm's QC program are compatible with federal, state, and local regulations, as well as, appropriate professional and technical standards.

This QC program has been organized into the following areas:

- QC Objectives and Checks
- Field Equipment, Handling, and Calibration
- Sampling Techniques
- Sample Handling and Packaging

It should be noted that project-specific work plans (e.g., Phase II ESA Work Plans, Remedial Investigation Work Plans) may have project specific details that will differ from the procedures in this QC program. In such cases, the project-specific work plan should be followed (subsequent to regulatory approval).

2.0 Quality Control Objectives

The United States Environmental Protection Agency (EPA) has identified five general levels of analytical data quality as being potentially applicable to site investigations conducted under CERCLA. These levels are summarized below:

- **Level I -** Field screening. This level is characterized by the use of portable instruments, which can provide real-time data to assist in the optimization of sampling point locations and for health and safety support. Data can be generated regarding the presence or absence of certain contaminants (especially volatiles) at sampling locations.
- **Level II -** Field analysis. This level is characterized by the use of portable analytical instruments, which can be used on site or in mobile laboratories stationed near a site (close-support labs). Depending upon the types of contaminants, sample matrix, and personnel skills, qualitative and quantitative data can be obtained.
- **Level III -** Laboratory analysis using methods other than the Contract Laboratory Program (CLP) Routine Analytical Services (RAS). This level is used primarily in support of engineering studies using standard EPA-approved procedures. Some procedures may be equivalent to CLP RAS, without the CLP requirements for documentation.
- **Level IV -** CLP Routine Analytical Services. This level is characterized by rigorous QC

protocols and documentation and provides qualitative and quantitative analytical data. Some regions have obtained similar support via their own regional laboratories, university laboratories, or other commercial laboratories.

- **Level V -** Non-standard methods. Analyses, which may require method modification and/or development. CLP Special Analytical Services (SAS) are considered Level V.

Unless stated otherwise, all data will be generated in accordance with Level IV. When CLP methodology is not available, federal and state approved methods will be utilized. Level III will be utilized, as necessary, for non-CLP RAS work which may include ignitability, corrosivity, reactivity, EP toxicity, and other state approved parameters for characterization. Level I will be used throughout the RI for health and safety monitoring activities.

All measurements will be made to provide that analytical results are representative of the media and conditions measured. Unless otherwise specified, all data will be calculated and reported in units consistent with other organizations reporting similar data to allow comparability of data bases among organizations. Data will be reported in micrograms per liter (µg/L) and milligrams (mg)/L for aqueous samples, and µg/ kilogram (kg) and mg/kg (dry weight) for soils, or otherwise as applicable.

The characteristics of major importance for the assessment of generated data are accuracy, precision, completeness, representativeness, and comparability. Application of these characteristics to specific projects is addressed later in this document. The characteristics are defined below.

2.1 Accuracy

Accuracy is the degree of agreement of a measurement or average of measurements with an accepted reference or "true" value and is a measure of bias in the system.

2.2 Precision

Precision is the degree of mutual agreement among individual measurements of a given parameter.

2.3 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct normal conditions.

2.4 Representativeness

Representativeness expresses the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition

Careful choice and use of appropriate methods in the field will ensure that samples are representative. This is relatively easy with water or air samples since these components are homogeneously dispersed. In soil and sediment, contaminants are unlikely to be evenly distributed, and thus it is important for the sampler and analyst to exercise good judgment when removing a sample.

2.5 Comparability

Comparability expresses the confidence with which one data set can be compared to another. The data sets may be inter- or intra- laboratory.

3.0 Measurement of Data Quality

3.1 Accuracy

Accuracy of a particular analysis is measured by assessing its performance with "known" samples. These "knowns" take the form of EPA standard reference materials, or laboratory prepared solutions of target analytes spiked into a pure water or sample matrix. In the case of gas chromatography (GC) or GC/MS (mass spectrometry) analyses, solutions of surrogate compounds are used. These solutions can be spiked into every sample and are designed to mimic the behavior of target analytes without interfering with their determination.

In each case the recovery of the analyte is measured as a percentage, correcting for analytes known to be present in the original sample if necessary, as in the case of a matrix spike analysis. For EPA supplied known solutions, this recovery is compared to the published data that accompany the solution.

For the firm's prepared solutions, the recovery is compared to EPA-developed data or the firm’s historical data as available. For surrogate compounds, recoveries are compared to EPA CLP acceptable recovery tables.

If recoveries do not meet required criteria, then the analytical data for the batch (or, in the case of surrogate compounds, for the individual sample) are considered potentially inaccurate. The analyst or his supervisor must initiate an investigation of the cause of the problem and take corrective action. This can include recalibration of the instrument, reanalysis of the QC sample, reanalysis of the samples in the batch, or flagging the data as suspect if the problems cannot be resolved. For highly contaminated samples, recovery of the matrix spike may depend on sample homogeneity. As a rule, analyses are not corrected for recovery of matrix spike or surrogate compounds.

3.2 Precision

Precision of a particular analysis is measured by assessing its performance with duplicate or replicate samples. Duplicate samples are pairs of samples taken in the field and transported to the laboratory as distinct samples. Their identity as duplicates is typically not known to the laboratory. For most purposes, precision is determined by the analysis of replicate pairs (i.e., two samples prepared at the laboratory from one original sample). Often in replicate analysis the sample chosen for replication does not contain target analytes so that quantitation of precision is impossible. For EPA CLP analyses, replicate pairs of spiked samples, known as matrix spike/matrix spike duplicate samples, are used for precision studies. This has the advantage that two real positive values for a target analyte can be compared.

Precision is calculated in terms of Relative Percent Difference (RPD).

- Where X_1 and X_2 represent the individual values found for the target analyte in the two replicate analyses or in the matrix spike/matrix spike duplicate analyses.
- RPDs must be compared to the method RPD for the analysis. The analyst or his supervisor must investigate the cause of RPDs outside stated acceptance limits. This may include a

visual inspection of the sample for non-homogeneity, analysis of check samples, etc. Follow-up action may include sample reanalysis or flagging of the data as suspect if problems cannot be resolved.

- During the data review and validation process, field duplicate RPDs are assessed as a measure of the total variability of both field sampling and laboratory analysis.

3.3 Completeness

Completeness for each parameter is calculated as follows:

- The firm's target value for completeness for all parameters is 100%. A completeness value of 95% will be considered acceptable. Incomplete results will be reported to the site managers. In planning the field sample collection, the site manager will plan to collect field duplicates from identified critical areas. This procedure should assure 100% completeness for these areas.

