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

Remedial Investigation Work Plan

Brownfield Cleanup Program

Location:

Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York

Prepared for:

Highland Grove, LLC
301 Exchange Street
Rochester, New York 14608

LaBella Project No. 2172056
November 2017

CERTIFICATIONS

"I DANIEL P. NOLL certify that I am currently a NYS registered professional engineer and that this Remedial Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10)."

STATE OF NEW YORK
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No. 081996
LICENSED PROFESSIONAL ENGINEER

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NYS Professional Engineer #	Date	Signature

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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 at the Former Sherwood Shoe Company, 625 South Goodman Street, City of Rochester, Monroe County, New York, herein after referred to as the "Site." A Site Location Map is included as Figure 1.

This RIWP is being submitted as part of an application to the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) on behalf of Highland Grove, LLC. The objective of the RI is to define the nature and extent of contamination at the Site.

Information gathered from previous investigations has identified the primary contaminants of concern at the Site to be chlorinated volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and heavy metals. In addition, low-level pesticide impacts have been identified at the Site. Implementation of this RIWP will support existing information and fill in data gaps to identify the extent to which remediation is warranted. The activities in this RIWP will be carried out in accordance with the NYSDEC's Department of Environmental Remedial (DER)-10 (*Technical Guidance for Site Investigation and Remediation)* issued May 3, 2010.

2.0 Site Description and History

2.1 Site Description and Surrounding Properties

The Site is comprised of an approximately 1.798± acre tax parcel (SBL 121-650-0002-039.000/0000 RY). Attached Figure 2 illustrates the location and surrounding area of the Site. The Site is currently undeveloped.

The Site is bounded by Interstate-490 (I-490) to the north, South Goodman Street to the east, Uhlen Place to the southeast, Karges Place to the south and various commercial and residential properties to the south and west.

Highland Grove, LLC plans to redevelop the Site with multi-family housing, which appears to fall under the "Restricted Residential" classification listed in the New York State BCP Development of Soil Cleanup Objectives Technical Support Document dated September 2006.

2.2 Site History

The Site appears to have been generally historically utilized for shoe manufacturing from approximately 1905 to the late 1930's, various industrial and commercial uses from the late 1930s to the late 1960s and appears to have been vacant since the late 1960s. Site buildings appear to have been demolished in the 1970s. Prior to acquisition of the property by Highland Grove, LLC, the Site was most recently owned by the New York State Department of Transportation (NYSDOT) and occasionally utilized for staging and/or storage of vehicles, equipment and materials (e.g., crushed stone).

Below is a comprehensive summary of apparent historical uses of the Site identified through the review of historical documents:

- Undeveloped prior to approximately 1905 and bordered by the Erie Canal to the north.
- The Sherwood Shoe Factory was constructed in approximately 1905. The northern-most portion of the building is depicted as utilized for oil and dye storage on historical mapping (refer to Figure 3). Additional operations appear to have included shoe cutting, fitting, packing and shipping. A boiler room, waste house and coal bin are depicted along the southern edge of the main building, in the central portion of the Site, on historical mapping (refer to Figure 3). A warehouse and automobile parking garage appear to have been located on the southwestern portion of the Site as part of Sherwood Shoe operations. The Erie Canal appears to have bordered the Site to the north as late as 1918 and a subway line and station appear to have bordered the Site to the north as early as 1926.
- Following the late 1930's, the Site appears to have been utilized for various commercial & industrial purposes including but not limited to a laundry, tool/gear manufacturing, machine shops, lamps and lampshade manufacturing, electrical sales, electrical testing of instruments, photography, printing, laboratory supplies, plastic products and paint sales.
- Historical mapping from 1950 depicts a laundry in the basement of the western portion of the former main building, located in the northwestern portion of the Site (refer to Figure 3). It is unclear if dry cleaning operations were completed as part of this business. This mapping also depicts printing operations in the eastern portion of the former main building and woodworking operations in a separate building located on the southern portion of the Site.
- A Phase I Environmental Site Assessment (ESA) completed by Stantec Consulting Services, Inc. (Stantec) identified permit mapping on file with the City of Rochester dated August 11, 1967 and updated September 21, 1967. The permit mapping depicts a 6,000-gallon #2 fuel oil underground storage tank (UST) located to the south of the former main building, adjacent to the former boiler room (refer to Figure 3).
- I-490 appears to have been constructed adjacent to the north of the Site in the early 1960s.
- Historical aerial photographs indicate that Site buildings were demolished in the 1970s. The Site appears to have been undeveloped since that time.

As noted above, the property adjacent to the north of the Site appears to have been occupied by the Erie Canal, subway or I-490 since the late 1800s. Properties adjacent to the south and east of the Site appear to have been utilized for residential and/or commercial purposes since the late 1800s. Properties adjacent to the west of the Site appear to have been utilized for residential and commercial purposes (including as a lumberyard and heating and cooling company) from the late 1800s.

A gasoline filling station appears to have been located approximately 100-ft to the southwest of the Site from at least the 1930s to the 1950s (refer to Figure 3). This filling station was historically addressed as 845-852 South Clinton Avenue.

3.0 Previous Investigations

The following environmental reports exist for the Site and were used in developing this RI Work Plan:

- *Phase I Environmental Site Assessment (ESA)*, completed by Stantec, December 2012;
- *Phase II ESA*, completed by Stantec, October 2016

Key findings of the abovementioned reports are summarized as follows. These reports are available upon request and have been included as exhibits in the BCP Application.

3.1 Phase I ESA report completed by Stantec dated December 2012

This Phase I ESA identified several Recognized Environmental Conditions (RECs), as summarized below:

- Potential for historical uses of the Site to have resulted in releases to the soil or groundwater. Historical uses of the Site are summarized in Section 2.2.
- Former presence of the 6,000-gallon #2 fuel oil UST documented in City of Rochester permit mapping dated 1967, as summarized in Section 2.2.
- Use of the Site by the NYSDOT for staging and storage during highway construction projects may have resulted in releases to the Site.
- A geophysical survey of the Site was reportedly performed in November 2012. The survey reportedly identified several magnetic anomalies which indicated the probability of buried metallic objects. The anomalies reportedly did not appear to be related to buried USTs but Stantec indicated they may have been related to features of environmental significance.

3.2 Phase II ESA report completed by Stantec dated October 2016

This Phase II ESA was conducted to evaluate the RECs identified by Stantec's 2012 Phase I ESA (refer to Section 3.1). Investigation locations are depicted on Figure 4.

Stantec's Phase II ESA generally consisted of the following:

- Fifteen (15) test pits were excavated to terminal depths between 8-feet (ft) and 10.5-ft below ground surface (bgs). Many of the test pits were advanced in locations to evaluate magnetic anomalies identified by the geophysical survey. The test pits encountered a fill layer generally 5-ft to 8-ft in thickness through much of the Site. The fill layer reportedly consisted of silty sand and gravel with variable urban fill comprised of ash, cinders, asphalt, brick and construction and demolition debris. Soils were screened with a photoionization detection meter (PID); elevated PID readings were not identified in test pits with the exception of TP-G, in which a maximum reading of 14.5 parts per million (ppm) was measured at a depth of 3.5-ft bgs.
- Four (4) soil borings were advanced to terminal depths between 16-ft and 20.5-ft bgs. Soils borings were designated KU-B-4, KU-B-7, KU-B-8 and KU-B-9. Bedrock appeared to have been encountered between 16-ft and 17-ft along the northern border of the Site and at approximately 20.5-ft bgs on the central portion of the Site.
- Overburden groundwater monitoring wells were reportedly installed in two (2) locations along the northern border of the Site and one (1) location in the central portion of the Site. The wells on

the northern portion of the Site (KU-MW-7 and KU-MW-8) have reportedly been dry during sampling attempts in October 2016 and January 2017. However, groundwater samples have been collected from well KU-MW-9, located in the vicinity of the former 6,000-gallon #2 fuel oil UST and TP-G (where elevated PID readings were encountered).

- Three (3) shallow soil samples were collected from approximately 2-inches (in) bgs. Two (2) of these samples were collected from a soil pile and berm, respectively.

As depicted on attached Figure 4 and Tables 1A-1E, Stantec's Phase II ESA identified elevated concentrations of semi-volatile organic compounds, PCBs, cyanide, heavy metals and pesticides in soils at the Site, particularly in shallow soils. Several compounds were detected at levels above New York Codes, Rules and Regulations (NYCRR) Part 375 Unrestricted Use and/or Restricted Residential Use Soil Cleanup Objective (SCOs).

In addition to these impacts, chlorinated volatile organic compounds (CVOCs) were identified in soil and groundwater in the central portion of the Site (refer to Figure 4 and Table 2). Specifically, trichloroethylene (TCE) was detected at 13,000 ug/kg in the soil sample collected from KU-TP-G (in which elevated PID readings were measured). This concentration is above the Unrestricted Use and Protection of Groundwater SCO of 470 ug/kg for TCE. CVOCs were also identified above laboratory method detection limits (MDLs) but below Unrestricted Use SCOs in soil samples collected from boring KU-B-4, KU-B-9 and KU-TP-C.

In addition, TCE and cis-1,2-dichloroethene (cis-1,2-DCE) were detected above NYSDEC Part 703 Groundwater Quality Standards in samples from well KU-MW-9 (located approximately 20-ft north of TP-G). TCE and cis-1,2-DCE were detected at 85 ug/L and 7.1 ug/L, respectively, in September 2016 and 32 ug/L and 1.5 ug/L in January 2017 in KU-MW-9 (refer to Table 2). The Groundwater Quality Standard for both of these compounds is 5 ug/L. The source of the CVOC impacts is unknown; however, historical Site operations including machining and manufacturing may have utilized chlorinated solvents.

The nature and extent of the impacts to soil and groundwater identified at the Site have not been identified.

Note that a groundwater flow study was not completed as part of the 2016 Phase II ESA. However, based on the presence of I-490 located adjacent to the north of the Site and at an elevation substantially lower than the Site's surface (i.e., at least 20-ft), the presence of the expressway and any associated dewatering infrastructure may be pulling groundwater at the Site to the north. A groundwater flow study is planned to be completed as part of the RI (refer to Section 6.1.5).

Finally, it should be noted that acetone was identified at elevated concentrations in a soil sample collected from KU-TP-N. However, based on the lack of elevated concentrations of this compound detected in other samples from the Site and the common use of acetone in laboratory operations, the presence of acetone in this soil sample may be a laboratory artifact and not representative of Site conditions.

4.0 Standards, Criteria and Guidelines

This section identifies the Standards, Criteria and Guidelines (SCGs) for the Site. The SCGs identified are used in order to quantify the extent of contamination at the Site that require remedial work based on the cleanup goal. The SCGs to be utilized as part of the implementation of this RI Work Plan are identified below:

Soil SCGs: The following SCGs for soil were used in developing this RI Work Plan:

- NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (RPSCOs) for the Protection of Groundwater;
- NYCRR Subpart 375-6 Remedial Program Soil Cleanup Objectives (RPSCOs) for Unrestricted Use;
- NYCRR Subpart 375-6 RPSCOs for the Protection of Public Health/Restricted Residential Use; and,

Groundwater SCGs: The following SCGs for groundwater were used in developing this RI Work Plan:

- NYSDEC Part 703 Groundwater Standards; and,
- Technical and Operational Guidance Series (TOGS) 1.1.1 Water Quality Standards and Guidance Values.

Soil Gas:

Note that as of the date of this RIWP there are no regulatory (NYSDEC or NYSDOH) guidance values for soil gas.

5.0 Objectives and Rationale

The objective of this RI is to determine the nature and extent of contamination at the Site and provide a qualitative risk assessment for any contaminants migrating off-site. In addition, the BCP general requirements (e.g., "full suite" testing, quality assurance/quality control (QA/QC), etc.) will also be fulfilled.

Areas of Concern

Based on the completion of investigation activities in 2016, there appear to be two (2) categories of contamination at the Site. Specifically, soil impacts from fill material throughout the Site (AOC #1) as well as CVOC impacts to soil and groundwater in the central portion of the Site (AOC #2). The AOCs are described further below and depicted on Figure 5.

Fill Material: Fill material reportedly consisting of silty sand and gravel with variable volumes of urban fill including ash, cinders, asphalt, bricks and construction and demolition debris have been encountered in several locations throughout the Site. Layers of fill material at the Site were reportedly between 5-ft and 8-ft in thickness, varying by location.

The presence of the fill material may be due to the historical use of the Site for industrial purposes combined with the historically common practice of disposing of urban fill on private property. Another potential source of the fill material may be the use of the Site by the NYSDOT for staging and storage during highway construction projects. The presence of a soil pile and berm located on the Site may also be attributed to NYSDOT and NYSDOT-related operations.

SVOCs have been identified in six (6) of the soil samples collected in 2016 at concentrations above Restricted Residential SCOs. The samples were collected throughout the Site (refer to Figure 4) and based on field logs, appear to have all been collected from areas of fill.

In addition, SVOCs, heavy metals, PCBs and pesticides have been identified at concentrations above Unrestricted Use SCOs in fill material throughout the Site (refer to Figure 4).

Chlorinated Volatile Organic Compounds: The 2016 Phase II ESA identified the highest levels of CVOC impacts to soil and groundwater in the central portion of the Site, in boring/monitoring well KU-B/MW-9 and test pit KU-TP-G. This area is located immediately to the south of the former footprint of the main building (refer to Figure 3), in the vicinity of the former 6,000-gallon fuel oil UST. Note that groundwater samples could only be collected from well KU-MW-9 based on the low water table at the Site and as such, this is the only area of the Site in which groundwater conditions have been evaluated.

As noted in Section 3.2, TCE was detected at 13,000 ug/kg in the soil sample collected from test pit KU-TP-G (in which elevated PID readings were measured). In addition, TCE and cis-1,2-DCE were detected above NYSDEC Part 703 Groundwater Quality Standards in samples from well KU-MW-9. Specifically, TCE and cis-1,2-DCE were detected at 85 ug/L and 7.1 ug/L, respectively, in September 2016 and 32 ug/L and 1.5 ug/L in January 2017 in this well (refer to Table 2).

In addition to the impacts identified in KU-B/MW-9 and KU-TP-G, low level CVOCs were detected slightly above laboratory MDLs in other areas of the Site. TCE and TCE breakdown products were identified in a soil sample collected from KU-B-4 (located approximately 80-ft to the west of KU-B/MW-9 and KU-TP-G) and tetrachloroethylene (PCE) was detected in a soil sample collected from KU-TP-C. PCE is a common compound utilized in dry cleaning operations and KU-TP-C was completed in the vicinity of the historical “laundry”.

The source of these impacts is unknown; however, prior uses of the Site included machining, manufacturing and laundering. These operations are known to have commonly historically utilized CVOCs.

6.0 Remedial Investigation Scope

The proposed remedial investigation field activities to be completed as part of the work plan have been separated into tasks and are presented in this section. A list with contact information for the anticipated personnel involved with the project is included in Appendix 2. Qualifications for the personnel are also included.

During all ground intrusive work conducted at the Site, air monitoring will be conducted in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP). A copy of this plan is included as Appendix 1.

6.1 Remedial Investigation Tasks

The RI Field Plan is detailed below:

Task 1: Surface Soil Sampling- Task 1 will be completed to delineate known shallow soil impacts and evaluate the potential for human exposure as well as the suitability of the soil cover for compliance with the Soil Cleanup Objectives.

Task 2: Overburden Soil and Groundwater Evaluation: This task will consist of the resampling of existing overburden groundwater monitoring wells, 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. Note that based on the prior investigation, groundwater present in the overburden may be limited.

Task 3: Soil Gas Sampling: This task will consist of the collection of soil gas samples near Site boundaries which border commercial and/or residential properties. 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 4: Shallow Bedrock Groundwater Evaluation: This task is designed to consist of the installation of up to two (2) 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 5: Groundwater Flow Study: This task is designed to consist of the collection of seasonally high and low static water level measurements from monitoring wells at the Site and the use of that data to determine approximate groundwater flow direction.

Task 6: Fish and Wildlife Resources Impact Analysis (FWRIA) Part 1: Resource Characterization- A Site characterization will be conducted to identify all fish and wildlife resources in accordance with DER-10 Section 3.10.1. If the results of the characterization indicate the need for further assessment, a FWRIA Part 2: Ecological Impact Assessment will be conducted in accordance with DER-10 Section 3.10.2.

Sampling procedures that require full suite parameters will include the following analyses:

- USEPA Target Compound List (TCL) VOCs including tentatively identified compounds (TICs) using United States Environmental Protection Agency (USEPA) Method 8260;
- USEPA TCL SVOCs including TICs using USEPA Method 8270;
- Target Analyte List (TAL) metals using USEPA Methods 6010/7470/7471;
- Cyanide using USEPA Method 9012;
- PCBs using USEPA Method 8082; and,
- Pesticides using USEPA Method 8081.

