NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 8
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June 8, 2020

Steve DiMarzo
Highland Grove LLC
301 Exchange Boulevard
Rochester, New York 14608

Re: Remedial Action Work Plan
Former Sherwood Shoe Company
Site No.: C828201
City of Rochester, Monroe (C)

Dear Mr. DiMarzo:

The New York State Department of Environmental Conservation (Department) in conjunction with the New York State Department of Health (NYSDOH) (collectively known as the State) have completed a review of the November 2019 Remedial Action Work Plan (RAWP) submitted for the Former Sherwood Shoe Company site (Site) located at 625 South Goodman Street, City of Rochester.

Based on the information presented in the RAWP, the Department is conditionally approving the RAWP with the following modifications and clarifications.

1. DER-10 Chapter 3, section 3.5.1 defines surface soil sampling as soil samples collected from the 0-2 inch or 0-6 inch interval. Whereas, for restricted-residential use the Department defines existing soil cover sampling as soil samples collected from the 0-2 feet interval as per the Department's Soil Screening Guidance.

   The Department understands that the existing soil cover is defined as the Site's soil/fill cover material at the Site prior to any Site development activities. Therefore, in Section 2.1, page 3 of the draft RAWP, the Department understands that the reference to surface soil sampling in the last bullet is referencing existing soil cover sampling as per the definition above. The existing soil sampling was conducted during the Site's remedial investigation to determine if the Site's existing soil/fill material within the 0-2 feet interval met the Site's soil cleanup objectives and potentially an acceptable component of the Site's final cover system.

2. In Section 2.1 on page 4 of the draft RAWP, the Department understands that the references to metal analyses is as follows: composite soil samples are TAL metals and bedrock groundwater are RCRA metals.

3. In Section 2.2 on page 5 - For AOC #5 the last sentence states *"This excavation work included a large volume of shallow soils from the areas in which elevated PFAS concentrations were identified."* The as-built drawing, Figure 4A, documenting the depths of soil removals in the revised March 2020 CCR presents the soil areas and the associated removal depths of 2 inches, 0.92 ft. 1 ft., 1.32 ft., 2 ft., and 3.23 ft. The validated remedial investigation PFAS data shows that the highest concentrations of PFAS (2 ppb to 4.07 ppb) are located within the 0-1-foot interval of the Site's existing soil/fill material. Given that only 2 areas of the Site had existing

Site soils were excavated to a depth that would address the PFAS impacts, not all PFAS impacted soil has been removed from the Site.

The 2 to 4.07 ppb of PFAS exceeds 1 ppb - the acceptable limit for soil to be imported to a site as a component of a final soil cover system. Documentation provided to the State clearly shows that in areas designated as green space, existing Site soils are considered to be a component of the Site's final cover system. In order for the Site soils in the green space areas to be acceptable final cover system material, the State is requesting that Synthetic Precipitation Leaching Procedure (SPLP) testing is conducted. The SPLP testing must show that the Site soils does not exceed 10 ppt for either PFOA or PFOS (individually). The sampling will be conducted in accordance with the Department's current PFAS titled "Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Remedial Programs, dated January 2020."

In addition, the Department's review of Figure 5 of the draft Final Engineering Report dated December 2019 indicates that pavers are going to be installed as part of the Site's final cover system. If paver stones are to be installed at the Site as part of the final cover system, a fabric layer must be placed, and polymeric sand (or equivalent) must be used to set and seal the pavers into place.

4. The State understands that the sub-slab depressurization system installation activities, the performance monitoring, and as-built drawings will be documented in the Site's Final Engineering Report.

5. The State also understands that the newly installed groundwater monitoring well at the Site will be documented in the Final Engineering Report.

6. Section 4.0, page 7 presents the final remedy for the Site. The Site's final remedy is presented in the Department's issued Decision Document dated June 2020.

7. The Special CAMP will be implemented at the Site for all fieldwork activities as the apartment complex building is occupied with tenants.

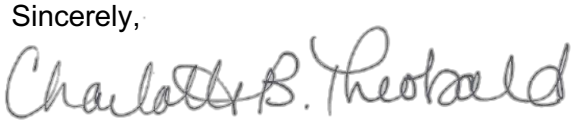
Within fifteen (15) days of the date of this letter the Applicant must elect in writing (electronic notification is acceptable) one of the following options:

- Option A: Accept the Department modified work plan;
- Option B: Invoke dispute resolution as set forth in 6 NYCRR Part 35-1.5(b)(2); or
- Option C: Terminate the Brownfield Cleanup Agreement in accordance with 6 NYCRR Part 375-3.5.

If the Applicant chooses to accept Option A then this letter becomes part of the accepted Remedial Action Work Plan. Also, if Option A is chosen then a copy of the accepted Remedial Action Work Plan along with this letter attached must be placed in the document repository within 1 week of the document repository re-opening from COVID-19 shutdown. Please provide notification to the Department that the Remedial Action Work Plan and a copy of this letter have been placed in the document repository (electronic notification is acceptable).

If you have any questions or concerns regarding this letter, the BCP requirements, or need further assistance with the Site, please feel free to contact me at 585-226-5354 or via e-mail at charlotte.theobald@dec.ny.gov.

Sincerely,



Charlotte B. Theobald
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Remedial Action Work Plan
RAOC #1 & RAOC #5 Cover System
NYSDEC BCP Site #C828201

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 2019

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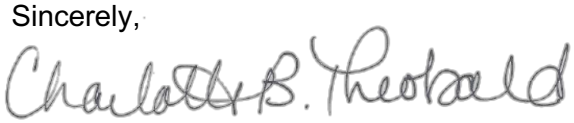

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CERTIFICATION

I DANIEL NOLL certify that I am currently a NYS registered professional engineer and that this Remedial Action 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).

081996	11/13/19	
NYS Professional Engineer #	Date	Signature

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1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP) details remedial actions to be implemented at 625 South Goodman Street, City of Rochester, Monroe County, New York, hereinafter referred to as "the Site". The Site is part of the Brownfield Cleanup Program (BCP) and designated as Site #C828201. The Volunteer entered into a Brownfield Cleanup Agreement with the New York State Department of Environmental Conservation (NYSDEC) dated March 2018 (Index number C828201-02-18). A Site Location Map is included as Figure 1.

LaBella Associates, D.P.C. ("LaBella") completed a Remedial Investigation (RI) on behalf of Highland Grove LLC at the Site in December 2018 and submitted a RI Report to the NYSDEC in March 2019. A Remedial Alternatives Analysis (RAA) evaluated viable remedial technologies for Remedial Areas of Concern (RAOC). This RAWP details the remedial alternatives selected for the Site and provides details regarding the final cover system.

1.1 *Site Description*

The Site is comprised of an approximately 1.798± acre tax parcel (SBL 121-650-0002-039.000/0000 RY) that is currently undergoing redevelopment and is to be redeveloped with an apartment building and associated parking lots.

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.

1.2 *Site History*

The Site appears to have been 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 early 1970s following a fire. 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). The City of Rochester Fire Department also appears to have intermittently utilized the Site for training purposes.