3.4 Representativeness

The characteristic of representativeness is not quantifiable. Subjective factors to be taken into account are as follows:

- The degree of homogeneity of a site;
- The degree of homogeneity of a sample taken from one point in a site; and
- The available information on which a sampling plan is based.

To maximize representativeness of results, sampling techniques and sample locations will be carefully chosen so that they provide laboratory samples representative of the site and the specific area. Within the laboratory, precautions are taken to extract from the sample bottle an aliquot representative of the whole sample. This includes premixing the sample and discarding pebbles from soil samples.

4.0 Quality Control Targets

Target values for detection limit, percent spike recovery and percent "true" value of known check standards, and RPD of duplicates/replicates are included in the QCP, Analytical Procedures. Note that tabulated values are not always attainable. Instances may arise where high sample concentrations, non-homogeneity of samples, or matrix interferences preclude achievement of target detection limits or other quality control criteria. In such instances, the firm will report reasons for deviations from these detection limits or noncompliance with quality control criteria.

5.0 Sampling Procedures

This section describes the sampling procedures to be utilized for each environmental medium that will be collected and analyzed in accordance with appropriate state and federal requirements. All procedures described are consistent with EPA sampling procedures as described in SW-846, third edition, September 1986, and subsequent updates. All samples will be delivered to the laboratory and analyzed within the holding times specified by the analytical method.

6.0 Soil & Groundwater Investigation

The groundwater sampling plan outlined in this subsection has been prepared in general accordance with RCRA Groundwater Monitoring Technical Enforcement Guidance Document 9950.1 (September 1986), Office of Solid Waste and Emergency Response.

Prior to drilling, all drill sites will be cleared with appropriate utility companies to avoid potential accidents relating to underground utilities.

6.1 Test Borings and Well Installation

6.1.1 Drilling Equipment

Direct Push Geoprobe Soil Borings:

Soil borings and monitoring wells will be advanced with a Geoprobe direct push sampling system. The use of direct push technology allows for rapid sampling, observation, and characterization of relatively shallow overburden soils. The Geoprobe utilizes a four-foot macrocore sampler, with disposable polyethylene sleeves. Soil cores will be retrieved in four-foot sections, and can be easily cut from the polyethylene sleeves for observation and sampling. The macrocore sampler will be decontaminated between samples and borings using an alconox and water solution. For soil borings in which soil samples for perfluorinated chemical (PFC) samples are to be collected, HDPE or PVC disposable sleeves should be used. If the appropriate disposable sleeves are unavailable, samples should be collected via stainless steel split spoons.

Hollow-Stem Auger Advanced Soil Borings:

The drilling and installation of soil borings and monitoring wells will be performed using a rotary drill rig which will have sufficient capacity to perform 4 1/2-inch inside diameter (ID) hollow-stem auger drilling in the overburden, retrieve Macrocore or split-spoon samples, and perform necessary rock coring to provide a minimum 3-inch diameter core, known in the industry as "NX." The borehole may be reamed to 5 1/2-inch diameter prior to monitoring well installation as cased hole in the bedrock, or may be left as open hole, with regulatory concurrence. Equipment sizes and diameters may vary based on project-specific criteria. Any investigative derived waste generated during the advancement of soil borings and monitoring well installations will be containerized and characterized for proper disposal.

6.1.2 Drilling Techniques

Direct Push Geoprobe Advanced Borings:

Prior to initiating drilling activities, the Geoprobe, Macrocores, drive rods, and pertinent equipment, will be steam cleaned or washed with an alconox and water solution. This cleaning procedure will also be used between each boring. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used. All sampling equipment will be steam cleaned or washed with an alconox and water solution upon completion of the investigation and prior to leaving the Site.

Test borings will be advanced with 2-inch (or larger) inside diameter (ID) direct push macrocore through overburden soils. Drilling fluids, other than water from a NYSDEC-approved source, will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

It will be the responsibility of the consultant to arrange for the appropriate drilling equipment to be present at the Site. Standby time to arrange for additional equipment or a water supply will not be allowed unless caused by unexpected Site conditions.

During the drilling, a properly calibrated photoionization detector (PID) will be used to screen soil cores retrieved from the Macrocores.

Direct Push Geoprobe advanced groundwater-monitoring wells typically utilize 1.25-inch threaded flush joint PVC or stainless steel pipe with 0.010-in. slotted screen. However, well construction will vary by project and will be specified in the project-specific work plan. PVC piping used for risers and screens will conform to the requirements of ASTM-D 1785 Schedule 40 pipe, and shall bear markings that will identify the material as that which is specified. All materials used to construct the wells will be NSF/ASTM approved. Solvent PVC glue shall not be used at any time in the construction of the wells. The bottom of the screen shall be sealed with a treated cap or plug. No lead shot or lead wool is to be employed in sealing the bottom of the well or for sealant at any point in the well. All risers and screens shall be set round, plumb, and true to line.

Hollow-Stem Auger Advanced Borings:

Prior to initiating drilling activities, the drill rig, augers, rods, Macrocore, split spoons, and/or other pertinent equipment will be steam cleaned or washed with an alconox and water solution. This cleaning procedure will also be used between each boring. These activities will be performed in a designated on-site decontamination area. Throughout and after the cleaning processes, direct contact between the equipment and the ground surface will be avoided. Plastic sheeting and/or clean support structures (e.g., pallets, sawhorses) will be used. The drilling rig and all equipment will be steam cleaned or washed with an alconox and water solution upon completion of the investigation and prior to leaving the site.

Test borings will be advanced with 4 1/2-inch (ID) hollow stem augers through overburden, and NX-sized diamond core barrels in competent rock, driven by truck-, track-, or trailer-mounted drilling equipment. Alternative methods of drilling or equipment may be allowed or requested for project-specific criteria, but must be approved by the NYSDEC. Drilling fluids, other than water from a NYSDEC-approved source, will not be allowed without special consideration and agreement from NYSDEC. The use of lubricants is also not allowed unless approved by the NYSDEC representative.

It will be the responsibility of the consultant to arrange for the appropriate drilling equipment to be present at the site. Standby time to arrange for additional equipment or a water supply will not be allowed unless caused by unexpected site conditions.

During the drilling, a (PID) will be used to screen soils retrieved from the split spoons or Macrocores.

Where bedrock wells are required, test borings shall be advanced into rock with NX (or similar) coring tools. Only water from an approved source shall be used in rock coring. The consultant shall monitor and record the petrology, core recovery, fractures, rate of advance, water levels, and water lost or produced in each test boring. The Rock Quality Determination (RQD) value shall be calculated for each 5-foot core. Each core shall be screened with a PID upon extraction to determine proper handling procedure. All core samples shall be retained and stored by the consultant in an approved wooden core box for a period of not less than one year.