QA/QC samples will also be collected and analyzed (e.g., trip blank, duplicate sample, matrix spike/ matrix spike duplicate (MS/MSD)). The specific QA/QC program is detailed in Section 6.4. The soil samples will be delivered under chain of custody procedures to an ELAP-certified laboratory. The laboratory will provide a NYSDEC Analytical Services Protocol (ASP) Category B Deliverables data package and a Data Usability Summary Report (DUSR) will be completed.

Tasks will be conducted in accordance with the QCP (refer to Section 6.4 and Appendix 4).

6.1.1 Task 1: Surface Soil Sampling

Surface Soil

Surface soil samples will be collected to evaluate the potential for human exposure as well as the suitability of the soil cover for compliance with the Soil Cleanup Objectives. Based on the current and anticipated future use of the Site for “Restricted Residential” purposes, the top 2-ft of Site soils will be assessed as part of Task 1.

The scope of Task 1 is based on Draft guidance obtained from the NYSDEC in October 2017. As depicted on attached Figure 6B, surface soil samples will be collected from vegetated areas throughout the Site. The Site comprises an area of approximately 1.798± acres. Based on this area and Draft NYSDEC guidance, a total of approximately 8 discrete and 4 composite sample *locations* have been identified. Discrete samples will be collected from two (2) depth intervals in each location, for a total of 16 discrete samples. The targeted depth intervals are 2-in to 6-in bgs and from 12-in to 24-in bgs. The 16 discrete samples (not including QA/QC samples; refer to Section 6.4) will be analyzed for USEPA TCL VOCs and up to 20 tentatively identified compounds (TICs) using USEPA Method 8260.

A total of 12 composite samples (not including QA/QC samples; refer to Section 6.4) will be collected from the approximate areas of the 4 locations depicted on Figure 6B. These samples will be collected from depths of 0 to 2-in bgs, 2-in to 12-in bgs and 12-in to 24-in bgs. The composite samples will be analyzed for the following parameters:

- USEPA TCL SVOCs and up to 20 TICs;
- USEPA TAL Metals;
- PCBs using USEPA Method 8082;
- Pesticides using USEPA Method 8081; and,
- Cyanide using USEPA Method 9012.

Each composite sample will be comprised of 3-5 discrete samples collected from the selected grid spaces identified on Figure 6B.

In addition to those discussed above, the following methods will be used to collect surface soil samples:

- The samples will be collected using new sterile sampling spoons or a clean shovel/trowel to prevent cross-contamination. The soil will then be screened using a PID and the readings will be recorded. Additionally, olfactory indications of impairment will be observed during surface soil sampling.
- The VOC samples will be collected utilizing USEPA Method 5035 (i.e., closed-system purge-and-trap).
- If additional sampling is required for delineation purposes pending the findings of the initial sample data, additional sample parameters may be limited to any contaminants of concern identified in the initial surface soil samples, pending approval from the NYSDEC and NYSDOH.

6.1.2 Task 2: Overburden Soil and Groundwater Evaluation

This task will evaluate subsurface soil and groundwater conditions across the Site. Prior to beginning the soil boring program, the three (3) existing wells installed by Stantec in 2016 will be located and resampled (if deemed viable) for TCL and CP-51 list VOCs including TICs via USEPA Method 8260. The objective of sampling these wells (if possible) initially is to help target RI locations. Groundwater sampling will be completed in accordance with the groundwater sampling procedures described later in this section.

Soil Boring Program:

Following sampling of the three (3) existing wells (if possible), approximately sixteen (16) overburden soil borings are anticipated to be advanced using a direct-push Geoprobe® sampling system. Note that final boring numbers may vary based on field conditions.

Proposed soil boring locations are depicted on Figure 6A; however, locations may vary based on field observations. Bedrock is anticipated to be encountered between approximately 16-ft and 21-ft bgs. 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. Borings will be advanced to equipment refusal, into an apparent confining layer or at the discretion of the field geologist or engineer.
- 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 6.3).
- The following soil samples are currently anticipated to be collected and analyzed for the following parameters based on evidence of impairment:
    - Six (6) soil samples for the list of "full suite" parameters defined in Section 6.1.
    - Three (3) soil samples for USEPA TCL and NYSDEC CP-51 VOCs including TICS using USEPA Method 8260;
    - Three (3) soil samples for USEPA TCL and NYSDEC CP-51 SVOCs including TICs using USEPA Method 8270; and,
    - Three (3) soil samples for TAL metals using USEPA Method 6010 and 7470.

- Soil samples collected for VOC analysis will be collected via USEPA Method 5035.
- In addition to the soil samples outlined above and pending subsurface conditions, up to two (2) soil samples are anticipated to be collected and analyzed for the following remedial design parameters associated with CVOC impacts. Note that the sample frequency may change pending initial field screening results during the soil boring program.
    - Permanganate Natural Oxidant Demand (PNOD) via ASTM Method D7262-10, Test Method A.
    - Soil Oxidant Demand with activated sodium persulfate via laboratory bench test.

Overburden Groundwater Monitoring Wells:

During the soil boring program, up to six (6) overburden groundwater monitoring wells are planned to be installed. 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.

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.

Groundwater samples from up to six (6) of the newly installed overburden wells will be collected and analyzed for the list of “full suite” parameters defined in Section 6.1. In the event that low recharge rates do not provide enough volume to collect all full suite parameters, samples will be collected in the order in which the parameters are listed in Section 6.1.

In addition to full suite analysis and pending available sample volume, approximately two (2) overburden groundwater samples are anticipated to be analyzed for the following remedial design parameters:

- Manganese and total iron via USEPA Method 6010;
- Sulfate, sulfide, nitrate and nitrite via USEPA Method 300.1; and,
- Total organic carbon (TOC) via Lloyd Kahn method.

Overburden Groundwater Sampling Procedures:

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 1 week 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 sample 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.

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

6.1.3 Task 3: Soil Gas Sampling

A total of four (4) soil gas sampling points will be installed on southern, eastern and western Site boundaries for collection of soil gas samples. Proposed sample locations are depicted on Figure 6A. 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 6.4 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 1$\mu g/m^3$ and 0.25 $\mu g/m^3$ for TCE and vinyl chloride, respectively.
- Soil gas sampling point locations, including elevations, will be surveyed by GPS.

6.1.4 Task 4: 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 two (2) 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 figures. Following the receipt of overburden data, LaBella will discuss proposed bedrock well locations with the NYSDEC before implementing Task 4.

Bedrock well installation procedures are as follows:

- The borehole will be advanced through overburden soils using 4 ¼" diameter hollow-stem augers. 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 and 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. At least three (3) well volumes will be developed from the well. In addition, 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 three (3) well volumes prior to sampling.

Following development, wells will be allowed to recharge for a minimum of 1 week prior to sampling. 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 of TCL VOCs including TICs via USEPA Method 6260. One (1) MS/MSD, one (1) field duplicate, and one (1) trip blank will be collected in addition to the above analysis.

6.1.5 Task 5: Groundwater Flow Study

Following installation of overburden and bedrock monitoring wells, well casing elevations will be measured via survey or GPS. Static water levels will be collected during approximate seasonally high and low water table levels. This data will be utilized to develop groundwater flow modeling using Golden Software Surfer 14.

6.1.6 Task 6: Fish and Wildlife Resources Impact Analysis (FWRIA) Part 1: Resource Characterization

Site characterization will be conducted to identify all fish and wildlife resources within 0.25 miles of the Site in accordance with DER-10 Section 3.10.1. If there are no resources identified, no further assessment will be conducted in regards to the FWRIA. If resources are identified, they will be depicted on a map to be included in the Remedial Investigation Report. In addition, contaminant migration pathways and contaminants of ecological concern will be identified, and conclusions will be made as to the potential adverse effects to fish and wildlife.

If the results of the characterization indicate the need for further assessment, a FWRIA Part 2: Ecological Impact Assessment will be conducted in accordance with DER-10 Section 3.10.2.

6.2 Health and Safety and Community Air Monitoring

LaBella's Health and Safety Plan (HASP) for this project is included in Appendix 3. The NYSDOH Generic Community Air Monitoring Plan (CAMP) and Fugitive Dust and Particulate Monitoring will be utilized for this RI and is included in Appendix 1.

6.3 Housekeeping and Investigation Derived Waste

Good housekeeping practices will be followed to prevent leaving contaminated material on the ground or floor surface (e.g., precautions will be taken to prevent impacts to the ground surface due to material spilled during soil sampling, etc.). Any material that does spill on to the ground/floor surface will be promptly picked up and placed in an appropriate location and the ground/floor surface will be cleaned.

Waste materials anticipated to be generated during the implementation of this RI Work Plan include soil generated from soil borings and groundwater generated from development and sampling of the wells. These waste materials will be containerized in 55-gallon drums and stored at the Site for characterization and future disposal.

Additional information regarding Investigation Derived Waste is included in Section 9 of the QCP, included in Appendix 4.

6.4 Quality Assurance/Quality Control Plan

Activities completed at the Site will be managed under LaBella's Quality Control Program, which is included in Appendix 4. Laboratory QA/QC sampling will include analysis of one (1) trip blank and one (1) duplicate sample for each matrix type (i.e., soil, air/vapor and groundwater) at a rate of one per 20 samples collected for each parameter group, or one per shipment, whichever is greater. Additionally, one (1) Matrix Spike/Matrix Spike Duplicate (MS/MSD) will be collected and analyzed for each twenty samples collected for each parameter group, or one per shipment, whichever is greater. The MS/MSD will be analyzed for the same parameters as that of the field samples. 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 TO-15 samples (indoor air, outdoor air, sub-slab soil vapor). For the TO-15 samples, the laboratory will provide a data package using the ASP Category B format. A data usability summary report (DUSR) will be completed for all ASP-B and ASP-B format laboratory data packages per DER-10. 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.

7.0 RI Schedule and Reporting – Deliverables

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

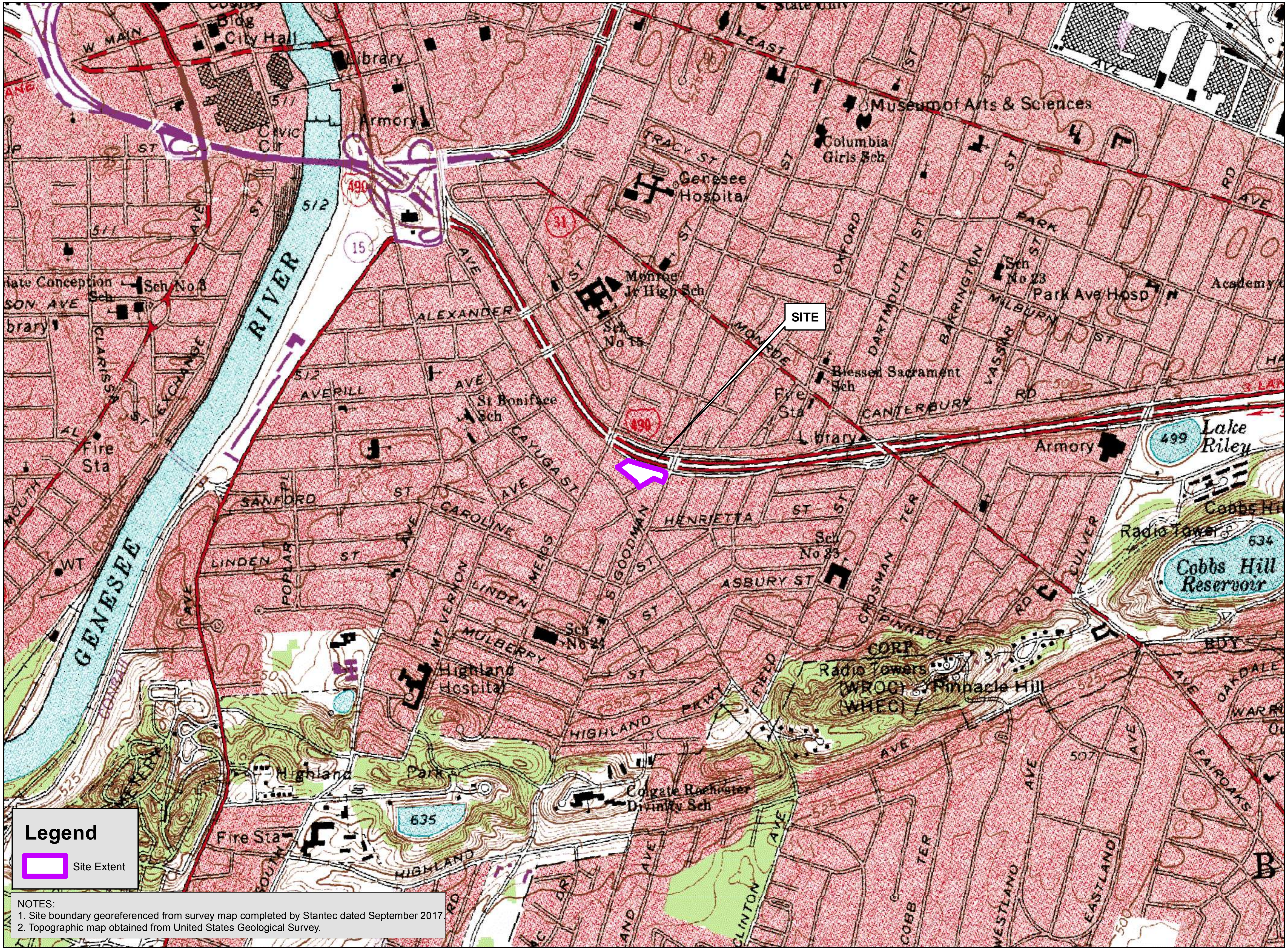
Implementation of the RI Work Plan is anticipated to begin within 60 days after NYSDEC approval of this work plan and the standard three-day Dig Safely New York waiting period. The field work is anticipated to require approximately 45 days to complete subsequent to implementation of the RIWP *(Note: this timeframe does not include laboratory analysis or data validation).* The RI Report will be submitted within two (2) months of receipt of DUSRs. It should be noted that, based on timing, the RI Report may not include all static water level data and groundwater flow modeling; this data will be submitted in a separate letter once completed.

The above schedule 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 as the need is identified and it will include a revised schedule.

All data will also be submitted in the NYSDEC-approved EDD format. The data will be submitted on a continuous basis immediately after data validation occurs.

I:\HIGHLAND GROVE LLC\2172056 - KARGES & UHLEN PLACE BCP APP\REPORTS\RIWP\RIWP 10.2017.SHERWOOD.DOCX

FIGURES



Legend

Site Extent

NOTES:
1. Site boundary georeferenced from survey map completed by Stantec dated September 2017.
2. Topographic map obtained from United States Geological Survey.

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Drawings\RIWP\FIGURE 1 Topo.mxd

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N / E / S / W

0 500 1,000 Feet
1 inch = 1,000 feet

INTENDED TO PRINT AS: 11" X 17"

PROJECT:

Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York

DRAWING NAME:

Topographic Map

PROJECT/DRAWING NUMBER:

2172056

FIGURE 1

NOTES:
1. Site boundary georeferenced from survey map completed by Stantec dated September 2017.
2. April 2015 aerial photograph obtained from Pictometry International.