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. 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. 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. 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.
- 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.

1.3 *Pre-BCP Investigations*

The following pre-BCP investigation reports have been prepared for the Site:

- Phase I ESA, by Stantec dated December 2012
- Phase II ESA, by Stantec dated October 2016

1.3.1 Phase I ESA by Stantec, dated December 2012:

A Phase I ESA report completed by Stantec for the Site in December 2012 identified several Recognized Environmental Conditions (RECs) at the Site. Specifically, RECs were identified associated with the following items:

- Potential for historical uses of the Site to have resulted in releases to the soil or groundwater. Specifically, between the early 1900s and the early 1970s operations at the Site have reportedly included oil and dye storage; chemical storage; a waste house and coal bin; shoe cutting, fitting, packing and shipping; a laundry; tool/gear manufacturing; machine shops; and, printing.
- Former presence of the 6,000-gallon #2 fuel oil UST documented in City of Rochester permit mapping dated 1967. This tank appears to have located in the center of the Site closer to the eastern side of the Site.
- 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.

1.3.2 Phase II ESA, by Stantec, dated October 2016:

In September-October 2016, Stantec completed a Phase II ESA at the Site. The Phase II ESA was conducted to evaluate RECs identified during the Phase I ESA conducted by Stantec in 2012.

Stantec's Phase II ESA identified elevated concentrations of SVOCs, 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. 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) at a depth of 3.5 feet. 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 borings KU-B-4, KU-B-9 and KU-TP-C.

TCE and cis-1,2-dichloroethene (cis-1,2-DCE) were detected above NYCRR Part 703 Groundwater Quality Standards in samples from well KU-MW-9 (located approximately 20-ft north of TP-G; refer to Figure 3). 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. The Groundwater Quality Standard for both of these compounds is 5 ug/L. The source of the CVOC impacts in this area is unknown; however, historical Site operations including machining and manufacturing may have utilized chlorinated solvents.

2.0 SUMMARY OF REMEDIAL INVESTIGATION

This section summarizes the investigation work completed at the Site and associated findings.

2.1 *Remedial Investigation Work*

A Remedial Investigation Work Plan was approved by the NYSDEC in May 2018 and a subsequent addendum Remedial Investigation Work Plan was approved by the NYSDEC in February 2019. RI activities were completed between May 31, 2018 and February 15, 2019. RI activities completed consisted of the following:

- Installation of four (4) soil vapor sampling points and collection of four (4) soil vapor samples as well as one (1) outdoor air sample.
- Advancement of twenty-seven (27) overburden soil borings.
- Advancement of ten (10) test pits.
- Advancement of (3) three borings into bedrock and installation of three (3) bedrock wells.
- Installation of nine (9) overburden wells.
- Decommissioning of five (5) overburden wells.
- A total of thirty-three (33) surface soil samples were collected from fourteen (14) locations.

The following analyses were performed during the Remedial Investigation:

- Four soil vapor samples and one (1) outdoor air for VOCs
- Eighteen (18) discrete surface soil samples for VOCs
- Fifteen (15) composite surface soil samples for SVOCs, metals, pesticides, PCBs and cyanide
- Six (6) subsurface soil samples for full-suite parameters
- Three (3) subsurface soil samples for SVOCs, metals and cyanide only.
- Fourteen (14) subsurface soil samples for VOCs only.
- Thirty (30) test pit soil samples for PFAS only.
- Two (2) bedrock groundwater sample of VOCs and PFAS only.
- One (1) bedrock groundwater sample for VOCs, SVOCs, metals, PCBs and PFAS
- Two (2) overburden groundwater samples for full-suite parameters and PFAS
- One (1) overburden groundwater samples for VOC and PFAS only.
- Two (2) overburden groundwater samples for VOCs only.

2.2 *Remedial Investigation Findings*

Areas of Concern (AOCs) were identified during previous investigations, defined in the RI Work Plan as AOC #1 and AOC #2. During the RI, three (3) additional AOCs were discovered and added to the investigation as they were encountered. The cumulative findings of the pre-BCP testing and the RI identified the following five (5) AOCs at the Site.

AOC #1: Fill Material*:* Urban fill material consisting of ash, cinders, slag and construction and demolition debris consisting of bricks, concrete, wood, glass, metal scraps and asphalt millings have been encountered in several locations throughout the site. Data collected during the pre-BCP investigation and the RI identified concentrations of PAHs and metals including lead, mercury, cadmium, silver and zinc above one or more of the Site's soil SCGs. Fill material was identified in numerous investigation locations throughout the Site. This fill material ranged in depth from 0 to 10-ft bgs, *prior* to the completion of redevelopment activities. These redevelopment activities included the excavation and landfill disposal of 13,266.44-tons of material, largely generated during Site grading and building footer installation. Much of this material consisted of the urban fill identified in AOC #1.

AOC #2: Central-Eastern CVOC impacts*:* CVOC impacts (i.e., TCE and breakdown products) were identified in the Phase II ESA by Stantec dated October 2016 immediately south of the former footprint of the main site building. CVOCs were identified in the groundwater exceeding Part 703 Groundwater Quality Standards and in soil exceeding Unrestricted and Protection of Groundwater SCOs. CVOCs are often associated with machining and manufacturing operations, similar to operations which historically occurred at the Site. Data collected during the RI identified similar levels of CVOC impacts to groundwater in this area of the Site.

AOC #3: Northwestern CVOC Impacts: CVOC impacts (i.e., PCE and breakdown products) were identified during the RI fieldwork in the northwestern portion of the Site in overburden groundwater exceeding Part 703 Groundwater Quality Standards. In addition, sampling of stockpiled soil generated from this area during redevelopment activities identified PCE in at least one (1) location in soil exceeding Unrestricted Use SCOs; subsequent investigation in this area did not identify additional elevated levels of PCE. Lower level CVOCs were detected in bedrock groundwater in the area below Part 703 Groundwater Quality Standards. This

area of the Site was specifically investigated based on the former "laundry" identified on historical mapping, although it is uncertain if this "laundry" included the usage of dry cleaning chemicals such as PCE.

AOC #4: Off-Site Petroleum Impacts Migrating on-Site: Petroleum related compounds were detected in groundwater in the southwestern corner of the property above Part 703 Groundwater Quality Standards. In addition, petroleum related odors were noted just above top of rock and LNAPL was initially observed in bedrock groundwater after installation and development of bedrock well RIBW-02. Following initial installation/development, LNAPL was not observed in RIBW-02. A lighter petroleum odor was also noted in RIBW-01 during development and sampling. RIBW-01 is hydrologically down-gradient of RIBW-02. A filling station was present at a property addressed as 846 South Clinton Avenue just southwest of the Site, approximately 55-ft from the edge of the Site from at least 1938 to at least 1958. NYSDEC Spill Listing #9713875 indicates petroleum contamination was previously identified at this adjacent property. In addition, another gasoline filling station approximately 250-ft up-gradient of the Site to the southwest and addressed as 809 South Clinton Avenue has been present from at least 1950 to the current day. An automotive repair facility addressed as 849 South Clinton Avenue just southwest of the Site has been present from at least 1960 to current day. All of these locations are hydraulically up-gradient of the Site based on groundwater flow contours modeled as part of the RI.