The method selected may be percussion or rotary drilling at the option of the subcontractor. The method and equipment selected must be capable of penetrating the bedrock at each well location to a depth required by the work plan and will be selected based on the results of the rock coring performed.

Bedrock well installation will involve construction of a rock socket in the weathered bedrock. The socket will be drilled into the top of rock (typically 1-ft. to 5-ft. into the top of rock) at each bedrock well location to allow a permanent steel casing to be grouted securely in place prior to completion of the well. The purpose for this is to provide a seal at the overburden/bedrock interface and into the upper bedrock surface, to prevent the entrance of overburden water into the bedrock. After the grout and casing have set up for a minimum of 24 hours, the remaining bedrock can be NX (or similar) cored through the steel casing to a depth determined by the project-specific work plan.

Bedrock wells will either be open coreholes in the rock or consist of threaded, flush-joint PVC or stainless steel piping. Construction will vary depending on the project and as such, specific construction of the wells will be detailed in the project-specific work plan. Bedrock wells which do utilized PVC piping for risers and screens will conform to the requirements of ASTM-D 1785 Schedule 40 pipe, and shall bear markings that will identify the material as that which is specified. All materials used to construct the wells will be NSF/ASTM approved.

The well screen slot size will be selected based on the filter pack grain size and the ability to hold back 85 percent or more of the filter pack materials. Screen and riser sections shall be joined by flush-threaded coupling to form watertight unions that retain 100% of the strength of the casing. Solvent PVC glue shall not be used at any time in the construction of the wells. The bottom of the screen shall be sealed with a treated cap or plug. No lead shot or lead wool is to be employed in sealing the bottom of the well or for sealant at any point in the well. All risers and screens shall be set round, plumb, and true to line.

6.1.3 Artificial Sand Pack

When utilized, granular backfill will be chemically and texturally clean, inert, siliceous, and of appropriate grain size for the screen slot size and the host environment The sand pack will be installed using a tremie pipe, when possible (i.e., a tremie pipe may not fit into smaller, 2-in. diameter boreholes). When utilized, the well screen and casing will be installed, and the sand pack placed around the screen and casing to a depth extending 2-ft. or at least 25 percent of the screen length above the top of the screen.

An artificial sand pack will not be utilized in bedrock wells without screens (i.e., open borehole wells).

6.1.4 Bentonite Seal

A minimum 2-ft. thick seal of tamped bentonite pellets will be placed directly on top of the sand pack, and care will be taken to avoid bridging. In the event that Site geology does not allow for a 2-ft. seal (e.g., only 1-ft. of space remains between the top of the sand pack and ground surface), the remaining space in the annulus will be filled with bentonite. The seal will be measured immediately after placement, without allowance for swelling.

6.1.5 Grout Mixture

Upon completion of the bentonite seal, the well may be grouted with a non-shrinking cement grout (e.g., Volclay^{R}) mix to be placed from the top of the bentonite seal to the ground surface. The cement grout shall consist of a mixture of Portland cement (ASTM C 150) and water, in the proportion of not more than 7 gallons of clean water per bag of cement (1 cubic foot or 94 pounds). Additionally, 3% by weight of bentonite powder shall be added, if permitted.

6.1.6 Surface Protection

At all times during the progress of the work, precautions shall be used to prevent tampering with or the entrance of foreign material into the well. Upon completion of the well, a suitable lockable cap shall be installed to prevent material from entering the well. Where permanent wells are to be installed, the well riser shall be protected by a flush mounted road box set into a concrete pad. A concrete pad, sloped away from the well, shall be constructed around the flush mount road box at ground level.

Any well that is to be temporarily removed from service or left incomplete due to delay in construction shall be capped with a watertight cap and equipped with a "vandal-proof" cover, satisfying applicable NYSDEC regulations or recommendations.

6.1.7 Surveying

Coordinates and elevations will be established for each monitoring well and sampling location. Elevations to the closest 0.01 foot shall be used for the survey. These elevations shall be referenced to a regional, local, or project-specific datum. USGS benchmarks will be used whenever available. The location, identification, coordinates, and elevations of the wells will be plotted on maps with a scale large enough to show their location with reference to other structures at each site.

6.1.8 Well Development

After completion of the well, but not sooner than 24 hours after grouting is completed, development will be accomplished using pumping, bailing, or surge blocking. No dispersing agents, acids, disinfectants, or other additives will be used during development or introduced into the well at any other time. During development, water will be removed throughout the entire water column by periodically lowering and raising the pump intake (or bailer stopping point).

Development water will be either properly contained and treated as waste until the results of chemical analysis of samples are obtained or discharged on Site as determined by the Site-specific work plans and/or consultation with the NYSDEC representatives on Site.

The development process will continue until a stabilization of pH, specific conductance, temperature, and turbidity (goal of <50 NTUs) of the discharge is achieved for three consecutive intervals following the removal of a minimum of 110% of the water lost during drilling, or three well volumes; whichever is greater. In the event that limited recharge does not allow for the recovery of all drilling water lost in the well or three (3) well volumes, the well will be allowed to stabilize to conditions deemed representative of groundwater conditions. Stabilization periods will vary by project but will be confirmed with the NYSDEC prior to sampling.

7.0 Geologic Logging and Sampling

At each investigative location, borings will be advanced through overburden using either a drill rig and hollow-stem auger or direct push technology. Soils will be evaluated for visual and olfactory evidence of impairment (i.e., staining, odors, and elevated PID readings) by a geologist, engineer or qualified Environmental Professional. Sampling devices will be decontaminated according to procedures outlined in the Decontamination section of this document. When utilized, split-spoon samplers will be driven into the soil using a minimum 140-pound safety hammer and allowed to free-fall 30-inches, in accordance with ASTM-D 1586-84 specifications. The number of blows required to drive the sampler each 6-inches of penetration will be recorded. When required, samples will be stored in glass jars until they are needed for testing or the project is complete.

If hard boulders or bedrock result in auger refusal, rock coring will be used to advance the hole to design depth. If hydrogeologic conditions are favorable for well installation at a depth less than design, the well may be installed at the boring or coring termination depth. In the event that maximum design depth is reached and hydrogeologic conditions are not suitable for well installation, the maximum drilling depth may be revised. Hydrogeologic suitability for well placement will be determined by the supervising geologist, engineer or qualified Environmental Professional in consultation with NYSDEC, based on thickness and estimated hydraulic conductivity of the saturated zone encountered. If necessary, the borehole will be advanced to water or abandoned.