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PROJECT:

Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York

DRAWING NAME:

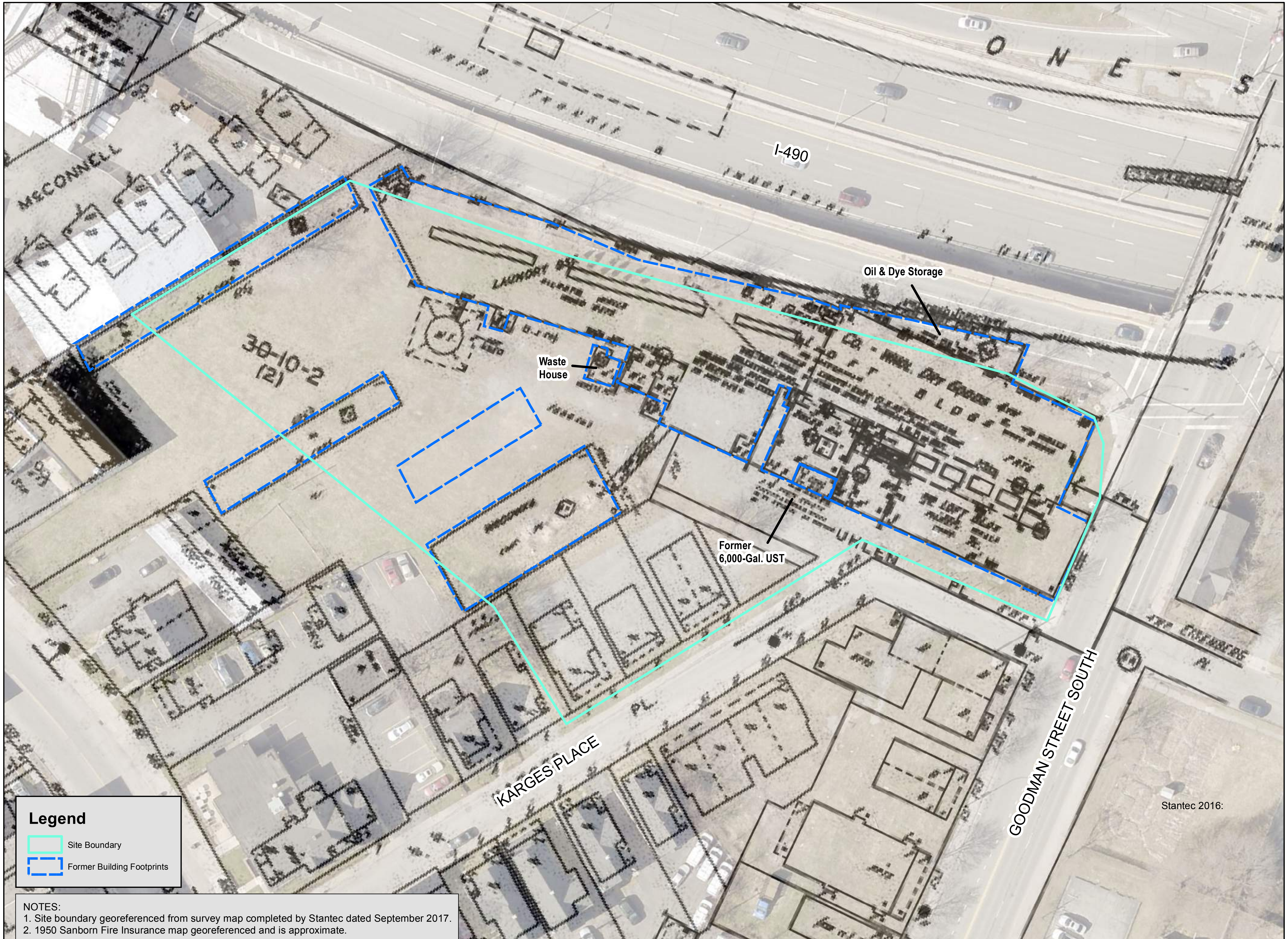
Site Location Map

PROJECT/DRAWING NUMBER:

2172056

FIGURE 2

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Drawings\RIWP\FIGURE 2 Site Location Map.mxd



Legend
- Site Boundary
- Former Building Footprints

NOTES:
1. Site boundary georeferenced from survey map completed by Stantec dated September 2017.
2. 1950 Sanborn Fire Insurance map georeferenced and is approximate.

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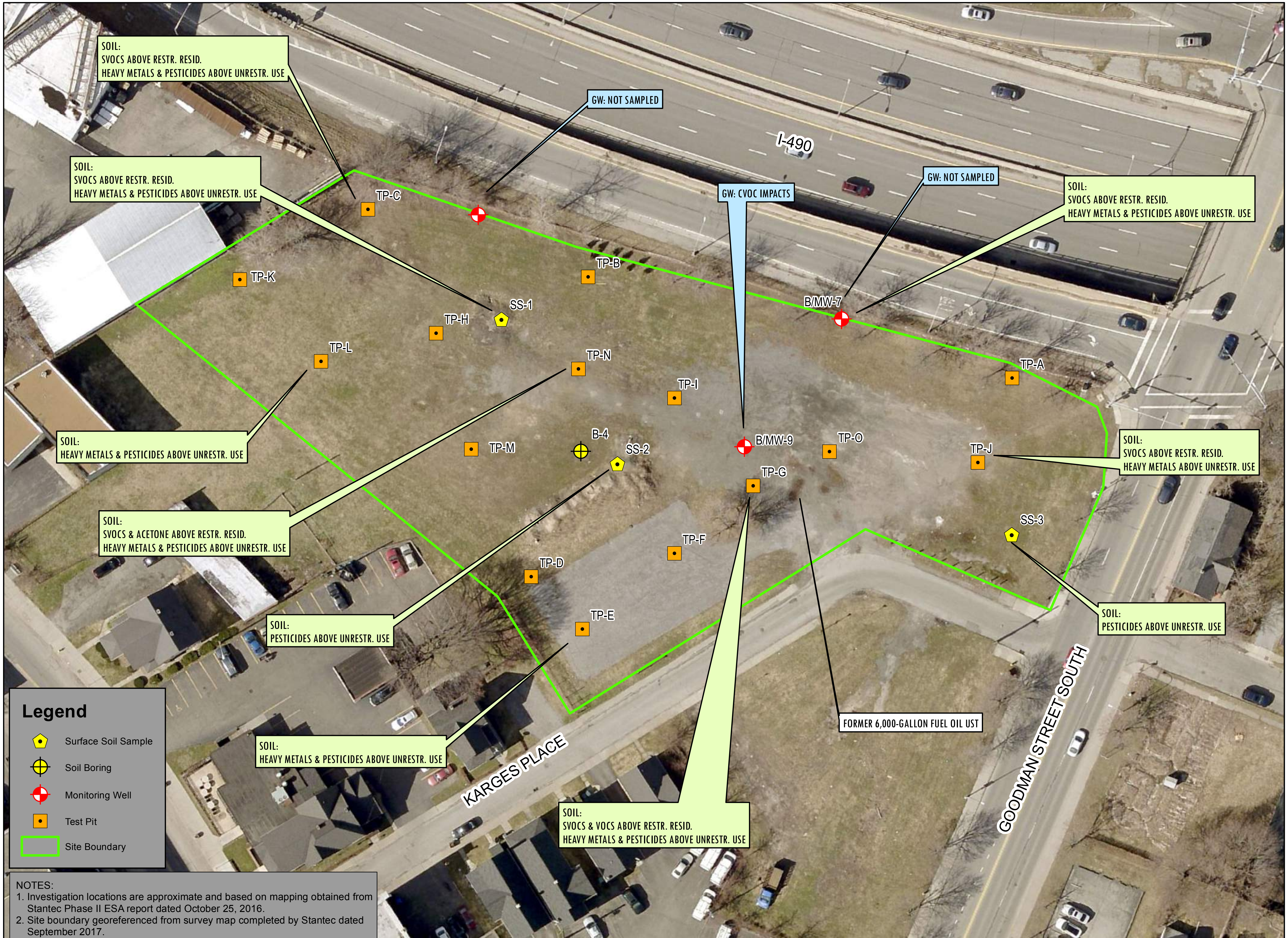
PROJECT:
Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York

Remedial Investigation Work Plan

DRAWING NAME:
Relevant Historical Features

PROJECT/DRAWING NUMBER:
2172056

FIGURE 3



Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Drawings\RIWP\FIGURE 4 2016 Investigation.mxd

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1 inch = 50 feet

INTENDED TO PRINT AS: 11" X 17"

PROJECT:
Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York

DRAWING NAME:
2016 Phase II Environmental Site Assessment

PROJECT/DRAWING NUMBER:
2172056

FIGURE 4

NOTES:
1. Site boundary georeferenced from survey map completed by Stantec dated September 2017.
2. Investigation locations are approximate and based on mapping obtained from Stantec Phase II ESA report dated October 25, 2016.
3. Soil and groundwater impacts are based on data obtained from Stantec's Phase II ESA and have not been delineated.
4. April 2015 aerial photograph obtained from Pictometry International.
5. Areas of Concern submit to change pending results of Remedial Investigation.

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PROJECT:

Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York

DRAWING NAME:

Areas of Concern

PROJECT/DRAWING NUMBER:

2172056

FIGURE 5

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Drawings\RIWP\FIGURE 5 AOCs.mxd

NOTES:
1. Site boundary georeferenced from survey map completed by Stantec dated September 2017.
2. Proposed investigation locations are subject to change pending Site conditions, field screening and analytical data.
3. Proposed bedrock well locations are not depicted as they will be heavily dependent on the results of overburden data.
4. Proposed shallow soil samples are shown on Figure 6B.
5. Stantec 2016 investigation locations were georeferenced and are considered approximate.

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0 25 50 100 Feet
1 inch = 60 feet

INTENDED TO PRINT AS: 11" X 17"

PROJECT:

Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York

Remedial Investigation Work Plan

DRAWING NAME:

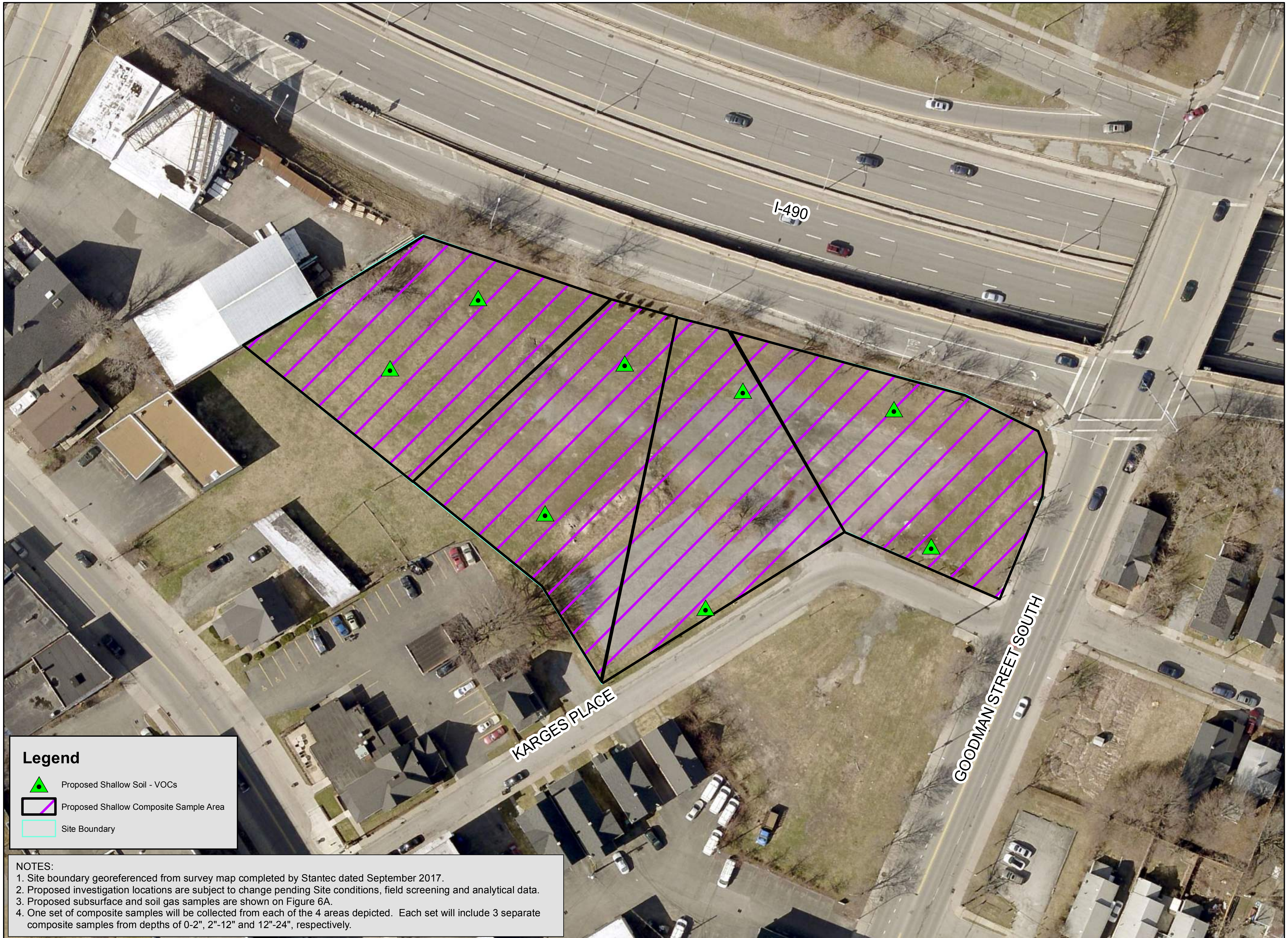
Proposed Investigation Locations: Subsurface

PROJECT/DRAWING NUMBER:

2172056

FIGURE 6A

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Drawings\RIWP\FIGURE 6A Proposed RI.mxd



Legend

- Proposed Shallow Soil - VOCs
- Proposed Shallow Composite Sample Area
- Site Boundary

NOTES:
1. Site boundary georeferenced from survey map completed by Stantec dated September 2017.
2. Proposed investigation locations are subject to change pending Site conditions, field screening and analytical data.
3. Proposed subsurface and soil gas samples are shown on Figure 6A.
4. One set of composite samples will be collected from each of the 4 areas depicted. Each set will include 3 separate composite samples from depths of 0-2", 2"-12" and 12"-24", respectively.

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INTENDED TO PRINT AS: 11" X 17"

PROJECT:

Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York

Remedial Investigation
Work Plan

DRAWING NAME:

Proposed Investigation
Locations: Shallow Soil

PROJECT/DRAWING NUMBER:

2172056

FIGURE 6B

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Drawings\RIWP\FIGURE 6B Proposed RI Shallow.mxd

TABLES

Table 1A

Remedial Investigation Work Plan: Former Sherwood Shoe Factory, 625 South Goodman Street, Rochester, NY

Summary of Detected Volatile Organic Compounds in Soil

LaBella Project No. 2172056

Sample ID	NYCRR Part 375-6 Unrestricted Use (ppb)	NYCRR Part 375-6 Restricted Residential Use (ppb)	KU-B-4-S1	KU-B-4-S2	KU-B-7-S1	KU-B-7-S2	KU-B-8-S1	KU-B-8-S2	KU-B-9-S1	KU-B-9-S2	KU-TP-C-S	KU-TP-E-S	KU-TP-G-S	KU-TP-J-S	KU-TP-L-S	KU-TP-N-S
Sample Depth (feet below ground surface)			8' - 8.5'	17.9' - 18.2'	2.5' - 3.2'	14' - 14.5'	5' - 6'	14' - 14.5'	7' - 8'	15' - 15.5'	3.5'	4'	3.5'	2.5'	2'	2.5'
Date Collected			9/26/2016	9/26/2016	9/26/2016	9/26/2016	9/26/2016	9/26/2016	9/27/2016	9/27/2016	9/12/2016	9/12/2016	9/12/2016	9/12/2016	9/12/2016	9/12/2016
Acetone	50	100,000	**46** B	**5.4** BJ	<5.2 U	<5.5 U	<5.1 U	**7.3** BJ	<5.2 U	**5.1** BJ	<5.2 U	<5.4 U	<5.6 U	<5.5 U	<5.2 U	**190** T
Chloroform	370	49,000	<5.8 U	<5.8 U	<5.2 U	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	<5.4 U	**0.36** BJ	<5.5 U	**0.33** BJ	**0.43** BJ
Tetrachloroethene	1,300	19,000	<5.8 U	<5.8 U	<5.2 U	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	**0.81** J	<5.4 U	<5.6 U	<5.5 U	<5.2 U	<5.6 U
Trichloroethene	470	21,000	<5.8 U	<5.8 U	<5.2 U	<5.5 U	<5.1 U	<5.5 U	**24**	**27** T	<5.2 U	<5.4 U	**13,000**	<5.5 U	<5.2 U	<5.6 U
Cis-1,2-Dichloroethene	250	100,000	<5.8 U	**2.2** J	<5.2 U	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	<5.4 U	**17**	<5.5 U	<5.2 U	<5.6 U
Trans-1,2-Dichloroethene	190	100,000	<5.8 U	<5.8 U	<5.2 U	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	<5.4 U	**0.70** J	<5.5 U	<5.2 U	<5.6 U
1,3,5 Trimethylbenzene	8,400	52,000	**1.6** J	<5.8 U	<5.2 U	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	<5.4 U	<5.6 U	<5.5 U	<5.2 U	<5.6 U
1,2,4-Trimethylbenzene	3,600	52,000	**4.3** J	<5.8 U	<5.2 U	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	<5.4 U	<5.6 U	<5.5 U	<5.2 U	<5.6 U
Methycyclohexane	100,000	1,000,000	**1.5** J	<5.8 U	<5.2 U	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	<5.4 U	<5.6 U	<5.5 U	<5.2 U	<5.6 U
Methylene Chloride	50	100,000	<5.8 U	<5.8 U	<5.2 U	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	**4.6** BJ	**7.6** B	**7.9** B	**7.5** B	**11** B
Naphthalene	12,000	100,000	**2.8** J	<5.8 U	**0.81** J	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	<5.4 U	<5.6 U	<5.5 U	<5.2 U	<5.6 U
Toluene	700	100,000	<5.8 U	<5.8 U	**0.61** J	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	<5.4 U	<5.6 U	<5.5 U	<5.2 U	<5.6 U
n-Propylbenzene	3,900	100,000	**0.57** J	<5.8 U	<5.2 U	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	<5.4 U	<5.6 U	<5.5 U	<5.2 U	<5.6 U
4-Isopropyltoluene	10,000[A]	10,000[A]	**0.52** J	<5.8 U	<5.2 U	<5.5 U	<5.1 U	<5.5 U	<5.2 U	<5.2 U	<5.2 U	<5.4 U	<5.6 U	<5.5 U	<5.2 U	<5.6 U
TOTAL VOCs	*NA*	*NA*	*57.3*	*7.6*	*1.4*	*0.0*	*0.0*	*7.3*	*24.0*	*32.1*	*0.81*	*4.6*	*13,025.66*	*7.9*	*7.83*	*201.43*

Legend:

Data obtained from Stantec Inc. Draft Phase II Environmental Site Assessment dated October 2016. Samples were not collected by LaBella Associates.