AOC #5: Poly- and Per-fluorinated Alkyl Substances (PFAS) Impacts: PFAS impacts were identified during the RI fieldwork in the central-eastern and southeastern portion of the Site in groundwater and in surface soils, with the highest concentrations identified in the top 1-ft of soils. Although there are no NYSDEC comparison criteria for PFAS in soil or groundwater, one (1) sample from one (1) well (i.e., overburden monitoring well RIMW-06) did have a concentration of 83 ng/L total PFOA and PFOS, which is above the USEPA Drinking Water Health Advisory Level of 70 ng/L for these compounds. During the RI fieldwork, the City of Rochester Fire Department was observed spraying alcohol resistant aqueous film forming foam (AR-AFFF) in this portion of the Site as part of training exercises. The extent of these exercises prior to this observation is unknown. LaBella personnel informed the Fire Department that the property is owned by a private company and in the Brownfield Cleanup Program. The Fire Department indicated they were unaware of this and said that they would no longer use the property for training purposes. Redevelopment activities included the excavation and landfill disposal of 13,266.44-tons of material, largely generated during Site grading and building footer installation. This excavation work included a large volume of shallow soils from the areas in which elevated PFAS concentrations were identified.

2.3 *Redevelopment Activities*

Earthwork activities completed at the Site were conducted in accordance with the NYSDEC-approved ISMP for the Site dated April 2018. This work is detailed in the June 2018 Construction Completion Report, submitted under separate cover. The primary objective of ISMP implementation was to properly characterize, manage and determine terminal points (e.g., on-site reuse, landfill disposal, etc.) of soil disturbed as part of redevelopment activities at the Site. This work also included implementation of the Community Air Monitoring Plan (CAMP) and the installation of a sub-slab depressurization system (SSDS) in the future building.

The following key activities were completed as part of the ISMP implementation between October 2018 and April 2019:

- Excavation and landfill disposal of approximately 13,266.44 tons of soil and fill material. Based on the identification of contaminants of concern in these materials as part of the RI and the planned reuse of the Site, these materials were transported to Seneca Meadows Landfill in Waterloo, New York between November 2018 and April 2019.
- Re-use of approximately 1200 cubic yards (CY) of soil following sampling in accordance with DER-10 and NYSDEC approval.
- Importation of 192.4-tons of crusher run #1; 5,691.87-tons of crusher run #2; 427.61-tons of crusher run #1/#2 blend; 946.74-tons of #1/#2 blend washed stone; 32.34-tons of #1 washed stone; and 565.35-tons of #2 washed stone from The Dolomite Group quarry in Rochester, New York following NYSDEC approval. Note that these materials are exempted from sampling per DER-10.
- Importation of 50-CY of sand from Valley Sand and Gravel in Caledonia, New York following sampling in accordance with DER-10 and NYSDEC approval.
- Implementation of the CAMP during all earthwork activities including but not limited to excavation, backfill and grading.
- Documentation of the installation of the sub-slab portions of the SSDS based on the NYSDEC-approved SSDS Work Plan dated November 26, 2018 and revised February 12, 2019. The Site building is still under construction and the SSDS is expected to be fully operational later in 2019 when the building is completed.

2.3.1 Soil Removal During Redevelopment

Surface soils were removed from the entire footprint of the Site as part of redevelopment activities to bring the Site to required grades for construction purposes. This surface soil removal ranged from removal of the top 2-inches (in) of material in an area just north of the future Site building to approximately 3.23-ft of material in the footprint of the future parking garage. Note that deeper excavations were completed in areas of building footers and select utilities. Per NYSDEC requirements and due to the potential presence of PFAS, all soil reused at the Site as part of the redevelopment work was placed in areas to be covered by either 2-ft of clean material (e.g., approved stone) or under future impervious surface (building pad, asphalt parking lot, etc.). All soil reused at the Site was also sampled for PFAS in addition to the other parameters outlined in DER-10,

The surface soil removal was completed subsequent to the collection of the RI surface soil samples. Although a substantial volume of contaminated soil was removed from the Site as a result of the ISMP implementation, contamination remains at the Site. The majority of the Site is planned to be covered with impervious surface (i.e., asphalt parking lot, building pads, concrete sidewalks, brick pavers, etc.). In the limited area to the north of the future Site building which will generally be used for green space, a demarcation layer consisting of orange snow fence was placed on top of “native” soils following the soil removal and subsequent to placement of stone and topsoil (refer to Figure 5). Surface soil sampling completed as part of the RI indicates material beneath this demarcation layer in these areas has select contaminants of concern above Unrestricted Use SCOs but below Restricted Residential SCOs.

3.0 STANDARDS, CRITERIA AND GUIDANCE

This section identifies the Standards, Criteria and Guidance (SCGs) for the Site. The SCGs identified are used in order to quantify the extent of contamination at the Site that may require remedial work based on the cleanup goal. It should be noted that these SCGs are applied based on the current and anticipated continued Site use (Restricted Residential).

Soil SCGs:

- New York Codes, Rules, and Regulations (NYCRR) Subpart 375-6.8(b) Soil Cleanup Objectives (SCOs) for Protection of Public Health/Restricted Residential Use;
- NYCRR Subpart 375-6.8(a) SCOs for Unrestricted Use; and,
- NYCRR Subpart 375-6.8(b) SCOs for the Protection of Groundwater.

Groundwater SCGs:

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

Note that there are currently no NYS groundwater comparison criteria for PFAS. As such, the USEPA Drinking Water Health Advisory Level for total perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) has been utilized in this RAA specifically for these compounds, which are types of PFAS. The USEPA Drinking Water Health Advisory level for total PFOA and PFOS combined is 70 nanograms per liter (ng/L).

4.0 FINAL REMEDY

The objective of this RAWP is to detail the cover system which is part of the final remedy. This RAWP details how the cover system will be constructed.

The following remedies were selected for each RAOC as detailed in the RAA.

- **RAOC #1 – Fill Material** - Cover System with Site Management (Track 4)
- **RAOC #2 – Central-Eastern CVOC impacts** - SSDS with Site Management (Track 4)
- **RAOC #3 – Northwestern CVOC impacts** - Site Management (Track 4)
- **RAOC #4 – Off-Site Petroleum Impacts Migrating On-Site** - No Further Action with Site Management (Track 4)
- **RAOC #5 – PFAS Impacts** - Cover System with Site Management with ICs/ECs (Track 4)

A Site Management Plan (SMP) has been developed which details institutional controls (ICs) and engineering controls (ECs) for the Site, as summarized below.

4.1 *Engineering Controls*

4.1.1 Cover System

Refer to Section 5 of this RAWP for cover system details.

4.1.2 Sub-slab depressurization system

A SSDS was installed during building construction. Final SSDS construction will be documented in a FER/CCR and operation and maintenance requirements for the SSDS will be specified in the SMP.