Boulders and bedrock encountered during well installation may be cored by standard diamond-core drilling methods using an "NX" size core barrel. All rock cores recovered will be logged by a geologist, labeled and stored in wooden core boxes. The cores will be stored by the firm until the project is completed or for at least one year. Drilling logs will be prepared by an experienced geologist or engineer, who will be present during all drilling operations. One copy of each field boring and well construction log and groundwater data, will typically be submitted as part of the investigation summary report (e.g., Phase II ESA Report, Remedial Investigation Report). The RQD value shall be calculated for each 5-foot section. Information provided in the logs shall include, but not be limited to, the following:

- Date, test hole identification, and project identification;
- Name of individual developing the log;
- Name of driller and assistant(s);
- Drill, make and model, auger size;
- Identification of alternative drilling methods used and justification thereof (e.g., rotary drilling with a specific bit type to remove material from within the hollow stem augers);
- Standard penetration test (ASTM D-1586) blow counts;
- Field diagram of each monitoring well installed with the depth to bottom of screen, top of screen, and pack, bentonite seal, etc.;
- Reference elevation for all depth measurements;
- Depth of each change of stratum;
- Thickness of each stratum;
- Identification of the material of which each stratum is composed, according to the USCS system or standard rock nomenclature, as appropriate;
- Depth interval from which each sample was taken;
- Depth at which hole diameters (bit sizes) change;
- Depth at which groundwater is encountered;
- Depth to static water level and changes in static water level with well depth;
- Total depth of completed well;
- Depth or location of any loss of tools or equipment;
- Location of any fractures, joints, faults, cavities, or weathered zones;
- Depth of any grouting or sealing;
- Nominal hole diameters;
- Amount of cement used for grouting or sealing;
- Depth and type of well casing;
- Description of well screen (to include depth, length, location, diameter, slot sizes, material, and manufacturer);
- Any sealing-off of water-bearing strata;

- Static water level upon completion of the well and after development;
- Drilling date or dates;
- Construction details of well; and
- An explanation of any variations from the work plan.

8.0 Groundwater Sampling Procedures

The groundwater in all new monitoring wells will be allowed to stabilize for at least 24-hours following development. Water levels will be measured to within 0.01 feet prior to purging and sampling. Sampling of each well will typically be accomplished by active sampling via peristaltic pump using HDPE tubing or dedicated HDPE or PVC bailers on new cotton or polypropylene line.

Purging will be completed prior to sampling via peristaltic pump. During purging, the following will be recorded in field books or groundwater sampling logs:

- date
- purge start time
- weather conditions
- PID reading immediately after the well cap is removed
- presence of NAPL, if any, and approximate thickness
- pH
- dissolved oxygen
- temperature
- specific conductance
- depth of well
- depth to water
- estimated water volume
- purge end time
- volume of water purged

In general, wells will be purged until the pH, conductivity, temperature, and turbidity of the water being pumped from the well have stabilized with a turbidity goal of 50 NTU. All wells will be purged of at least three well volumes or to dryness.

All groundwater samples and their accompanying QC samples will be run for volatile organic compounds (VOCs) using NYSDEC Analytical Services Protocol (ASP; revised July 2005 and subsequent amendments or revisions).

9.0 PFC Sampling Protocol

PFC sample analysis included in the project work plan requires strict sampling protocol be implemented due to high analytical sensitivities associated with PFCs. Low detection limits are needed for analysis and there are many potential sources of trace levels of PFCs. Specific requirements set forth are to avoid introducing PFC contamination into samples. Use of certain materials or lack thereof and procedures outlined in this section are intended to ensure samples collected are representative of the Site conditions.

PFCs are often found associated with non-stick coatings, water proof or water resistant products, and other everyday items. In order to minimize the possibility of contaminating samples to be collected, the following field personnel will take the following precautions immediately prior to and during the collection and handling of samples to be analyzed for PFCs:

- No use of Teflon®-containing materials. This may include, but is not limited to sample jar lid liners, tubing, Teflon® tape, and plumbing paste.
- Polypropylene or HDPE sample bottles with unlined caps will be used for storing samples. LDPE containers should not be used.
- Tubing for pumps will consist of HDPE or silicon material. HDPE or PVC bailers will be used if necessary with cotton string.
- Clothing treated with stain and/or water resistant coatings (e.g., Gore-Tex®) will not be worn onsite. This includes boots worn onsite.
- Clothes worn onsite will have been laundered multiple times (a minimum of six times from time purchase). Clothes are not to be new and not be washed with fabric softener. Clothes made of synthetic and natural fibers are acceptable, although cotton is preferred.
- Tyvek® Suits will not be worn.
- No use of sunscreen, insect repellants, cosmetics, lotions, and moisturizers will be worn.
- Ballpoint pens will be used for notes and labeling samples.
- Markers (e.g., Sharpies®) will not be used.
- No Post-It® notes or aluminum foil will be brought onsite.
- No packaged food or beverages will be brought onsite. This includes but is not limited to fast food wrappers, microwave popcorn, and disposable cups.
- No chemical (blue) ice packs will be brought on site or used for cooling samples. Regular ice will be used and bagged to prevent cross contamination.

If field personnel come into contact with materials described above, they must wash their hands prior to sampling. Nitrile gloves will be worn for sample collection and sampling handling activities. Only sample containers provided by the lab doing the sample analysis will be used for sample collection. PFC-free deionized water provided by the laboratory will be used for trip, field, and equipment blank samples, as well as for decontamination of equipment coming into contact with soils or water that is to be sampled. If composite soils samples are to be collected a stainless steel bowl with a stainless steel sampling spoon will be used and decontaminated between samples. Wells will be developed with procedures and equipment in this section to ensure that no PFC compounds affect groundwater prior to sampling.

10.0 Management of Investigative-Derived Waste

Purpose:

The purposes of these guidelines are to ensure the proper holding, storage, transportation, and disposal of materials that may contain hazardous wastes. Investigation-derived waste (IDW) included the following:

- Drill cuttings, discarded soil samples, drilling mud solids, and used sample containers;
- Well development and purge waters and discarded groundwater samples;
- Decontamination waters and associated solids;
- Soiled disposable personal protective equipment (PPE);
- Used disposable sampling equipment;
- Used plastic sheeting and aluminum foil;
- Other equipment or materials that either contain or have been in contact with potentially-

impacted environmental media.

- Because these materials may contain regulated chemical constituents, they must be managed as a solid waste. This management may be terminated if characterization analytical results indicate the absence of these constituents.