VOCs analysis completed by USEPA Method 8260

Concentrations in micrograms per kilogram (ug/kg) or parts per billion (ppb)

J - Analyte detected below quantitation limits

T- Quality control recovery is outside acceptable limits.

B - Analyte was found in blank and sample.

U - Compound analyzed for but not detected.

NA - Not Applicable

[A] Part 375-6 SCO not listed; Commissioner Policy 51 Supplemental Soil Cleanup Objective used.

Bolded font represents concentrations detected above laboratory MDL.

Yellow highlight exceeds NYCRR Part 375-6 Unrestricted Use SCO

Orange highlight exceeds NYCRR Part 375-6 Restricted Residential Use SCO and Unrestricted Use SCO

Table 1B

Remedial Investigation Work Plan: Former Sherwood Shoe Factory, 625 South Goodman Street, Rochester, NY

Summary of Detected Semi-Volatile Organic Compounds in Soil

LaBella Project No. 2172056

Sample ID	NYCRR Part 375-6 Unrestricted Use (ppb)	NYCRR Part 375-6 Restricted Residential (ppb)	KU-B-4-S2	KU-B-7-S1	KU-B-8-S1	KU-B-9-S1	KU-TP-C-S	KU-TP-E-S	KU-TP-G-S	KU-TP-J-S	KU-TP-L-S	KU-TP-N-S	SS-1	SS-2	SS-3
Sample Depth (feet below ground surface)			17.9' - 18.2'	2.5' - 3.2'	5' - 6'	7' - 8'	3.5'	4'	3.5'	2.5'	2'	2.5'	0.2'	0.2'	0.2'
Date Collected			9/26/2016	9/26/2016	9/26/2016	9/27/2016	9/12/2016	9/12/2016	9/12/2016	9/12/2016	9/12/2016	9/12/2016	9/26/2016	9/27/2016	9/27/2016
Anthracene	100,000	100,000	<200 U	**570** J	<170 U	<170 U	**260** J	**65** J	**320** J	**770** J	<870 U	<3,800 U	<3,500 U	<1,900 U	<960 U
Acenaphthylene	100,000	100,000	<200 U	<170 U	<170 U	<170 U	<880 U	**49** J	**270** J	**450** J	<870 U	<3,800 U	<3,500 U	<1,900 U	<960 U
Acenaphthene	20,000	100,000	<200 U	<170 U	<170 U	<170 U	<880 U	<190 U	<940 U	**220** J	<870 U	<3,800 U	<3,500 U	<1,900 U	<960 U
Benzo(a)anthracene	1,000	1,000	<200 U	**1,700** J	<170 U	<170 U	**880**	**320**	**1,300**	**2,300**	**310** J	**2,400** J	**2,500** J	**510** J	**460** J
Benzo(a)pyrene	1,000	1,000	<200 U	**1,800**	<170 U	<170 U	**970**	**340**	**1,800**	**2,300**	**390** J	**2,200** J	**3,300** J	**510** J	**530** J
Benzo(b)fluoranthene	1,000	1,000	<200 U	**2,400**	<170 U	<170 U	**1,200**	**390**	**2,200**	**3,200**	**610** J	**2,900** J	**4,900**	**600** J	**630** J
Benzo(g,h,i)perylene	100,000	100,000	<200 U	**1,500** J	<170 U	<170 U	**750** J	**260**	**1,700**	**1,900**	**340** J	**1,800** J	**3,800**	**360** J	**480** J
Benzo(k)fluoranthene	800	3,900	<200 U	**1,300** J	<170 U	<170 U	**410** J	**160** J	**670** J	**1,100**	<870 U	**580** J	**1,800** J	**330** J	**400** J
Carbazole			<200 U	**260** J	<170 U	<170 U	<880 U	**23** J	<940 U	**390** J	<870 U	<3,800 U	<3,500 U	<1,900 U	<960 U
Chrysene	1,000	3,900	<200 U	**1,800**	<170 U	<170 U	**1,100**	**350** J	**1,500**	**2,700**	**390** J	**2,600** J	**3,500**	**610** J	**560** J
Dibenzofuran			<200 U	<170 U	<170 U	<170 U	<880 U	<190 U	<940 U	**280** J	<870 U	<3,800 U	<3,500 U	<1,900 U	<960 U
Fluoranthene	100,000		<200 U	3,600	<170 U	<170 U	2,000	**640**	**2,200**	**5,700**	**580** J	**6,200**	**6,900**	**1,000** J	**930** J
Fluorene	30,000		<200 U	<170 U	<170 U	<170 U	<880 U	**24** J	**110** J	**330** J	<870 U	<3,800 U	<3,500 U	<1,900 U	<960 U
Indeno(1,2,3-cd)pyrene	500	500	<200 U	**1,300** J	<170 U	<170 U	**640** J	**230**	**1,400**	**1,700**	**290** J	**1,500** J	**2,900** J	**320** J	**390** J
Naphthalene	12,000		<200 U	<170 U	<170 U	<170 U	<880 U	<190 U	<940 U	**270** J	<870 U	<3,800 U	<3,500 U	<1,900 U	<960 U
Phenanthrene	100,000	100,000	<200 U	**2,500**	<170 U	<170 U	**1,100**	**290**	**1,100**	**4,200**	**310** J	**3,300** J	**2,500** J	**870** J	**360** J
Pyrene	100,000	100,000	<200 U	**2,700**	<170 U	<170 U	**1,600**	**560**	**2,200**	**4,600**	**530** J	**4,200**	**5,200**	**840** J	**750** J

Legend:

Data obtained from Stantec Inc. Draft Phase II Environmental Site Assessment dated October 2016. Samples were not collected by LaBella Associates.

SVOC analysis completed by USEPA Method 8270

Concentrations in micrograms per kilogram (ug/kg) or parts per billion (ppb)

J - Analyte detected below quantitation limits

T- Quality control recovery is outside acceptable limits.

B - Analyte was found in blank and sample.

U - Compound analyzed for but not detected.

NA - Not Applicable

[A] Part 375-6 SCO not listed; Commissioner Policy 51 Supplemental Soil Cleanup Objective used.

Bolded font represents concentrations detected above laboratory MDL.

Yellow highlight exceeds NYCRR Part 375-6 Unrestricted Use SCO

Orange highlight exceeds NYCRR Part 375-6 Restricted Residential Use SCO and Unrestricted Use SCO

Table 1C

Remedial Investigation Work Plan: Former Sherwood Shoe Factory, 625 South Goodman Street, Rochester, NY

Summary of Detected Metals in Soil

LaBella Project No. 2172056

Sample ID	NYCRR Part 375-6 Unrestricted Use (ppm)	NYCRR Part 375-6 Restricted Residential Use (ppm)	KU-B-7-S1	KU-B-8-S1	KU-B-9-S1	KU-TP-C-S	KU-TP-E-S	KU-TP-G-S	KU-TP-J-S	KU-TP-L-S	KU-TP-N-S	SS-1	SS-2	SS-3
Sample Depth (feet below ground surface)			**2.5' - 3.2'**	**5' - 6'**	**7' - 8'**	**3.5'**	**4'**	**3.5'**	**2.5'**	**2'**	**2.5'**	**0.2'**	**0.2'**	**0.2'**
Date Collected			**9/26/2016**	**9/26/2016**	**9/27/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/26/2016**	**9/27/2016**	**9/27/2016**
Arsenic	13	16	**5.0**	**3.3**	**8.8**	**3.7**	**5.3**	**4.4**	**4.9**	**5.5**	**4.8**	**3.5**	**3.4**	**3.6**
Barium	350	400	**152**	**33.5**	**60.2**	**59.9** T	**84.8**	**57.5**	**119**	**140**	**96**	**49**	**31.2** T	**39.2**
Cadmium	2.5	4.3	**0.43**	**0.11** J	**0.18** J	**0.41**	**0.38**	**0.19** J	**0.28**	**0.53**	**0.46**	**0.35**	**0.28**	**0.30**
Chromium	30	180	**13.8**	**6.5**	**7.9**	**11.6**	**11**	**9.9**	**14.7**	**16.3**	**13.9**	**93.5**	**7.5**	**10.3**
Lead	63	400	**158.0**	**6.7**	**7.4**	**99.2** T	**236**	**73.3**	**86.3**	**121**	**158**	**70.7**	**52.5**	**56**
Mercury	0.18	0.81	**0.71**	<0.020 U	<0.021 U	**0.093**	**0.17**	**0.17**	**0.23**	**0.15**	**0.18**	**0.0016** J	**0.067**	**0.07**
Selenium	3.9	180	<4.0 U	<4.1 U	<4.5 U	<4.4 U	<4.6 U	<4.5 U	<4.8 U	<4.4 U	<4.4 U	<4.5 U	<4.4 UT	<4.6 U
Silver	2	180	<0.61 U	<0.61 U	<0.67 U	**0.24** J	<0.68 U	<0.68 U	<0.72 U	**0.75**	<0.67 U	<0.67 U	<0.66 UT	<0.68 U
Cyanide	27	27	<0.99 UT	<1.0 UT	<1.0 UT	<0.98 U	<1.1 U	<1.0 U	<1.1 U	<1.0 U	<0.99 U	**9.4**	<1.1 UT	<1.1 UT

Legend:

Data obtained from Stantec Inc. Draft Phase II Environmental Site Assessment dated October 2016. Samples were not collected by LaBella Associates.

Metals analysis completed by USEPA Methods 6010/7470

Concentrations in milligrams per kilogram (mg/kg) or parts per million (ppm)

J - Analyte detected below quantitation limits

T- Quality control recovery is outside acceptable limits.

B - Analyte was found in blank and sample.

U - Compound analyzed for but not detected.

NA - Not Applicable

[A] Part 375-6 SCO not listed; Commissioner Policy 51 Supplemental Soil Cleanup Objective used.

Bolded font represents concentrations detected above laboratory MDL.

Yellow highlight exceeds NYCRR Part 375-6 Unrestricted Use SCO

Orange highlight exceeds NYCRR Part 375-6 Restricted Residential Use SCO and Unrestricted Use SCO

Table 1D

Remedial Investigation Work Plan: Former Sherwood Shoe Factory, 625 South Goodman Street, Rochester, NY

Summary of Polychlorinated Biphenyls (PCBs) in Soil

LaBella Project No. 2172056

Sample ID	NYCRR Part 375-6 Unrestricted Use (ppb)	NYCRR Part 375-6 Commerical Use (ppb)	KU-B-7-S1	KU-B-8-S1	KU-B-9-S1	KU-TP-C-S	KU-TP-E-S	KU-TP-G-S	KU-TP-J-S	KU-TP-L-S	KU-TP-N-S	SS-1	SS-2	SS-3
Sample Depth (feet below ground surface)			**2.5' - 3.2'**	**5' - 6'**	**7' - 8'**	**3.5'**	**4'**	**3.5'**	**2.5'**	**2'**	**2.5'**	**0.2'**	**0.2'**	**0.2'**
Date Collected			**9/26/2016**	**9/26/2016**	**9/27/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/26/2016**	**9/27/2016**	**9/27/2016**
Aroclor 1016	NA	NA	<170 U	<180 U	<200 U	<220 U	<221 U	<223 U	<180 U	<224 U	<222 U	<180 U	<224 U	<170 U
Aroclor 1221	NA	NA	<170 U	<180 U	<200 U	<220 U	<221 U	<223 U	<180 U	<224 U	<222 U	<180 U	<224 U	<170 U
Aroclor 1232	NA	NA	<170 U	<180 U	<200 U	<220 U	<221 U	<223 U	<180 U	<224 U	<222 U	<180 U	<224 U	<170 U
Aroclor 1242	NA	NA	<170 U	<180 U	<200 U	<220 U	<221 U	<223 U	<180 U	<224 U	<222 U	<180 U	<224 U	<170 U
Aroclor 1248	NA	NA	<170 U	<180 U	<200 U	<220 U	<221 U	<223 U	<180 U	<224 U	<222 U	<180 U	<224 U	<170 U
Aroclor 1254	NA	NA	**220**	<180 U	<200 U	<220 U	<221 U	<223 U	<180 U	<224 U	<222 U	<180 U	<224 U	<170 U
Aroclor 1260	NA	NA	<170 U	<180 U	<200 U	<220 U	<221 U	<223 U	<180 U	<224 U	<222 U	<180 U	<224 U	<170 U
Total PCBs	100	1,000	**220**	None Detected	None Detected	None Detected	None Detected	None Detected	None Detected	None Detected	None Detected	None Detected	None Detected	None Detected

Legend:

Data obtained from Stantec Inc. Draft Phase II Environmental Site Assessment dated October 2016. Samples were not collected by LaBella Associates.

PCB analysis completed by USEPA Method 8082

Concentrations in micrograms per kilogram (ug/kg) or parts per billion (ppb)

J - Analyte detected below quantitation limits

T- Quality control recovery is outside acceptable limits.

B - Analyte was found in blank and sample.

U - Compound analyzed for but not detected.

NA - Not Applicable

[A] Part 375-6 SCO not listed; Commissioner Policy 51 Supplemental Soil C

Bolded font represents concentrations detected above laboratory MDL.

Yellow highlight exceeds NYCRR Part 375-6 Unrestricted Use SCO

Orange highlight exceeds NYCRR Part 375-6 Restricted Residential Use SCO and Unrestricted Use SCO

Table 1E

Remedial Investigation Work Plan: Former Sherwood Shoe Factory, 625 South Goodman Street, Rochester, NY

Summary of Detected Pesticides in Soil

LaBella Project No. 2172056

Sample ID	NYCRR Part 375-6 Unrestricted Use (ppb)	NYCRR Part 375-6 Commerical Use (ppb)	**KU-B-7-S1**	**KU-B-8-S1**	**KU-B-9-S1**	**KU-TP-C-S**	**KU-TP-E-S**	**KU-TP-G-S**	**KU-TP-J-S**	**KU-TP-L-S**	**KU-TP-N-S**	**SS-1**	**SS-2**	**SS-3**
Sample Depth (feet below ground surface)			**2.5' - 3.2'**	**5' - 6'**	**7' - 8'**	**3.5'**	**4'**	**3.5'**	**2.5'**	**2'**	**2.5'**	**0.2'**	**0.2'**	**0.2'**
Date Collected			**9/26/2016**	**9/26/2016**	**9/27/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/12/2016**	**9/26/2016**	**9/27/2016**	**9/27/2016**
Alpha Bhc	20	3,400	**7.4** BJ	**0.41** BJ	**0.42** BJ	<8.8 U	<9.3 U	<18 U	<18 U	<3.5 U	<37 U	<87 U	<19 U	<19 U
Beta Bhc	36	3,000	**17** J	<1.7 U	<1.7 U	<8.8 U	<9.3 U	<18 U	<18 U	<3.5 U	<37 U	**18** J	<19 U	<19 U
Dieldrin	5	1,400	**9.5** J	<1.7 U	<1.7 U	<8.8 U	**24**	<18 U	<18 U	<3.5 U	<37 U	<87 U	<19 U	<19 U
Gamma Bhc (Lindane)	100	9,200	<36 U	<1.7 U	<1.7 U	**2.4** J	<9.3 U	<18 U	<18 U	<3.5 U	<37 U	**19** J	<19 U	<19 U
Methoxychlor	1,200[(a)]	1,200[(a)]	**15** J	<1.7 U	<1.7 U	**2.9** J	**2.8** J	**6.9** J	**7.0** J	**1.3** J	**8.7** J	<87 U	<19 U	<19 U
4,4'-DDD	3.3	62,000	<36 U	<1.7 U	<1.7 U	**8.0** J	**31**	<18 U	<18 U	<3.5 U	**110**	<87 U	**22**	<19 U
4,4'-DDE	3.3	47,000	<36 U	<1.7 U	<1.7 U	**7.7** J	**81**	**3.9** J	<18 U	**8.0**	**62**	<87 U	**7.9** J	<19 U
4,4'-DDT	3.3	92,000	**9.3** J	**0.52** J	<1.7 U	**11**	**170**	<18 U	<18 U	**13**	**170**	**27** J	**10** J	**6.4** J

Legend:

Data obtained from Stantec Inc. Draft Phase II Environmental Site Assessment dated October 2016. Samples were not collected by LaBella Associates.

Pesticide analysis completed by USEPA Method 8081

Concentrations in micrograms per kilogram (ug/kg) or parts per billion (ppb)

J - Analyte detected below quantitation limits

T- Quality control recovery is outside acceptable limits.