4.1.3 Groundwater/NAPL Monitoring

Based on the presence of VOCs above groundwater standards in RAOCs #2, #3 and #4 and the presence of elevated concentrations of PFAS in RAOC #5, long-term groundwater monitoring will be completed. This will include NAPL monitoring in RAOC #4. The monitoring plan will be specified in the SMP. The SMP will also include a contingency plan for NAPL removal if NAPL is encountered at the Site, particularly in RAOC #4.

4.2 *Institutional Controls*

An environmental easement will be implemented that includes the following ICs:

- The property may be used for restricted residential use;
- All ECs must be operated and maintained as specified in the SMP;
- All ECs must be inspected at a frequency and in a manner defined in the SMP.
- Data and information pertinent to site management must be reported at the frequency and in a manner as defined in the SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with the SMP;
- Access to the Site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement.
- Vegetable gardens and farming on the site are prohibited; and
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP.

5.0 RAOC #1 & RAOC #5 FINAL REMEDY – COVER SYSTEM

This section details the cover system which will serve as the final remedy for RAOC #1 and RAOC #5. The entire Site will be covered with a minimum of 2-feet of topsoil that meets Site SCGs, and/or impervious surface (e.g., concrete, asphalt, pavers, etc.). As of the date of this report, a majority of the cover system has been constructed. All ground level concrete floor slabs and the asphalt pavement parking areas have been constructed. By the end of 2019, all cover systems will be constructed. See Figure 5 for details on each cover type. Each cover type is summarized below.

5.1 *Asphalt*

All parking areas will be covered with asphalt, comprising approximately 1/3 of the Site. The asphalt subbase, consisting of 10-inches of crusher run #2, is in place. The crusher run was exempt from testing per DER-10 and a request to import this material was approved by the NYSDEC on September 20, 2018. 2-inches of asphalt binder course and 1.5-inches of top course have been constructed above the crusher run #2. Refer to Figure 5 for construction details.

5.2 *Concrete*

All interior first level floors are constructed of concrete, as are exterior sidewalks, which will cover another approximately 1/3 of the Site. Currently, the interior floors are installed, with sidewalks to be constructed as part of the final cover. The concrete floor slabs consist of 5-inches of concrete underlain by a 15-MIL vapor barrier and 18-inches of compacted crusher run. Sidewalks and the patio area will consist of 5-inches of concrete underlain by 8-inches of crusher run #2. Refer to Figure 5 for construction details.

5.3 *Green Space*

A section of the northern portion of the Site is to be comprised of green space, which will cover approximately 1/3 of the Site. Due to the shallow soil impacts found in this area of the Site, soil was removed to lower the existing grade of the area and a demarcation layer (orange snow fence) was placed. Based on the depth of impacts identified above Restricted Residential SCOs, up to 2-ft of soil was removed and the demarcation layer was placed. Approved stone was placed on top of the demarcation layer to hold it in place prior to placement of clean topsoil. Up to two (2) feet of clean topsoil will be placed over this demarcation layer to prevent direct contact with any residual contamination. In select areas where surface soil samples collected from depths beneath the demarcation layer did not identify impacts above Restricted Residential SCOs, less than 2-ft of clean topsoil will be placed. In all green areas, at least 2-ft of "clean" soil (i.e., soil with impacts below Restricted Residential SCOs) will be present, whether it consists entirely of imported material or a combination of imported and existing material. Topsoil will be seeded for erosion control.

Topsoil will be imported from Green Wood Park Luxury Apartments and Townhomes in Rochester, New York, which was been tested per DER-10 on May 14, 2019 and was approved for import by NYSDEC on June 26, 2019. CAMP monitoring will be completed during grading of this material.

5.4 *Health and Safety and Community Air Monitoring*

LaBella's Health and Safety Plan (HASP) for this project is included in Appendix 1. The NYSDOH Generic Community Air Monitoring Plan (CAMP) and Fugitive Dust and Particulate Monitoring will be utilized for this RAWP and is included in Appendix 2.

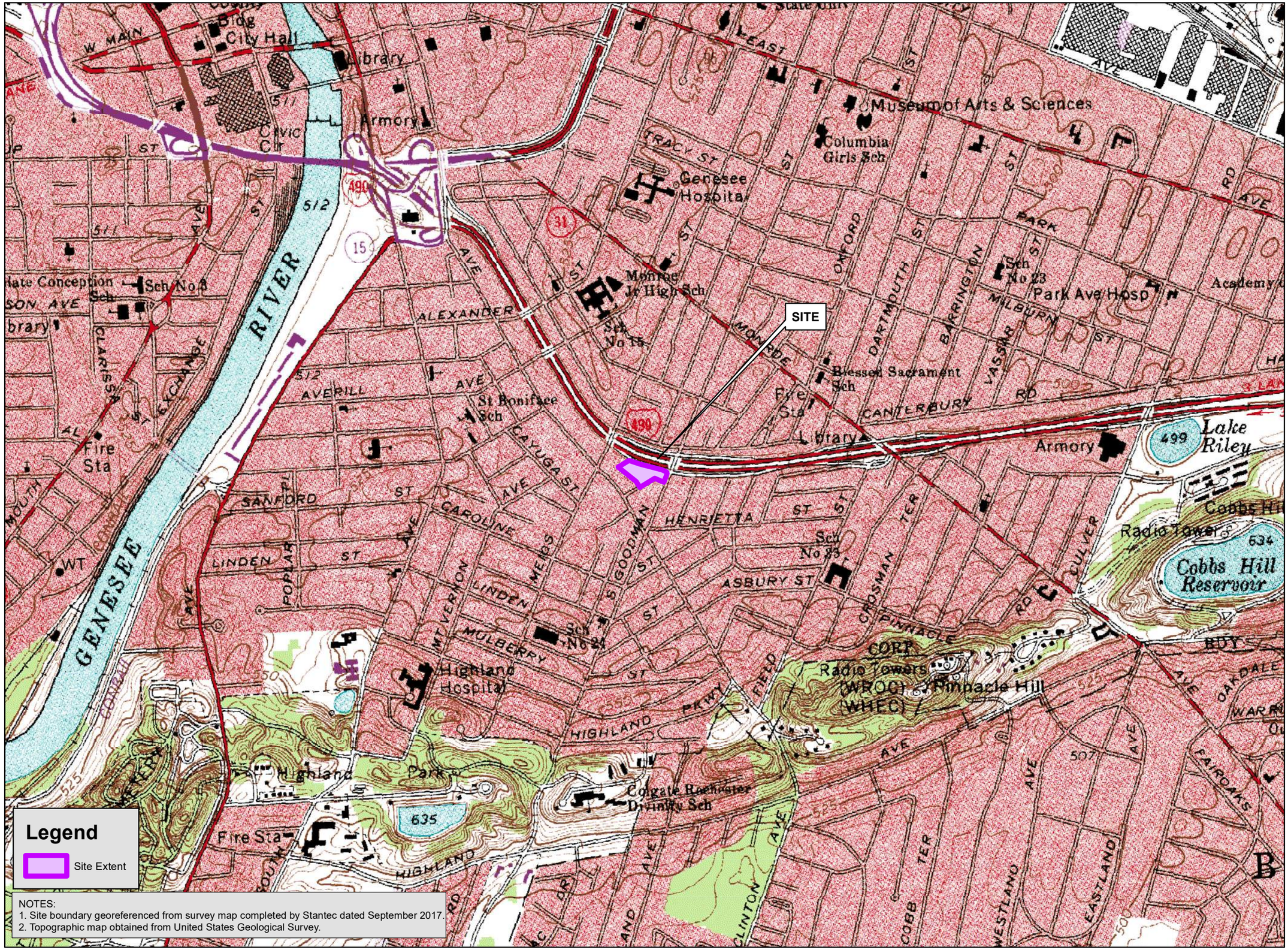
5.5 *Quality Assurance / Quality Control Plan*

Activities completed at the Site will be managed under LaBella's Quality Control Program, which is included in Appendix 3.