Procedure:

1. Contain all investigation-derived wastes in Department of Transportation (DOT)-approved 55-gallon drums, roll-off boxes, or other containers suitable for the wastes.
2. Containerize wastes from separate borings or wells in separate containers (i.e. do not combine wastes from several borings/wells in a single container, unless it is a container used specifically for transfer purposes, or unless specific permission to do so has been provided by the LaBella Project Manager. Unused samples from surface sample locations within a given area may be combined.
3. To the extent practicable, separate solids from drilling muds, decontamination waters, and similar liquids. Place solids within separate containers.
4. Transfer all waste containers to a staging area. Access to this area will be controlled. Waste containers must be transferred to the staging area as soon as practicable after the generating activity is complete.
5. Pending transfer, all containers will be covered and secured when not immediately attended,
6. Label all containers with regard to contents, origin, and date of generation. Use indelible ink for all labeling.
7. Collect samples for waste characterization purposes, use boring/well sample analytical data for characterization.
8. For wastes determined to be hazardous in character, be aware on accumulation time limitations. Coordinate the disposal of these wastes with the Owner and NYSDEC.
9. Dispose of investigation-derived wastes as follows;
    - Soil, water, and other environmental media for which analysis does not detect organic constituents, and for which inorganic constituents are at levels consistent with background, may be spread on-site (pending NYSDEC approval) or otherwise treated as a non-waste material.
    - Soils, water, and other environmental media in which organic compounds are detected or metals are present above background will be disposed as industrial waste or hazardous waste, as appropriate. Alternate disposition must be consistent with applicable State and Federal laws.
    - Personal protective equipment, disposable bailers, and similar equipment may be disposed as municipal waste, unless waste characterization results mandate disposal as industrial wastes
10. If waste is determined to be listed hazardous waste, it must be handled as hazardous waste as described above, unless a contained-in determination is accepted by the NYSDEC.

11.0 Decontamination

Sampling methods and equipment have been chosen to minimize decontamination requirements and to prevent the possibility of cross-contamination. Decontamination of equipment will be performed between discrete sampling locations. Equipment used to collect samples between composite sample locations will not require decontamination between collection of samples. All drilling equipment will be decontaminated after the completion of each drilling location. Special attention will be given to the drilling assembly and augers.

Split spoons and other non-disposable equipment will be decontaminated between each sampling event. The sampler will be cleaned prior to each use, by one of the following procedures:

- Initially cleaned of all foreign matter;
- Sanitized with a steam cleaner;

OR

- Initially cleaned of all foreign matter;
- Scrubbed with brushes in alconox solution;
- Triple rinsed; and
- Allowed to air dry.

12.0 Sample Containers

The containers required for sampling activities are pre-washed and ordered directly from a laboratory, which has the containers prepared in accordance with USEPA bottle washing procedures. The following tables detail sample volumes, containers, preservation and holding time for typical analytes.

Table 12-1
Water Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time
VOCs	40-ml glass vial with Teflon-backed septum	Two (2); fill completely, no air space	Cool to 4° C (ice in cooler), Hydrochloric acid to pH <2	14 days
Semivolatile Organic Compounds (SVOCs)	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Pesticides	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Polychlorinated biphenyls (PCBs)	1,000-ml amber glass jar	One (1); fill completely	Cool to 4° C (ice in cooler)	7/40 days
Metals	500-ml polyethylene	One (1); fill completely	Cool to 4° C (Nitric acid to pH <2	180 days (28 for mercury)
Cyanide	1,000-mL HDPE	One (1); fill completely	Cool to 4° C (ice in cooler) Nitric acid to pH <2	14 days

*Holding time is based on verified time of sample collection.

Note: *All sample bottles will be prepared in accordance with USEPA bottle washing procedures.*

TABLE 12-2
Soil Samples

Type of Analysis	Type and Size of Container	Number of Containers and Sample Volume (per sample)	Preservation	Maximum Holding Time
VOCs, SVOCs, PCBs, and Pesticides	8-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14 days
VOCs by USEPA Method 5035 (if specified in work plan) Closed-system Purge and Trap Method	40-ml glass vial with Teflon-backed septum	Three (3), fill with 5 grams of soil using soil syringe	Cool to 4° C (ice in cooler). Two (2) with 10 mL DI water or 5 mL sodium bisulfate, one (1) with 5 mL methanol.	14 days
SVOCs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	7/40 days
PCBs	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	7/40 days
Pesticides	4-oz, glass jar with Teflon-lined cap	One (1), fill as completely as possible	Cool to 4° C (ice in cooler)	14/40 days
RCRA/TAL Metals, and cyanide	8-oz. glass jar with Teflon-lined cap	One (1); fill completely	Cool to 4° C (ice in cooler)	Must be extracted within 10 days; analyzed with 30 days

* Holding time is based on the times from verified time of sample collection.

Note: All sample bottles will be prepared in accordance with USEPA bottle washing procedures.

TABLE 12-3
List of Major Instruments for Sampling and Analysis

- MSA 360 0_2 /Explosimeter
- Hollige Series 963 Nephlometer (turbidity meter)
- EM-31 Geomics Electromagnetic Induction Device
- pH/Temperature/Conductivity Meter - Portable
- Hewlett Packard (HP) 1000 computer with RTE-6 operating system; and HP 9144 computer with RTE-4 operating system equipped with Aquarius software for control and data acquisition from gas chromatograph/mass spectrometer (GC/MS) systems; combined wiley and National Bureau of Standards (NBS) mass spectral library; and data archiving on magnetic tape
- Viriam 6000 and 37000 gas chromatrographs equipped with flame ionization, electron capture, photoionization and wall detectors as appropriate for various analyses,, and interfaced to Variam DS604 or D5634 data systems for processing data.
- Spectra-Physics Model SP 4100 and SP 4270 and Variam 4270 cam puting integrators
- Perkin Eimer (PE) 3000% and 3030% fully Automated Atomic Absorption Spectrophotometers (AAS) with Furnace Atomizer and background correction system
- PE Plasma II Inductively Coupled Argon Plasma (ICAP) Spectre meter with PE7500 laboratory computer
- Dionex 20001 ion chromatograph with conductivity detector for anion analysis, with integrating recorder

13.0 Sample Custody

This section describes standard operating procedures for sample identification and chain-of-custody to be utilized for all field activities. The purpose of these procedures is to ensure that the quality of the samples is maintained during their collection, transportation, and storage through analysis. All chain-of-custody requirements comply with standard operating procedures indicated in USEPA sample handling protocol.

Sample identification documents must be carefully prepared so that sample identification and chain-of-custody can be maintained and sample disposition controlled. Sample identification documents include:

- Field notebooks,
- Sample label,
- Custody seals, and
- Chain-of-custody records.