B - Analyte was found in blank and sample.

U - Compound analyzed for but not detected.

NA - Not Applicable

[A] Part 375-6 SCO not listed; Commissioner Policy 51 Supplemental Soil Cleanup Objective used.

Bolded font represents concentrations detected above laboratory MDL.

Yellow highlight exceeds NYCRR Part 375-6 Unrestricted Use SCO

Orange highlight exceeds NYCRR Part 375-6 Restricted Residential Use SCO and Unrestricted Use SCO

Table 2

Remedial Investigation Work Plan: Former Sherwood Shoe Factory, 625 South Goodman Street, Rochester, NY

Summary of Detected Volatile Organic Compounds in Groundwater

LaBella Project No. 2172056

Sample ID	NYSDEC Part 703 Groundwater Quality Standards	**MW-09**		**MW-09**	
Screened interval (feet below ground surface)		**10.3' - 20.3'**		**10.3' - 20.3'**	
Date Collected		**9/29/2016**		**1/5/2017**	
Carbon Disulfide	60	**0.22**	**J**	**<1.0**	**U**
cis-1,2-Dichloroethane	5	**7.1**		**1.5**	
Trichloroethene	5	**85**		**32**	
Total VOCs	*NA*	*92.3*		*33.5*	

Legend:

Data obtained from Stantec Inc. Draft Phase II Environmental Site Assessment dated October 2016. Samples were not collected by LaBella Associates.

VOC analysis completed by USEPA Method 8260

Concentrations in micrograms per liter (ug/L) or parts per billion (ppb)

J - Analyte detected below quantitation limits

U - Compound analyzed for but not detected.

NA - Not applicable

Yellow highlight exceeds NYSDEC Part 703 Groundwater Quality Standards

APPENDIX 1

Community Air Monitoring Plan

APPENDIX 1A

New York State Department of Health
Generic Community Air Monitoring Plan

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

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

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

Community Air Monitoring Plan

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

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

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

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/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.

- 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.

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

APPENDIX 2

Anticipated Project Personnel Qualifications

Greg Senecal, CHMM

Greg is Director of Environmental Services and is a Certified Hazardous Materials Manager and is responsible for the direction of all environmental investigation related projects undertaken by the firm. He has more than 23 years experience in designing, managing, and conducting numerous site assessments, remedial projects, brownfield redevelopment projects, groundwater monitoring well installations, test pit excavations, and underground petroleum storage tank removals and spill cleanups.

Greg coordinates staffing and client relationships for many of the firm's environmental clients. This effort includes working closely with the client, and forming the best technical project teams for the diverse array of environmental consulting and engineering services offered by the firm.

PHASE I/II INTRO:
As Director of Environmental Services, Greg is responsible for the direction of all environmental investigation related projects undertaken by the firm. Greg has more than 24 years experience scoping, scheduling, and reviewing Phase I Environmental Site Assessments, Phase II Environmental Site Assessments, and remedial efforts undertaken by the firm.

Greg is a Certified Hazardous Materials Manager (CHMM) and has extensive experience in the field of Environmental Management relating to Phase I and Phase II Environmental Site Assessments, remediation, and environmental compliance evaluations. Greg has conducted or supervised over 3,000 Phase I Environmental Site Assessments and over 1,500 Phase II Environmental Site Assessments, as the firm has averaged performing 300-340 assessments per year.

Director, Environmental Division

- State University of New York at Syracuse, School of Environmental Science and Forestry: BS, Environmental Science
- State University of New York at Cobleskill: AAS, Fisheries and Wildlife Technology

Certification / Registration

- Certified Hazardous Materials Manager
- Certified Hazardous Waste Operations & Emergency Response (40-Hour OSHA Health and Safety Training 29)

Project Experience

Monoco Oil Brownfield Cleanup
Pittsford, NY
Greg is responsible for directing all environmental services associated with the NYSDEC Brownfield Cleanup Program for this project. This complex environmental project involves the cleanup and demolition of a 20-acre blighted vacant oil refinery. The redevelopment plan for the project includes redevelopment of an upscale waterfront apartment and town home complex along the Canal.

935 West Broad Street
Rochester, NY
Greg is Client Manager for the Remedial Investigation, Remedial Alternatives Analysis, Site Re-use Concept Plan and a Corrective Action Plan. This project is funded under the NYSDEC 1996 Clean Water/Clean Air Bond Act. Projects tasks completed to date include: geophysical site assessment; comprehensive soil and groundwater characterization; computer model contaminant plume migration trends; GIS mapping to depict site features, analytical data, contaminant plumes; developed reuse concept site plan.

Monroe County Environmental Testing Term Agreement Monroe County, NY
As Director of Environmental Services, Greg has been responsible for the successful completion of over 12 years of term agreements (with annual renewals) for hazardous materials inspection and abatement design with Monroe County. Assignments typically involve

asbestos and lead inspections, but have also included other Regulated Building Materials and mold. Projects have ranged in size from small utility spaces to large multi-story office/housing complexes. A recently completed project involved the inspection of 160,000 sq ft of the Public Safety Building.

Environmental Term Agreement | City of Rochester
Rochester, NY
Client Manager who directs all of the projects under the term. Projects range from Phase I Environmental Site Assessments to Site Characterizations, Remedial Cost Estimates, and Brownfield Cleanups.

690 St. Paul Street | NYSDEC Brownfield Cleanup Project
Rochester, NY
Greg is serving as the project director for this multi-faceted Brownfield investigation and cleanup project. Greg acts as the liaison between the building owners, the former owner (Bausch & Lomb), the Building tenant (City of Rochester School District), and the numerous regulatory agencies involved in the project. This project includes a large SVI investigation, design and installation of a SVI mitigation system, monthly performance monitoring of indoor, sub slab, and exterior air, and communication of the above results to the agencies, tenants, and various stakeholder groups this project also included several IRM's for the removal of orphan tanks and petroleum impacted soils. The RI is currently focusing on the identification and delineation of suspected TCE plumes on the property and under the building structures.

Buffalo Avenue Industrial Corridor Brownfield Opportunity Area | Pre-Nomination Study
Niagara Falls, NY
Greg served as the project director for this 1500 acre, 2500 industrial parcel Brownfield Opportunity Area Project. Greg coordinated the effort between LaBella's Planning and environmental division. He also oversaw the schedule and public outreach components of the project.

Vacuum Oil/South Genesee Brownfield Opportunity Area | Pre-Nomination Study
Rochester, NY
Director of the Project Team for the City of to prepare a pre-nomination study for the proposed Vacuum Oil-South Genesee River Corridor Brownfield Opportunity Area. LaBella developed mapping that allowed for the Brownfield Opportunity Area boundaries to be established in a logical manner at the 56 acre 1.2 mile long corridor along the Genesee River. LaBella conducted economic and demographic research for the project site and gathered zoning, occupancy, and environmental information for potential underutilized Brownfield properties within the BOA.

Port of Rochester Redevelopment Project | Phase II Site Characterization
Rochester, NY
Project Manager for complete Phase II Site Characterization, which involved sub surface characterization of approximately 38 acres. Greg directed the environmental team who received a beneficial re-use determination to re use 80,000 cubic yards of iron foundry slag as on site fill.

Bureau of Water, Lighting, & Parking Meter Operations
Rochester, NY
Greg served as Client Manager to remediate the Water Bureau site to obtain regulatory closure or inactivation. The project scope includes the redevelopment of the current site for reuse as a new facility for the operations center.

CSXT Train Derailment & Hazardous Materials Spill
Rochester, NY
Project Manager responsible for review of all delineation reports, implementation of additional delineation studies, review of remedial work plans, and oversight of all facets of the execution of IRM as it related to achieving a cleanup that would limit long term liability for the City and allow for the planned redevelopment to occur.

Rochester Rhinos Stadium Brownfield Redevelopment
Rochester, NY
Greg served as Project Manager of the NYSDEC Voluntary Cleanup of this prominent urban redevelopment site. The voluntary clean was based around a soils management plan approach that included the re-use of approximately sixty thousand yards of low level petroleum contaminated soils as on site fill under parking lots and in landscaped berm areas of the property.

Dennis Porter, CHMM

Dennis is the Environmental Operations and Phase II Environmental Site Assessment/Remediation Program Manager, and is a Certified Hazardous Materials Manager. He has managed numerous Phase I and II Environmental Site Assessments, Remedial Investigations, Feasibility Studies, industrial hygiene studies, project monitoring and asbestos sampling surveys. Dennis also has significant experience in Brownfield Redevelopment and has completed numerous Site Redevelopment Projects under the NYSDEC's Brownfield Cleanup Program.

Manager of Environmental Operations with 23 Years of Experience

- SUNY Oswego: BS, Biology
- Certified Hazardous Materials Manager (CHMM)
- Certified Hazardous Waste Operations & Emergency Response (40 Hour OSHA Health and Safety Training 29)
- New York State Commercial Association of Realtors
- CHMM Local Chapter

Project Experience

Former Photech Imaging | City of Rochester
Rochester, NY
Project Manager responsible for all aspects of the project including; design phase investigations, building demolition, bid documents, contractor interviews & selection, remedial action work plans, waste profiling, contract implementation and construction management. Primary contaminants at this 12.5 acre site include asbestos, heavy metals and Semi-Volatile Organic Compounds (SVOCs) Metals contamination, primarily Silver, Cadmium and Chromium have been distributed across the site from the historical manufacturing operations.

Penn Yan Marine | Yates County
Penn Yan, NY
Project Manager working closely with Yates County and the NYSDEC to design an environmental cleanup at the site, which will be consistent with the future use of the waterfront as a mixed use marine community. Responsibilities included conducting environmental investigations, remedial action work plans, and design documents to investigate and develop cleanup plans for a vacant and contaminated former boat manufacturing facility.

Predevelopment Site Conditions Gap Investigation (PSCGI) | Port of Rochester Marina | City of Rochester
Rochester, NY
Project Manager responsible for defining localized and site-wide environmental issues at the proposed marina site including the horizontal and vertical distribution of the slag layers or other regulated solid waste known to be present at the Site, evaluate potential issues associated with redevelopment of the subject site, and collect site-specific geotechnical data for use by the Design Team. To investigate the data gaps identified in the assessment of available data, the PSCGI fieldwork included the advancement of thirty-four (34) soil borings and the installation of three, 2-inch inside diameter groundwater monitoring wells. In addition, the New York State Department of Environmental Conservation (NYSDEC) was petitioned for approval of a site-specific Beneficial Use Determination (BUD) for the reuse of the slag excavated as part of the marina construction project.

NYSDEC Brownfield Cleanup Program
Penfield, NY
Dennis served as the Remedial Program Manager for the Project. This complex project involved a detailed investigation and characterization regarding multiple source areas of chlorinated solvent contamination which included installing shallow overburden and deep overburden groundwater monitoring wells and an extensive soil boring grid. In addition, an exposure assessment for evaluating potential on-site and off-site exposures was completed. This project was further complicated by the close proximity of the Site to residential properties and a commercial Day Care Facility. The RI concluded that an Interim Remedial Measure (IRM) was warranted to immediately remove a source

area in order to minimize off-site migration and significantly reduce groundwater impacts in a cost effective and timely manner.

NYSDEC Brownfield Cleanup Program
Wolcott, NY
Dennis served as the Project Manager for all facets of environmental investigation, characterization and remediation associated with an area of mercury contamination. A Remedial Investigation (RI) was designed in accordance with the NYSDEC BCP in order to provide for the investigation and characterization of the extent of mercury contamination at the site, including the evaluation of human exposures to mercury. The selected remedial approach was to cap the area of mercury contaminated soil with asphalt. This approach allowed for the reduction in potential human exposure to the contaminated soils through direct contact, allowed the site owner to develop additional vehicle parking for the employees and eliminated the need for costly off-site landfill disposal of the mercury impacted soils.

NYSDEC Brownfield Cleanup Program
North Goodman, Rochester, NY
As Project Manager, Dennis guided the Client through the NYSDEC Brownfield Cleanup Program. The project involved the Developer acquiring the contaminated parcel from the existing owner, assuming all responsibility for cleanup and subsequently entering into the NYSDEC Brownfield Cleanup Program as a Volunteer. This complex project involved detailed investigation and characterization regarding multiple source areas, defining off-site migration pathways, installation of a sub-slab vapor mitigation system for the existing structure and completing the evaluation of bedrock groundwater.

NYSDEC Brownfield Cleanup Program
Henrietta, NY
LaBella Associates, P.C. was retained by a local manufacturing company to complete the site remediation under the NYSDEC Brownfield Cleanup Program. The project was initiated by another consultant; however, due to cost overruns and timing of the work, the Client selected LaBella to complete the project. Dennis served as the Remedial Program Manager for this Project. Timely response and client involvement was the key to bringing the project back on track.

NYSDEC Brownfield Cleanup Program | Former Monoco Oil Facility | Mark IV
Pittsford, NY
As Project Manager, Dennis completed a Brownfield Cleanup Program (BCP) Application & Work Plan to conduct a Remedial Investigation at a former bulk petroleum facility. A soil, groundwater, and soil gas study was undertaken to develop remedial costs and assist with redeveloping the property. Subsequently, an Interim Remedial Measure was designed to remove the source area of impacts from the Site.

USEPA Brownfield Cleanup Grant | Seneca Nation of Indians
Salamanca, NY
Dennis served as the Remedial Design Manager and assisted in authoring a United States Environmental Protection Agency (USEPA) Brownfield Cleanup Grant for the Seneca Nation. The successful grant application that was prepared sought $200,000 for the cleanup of a vacant rail yard contaminated with diesel fuel and heavy metals. The rail yard is located in the Seneca Nation's Allegheny territory in Salamanca, New York.

USEPA Brownfield Cleanup Grant: 935 Broad Street | City of Rochester
Rochester, NY
Dennis served as the Project Manager for the City of Rochester during the design and implementation of a comprehensive Remedial Investigation, Remedial Alternatives Analysis, Site Re-Use Concept Plan and a Corrective Action Plan for a Former Gasoline Station at 935 West Broad Street. This project was funded under the NYSDEC 1996 Clean Water/Clean Air Bond Act.

USEPA Brownfield Cleanup Grant | Former Photech Imaging, 1000 Driving Park | City of Rochester
Rochester, NY
The City of Rochester received a USEPA Remediation Grant for $200,000 to remediate an area of hazardous and non-hazardous contamination associated with the facilities former silver wastewater recovery system. Dennis served as the Project Manager responsible for all aspects of the project including; design phase investigations, remedial design, bid documents,

contractor interviews & selection, remedial action work plans, waste profiling, contract implementation and construction management.

NEW YORK STATE BROWNFIELD OPORTUNITY AREAS (BOAs)

Brownfield Opportunity Area | Pre-Nomination Study | City of Rochester
Rochester, NY
Dennis worked on the Project Team for the City of Rochester to prepare a pre-nomination study for the proposed Vacuum Oil-South Genesee River Corridor Brownfield Opportunity Area. LaBella developed mapping that allowed for the Brownfield Opportunity Area boundaries to be established in a logical manner at the 56 acre 1.2 mile long corridor along the Genesee River. LaBella conducted economic and demographic research for the project site and gathered zoning, occupancy, and environmental information for potential underutilized Brownfield properties within the Brownfield Opportunity Area.

Vacuum Oil/South Genesee Brownfield Opportunity Area | Pre-Nomination Study
Rochester, NY
Dennis worked on the Project Team for the City of Rochester to prepare a pre-nomination study for the proposed Vacuum Oil-South Genesee River Corridor Brownfield Opportunity Area. LaBella developed mapping that allowed for the Brownfield Opportunity Area boundaries to be established in a logical manner at the 56 acre 1.2 mile long corridor along the Genesee River. LaBella conducted economic and demographic research for the project site and gathered zoning, occupancy, and environmental information for potential underutilized Brownfield properties within the BOA.

Buffalo Avenue Industrial Corridor Brownfield Opportunity Area | Pre-Nomination Study
Niagara Falls, NY
Dennis worked on the Project Team for the City of to prepare a pre-nomination study for this 1500 acre, 2500 industrial parcel Brownfield Opportunity Area Project. Dennis assisted in the coordination; compilation, analysis and presentation of project data; and production of a BOA program-compliant Pre-nomination Study.

SITE CHARACTERIZATION

15 Flint Street | City of Rochester
Rochester, NY
As Project Manager, Dennis managed the implementation of a comprehensive Phase II Environmental Site Assessment (ESA) Subsurface Investigation at the property located at 15 Flint Street in the City of Rochester, Monroe County, New York. The Site encompasses approximately 5.23 acres and was historically operated as an oil refinery by Vacuum Oil and others from approximately 1875 to 1935. To evaluate the RECs identified in the Phase I ESA, the Phase II ESA Subsurface Investigation fieldwork included the advancement of twenty-eight soil borings, three test pits, and the installation of seventeen, 2-in. inside diameter temporary monitoring wells.