6.0 DELIVERABLES

Completion of remaining components of the cover system are anticipated to be completed by early December 2019 and will be documented in a Final Engineering Report (FER) to be submitted in mid-December 2019.

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.

LaBella
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0 500 1,000
Feet

1 inch = 1,000 feet

INTENDED TO PRINT AS: 11" X 17"

CLIENT:

HIGHLAND GROVE LLC

PROJECT:

FORMER SHERWOOD SHOE COMPANY
625 SOUTH GOODMAN STREET
ROCHESTER, NEW YORK

REMEDIAL ACTION WORK PLAN

DRAWING NAME:

SITE LOCATION MAP

PROJECT/DRAWING NUMBER:

2172056

FIGURE 1

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Reports\RAWP\GIS files\2172056 Figure 1 - Site Location.mxd

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Feet

1 inch = 80 feet
INTENDED TO PRINT AS: 11" X 17"

CLIENT:

HIGHLAND GROVE LLC

PROJECT:

FORMER SHERWOOD SHOE COMPANY
625 SOUTH GOODMAN STREET
ROCHESTER, NEW YORK

REMEDIAL ACTION WORK PLAN

DRAWING NAME:

SITE FEATURES

PROJECT/DRAWING NUMBER:

2172056

FIGURE 2

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Reports\RAWP\GIS files\2172056 Figure 2 - Site Features.mxd

Legend

- Site Boundary
- PFAS Test Pits
- RI Bedrock Well
- RI Soil Boring
- RI Overburden Monitoring Well
- RI Soil Gas Point/Sample
- RI Surface Soil Discrete Sample
- RI Surface Soil Comp. Samples
  - SS-Comp-01
  - SS-Comp-02
  - SS-Comp-03
  - SS-Comp-04
  - SS-Comp-05
- Surface Soil Sample (Stantec 2016)
- Soil Boring (Stantec 2016)
- Monitoring Well (Stantec 2016)
- Test Pit (Stantec 2016)

NOTES:
1. Site boundary georeferenced from survey map completed by Stantec dated September 2017.
2. Aerial image was obtained from Pictometry and may not represent current Site features.
3. Testing locations were identified using an EOS Arrow Gold GPS Unit capable of 1 cm horizontal accuracy.
4. Stantec 2016 investigation locations were georeferenced from Stantec's Phase II ESA Report dated October 2016.

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Drawings\RAA\FIGURE 3_ALL TESTING LOCATIONS V4.mxd

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Feet

1 inch = 40 feet
INTENDED TO PRINT AS: 11" X 17"

CLIENT:

HIGHLAND GROVE LLC

PROJECT:

FORMER SHERWOOD SHOE COMPANY
625 SOUTH MAIN STREET
ROCHESTER, NEW YORK

REMEDIAL ACTION WORK PLAN

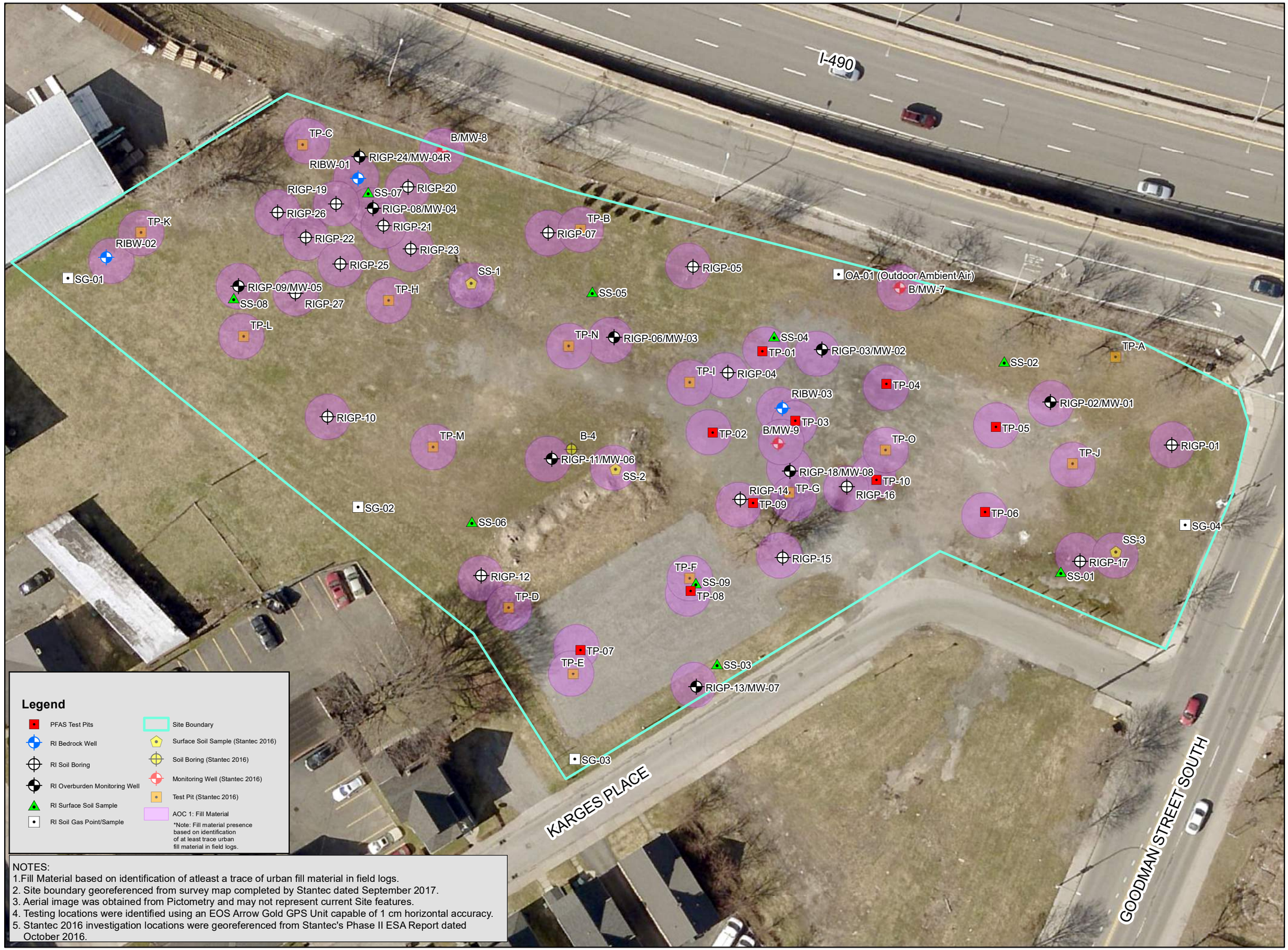
DRAWING NAME:

CUMULATIVE INVESTIGATION LOCATIONS

PROJECT/DRAWING NUMBER:

2172056

FIGURE 3



Legend

- PFAS Test Pits
- RI Bedrock Well
- RI Soil Boring
- RI Overburden Monitoring Well
- RI Surface Soil Sample
- RI Soil Gas Point/Sample
- Site Boundary
- Surface Soil Sample (Stantec 2016)
- Soil Boring (Stantec 2016)
- Monitoring Well (Stantec 2016)
- Test Pit (Stantec 2016)
- AOC 1: Fill Material

*Note: Fill material presence based on identification of at least trace urban fill material in field logs.

NOTES:
1.Fill Material based on identification of atleast a trace of urban fill material in field logs.
2. Site boundary georeferenced from survey map completed by Stantec dated September 2017.
3. Aerial image was obtained from Pictometry and may not represent current Site features.
4. Testing locations were identified using an EOS Arrow Gold GPS Unit capable of 1 cm horizontal accuracy.
5. Stantec 2016 investigation locations were georeferenced from Stantec's Phase II ESA Report dated October 2016.

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Drawings\RI Report\FIGURE 5A_AOC1 Fill Material V2.mxd

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Feet
1 inch = 40 feet

INTENDED TO PRINT AS: 11" X 17"

CLIENT:

HIGHLAND GROVE LLC

PROJECT:

FORMER SHERWOOD SHOE COMPANY
625 SOUTH MAIN STREET
ROCHESTER, NEW YORK

REMEDIAL ACTION WORK PLAN

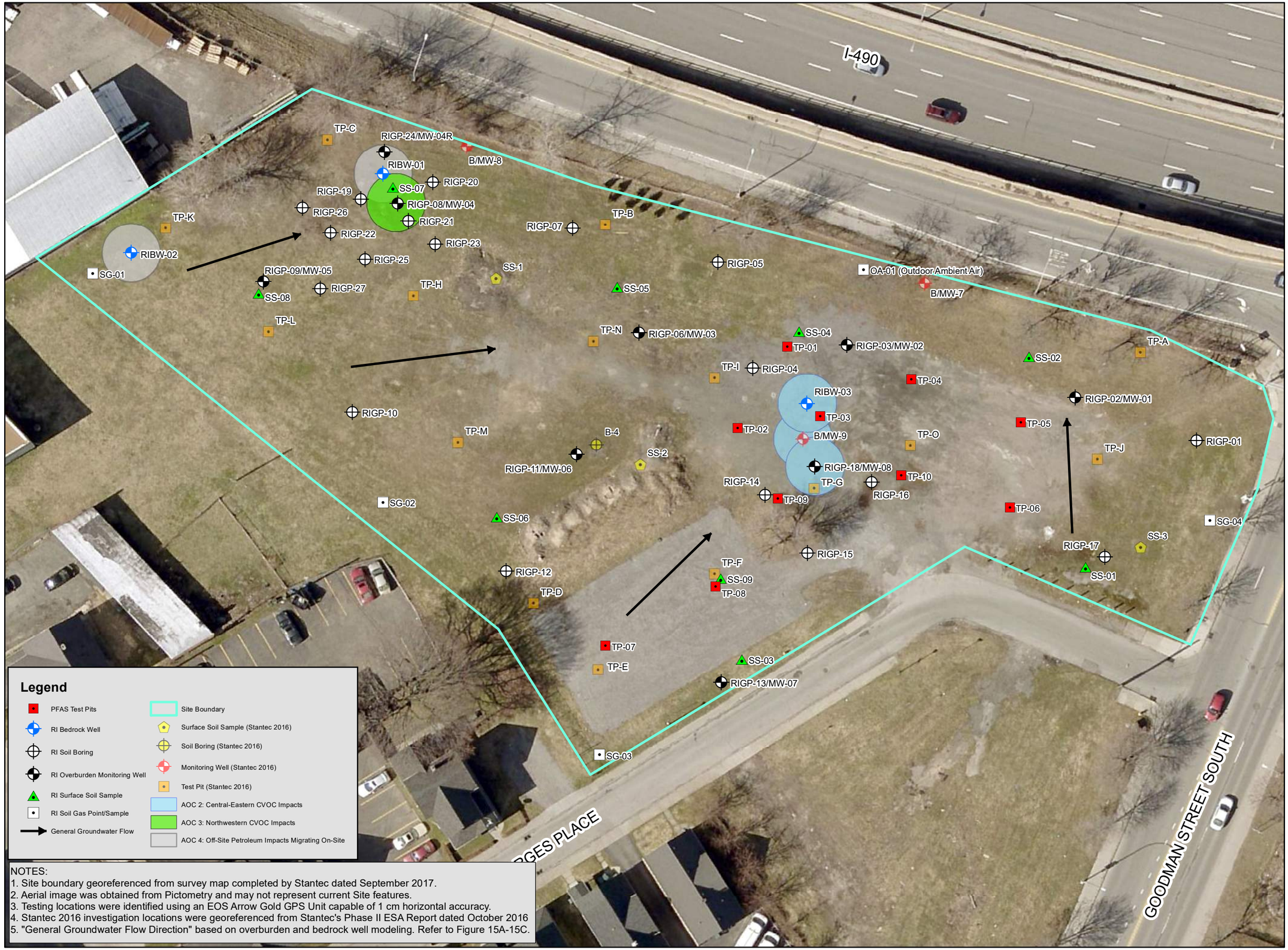
DRAWING NAME:

AOC #1: FILL MATERIAL

PROJECT/DRAWING NUMBER:

2172056

FIGURE 4A



NOTES:
1. Site boundary georeferenced from survey map completed by Stantec dated September 2017.
2. Aerial image was obtained from Pictometry and may not represent current Site features.
3. Testing locations were identified using an EOS Arrow Gold GPS Unit capable of 1 cm horizontal accuracy.
4. Stantec 2016 investigation locations were georeferenced from Stantec's Phase II ESA Report dated October 2016
5. "General Groundwater Flow Direction" based on overburden and bedrock well modeling. Refer to Figure 15A-15C.