13.1 Chain-of-Custody

The primary objective of the chain-of-custody procedures is to provide an accurate written or computerized record that can be used to trace the possession and handling of a sample from collection to completion of all required analyses. A sample is in custody if it is:

- In someone's physical possession;
- In someone's view;
- Locked up; or
- Kept in a secured area that is restricted to authorized personnel.

13.2 Field Custody Procedures

- As few persons as possible should handle samples.
- Sample bottles will be obtained pre-cleaned from a source such as I-Chem. Coolers or boxes containing cleaned bottles should be sealed with a custody tape seal during transport to the field or while in storage prior to use.
- The sample collector is personally responsible for the care and custody of samples collected until they are transferred to another person or dispatched properly under chain-of-custody rules.
- The sample collector will record sample data in the notebook.
- The site manager will determine whether proper custody procedures were followed during the fieldwork and decide if additional samples are required.

13.3 Sample Tags

Sample tags attached to or affixed around the sample container must be used to properly identify all samples collected in the field. The sample tags are to be placed on the bottles so as not to obscure any QC lot numbers on the bottles; sample information must be printed in a legible manner using waterproof ink. Field identification must be sufficient to enable cross-reference with the logbook. For chain-of-custody purposes, all QC samples are subject to exactly the same custodial procedures and documentation as "real" samples.

13.4 Transfer of Custody and Shipment

- The coolers in which the samples are packed must be accompanied by a chain-of-custody record. When transferring samples, the individuals relinquishing and receiving them must sign, date, and note the time on the chain-of-custody record. This record documents sample custody transfer
- Shipping containers must be sealed with custody seals for shipment to the laboratory. The method of shipment, name of courier, and other pertinent information are entered in the "Remarks" section of the chain-of-custody record and traffic reports.
- All shipments must be accompanied by the chain-of-custody record identifying their contents. The original record accompanies the shipment. The other copies are distributed appropriately to the site manager.
- If sent by mail, the package is registered with return receipt requested. If sent by common carrier, a bill of lading is used. Freight bills, Postal Service receipts, and bill of lading are retained as part of the permanent documentation.

13.5 Chain-of-Custody Record

The chain-of-custody record must be fully completed in duplicate, using black carbon paper where possible, by the field technician who has been designated by the project manager as responsible for sample shipment to the appropriate laboratory for analysis. In addition, if samples are known to require rapid turnaround in the laboratory because of project time constraints or analytical concerns (e.g., extraction time or sample retention period limitations, etc.), the person completing the chain-of-custody record should note these constraints in the "Remarks" section of the record.

13.6 Laboratory Custody Procedures

A designated sample custodian accepts custody of the shipped samples and verifies that the sample identification number matches that on the chain-of-custody record and traffic reports, if required. Pertinent information as to shipment, pickup, and courier is entered in the "Remarks" section.

13.7 Custody Seals

Custody seals are preprinted adhesive-backed seals with security slots designed to break if the seals are disturbed. Sample shipping containers (coolers, cardboard boxes, etc., as appropriate) are sealed in as many places as necessary to ensure security. Seals must be signed and dated before use. On receipt at the laboratory, the custodian must check (and certify, by completing the package receipt log and LABMIS entries) that seals on boxes and bottles are intact. Strapping tape should be placed over the seals to ensure that seals are not accidentally broken during shipment.

14.0 Laboratory Requirements and Deliverables

This section will describe laboratory requirement and procedures to be followed for laboratory analysis. Samples collected in New York State will be analyzed by a New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory. When required, analyses will be conducted in accordance with the most current NYSDEC Analytical Services Protocol (ASP). For example, ASP Category B reports will be completed by the laboratory for samples representing the final delineation of the Investigation, confirmation samples, samples to determine closure of a system, and correlation samples taken using field testing technologies analyzed by an ELAP-certified laboratory to determine correlation to field results. Data Usability Summary Reports will be completed by a third party for samples requiring ASP Category B format reports. Electronic data deliverables (EDDs) will also be generated by the laboratory in EQUIS format for samples requiring ASP Category B format reports.

15.0 Documentation

15.1 Sample Identification

All containers of samples collected from the project will be identified using the following format on a label or tag fixed to the sample container:

XX-ZZ-O/D

XX:	This set of initials indicates the Site from which the sample was collected.
ZZ:	These initials identify the sample location. Actual sample locations will be recorded in the task log.
O/D:	An "O" designates an original sample; "D" identifies it as a duplicate.

Each sample will be labeled, chemically preserved (if required) and sealed immediately after collection. To minimize handling of sample containers, labels will be filled out prior to sample collection when possible. The sample label will be filled out using waterproof ink and will be firmly affixed to the sample containers. The sample label will give the following information:

- Date and time of collection
- Sample identification
- Analysis required
- Project name/number
- Preservation

15.2 Daily Logs

Daily logs and data forms are necessary to provide sufficient data and observations to enable participants to reconstruct events that occurred during the project and to refresh the memory of the field personnel if called upon to give testimony during legal proceedings.

The site log is the responsibility of the site manager and will include a complete summary of the day's activity at the site.

The **Task Log** will include:

- Name of person making entry (signature).
- Names of team members on-site.
- Levels of personnel protection:
  - Level of protection originally used;
  - Changes in protection, if required; and
  - Reasons for changes.
- Time spent collecting samples.
- Documentation on samples taken, including:
  - Sampling location and depth station numbers;
  - Sampling date and time, sampling personnel;
  - Type of sample (grab, composite, etc.); and
  - Sample matrix.

- On-site measurement data.
- Field observations and remarks.
- Weather conditions, wind direction, etc.
- Unusual circumstances or difficulties.
- Initials of person recording the information.

16.0 Corrections to Documentation

16.1 Notebook

As with any data logbooks, no pages will be removed for any reason. If corrections are necessary, these must be made by drawing a single line through the original entry (so that the original entry can still be read) and writing the corrected entry alongside. The correction must be initialed and dated. Most corrected errors will require a footnote explaining the correction.

16.2 Sampling Forms

As previously stated, all sample identification tags, chain-of-custody records, and other forms must be written in waterproof ink. None of these documents are to be destroyed or thrown away, even if they are illegible or contain inaccuracies that require a replacement document.

If an error is made on a document assigned to one individual, that individual may make corrections simply by crossing a line through the error and entering the corrected information. The incorrect information should not be obliterated. Any subsequent error discovered on a document should be corrected by the person who made the entry. All corrections must be initialed and dated.