Predevelopment Subsurface Conditions Analysis Investigation, Development Parcel 1 | Port of Rochester | City of Rochester
Rochester, NY
As Project Manager, Dennis managed the implementation of a Predevelopment Subsurface Conditions Analysis Investigation (PSCAI) of a parcel of land within the Port of Rochester located at 4700 Lake Avenue within the City of Rochester, Monroe County, New York. The Site is a portion of the Port of Rochester which has been targeted for redevelopment. To evaluate the site LaBella conducted the following; electromagnetic survey using a Geonics EM61 unit, a high-sensitivity, high-resolution, time domain electromagnetic (TDEM) metal detector that can detect both ferrous and nonferrous metallic objects to an approximate depth of 10 feet below ground surface (BGS); an exploratory test pit investigation including the advancement of sixteen test pits; and the implementation of eight (8) geotechnical and environmental soil borings.

Site Characterization, 51 Chili Avenue | City of Rochester
Rochester, NY
LaBella was retained by the City of Rochester to complete a comprehensive site characterization for a parcel located at 51 Chili Avenue located in the City of Rochester, Monroe County, New York. The Site was historically utilized as a gasoline filling station and automobile repair shop. As Project Manager, Dennis

managed the decommission of two (2) orphan underground storage tanks (USTs); the advancement of twenty-six (26) direct-push soil borings; five (5) truck-mounted rotary drill rig borings including the installation of one (1) overburden well and four (4) "bedrock/overburden interface" groundwater monitoring wells; and the advancement of six (6) test pits. This information supported a cost recovery action against the former responsible party.

Site Characterization – USEPA Funded Brownfield Assistance Program | 900 Maple Street, Cylinder Services, Inc. | City of Rochester
Rochester, NY

LaBella was retained by the City of Rochester (City) and Cylinder Services, Inc. under the City of Rochester's Brownfields Assistance Program (BAP) to conduct a Preliminary Geotechnical Evaluation with Environmental Confirmation Sampling of the property located at 900 Maple Street, City of Rochester, Monroe County, New York. The Site consists of two (2) contiguous parcels that total 5.44-acres zoned for commercial and warehouse storage use and is improved with one (1) 29,520 ± square foot structure that was constructed between the late 1950's and the early 1960's. Site Characterization Activities included; retaining the services of a professional plumber to "televise" available drains at the Site in order to verify connection to the sanitary or storm sewer or to determine the distance and direction from the structure that the wastewater discharge piping terminates. A total of 21 floor drains and a sump were televised to evaluate discharge locations. In addition, nine (9) test pits, nine (9) Geoprobe direct-push soil borings and twelve (12) Truck-mounted BK81 Rotary Drill Rig advanced soil borings were advanced at the Site.

Site Characterization – USEPA Funded Brownfield Assistance Program | 110 Colfax Street, Peko Precision Products, Inc. | City of Rochester
Rochester, NY

LaBella was retained by the City of Rochester (City) and Peko Precision Products, Inc. under the City of Rochester's Brownfields Assistance Program (BAP) to conduct a Phase II Environmental Site Assessment (ESA); Preliminary Site Characterization (PSC) at the property known as the City of Rochester Forestry Division and Auto Pound Auction Lot located at 110 Colfax Street in the City of Rochester, Monroe County, New York1. The 110 Colfax Street parcel is a 2.7-acre portion of the City of Rochester property addressed as 110-220 Colfax Street. This 2.7-acre portion of land is located within the Former Emerson Street Landfill (FESL) footprint. To facilitate the redevelopment of the site a source removal program including an Environmental Management Plan (EMP) was designed and implemented. In addition, to mitigate potential Human Health considerations associated with occupying the on-site structure a full building sub-slab vapor depressurization system was designed and installed.

Predevelopment Site Conditions Gap Investigation | Port of Rochester Marina | City of Rochester
Rochester, NY

As Project Manager, Dennis managed the implementation of a Predevelopment Site Conditions Gap Investigation (PSCGI) at the Port of Rochester in the City of Rochester, Monroe County, New York. The primary focus of the PSCGI was to define localized and site-wide environmental issues at the proposed marina site including the horizontal and vertical distribution of the slag layers or other regulated solid waste known to be present at the Site, evaluate potential issues associated with redevelopment of the subject site, and collect site-specific geotechnical data for use by the Design Team. To investigate the data gaps identified in the assessment of available data, the PSCGI fieldwork included the advancement of thirty-four (34) soil borings and the installation of three, 2-inch inside diameter groundwater monitoring wells. In addition, the New York State Department of Environmental Conservation (NYSDEC) was petitioned for approval of a site-specific Beneficial Use Determination (BUD) for the reuse of the slag excavated as part of the marina construction project.

NYSDEC Brownfield Cleanup Program | JML Optical, Portland Ave.
Rochester, NY

As Project Manager, Dennis managed the implementation of a comprehensive environmental due diligence program prior to the Client divesting the real-estate associated with the complex. Due diligence activities included the performance of an ASTM Phase I

Environmental Site Assessment, a Pre-Demolition Asbestos Survey, a Preliminary Phase II Environmental Site Assessment/Remedial Investigation a Remedial Alternatives Analysis Report; and Preliminary Remedial Design. This complex project is scheduled to begin remediation late in 2007.

Remedial Investigation, Proposed Port Marina | Port of Rochester
Rochester, NY
Dennis served as the Project Manager for the City of Rochester regarding the design and implementation of the Remedial Investigation (RI) regarding the proposed Port Marina Project. The project approach selected consisted of a multi-step investigative process. The main focus for the RI was to evaluate the environmental implications, potential human health exposure issues and associated cost burdens associated with the potential redevelopment of the site as a marina.

Bureau of Water, Lighting, & Parking Meter Operations
Rochester, NY
Dennis served as Environmental Project Manager for the City of Rochester's new Bureau of Water, Lighting, and Parking Meter Operations complex. He managed a team of LaBella Technical Staff combined with City staff to develop and implement a cost effective site investigation, remedial action plan and successful redevelopment of the Site. This Project was the recipient of the American Public Works Association Environmental Project of the Year for New York State.

Port of Rochester Redevelopment Project | Phase II Site Characterization
Rochester, NY
Dennis served as the Technical Team Leader / Sr. Environmental Analyst for complete Phase II Site Characterization of the entire Port of Rochester. This project involved the sub surface characterization of approximately 38 acres of formerly industrial land targeted for redevelopment for the Fast Ferry Project. The site received a beneficial re-use determination to re utilize 80,000 cubic yards of iron foundry slag as on-site fill and part of the redevelopment of the Site.

Adelphia Communications World Headquarters
Coudersport, PA
Dennis served as the Field Project Manager regarding all facets of environmental investigation, characterization, and remediation associated with two former gas stations and a former agricultural distribution center that had been purchased to redevelop as a communications firm $26 million dollar World Headquarters. Planning and management were key to the project's success. The success of the project was driven by Dennis' significant involvement with Adelphia's corporate, legal and design groups and numerous public and private organizations; from utilities and construction crews to neighborhood groups.

Valeo North America | Facility Wide Decommissioning
Rochester, NY
Dennis served as the Project Manager representing Valeo during the decommissioning of the Complex which consists of an approximately 22-acre site with 1.5 million square feet of manufacturing and warehouse space. LaBella provided Valeo with comprehensive environmental engineering design and management services associated with the phased reduction of operations at the Facility. In addition to the technical decommissioning of much of the manufacturing related infrastructure, it was paramount that LaBella design and manage each aspect to the project to minimize Valeo's long term liability associated with the Facility.

Project Management: Remediation, Demolition, and Preliminary Site Work | Wegmans Food Markets
Buffalo, NY
Dennis provided on-site Project Management for the remediation, demolition and preliminary site work in preparation for the construction of a new retail facility. The site consisted of an approximately 400,000 square foot industrial complex. This complex project involved pre-demolition remedial measures consisting of an asbestos survey, the removal of underground petroleum bulk storage tanks, above ground paint storage tanks, asbestos abatement, and the dismantlement and disposal of PCB contaminated equipment and materials.

Foster Wheeler Plant | Site Characterization
Dansville, NY
Dennis was the Remedial Investigation Manager for the due diligence investigation regarding Foster Wheeler's Dansville Facility, which was first developed for industrial purposes in the 1830's as a foundry and heavy industrial operation. The complex consisted of over 500,000 square feet of manufacturing buildings situated on an approximately 80 acre site. The facility had a long history of environmental related issues including: Consent Orders from the NYSDEC, being listed as a NYSDEC Inactive Hazardous Waste Disposal Site (IHWDS) and multiple documented chemical releases.

Chautauqua County Jail
Mayville, NY
Project Manager for environmental services in support of the construction of a 240-bed addition to this existing jail facility and renovations in the existing facility. Environmental issues included defining the nature and extent of existing contamination, completing design/ bidding documents, on-site management during construction and mitigating human-health expose issues for both on-site construction workers and the future occupants of the structure.

Rochester Economic Development | 110 Colfax St. & 690 Portland Ave.
Rochester, NY
Project Manager for a Remedial Investigation, Remedial Alternatives Analysis, Site Re-Use Concept Plan and a Corrective Action Plan for the former municipal landfill and manufacturing facility, respectively.

Environmental Term Agreement | City of Rochester
Rochester, NY
Project Manager on the term agreement, whose responsibilities range from Phase I Environmental Site Assessments to Site Characterizations, Remedial Cost Estimates, and Brownfield Cleanups.

Pike Company | Spill Closure
Rochester, NY
Project Manager responsible for the completion of spill closure requirements for a New York State Department of Environmental Conservation (NYSDEC) Active Spill and to delineate and remediate extensive soils impaired with gasoline.

CSXT Train Derailment & Hazardous Materials Spill
Rochester, NY
Sr. Environmental Analyst responsible for review of all delineation reports, implementation of additional delineation studies, review of remedial work plans, and oversight of all facets of the execution of IRM as it related to achieving a cleanup that would limit long term liability for the City and allow for the planned redevelopment to occur.

North Buffalo Street over Camp Brook Creek | PENNDOT District 3-0
Elkland, PA
Sr. Environmental Analyst for the new 60 ft, single span bridge replacement.

Water District No. 4
Town of Kendall, NY
Sr. Environmental Analyst for four projects to install approximately 18 miles of water mains to extend the Town's distribution system.

NYSDOT

Dennis is a Phase II Environmental Site Assessment and Remediation Program Manager and Certified Hazardous Materials Manager. He will be the Senior Environmental Analyst for the Project. Dennis has completed numerous Phase I and II Environmental Site Assessments, Remedial Investigations and Design, Feasibility Studies, industrial hygiene studies, project monitoring and asbestos sampling surveys. Dennis has also completed Hazardous Waste/Contaminated Materials (HW/CM) Assessments on the following NYSDOT projects:

Jefferson Road, Route 252 Phases I-IV, PIN 4046.11
Sr. Environmental Analyst

Daniel Noll, PE

Dan has over 15 years of experience with environmental projects at industrial/manufacturing facilities and environmental investigation projects for a variety of clients including developers, financial institutions, industrial clients, and municipalities. Dan has managed numerous Phase II Environmental Site Assessments and remediation projects such as groundwater monitoring programs, soil vapor investigations, test pit investigations, geo-probe investigations, underground storage tank removals, soil removals, bio-cell remediations, and in-situ groundwater remediation. He also has experience with the design and installation oversight of mitigation systems. In addition, Dan has assisted industrial, municipal and agricultural clients with permitting and annual reporting for State Pollution Discharge Elimination System (SPDES) permits, Part 360 Land Application permits, Composting permits, and Petroleum Bulk Storage (PBS) registrations.

Brownfield Program Manager

- Clarkson University: BS, Chemical Engineering

Certification / Registration

- Professional Engineer, NY
- OSHA 40-Hour Certified Hazardous Waste Site Worker Training
- OSHA 8-Hour Certified Hazardous Waste Site Worker Refresher Training

Project Experience

Carriage Cleaners BCP Site | Springs Land Company
Rochester, NY
As Project Manager, Dan completed a Brownfield Cleanup Program (BCP) Application & Work Plan to conduct a Remedial Investigation at a former dry cleaning facility. A soil, groundwater, and soil gas study was undertaken to develop remedial costs and assist with redeveloping the property. Subsequently, an Interim Remedial Measure was completed to remove the source area of impacts from the Site. Dan completed a remedial alternatives analysis for selecting a treatment approach for the residual groundwater plume. Dan also attended Town Board Meetings regarding this project.

Former Manufacturing Facility - BCP Site | Stern Family Limited Partnership
Rochester, NY
Dan was the Project Engineer for this BCP Site, which underwent a Remedial Investigation, Interim Remedial Measures, and installation of a sub-slab depressurization system. Dan completed and stamped the Final Engineering Report required to obtain the Certificate of Completion for the property owner, allowing them to obtain their tax credits.

Former Bausch & Lomb Facility BCP Site | Genesee Valley Real Estate
Rochester, NY
Dan is Project Manager for this Brownfield site that served as a manufacturing facility from the 1930s to the 1970s. The project includes a Remedial Investigation (RI) of a four-acre parcel with ten areas of concern identified based on historic information. The RI identified four areas requiring remedial actions and Interim Remedial Measures have been completed in three of the locations. The areas of remediation included petroleum impacted soil and groundwater with free floating petroleum product, and chlorinated solvent contamination including bedrock impacts at depth. A remedial alternatives analysis is being completed to determine a final remedy for the site.

Vacuum Oil – BCP Site | One Flint Street Associates
Rochester, NY
Dan was the Project Manager for this Brownfield site that is the oldest oil refinery in the United States. The current project includes developing a remedial investigation plan for two parcels that have had a history of oil refining since the 1800s. The remedial investigation was designed to fill data gaps from previous studies in order to minimize cost to the Client.

Petroleum Soil Removal & Oxygen Injection System| City of Rochester
Rochester, NY
As Project Engineer, Dan developed a soil and groundwater study to investigate former underground storage tanks at a former gasoline/auto repair facility. A remedial alternatives analysis was conducted to evaluate several options for remediating soil and groundwater at the site including light non-aqueous phase liquid. Dan followed this project through remediation which consisted of removing about 1,500 cy of soil and designing/installing an oxygen injection system to remediate groundwater over time.

Former Emerson Power Transmission Facility
Ithaca, NY
Dan completed a detailed review of this 100-acre site with 800,000 sq. ft. of manufacturing space. The site is in the NYSDEC Inactive Hazardous Waste Disposal Site registry and was a heavy industrial facility for over 100 years. The facility closed in 2009 and Dan is the project manager for environmental due diligence activities for a potential buyer. The facility has known issues with chlorinated solvents in bedrock and with significant off-site impacts. The overall project will include a detailed and in-depth environmental site assessment with sampling for soil, bedrock, groundwater, soil gas, sediments, and surface waters in order to document any impacts above NYSDEC criteria and thus limit liability for the purchaser.

Genesee River Dredging Project | City of Rochester
Rochester, NY
Dan managed a project to permit three areas for dredging near the mouth of the Genesee River. The project included evaluating the previous dredging operations in the area, the existing sediment sampling data, sediment levels, discharge points in the area to be dredged and 3-D modeling of the sediments for accurate volume calculations. This information was summarized in a presentation to NYSDEC and the Army Corp of Engineers in order to streamline the permitting process and determine any additional requirements for obtaining a permit. Subsequent to the presentation, Dan developed the permit and submitted them to the Client for signature, and then approval by regulatory agencies.

Port Marina | City of Rochester
Rochester NY
Dan assisted with the environmental investigation of the City of Rochester Port Marina. This project included evaluating the extent of slag fill materials that would require proper management during any redevelopment work. The extent of slag was evaluated by implementing a grid pattern of soil borings and using the resulting data to develop a 3-dimensional model of the subsurface at the Site. This model was used to generate volumes of material to be disturbed during redevelopment and estimate the cost burden of the environmental portion of the project. This project also included evaluating the magnitude and permitting of a massive dewatering program to allow the mass excavation to be completed.

NYSDEC Legacy Site Soil Vapor Intrusion Project | City of Rochester
Rochester, NY
Dan is Project Manager for this project which includes evaluating soil vapor intrusion from a former 230-acre municipal landfill with methane gas and chlorinated solvent impacts. The landfill was converted into an industrial park after closure in 1971 and is now developed with 45 separate parcels and over 2,000,000 square feet of building space. This challenging project included obtaining access from 27 different property owners and conducting site assessments at each facility and separately evaluating groundwater impacts over approximately 20-acre area. The results of this work determined the cost burden and liability of the City for addressing soil vapor intrusion. LaBella utilized all of the following mitigation approaches for minimizing this significant cost burden to the City: sealing of floors, vapor barriers, sub-slab depressurization systems and building pressurization depending on building conditions/uses.