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Drawings\RI Report\FIGURE 5B_AOCs 2_3_and_4.mxd

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Feet
1 inch = 40 feet

INTENDED TO PRINT AS: 11" X 17"

CLIENT:
HIGHLAND GROVE LLC

PROJECT:

FORMER SHERWOOD SHOE COMPANY
625 SOUTH MAIN STREET
ROCHESTER, NEW YORK

REMEDIAL ACTION WORK PLAN

DRAWING NAME:

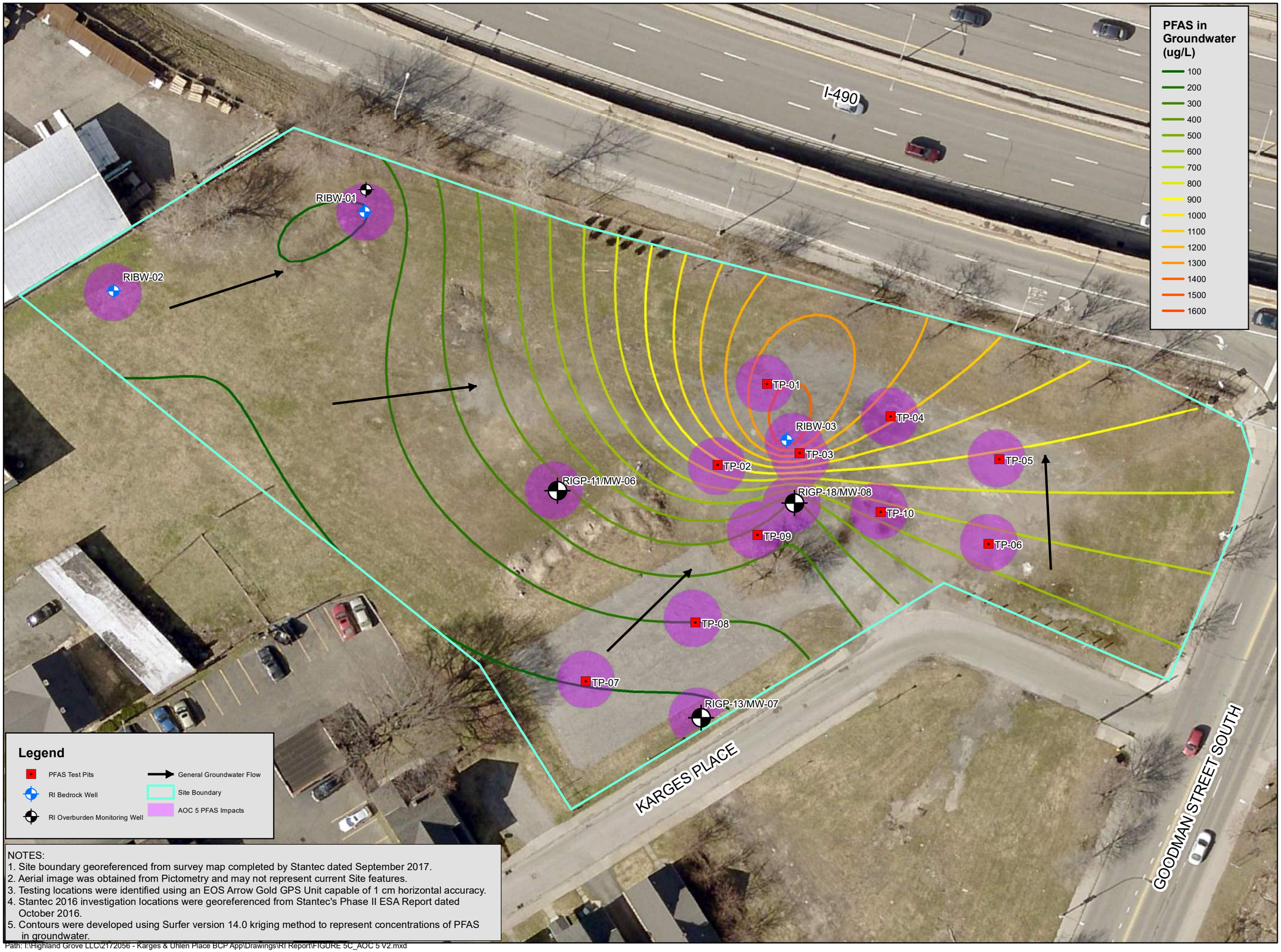
AOCs 2, 3, & 4

AOC 2: CENTRAL-EASTERN
CVOC IMPACTS
AOC 3: NORTHWESTERN
CVOC IMPACTS
AOC 4: OFF-SITE PETROLEUM
IMPACTS MIGRATING ON-SITE

PROJECT/DRAWING NUMBER:

2172056

FIGURE 4B



NOTES:
1. Site boundary georeferenced from survey map completed by Stantec dated September 2017.
2. Aerial image was obtained from Pictometry and may not represent current Site features.
3. Testing locations were identified using an EOS Arrow Gold GPS Unit capable of 1 cm horizontal accuracy.
4. Stantec 2016 investigation locations were georeferenced from Stantec's Phase II ESA Report dated October 2016.
5. Contours were developed using Surfer version 14.0 kriging method to represent concentrations of PFAS in groundwater.

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Drawings\RI Report\FIGURE 5C_AOC 5 V2.mxd

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Feet
1 inch = 40 feet

INTENDED TO PRINT AS: 11" X 17"

CLIENT:

HIGHLAND GROVE LLC

PROJECT:

FORMER SHERWOOD SHOE COMPANY
625 SOUTH MAIN STREET
ROCHESTER, NEW YORK

REMEDIAL ACTION WORK PLAN

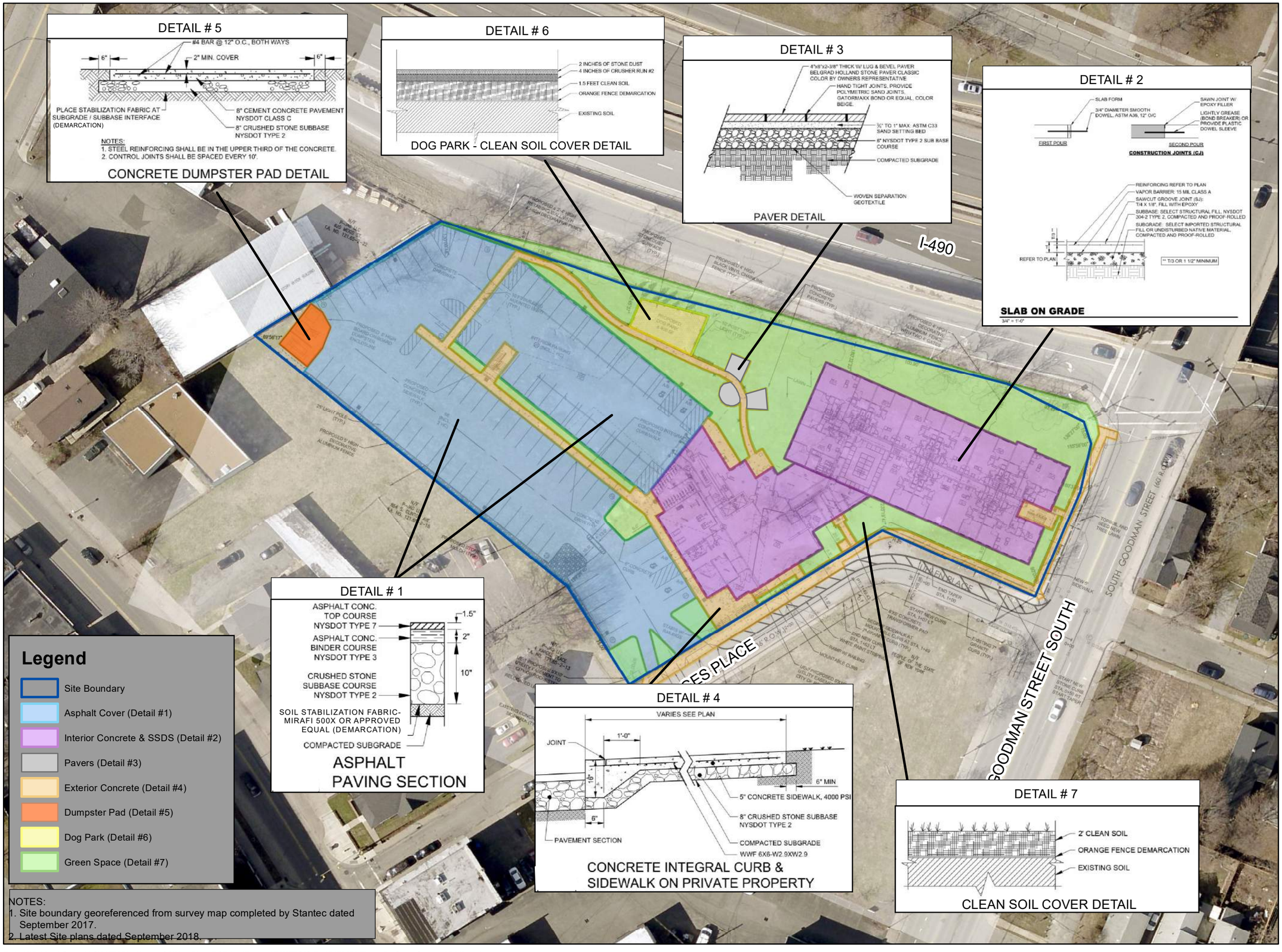
DRAWING NAME:

AOC 5: PFAS IMPACTS IN SOIL AND GROUNDWATER

PROJECT/DRAWING NUMBER:

2172056

FIGURE 4C



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Feet
1 inch = 60 feet

INTENDED TO PRINT AS: 11" X 17"

CLIENT:

HIGHLAND GROVE LLC

PROJECT:

FORMER SHERWOOD SHOE COMPANY
625 SOUTH MAIN STREET
ROCHESTER, NEW YORK

REMEDIAL ACTION WORK PLAN

DRAWING NAME:

RAOC #1 & RAOC #5
REMEDY
COVER SYSTEM

PROJECT/DRAWING NUMBER:

2172056

FIGURE 5

Path: I:\Highland Grove LLC\2172056 - Karges & Uhlen Place BCP App\Reports\RAWP\GIS files\2172056 Figure 5 - Cover System AB V3.mxd

APPENDIX 1

Health and Safety Plan

Site Health and Safety Plan
NYSDEC BCP Site #C828201

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 2019

300 State Street, Suite 201 | Rochester, NY 14614 | p 585-454-6110 | f 585-454-3066
www.labellapc.com

Site Health and Safety Plan

Location:

Former Sherwood Shoe
625 South Goodman Street
Rochester, New York

Prepared For:

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

LaBella Project No. 2172056

November 2019

Table of Contents

Tables

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

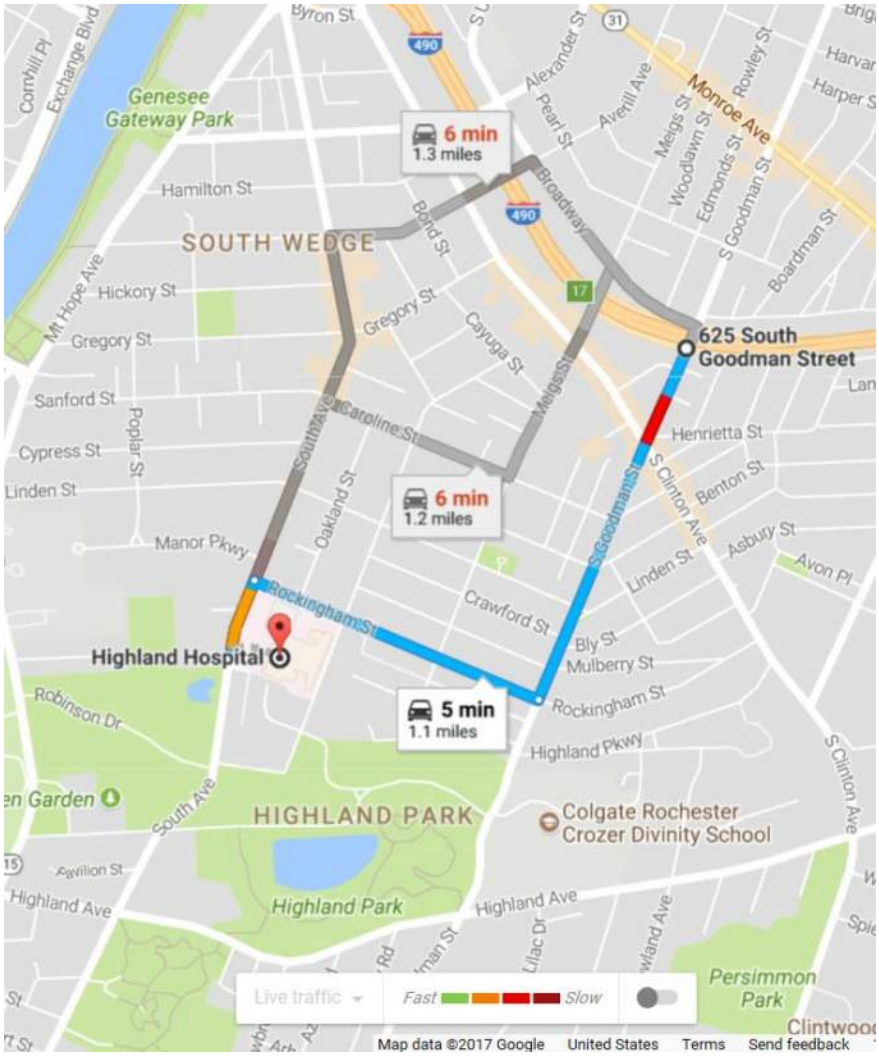
	Name	Phone Number
Ambulance:	As Per Emergency Service	911
Hospital Emergency:	Highland Hospital	585-473-2200
Poison Control Center:	Finger Lakes Poison Control	716-275-5151
Police (local, state):	Rochester Police Department	911
Fire Department:	Rochester Fire Department	911
Site Contact:	Mr. Steve DiMarzo	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 Action Work Plan (RAWP) 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 2

Community Air Monitoring Program

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 3

Quality Control Plan

Quality Control (QC) Program
NYSDEC BCP Site #C828201

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®) 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.