16.3 Photographs

Photographs will be taken as directed by the site manager. Documentation of a photograph is crucial to its validity as a representation of an existing situation. The following information will be noted in the task log concerning photographs:

- Date, time, location photograph was taken;
- Photographer
- Description of photograph taken;

17.0 Sample Handling, Packaging, and Shipping

The transportation and handling of samples must be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to the possible hazardous nature of samples. Regulations for packaging, marking, labeling, and shipping hazardous materials are promulgated by the United States DOT in the Code of Federal Regulation, 49 CFR 171 through 177. All samples will be delivered to the laboratory and analyzed within the holding times specified by the analytical method for that particular analyte.

All chain-of-custody requirements must comply with standard operating procedures in the USEPA sample handling protocol.

17.1 Sample Packaging

Samples must be packaged carefully to avoid breakage or contamination and must be shipped to the laboratory at proper temperatures. The following sample packaging requirements will be followed:

- Sample bottle lids must never be mixed. All sample lids must stay with the original containers.
- The sample volume level can be marked by placing the top of the label at the appropriate sample height, or with a grease pencil. This procedure will help the laboratory to determine if any leakage occurred during shipment. The label should not cover any bottle preparation QC lot numbers.
- All sample bottles are placed in a plastic bag to minimize the potential for cross-contamination.
- Shipping coolers must be partially filled with packing materials and ice when required, to prevent the bottles from moving during shipment.
- The sample bottles must be placed in the cooler in such a way as to ensure that they do not touch one another. Ice will be added to the cooler to ensure that the samples reach the laboratory at temperatures no greater than 4°C.
- The environmental samples are to be placed in plastic bags. Ice is not to be used as a substitute for packing materials.
- Any remaining space in the cooler should be filled with inert packing material. Under no circumstances should material such as sawdust, sand, etc., be used.
- A duplicate custody record and traffic reports, if required must be placed in a plastic bag and taped to the bottom of the cooler lid. Custody seals are affixed to the sample cooler.

17.2 Shipping Containers

Shipping containers are to be custody-sealed for shipment as appropriate. The container custody seal will consist of filament tape wrapped around the package and custody seals affixed in such a way that access to the container can be gained only by cutting the filament tape and breaking a seal.

Field personnel will make arrangements for transportation of samples to the lab. The lab must be notified as early in the week as possible regarding samples intended for Saturday delivery.

17.3 Marking and Labeling

- Chain of custody seals shall be placed on the container, signed, and dated prior to taping the container to ensure the chain of custody seals will not be destroyed during shipment.
- If samples are designated as medium or high hazard, they must be sealed in metal paint cans, placed in the cooler with vermiculite and labeled and placarded in accordance with DOT regulations.
- In addition, the coolers must also be labeled and placarded in accordance with DOT regulations if shipping medium and high hazard samples.

18.0 Calibration Procedures and Frequency

All instruments and equipment used during sampling and analysis will be operated, calibrated, and maintained according to the manufacturer's guidelines and recommendations as well as criteria set forth in the applicable analytical methodology references. Operation, calibration, and maintenance will be performed by personnel properly trained in these procedures. Section 11 lists the major instruments to be used for sampling and analysis. In addition, brief descriptions of calibration procedures for major field and laboratory instruments follow.

19.0 Field Instrumentation

19.1 Photovac/MiniRae Photoionization Detector (PID)

Standard operating procedures for the PID require that routine maintenance and calibration be performed every six months. The packages used for calibration are non-toxic analyzed gas mixtures available in pressurized containers.

19.2 Organic Vapor Analyzer

Organic vapor analyzers (OVAs) are calibrated and routine maintenance performed every six months when the units are not in use. Calibration is performed and the major system checks are performed prior to the instrument being released for field use.

Calibration of the OVA 128 GC must be performed by a factory-authorized service representative. The instrument is removed from its protective case and the probe is connected to the base unit. After checking for an airtight seal in the sample line (plugging the sample inlet to stop the pump), the hydrogen supply is turned on and the pressure is set to 10 psi. The electronics are turned on and the instrument is allowed to warm up for at least 5 minutes. After warm up, the instrument is zeroed on the "X10" scale using the adjust knob. The flame is then lit and a gas-tight sample bag is filled with a mixture of 100 ppm methane in air. The sample bag is then attached to the probe inlet and the internal pump is allowed to draw in as much sample as is needed. R32 on the control board is adjusted to read 100 ppm on the "X10" scale and then the hydrogen supply is shut down. The pump can now be turned off and the sample bag removed. Using the adjust knob, the meter is set to read 4 ppm on the "X1" scale. Switching back to the "X10" scale the adjust knob is again used to set the meter to 40 ppm. The scale is then set to "X100" and R33 is adjusted until the meter reads 40 ppm on the "X100" scale.

The OVA has a detection limit of 0.1 ppm in methane equivalents and a working range of 0 to 1,000 ppm. During daily field use, system checks are performed which involve calibration and maintenance of the pump systems, gases, and filters. Care is taken to check for and prevent clogging or leaks. Quad rings and the burner chamber are examined on a weekly basis. Routine biannual maintenance includes a thorough cleaning as well as a re-examination of the pump system for leaks and wear. Parts are replaced as necessary. Instrument operation is verified by calibrating and running the OVA for 4 to 6 hours. An instrument specific logbook is maintained with the OVA to document its use and maintenance.

19.3 Conductance, Temperature, and pH Tester

Temperature and conductance instruments are factory calibrated. Temperature accuracy can be checked against an NBS certified thermometer prior to field use if necessary. Conductance accuracy may be checked with a solution of known conductance and recalibration can be instituted, if necessary.

19.4 Turbidity Meter

LaMotte 2020WE Turbidity Meter is calibrated before each use. The default units are set to NTU and the default calibration curve is formazin. A 0 NTU Standard (Code 1480) is included with the meter. To calibrate, rinse a clean tube three times with the blank. Fill the tube to the fill line with the blank. Insert the tube into the chamber, close the lid, and select "scan blank".

20.0 Internal Quality Control Checks

QC data are necessary to determine precision and accuracy and to demonstrate the absence of interferences and/or contamination of field equipment. Field-based QC will comprise at least 10% of each data set generated and will consist of standards, replicates, spikes, and blanks. Field duplicates and field blanks will be analyzed by the laboratory as samples and will not necessarily be identified to the laboratory as duplicates or blanks. For each matrix, field duplicates will be provided at a rate of one per 10 samples collected or one per shipment, whichever is greater. Field blanks which consist of trip, routine field, and rinsate blanks will be provided at a rate of one per 20 samples collected for each parameter group, or one per shipment, whichever is greater.

Calculations will be performed for recoveries and standard deviations along with review of retention times, response factors, chromatograms, calibration, tuning, and all other QC information generated. All QC data, including split samples, will be documented in the site logbook. QC records will be retained and results reported with sample data.