Fill Relocation and Sub-Slab Mitigation System | City of Rochester
Rochester, NY
Dan was project manager for this project which relocated approximately 3,000 cubic yards of fill material from a development site that is located on a former landfill operated by the City of Rochester. This work was conducted for the City but on private property. The fill was relocated and placed in a soil berm on City property with NYSDEC approval. In addition, Dan designed and oversaw construction of a sub-slab depressurization system for the new 8,000 square foot building.

Relationships. Resources. Results.

Jennifer Gillen, MS

Jennifer is a Project Geologist responsible for the coordination and successful completion of Phase II Environmental Site Assessments (ESAs) and several Sites in the NYSDEC Brownfield/ Voluntary Cleanup Programs. Jennifer has also worked on several Brownfield Opportunity Area (BOA) studies. Jennifer was previously the Phase I ESA Program Manager at LaBella and has completed hundreds of Phase I ESAs, numerous Phase II ESAs, and has experience with many Sites with chlorinated solvent impacts as well as NYSDEC Spill Sites.

Project Geologist

- SUNY Albany: BS, Geological Sciences
- SUNY Albany: MS, Geological Sciences
- Certified Hazardous Waste Operations & Emergency Response (40 Hour OSHA Health and Safety Training 29)
- OSHA 8 Hour Hazardous Waste Operations and Emergency Response Course

Project Experience

Canal Corridor Brownfield Opportunity Area Study | Oswego, NY
Jennifer was responsible for the compilation, analysis and dissemination of data associated with the BOA project, which spans 1,344 acres along the Oswego Canal and shore of Lake Ontario, within in the City of Oswego.

Tonawanda Brownfield Opportunity Area Study | Tonawanda, NY
Jennifer was responsible for the compilation, mapping and analysis of data associated with this 1,000 acre BOA on the Niagara River, which included properties used for radiological waste disposal associated with the Manhattan Project.

NYSDEC BCP Site #C828159, 690 Saint Paul Street | Rochester, NY
Jennifer assisted with the development of two Interim Remedial Measure Work Plans, the Remedial Investigation Report and Remedial Alternatives Analysis/Remedial Action Work Plan for the remediation of a NYSDEC Brownfield Cleanup Program site formerly utilized as an industrial manufacturing facility. Implemented the two Interim Remedial Measures and portions of the Remedial Investigation at the Site which included the excavation of contaminated soil and bedrock, the advancement of soil borings, and the installation and sampling of groundwater monitoring wells. Also, included in this work was the installation of bedrock monitoring wells using conventional rock coring methods and installation of infrastructure for *in situ* chemical treatment. This process involved coordination with the NYSDEC, the NYSDOH, and the City of Rochester School District.

Penn Yan Marine | Penn Yan, NY
Currently completing a groundwater delineation investigation and BCP application as well as a work plan for *in situ* treatment of groundwater contaminated with chlorinated volatile organic compounds. The implementation of the groundwater delineation investigation has included the installation and sampling of nineteen groundwater monitoring wells.

NYSDEC VCP Site #V00585-6, Lake Ontario Mariners Marina | Henderson Harbor, NY
Developed a Remedial Alternatives Analysis/Remedial Action Work Plan for this NYSDEC Voluntary Cleanup Site. This work included the design of a sub-slab depressurization system within a building under which a plume of petroleum-contaminated groundwater is located and the design of a pilot test for an air sparging system.

Former Emerson Power Transmission Facility | Ithaca, NY
Jennifer assisted with a detailed review of this 100-acre site with 800,000 sq. ft. of manufacturing space. The facility was a heavy industrial facility for over 100 years and has known issues with chlorinated solvents in bedrock and with significant off-site impacts. The project included a detailed and in-depth environmental site assessment in order to document any impacts above NYSDEC criteria and thus limit liability for the purchaser.

NYSDEC Spill Site #0906903, 185 Scio Street | Rochester, NY
Oversaw the installation of dedicated bedrock groundwater monitoring wells at the Site using conventional rock coring methods.

City of Rochester Department of Environmental Services, Division of Environmental Quality, Pump Test Report, Port of Rochester | Rochester, NY

which included geotechnical sampling. Implementation of the pump test included the pumping of over 650,000-gallons of water and the analysis of drawdown effects on observation wells. This process involved coordination with the New York State Department of Environmental Conservation, Monroe County Pure Waters, and the City of Rochester Division of Environmental Quality.

NYSDEC Spill Site #0906903, 185 Scio Street | Rochester, NY
Oversaw the installation of dedicated bedrock groundwater monitoring wells at the Site using conventional rock coring methods. Completed sampling of these wells using standard low-flow methods.

NYSDEC Spill #0911669, Phase II Environmental Site Assessment and Remediation, Wemco Corp., Saltonstall Street | Canandaigua, NY
Conducted geoprobe soil boring sampling and groundwater sampling to evaluate for potential subsurface effects related to historic fuel distribution operations. Following the subsurface investigation, assisted with the implementation of remedial excavations at the Site and coordinated with the NYSDEC for the closure of the Spill.

NYSDEC Site #C738046, Former Breneman Site | Oswego, NY
Developed Remedial Investigation Work Plan and Citizen Participation Work Plan in anticipation of the upcoming Remedial Investigation at the Site.

Brownfield Cleanup Program Project, Greenport Crossings LLC., 181 Union Turnpike| Greenport, NY

Phase I Environment Site Assessments | Northeastern United States
Performed numerous Phase I ESAs and Transaction Screens on a wide variety of residential, commercial, industrial, and manufacturing facilities including gasoline stations, repair shops, apartment complexes, office buildings, and restaurants for the following groups:
Financial Institutions
- Bank of Castile
- Canandaigua National Bank
- ESL Federal Credit Union
- First Niagara Bank
- Genesee Regional Bank
- Northwest Savings Bank
- Steuben Trust Company

Municipal and Government Clients
- City of Rochester
- City of Oswego
- New York State Department of Transportation
- Town of Victor
- Yates County

Development and Construction Companies
- Urban Housing League of Rochester
- Edgemere Development
- Chrisanntha, Inc.
- Buckingham Properties
- Morgan Management
- Rochester Cornerstone Group

Seth Davis, MS

Seth is an Environmental Analyst with six years of experience. His responsibilities include all aspects of site characterization for site development and Brownfield Cleanup Program projects, including Phase I and II Environmental Site Assessments and subsurface exploration and sampling programs. He has also performed numerous environmental remediation projects that include soil, groundwater and sediment mitigation activities.

Seth also has experience with project management activities, including: preparation of proposals and cost estimates, and development of work plans for investigation and remediation.

Environmental Analyst with Four Years of Experience

- West Virginia University: MS, Wildlife and Fisheries Resources
- West Virginia University: BS, Wildlife and Fisheries Science
- OSHA 40-hour HAZWOPER Training
- Pennsylvania Dept. of Environmental Protection — Wetland Delineation Training, April 2010
- First Aid
- CPR

Project Experience

Howard Wind Project | Town of Howard
Howard, NY
Environmental Monitor throughout the construction of 27 wind turbines. Responsibilities included monitoring of the local roads to ensure any impacts from the construction project were mitigated, routine SWPPP inspections, and agricultural monitoring. The project included oversight to a variety of different contractors spanning a jobsite with a great geographic spread. The restoration goals on this complex project were obtained by the end of scheduled construction, one year ahead of the required restoration goal.

Phase I & II Environmental Site Assessment | Wal-Mart #2785-01 | 360 Commerce Drive
Victor, NY
Environmental Analyst for the investigation of potential sub-surface environmental issues associated with historical uses of the site as a permitted construction and demolition waste disposal facility and gravel pit. This project involved the implantation of over twenty-five test boring and six groundwater monitoring wells in areas of suspect concern identified in previous investigations.

Development and Implementation of Proposed Waste/Fill Management Plan | Unity Health Systems
Assisted with the implementation of the W/F Management Plan including overseeing the excavation of regulated solid wasted and subsequent transportation off-site. Monitoring included defining the extent of the waste material.

Former Monoco Oil BCP | Mark IV Enterprises
Pittsford, NY
Environmental Analyst for the Interim Remedial Measures implemented to satisfy the conditions of the site's Brownfield Cleanup Agreement. The project is ongoing and includes removal of all source area and grossly contaminated soil and groundwater present as a result of the site being an oil distribution facility. Following the remediation phase, the site will be redeveloped into several apartment buildings and a restaurant.

Brownfield Cleanup Program | Former Photech Imaging | City of Rochester
Rochester, NY
Conducted pre-demolition asbestos and hazardous/ contaminated material surveys, sampling, and waste characterization in support of demolition bid package preparation. Assisted in bid package preparation and review of bids. Coordinated sample and relocation of ~1,200 cubic yards of soil to the Site to be used as backfill

Seth Davis, MS

in accordance with the imported fill sampling requirements in NYSDEC DER-10. Provided oversight during the final remediation phase, which included construction management as well as environmental screening and sampling. In addition, Seth generated the final reporting as required by the NYSDEC, which included preparation of the Final Engineering Report and Site Management Plan.

Remedial Action Implementation | Unity Hospital
Rochester, NY
Oversight of remedial action implementation for over 750 ft of drainage channel impacted with high levels of petroleum. Performed sediment sampling and characterization, and managed remedial excavation and disposal and follow-up sampling.

Native Soil Characterization | Unity Hospital
Rochester, NY
Developed plan, implemented sampling program and prepared report for characterization of potential pesticide contamination of soil within the footprint of an excavation proposed stormwater retention pond. The site was a former agricultural and orchard area, and the excavated soil was slated for offsite usage by the Town of Greece. Contaminants of concern included pesticides, arsenic and heavy metals.

Voluntary Cleanup Agreement Project | Ultralife Corporation
Newark, NY
Environmental Analyst for remedial action implementation to satisfy the conditions of the site's Voluntary Cleanup Agreement. Included excavation and disposal of impacted sediment from approximately 400 ft of drainage channels, and restoration that included backfilling, erosion and sedimentation control measures, seeding to re-establishing native vegetative species diversity, long-term monitoring, and preparation of Final Engineering Report and Site Management Plan.

Phase II Environmental Site Assessment | City of Rochester | 51 Chili Ave.
Rochester, NY
Environmental Analyst for the investigation of potential underground storage tanks. This project involved overseeing the excavation of test pits to investigate anomalies discovered during a geotechnical investigation, overseeing the decommissioning and removal of two underground storage tanks, and conducting a geoprobe and overburden groundwater sampling program to delineate impacts from the former underground storage tanks.

Supplemental Phase II Environmental Site Assessment | Wal-Mart #2107-02
Lockport, NY
Assisted with the excavation of test pits to investigate anomalies identified during a geotechnical investigation.

Phase II Environmental Site Assessment | 2485 Harlem Road
Cheektowaga, NY
Environmental Analyst for the investigation of potential contaminants related to the historical use of the site as a dry cleaner. The project involved four test borings and two groundwater monitoring wells in areas of concern as identified in a previous Phase I ESA.

Phase II Environmental Site Assessment | Beck's Recycling
Shortsville, NY
Assisted with groundwater sampling and test pit excavation to investigate contamination associated with the Sites use as a scrap metal yard.

Pre-construction/pre-demolition Asbestos Surveys | NYSDOT
Various Locations
Assisted with asbestos surveys on bridges throughout western NY prior to scheduled construction or demolition.

Transformer Oil Spill Remediation | Dansville Properties Dansville, NY
Conducted soil sampling, oil sampling and waste characterization in response to a transformer oil spill. Also assisted with remedial actions to excavate impacted soil and prepared documentation to gain closure of the spill.

LABELLA Associates, D.P.C.

Relationships. Resources. Results.

Ann Aquilina, EIT

Ann is an Engineer in Training responsible for assisting with Phase II Environmental Site Assessments (ESAs) and environmental remediation projects. Project experience includes conducting Phase I ESAs, Phase II ESAs including soil and groundwater sampling and reporting, data management and analysis, and creating site maps and conceptual site models using geographic information system (GIS). Ann is 40 hour OSHA HAZWOPER certified.

Project Experience

Former Emerson Street Landfill, City of Rochester, Rochester, New York
Developed and implemented remedial investigation work plans for a former landfill including soil and groundwater sampling, reporting, and GIS data management. Developed a Delisting Petition for a portion of the NYSDEC Listed Inactive Hazardous Waste Disposal Site.

Phase II Environmental Site Assessment, 177 University Avenue, City of Rochester, Rochester, New York
Conducted a Phase II ESA to delineate subsurface contamination in soil and groundwater. Conducted soil boring logging, soil and groundwater sampling, reporting, and GIS data management.

Institutional Control Program, City of Rochester Rochester, New York
Collected and developed Site Management Plans and site maps for over 175 properties in the City of Rochester with previous environmental investigations and/or remediation. Created a database for properties with environmental related institutional controls consisting of property information and Site Management Plans for use on the City of Rochester's website.

Canandaigua Multi-Brownfield Site, Canandaigua, New York
Conducted a design phase investigation to define interim remedial measures for an approximate 15 acre site in the NYSDEC Brownfield Cleanup Program. Was responsible for soil boring logging, soil sampling, GIS data management, and developing a, interim remedial measures work plan addendum.

Engineer In Training

- Stevens Institute of Technology:
  B.Eng., Environmental Engineering,
  Minors in Green Engineering and Science Communication

Certification / Registration

- Engineer In Training; National Council of Examiners for Engineering and Surveying
- 40-hour OSHA HAZWOPER Certified

Professional Affiliations

- American Academy of Environmental Engineers and Scientists (AAEES)

Waste Minimization Plan, MTA New York, New York
Developed a waste minimization plan report for a large quantity generator by analyzing quantities and types of waste streams. Compared annual data from previous years and compiled tables to display data in a detailed report.

Pump and Treat Groundwater Treatment System, City of Rochester, Rochester, New York
Compiled annual reports for a groundwater treatment system in order to meet regulatory agency requirements. Compiled and interpreted over a decade worth of analytical data to create graphs and identify emission and concentration trends over time. Compiled graphs and summarized findings into detailed reports.

Ann Aquilina, EIT

Phase II Environmental Site Assessment, 131 Water Street, Penn Yan, New York
Completed a Phase II ESA at a former automobile repair shop. Ann was responsible for soil boring logging, soil and groundwater sampling, GIS data management, and reporting.

Pre-Development Site Assessment, Kodak Park South, Rochester, New York
Conducted a pre-development site assessment for an approximate 122 acre former industrial site. Was responsible for soil and groundwater sampling and GIS data management. Organized the findings of this study and previous environmental studies conducted at the site in a detailed report.

Phase II Environmental Site Assessment, 310 Lyell Avenue, Rochester, New York
Completed a Phase II ESA at a portion of the former Rochester Subway and Canal. Researched historic documentation in order to select soil boring and test pit locations. Conducted soil boring logging, soil and groundwater sampling, GIS data management, and reporting.

Relationships. Resources. Results.

Alexander Brett, EIT

Alex Brett is an Engineer in Training (EIT) in LaBella's Phase II and Brownfield Group. He is responsible for the successful completion of environmental investigation and remediation projects. His experience includes environmental field work, including soil and groundwater sampling, fieldwork oversight, and project reporting.

Environmental Engineer

- University at Buffalo: BS, Environmental Engineering
- Engineer in Training
- 40 Hour OSHA HAZWOPER Certified
- RCRA & DOT Hazardous Waste Shipping Training
- Erosion & Sediment Control Training

Project Experience

Field Activities:
-Low-flow groundwater sampling utilizing bladder and peristaltic pumps.
-Soil sampling and logging using direct push drilling rigs
-Monitoring well installation oversight
-SVI sampling

Monroe Hollywood Collision: 1821 Monroe Avenue—Brighton, NY
Conducted low-flow peristaltic groundwater sampling as part of scheduled quarterly groundwater monitoring.

Corning Hospital NYSDEC BCP Site:
176 Denison Parkway– Corning, NY
Performed low-flow peristaltic groundwater sampling for onsite wells for two separate sampling events. Provided CAMP monitoring for Site demolition activities.

Former Unisys Site Groundwater Monitoring—Lake Success, NY*
Coordinated quarterly groundwater sampling rounds and conducted low-flow bladder pump groundwater sampling according to the Site Sampling and Analysis Plan. Prepared quarterly OMM reports for onsite treatment systems ensuring proper operation.

NYSDEC: Al Tech Specialty Steel , Watervliet, NY*
Conducted low-flow groundwater sampling as part of the annual groundwater monitoring requirement using peristaltic pumps. Conducted the inspection of the landfill looking at the condition of the cover and drainage system. Also inspected the treatment system for the condition of the storage tanks and operational controls.

Confidential Client: Site Demolition & Restoration—Green Island, NY*
Construction manager of site demolition and restoration activities. Restoration included placement of a 40 mil HDPE liner over the former slab location of a previously demolished building to prevent infiltration of water pending further investigation into the subsurface. Responsible for proper shipment of hazardous wastes associated with a previous building demolition. Oversaw the demolition and asbestos abatement of a former steel baghouse containing ACM gaskets.