20.1 Blank Samples

Blank samples are analyzed in order to assess possible contamination from the field and/or laboratory so that corrective measures may be taken, if necessary. Field samples are discussed in the following subsection:

20.2 Field Blanks

Various types of blanks are used to check the cleanliness of field handling methods. The following types of blanks may be used: the trip blank, the routine field blank, and the field equipment blank. They are analyzed in the laboratory as samples, and their purpose is to assess the sampling and transport procedures as possible sources of sample contamination. Field staff may add blanks if field circumstances are such that they consider normal procedures are not sufficient to prevent or control sample contamination, or at the direction of the project manager. Rigorous documentation of all blanks in the site logbooks is mandatory.

- **Routine Field Blanks** or bottle blanks are blank samples prepared in the field to access ambient field conditions. They will be prepared by filling empty sample containers with deionized water and any necessary preservatives. They will be handled like a sample and shipped to the laboratory for analysis.
- **Trip Blanks** are similar to routine field blanks with the exception that they are **not** exposed to field conditions. Their analytical results give the overall level of contamination from everything except ambient field conditions. For the RI/FS, one trip blank will be collected with every batch of water samples for VOC analysis. Each trip blank will be prepared by filling a 40-ml vial with deionized water prior to the sampling trip, transported to the site,

handled like a sample, and returned to the laboratory for analysis without being opened in the field.

- **Field Equipment Blanks** are blank samples (sometimes called transfer blanks or rinsate blanks) designed to demonstrate that sampling equipment has been properly prepared and cleaned before field use, and that cleaning procedures between samples are sufficient to minimize cross contamination. If a sampling team is familiar with a particular site, they may be able to predict which areas or samples are likely to have the highest concentration of contaminants. Unless other constraints apply, these samples should be taken last to avoid excessive contamination of sampling equipment.

20.3 Field Duplicates

Field duplicate samples consist of a set of two samples collected independently at a sampling location during a single sampling event. In some instances the field duplicate can be a blind duplicate, i.e., indistinguishable from other analytical samples so that personnel performing the analyses are not able to determine which samples are field duplicates. Field duplicates are designed to assess the consistency of the overall sampling and analytical system.

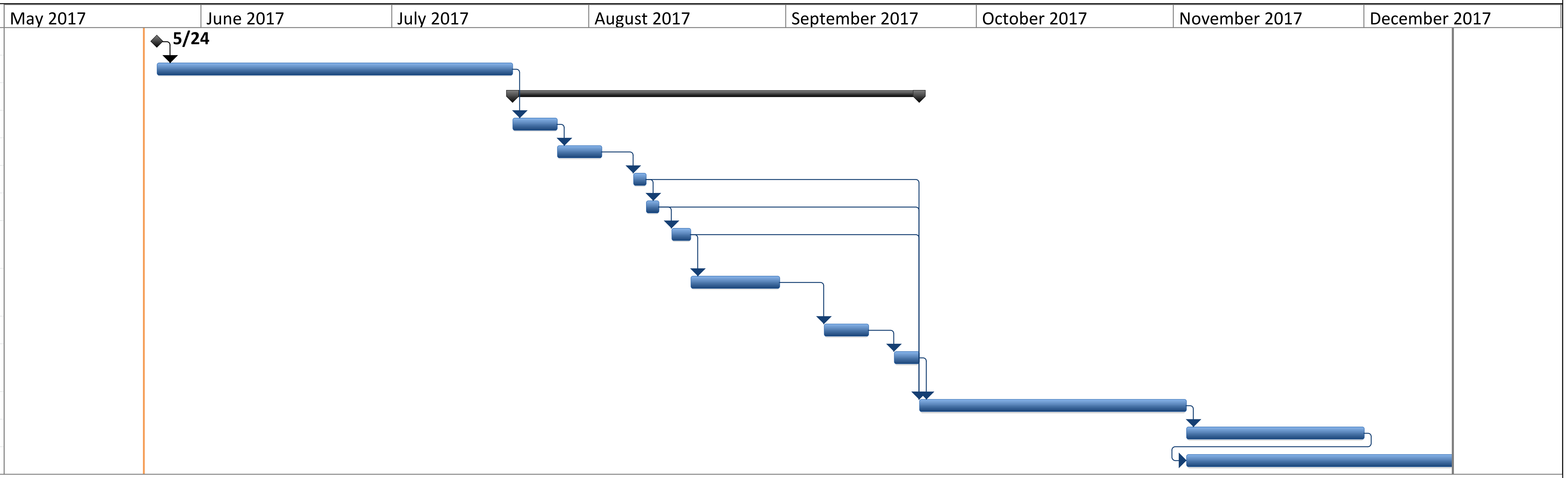
20.4 Quality Control Check Samples

Inorganic and organic control check samples are available from EPA free of charge and are used as a means of evaluating analytical techniques of the analyst. Control check samples are subjected to the entire sample procedure, including extraction, digestion, etc., as appropriate for the analytical method utilized.

Appendix 4: Anticipated Project Schedule

Anticipated Project Schedule - Remedial Investigation

ID	Task Name	Duration	Start	Finish
1	Submit RIWP to NYSDEC	1 day	Wed 5/24/17	Wed 5/24/17
2	NYSDEC RIWP Review	2 mons	Thu 5/25/17	Wed 7/19/17
3	**RI Fieldwork**	**46 days**	**Thu 7/20/17**	**Thu 9/21/17**
4	Contractor Coordination	1 wk	Thu 7/20/17	Wed 7/26/17
5	Site Survey	1 wk	Thu 7/27/17	Wed 8/2/17
6	Soil Gas Survey	2 days	Tue 8/8/17	Wed 8/9/17
7	Overburden Soil Borings	2 days	Thu 8/10/17	Fri 8/11/17
8	Overburden Groundwater Development/Sampling	3 days	Mon 8/14/17	Wed 8/16/17
9	Overburden Sample Analysis (Prelim. Data)	2 wks	Thu 8/17/17	Wed 8/30/17
10	Bedrock Well Installation	5 days	Thu 9/7/17	Wed 9/13/17
11	Bedrock Well Development/Sampling	4 days	Mon 9/18/17	Thu 9/21/17
12	Laboratory Analysis	1.5 mons	Fri 9/22/17	Thu 11/2/17
13	Data Validation	1 mon	Fri 11/3/17	Thu 11/30/17
14	Develop RI Report	1.5 mons	Fri 11/3/17	Thu 12/14/17



Project: Former Starlite Dry Cleaners
NYSDEC #837016
Date: Tue 5/23/17

Task ▬ Milestone ◆ Summary ▬ Progress ▬