Confidential Client: Facility Decommissioning & Restoration—Niskayuna, NY*
Provided oversight of contractors for multiple activities including asbestos abatement, and facility cleaning/restoration. The facility restoration included concrete fixes, removing oil from trenches followed by cleaning the trenches, and cleaning floors and beams. Worked directly with on-site employees to ensure proper waste characterization, and scheduling for disposal of wastes. Compiled all project documents and wrote the final decommissioning and restoration report for the site.

*Completed under previous employment

Alexander Brett, EIT

Confidential Client: Nail Creek Sampling—Utica, NY*
Assisted the project manager with oversight and sampling of soil and sediments to be analyzed for PCBs as part of the remedial investigation. Samples were located in a stream channel armored with large loose-fit limestone blocks and next to a highway interchange. Samples were recovered using a Geoprobe in soils surrounding the channel, and undisturbed sediments beneath the large blocks by angling the Geoprobe or by drilling directly through the rocks. Used a hand auger to collect additional soil samples in the stream channel where no rock was present.

Confidential Client: Sludge Drying Beds—Selkirk, NY*
Oversaw contractors to determine the flow path of two sludge drying beds on the site. Oil and water mixture was pumped out of distribution chamber that acted as an oil water separator. Dyed water was added to the each sludge drying bed separately to confirm it drained to the chamber. The dyed water level was raised to find the outlet of the chamber. The tank edges were excavated and a new tank entrance was found to determine that both beds entered the chamber though a single pipe.

Confidential Client: Beacon Park Containment Delineation—Allston, MA*
Contractor oversite of vacuum excavation to a depth of 5 feet to clear boring locations for utility lines and other obstructions using an air vacuum excavation truck. Marked out new boring locations and confirmed new location with the project manager. Oversight of direct push soil borings using a Geoprobe. Logged all soils from borehole locations, collected headspace PID readings, and collected soil samples at designated depth intervals as required to find the extent of impacted soils for the site investigation. Provided daily updates of work progress to project manager.

*Completed under previous employment

Steven Rife

Steven is a Project Geologist with LaBella's Environmental Division and is primarily involved with field operations for Phase II Environmental Site Assessments. He has more than 2 years of geology experience in related field work including shallow overburden soil sampling, bedrock mapping, basic surveying, and well logging on deep natural gas wells. When in-house, he also assists with GIS mapping, laboratory sample logistics, and report synthesis.

Steven coordinates with senior Project Managers, Engineers and Geologists to implement site-tailored remediation plans pursuant to the objectives of the client. Working closely with environmental construction personnel, he is most commonly involved with DPT soil core sampling and screening using a Geoprobe 54-LT unit and PID.

Project Geologist, Environmental Division

- State University of New York at Fredonia: BS, Geology

Certification / Registration

- Certified Hazardous Waste Operations & Emergency Response (40 Hour OSHA Health and Safety Training (29 CFR 1910.120)
- PEC Safe Land USA Oilfield Training
- PEC Globally Harmonized System HazCom Training
- Professional Member: GSA, AAAS

Project Experience

Phase II Environmental Site Assessments

1777 East Henrietta Road | Getinge, USA | Henrietta, NY
Member of the Environmental Geology team responsible for planning and field investigation on this large industrial site with multiple REC's. Oversaw implementation of soil borings that were advanced on the interior and exterior of the facility and overburden monitoring wells installed to characterize potential impacts. Coordinated with project manager to give best data coverage representation for our client, the buyer.

1821 Monroe Avenue | Monroe Hollywood Collision| Brighton, NY
Worked closely with Senior Environmental Geologist on a DEC mandated bedrock interface well installation operation. On-site work consisted of: property owner coordination, drilling contractor oversight, soil contamination screening, RQD rock core determination, well installation, SWL measurement, well location surveying, and low-flow peristaltic groundwater sampling. Used ArcGIS to map previous report well locations and model groundwater flow based on SWL readings.

182 Avenue D | Urban League of Rochester | Rochester, NY
Advanced borings in a direct push study to characterize the extent of SVOC contamination detected in a previous LaBella Phase II. Coordinated aspects of site utility stakeout with the Monroe County Water Authority.

7185 West Main Road | Client Proposed ATM Site | LeRoy, NY
Sole project geologist tasked with a soil boring investigation designed to detect a potential groundwater VOC plume that may have resulted from an automotive facility to the south of the parcel. Handled all aspects of the project from preliminary GIS mapping, securing equipment, and proper sample collection.

UST Contamination Investigations

120 Main Street | Historical UST Location| Geneseo, NY
Supervised a UST Geoprobe soil investigation to characterize the nature and extent of a VOC plume from a historical automobile refueling station. Predicted groundwater flow direction against adjacent structure and collected supporting quantitative evidence.

Horizon Well Logging,
(9 Months: 2013)

Steve worked as a Self-Supervising Logging Geologist, providing real time well-site lithologic identification, well logging, and hydrocarbon monitoring with a gas chromatograph. After four months, Steve was promoted to lead logger, and worked to train two staff members under him.

Field Soil Sampling | Cornell University
(4 Months: 2012)

Steve used a 0-30 cm basic DPT probe to sample soil cores at select commercial agricultural sites in Tompkins County as part of a USDA funded soil carbon inventory project. Steve updated the Cornell Climate Change website by interviewing faculty about their current research.

APPENDIX 3

Health and Safety Plan

LABELLA
Associates, D.P.C.

Site Health and Safety Plan

Location:

Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York

Prepared For:

Highland Grove, LLC
301 Exchange Street
Rochester, New York 14608

LaBella Project No. 2172056

November 2017

Table of Contents

SITE HEALTH AND SAFETY PLAN

Project Title:	Former Sherwood Shoe Factory - Brownfield Cleanup Program
Project Number:	2172056
Project Location (Site):	625 South Goodman Street, Rochester, NY 14607
Environmental Director:	To Be Determined
Project Manager:	To Be Determined
Plan Review Date:	October 5, 2017
Plan Approval Date:	October 12, 2017
Plan Approved By:	Mr. Richard Rote, CIH
Site Safety Supervisor:	To Be Determined
Site Contact:	Mr. Steve DiMarzo
Safety Director:	To Be Determined
Proposed Date(s) of Field Activities:	To Be Determined
Site Conditions:	1.798± acres; Site is currently undeveloped.
Site Environmental Information Provided By:	❑ *Phase I Environmental Site Assessment (ESA)*, completed by Stantec, December 2012; ❑ *Phase II ESA*, completed by Stantec, October 2016 ❑
Air Monitoring Provided By:	To Be Determined
Site Control Provided By:	Contractor(s)

EMERGENCY CONTACTS

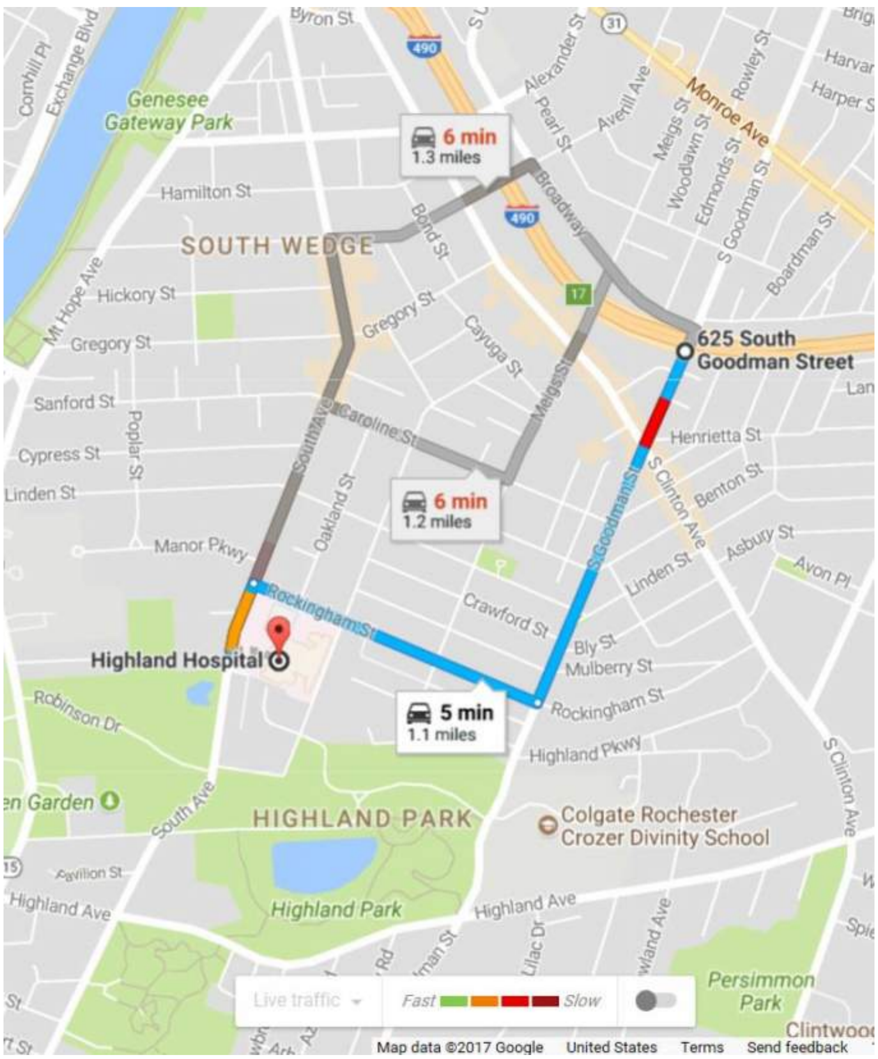
	Name	Phone Number
Ambulance:	As Per Emergency Service	911
Hospital Emergency:	Highland Hospital	585-473-2200
Poison Control Center:	Finger Lakes Poison Control	716-275-5151
Police (local, state):	Rochester Police Department	911
Fire Department:	Rochester Fire Department	911
Site Contact:	Mr. Steve DiMarzo	585-232-1760
Agency Contact:	NYSDEC – Ms. Charlotte Theobald NYSDOH – To Be Determined	585-226-5354 To Be Determined
Environmental Director:	To Be Determined	To Be Determined
Project Manager:	To Be Determined	To Be Determined
Site Safety Supervisor:	To Be Determined	To Be Determined
Safety Director	To Be Determined	To Be Determined

MAP AND DIRECTIONS TO THE MEDICAL FACILITY - HIGHLAND HOSPITAL

Total Est. Time: 5 minutes **Total Est. Distance:** 1.1 miles

1:	Start out going SOUTHWEST on SOUTH GOODMAN ST toward EISENBERG PLACE	0.5 miles
2:	Turn RIGHT onto ROCKINGHAM STREET	0.4 miles
3:	Turn LEFT onto SOUTH AVENUE	0.1 miles

End at **1000 South Avenue**
Rochester, NY 14620



Source: Google Maps 2017

1.0 Introduction

The purpose of this Health and Safety Plan (HASP) is to provide guidelines for responding to potential health and safety issues that may be encountered during the Remedial Investigation (RI) at the Former Sherwood Shoe Company, 625 South Goodman Street in the City of Rochester, Monroe County, New York (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. This document's project specifications, and the Community Air Monitoring Plan (CAMP), are to be consulted for guidance in preventing and quickly abating any threat to human safety or the environment. The provisions of the HASP do not replace or supersede any regulatory requirements of the USEPA, NYSDEC, OSHA or other regulatory bodies.

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 and remediation activities
- 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 Safety Officer has responsibility for site safety and his instructions must be followed.

5.1 Hazards Due to Heavy Machinery

Potential Hazard:
Heavy machinery including trucks, drilling rigs, trailers, 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. Excavations 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. Subsequently, approved personnel are to receive authorization for entry from the Site Safety Officer. Approved personnel are not to enter excavations over 4 feet in depth unless excavations are adequately sloped. 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. Do not proceed closer than 3 feet to an unsupported or non-sloped excavation side wall.

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 and 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:
The Project Manager is responsible for making First Aid supplies available at the work site to treat minor injuries. The Site Safety Officer is responsible for arranging the transportation of authorized on-site personnel to medical facilities when First Aid treatment in not sufficient. Do not move seriously injured workers. All injuries requiring treatment are to be reported to the Project Manager. Serious injuries are to be reported immediately to the Site Safety Officer

5.4 Injury Due to Exposure of Chemical Hazards

Potential Hazards:
Contaminants identified in testing locations at the Site include various petroleum-related volatile organic compounds (VOCs). Volatile organic vapors, chlorinated solvents or other chemicals may be encountered during subsurface activities at the project work site. Inhalation of high concentrations of volatile 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 are 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.

6.0 Work Zones

In the event that conditions warrant establishing various work zones (i.e., based on hazards - Section 5.0), 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 procedure listed below. Air monitoring instruments will be calibrated and maintained in accordance with the manufacturer's specifications.

The Air Monitor will utilize a photoionization detector (PID) to screen the ambient air in the work areas (drilling, excavation, soil staging, and soil grading areas) for total Volatile Organic Compounds (VOCs) and a DustTrak tm Model 8520 aerosol monitor or equivalent for measuring particulates. Work area ambient air will generally be monitored in the work area and downwind of the work area. Air monitoring of the work areas and downwind of the work areas will be performed at least every 60 minutes using a PID and the DustTrak meter.

If sustained PID readings of greater than 25 ppm are recorded in the breathing zone, either personnel are to leave the work area until satisfactory readings are obtained 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-hour 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 downwind PID measurements reach or exceed 25 ppm consistently for a 5 minute period downwind of the work area, PID readings will be taken within the buildings (if occupied) on Site to ensure that the vapors are not penetrating any occupied building and effecting the personnel working within. If the PID measurements reach or exceed 25 ppm within the nearby buildings, the personnel should be evacuated via a route in which they would not encounter the work area. The building should then be ventilated until the PID measurements within the building are at or below background levels. It should be noted that the site buildings are currently vacant.

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, wait at the assigned 'safe area' and follow the instructions of the Site Safety Officer.

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 remedial 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 4

Quality Control Plan

Quality Control (QC) Program

Location:

Former Sherwood Shoe Company
625 South Goodman Street
Rochester, New York

Prepared For:

Highland Grove, LLC
301 Exchange Street
Rochester, New York 14608

LaBella Project No. 2172056

November 2017

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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., 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 may 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 in four-foot or five-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. Any investigative derived waste generated during the advancement of soil borings and monitoring well installations will be containerized and characterized for proper disposal.

Hollow-Stem Auger Advanced Soil Borings:

The drilling and installation of soil borings and monitoring wells may 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/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. 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 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 completed with the hollow-stem auger 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.

If 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. It should be noted that the installation of bedrock wells is not currently planned for this Site.

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 12 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 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., 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 in one of two ways; active or passive.

Active Sampling:

Purging will be completed prior to active sampling. 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.

Passive Sampling:

Groundwater samples will be collected via passive methods (i.e., no-purge) according to the following procedures and in the volumes specified in Table 11-1:

- Samples will be collected via passive diffusion bag (PDB) samplers. PDB samplers are made of low-density polyethylene plastic tubing (typically 4 mil), filled with laboratory grade (ASTM Type II) deionized water and sealed at both ends.
- PDB samplers will only be used to collect groundwater samples which will be analyzed for VOCs.
- PDB samplers will be deployed by hanging in the well at the middle of the well screen unless a low water table, need to deploy multiple samplers or the targeting of a specific depth interval is identified. The PDB samplers will be deployed at least 14 days prior to sampling.
- The PDB samplers will be deployed using a Teflon® coated string or synthetic rope.
- When transferring water from the PDB to sample containers, care will be taken to avoid agitating the sample, since agitation promotes the loss of volatile constituents;
- Any observable physical characteristics of the groundwater (e.g., color, sheen, odor, turbidity) at the time of sampling will be recorded; and
- Weather conditions (i.e., air temperature, sky condition, recent heavy rainfall, drought conditions) at the time of sampling will be recorded.

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 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.

10.0 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;
- Rinsed; and
- Allowed to air dry.

11.0 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 11-1
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	7 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	6 months
Cyanide	500-ml polyethylene	One (1); fill completely	Cool to 4° C (Sodium hydroxide to pH >12, plus 0.6 grams ascorbic acid)	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 11-2
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)	7 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
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 11-3
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

12.0 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.

12.1 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.

12.2 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.

12.3 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.

12.4 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.

12.5 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.

12.6 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.

12.7 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.

13.0 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 Remedial 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.

14.0 Documentation

14.1 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-DDMMYYYY

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.
DDMMYYYY:	This set of initials indicates the date the sample was collected

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

14.2 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.
- 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.

15.0 Corrections to Documentation

15.1 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.

15.2 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.

15.3 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;

16.0 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.

16.1 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.

16.2 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.

16.3 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.

17.0 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.

18.0 Field Instrumentation

18.1 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.

18.2 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.

18.3 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.

18.4 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".

19.0 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.

19.1 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:

19.2 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.

19.3 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.

19.4 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.