LaBella
Powered by partnership.

Supplemental Investigation Work Plan

Location:

193 Ship Canal Parkway
Buffalo, New York 14218
NYSDEC BCP Site C915240

Prepared for:

Buffalo Urban Development Corporation
95 Perry Street, Suite 404
Buffalo, New York 14203

LaBella Project No. 2202521

September 29, 2020

CERTIFICATIONS

I __Rob Napieralski_____certify that I am currently a Qualified Environmental Professional as defined in 6 NYCRR Part 375 and that this Supplemental Investigation Work Plan was conducted in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

______________________ __September 29, 2020__

Signed: Date:

Table of Contents

TABLES, FIGURES AND APPENDICES

Figures

Appendix

1.0 INTRODUCTION

LaBella Associates, D.P.C. (LaBella) has been retained by Buffalo Urban Development Corporation (BUDC) to prepare and submit this Supplemental Investigation Work Plan (SIWP). The SIWP outlines additional investigation to be conducted at the property located at 193 Ship Canal Parkway, City of Buffalo, Erie County, New York, New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) Site #C915240, herein after referred to as the "Site." A Site Location Map is included as Figure 1. The supplemental investigation activities for the Site were requested by the NYSDEC in their letter dated April 27, 2020 included in Appendix 1. The NYSDEC request included the following general items.

- Preparation and submittal of this SIWP to the NYSDEC for approval
- Collection and laboratory analysis of fill samples for radioactive properties
- Collection and laboratory analysis of groundwater samples for emerging contaminants
- Update the Alternatives Analysis Report (AAR) to incorporate the findings of this supplemental investigation

LaBella has prepared this SIWP on behalf of BUDC to provide a detailed description of the SI program to be implemented at the Site to satisfy the NYSDEC's request. The activities in this SIWP will be carried out in accordance with the NYSDEC's Department of Environmental Remediation (DER)-10 (*Technical Guidance for Site Investigation and Remediation)* issued May 3, 2010 and the NYSDEC-approved Remedial Investigation Work Plan and subsequent amendments for the Site.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description and Surrounding Properties

The Site consists of approximately 9.65 acres situated within the 275-acre Buffalo Lakeside Commerce Park, is owned by BUDC and encompasses one tax parcel identified as SBL #132.20-1-12. The Site is currently vacant with areas of successional vegetation growing through exposed gravel, slag, concrete, and brick fill. A gravel drive transects the Site from east to west, a concrete pad and open concrete pit are located on the northeast portion of the Site, a gravel retention pond is located along the south Site boundary, and piles of debris and fill are located throughout the south portion of the Site. The current aerial image of the Site depicting the approximate Site boundaries is included as Figure 2. The Site was entered into the NYSDEC Brownfield Cleanup Program (BCP) in 2010. The intended future use of the Site is for light industrial purposes.

Three adjacent properties have been entered into the NYSDEC BCP including the east adjoining property, 231 Ship Canal Parkway: CertainTeed Site, Site Code: C915185; west adjacent property, 1 Ship Canal Parkway: Cobey LLC, Site Code:C915202; and north adjacent property, 200 Ship Canal Parkway, Site Code: C915227. The CertainTeed and Cobey LLC sites have been remediated under the BCP and are currently developed with manufacturing facilities. Remedial activities at these sites included removal of soil/fill material and the placement of cover systems. The prospective developer of the 200 Ship Canal Parkway site elected not to proceed with the project and the BCP agreement was cancelled in 2010.

2.2 Site History

The Site was formerly part of a larger industrial complex that encompassed approximately 113 acres and was in operation from approximately 1900 until 1982. The complex was initially operated by the Buffalo Union Steel Corporation, which commenced manufacturing pig iron during the period of 1900 to 1915. Pig iron is the immediate product of smelting iron ore with coke and limestone in a blast furnace. Following the construction of the blast furnaces, the Hanna Furnace Company acquired the property from Buffalo Union Steel. The National Steel Company subsequently purchased the property in 1929, and the corporate entity became known as the Hanna Furnace Corporation. During peak production, the Hanna Furnace Corporation employed over 800 personnel.

Iron ore, lime, coke and other raw materials were received via the Union Ship Canal, which was constructed in 1910 to service the facility, and were stockpiled along the northern and southern edges of the canal. It is likely that these raw materials were also shipped to the site on rail cars that were temporarily stored in the facility's railroad yard. Additionally, the pig iron manufactured at the facility was transported to customers via the network of railroad yards and railroads at and near the facility. The Hanna Furnace Corporation ceased all operations in 1982.

The Jordan Foster Scrap Corporation purchased the facility in 1983 and subsequently dismantled many of the buildings and removed the rails from the former railroad yard for scrap. The Jordan Foster Scrap Corporation filed for bankruptcy during 1986, and briefly leased the property to the Equity Scrap Processing Company. In 1998, the City of Buffalo gained title to the Hanna Furnace Site due to nonpayment of taxes. The Hanna Furnace Site was essentially unoccupied and unsecured from 1986 to 2002, when remedial action was initiated at the Site.

Following acquisition by the City, the Hanna Furnace Site was subdivided into four sub-parcels for remediation and redevelopment purposes, including:

- Sub-Parcel 1 - The Former Railroad Yard consisted of approximately 43 acres located in the southern portion of the Hanna Furnace Site.
- Sub-Parcel 2 - The Former Manufacturing Area consisted of approximately 29 acres located south of the Union Ship Canal.
- Sub-Parcel 3 - The area surrounding the Union Ship Canal approximately 200-feet wide on each side.
- Sub-Parcel 4 - The Former Filter Cake/Flue Ash Disposal Area located to the north of the Union Ship Canal.

A Site Map from the Remedial Action Work Plan for the Hanna Furnace Site: The Former Railroad Yard Area (Sub-Parcel 1), prepared by Malcolm Pirnie, Inc. (February 2002) is included in Appendix 2 and shows the boundaries of these four sub-parcels within the Hanna Furnace Site.

The Site consists of 9.65 acres within the Former Railroad Yard (Sub-Parcel 1) and appears to have been occupied by rail facilities throughout the life of the Hanna Furnace facility.

The NYSDEC prepared an "Inactive Hazardous Waste Disposal Site Report" for the Hanna Furnace Site in 1983, assigning the site a classification of "2A," indicating the potential for hazardous waste. Subsequently, several environmental investigations of the Hanna Furnace Site were conducted and in 1995, the NYSDEC concluded that no evidence of hazardous waste was identified at the property. As a result, the Hanna Furnace Site was delisted from the registry of inactive hazardous waste sites.

More extensive sampling was completed on the Former Railroad Yard (Sub-Parcel 1) in 1999, 2000, and 2001 to fulfill the requirements for a Voluntary Cleanup Agreement.

The Remedial Investigation (RI) for the Site was completed in March 2017. The RI included the advancement of test pits and soil borings to characterize the subsurface of the Site; collection and chemical analysis of soil/fill samples; and installation, development, and sampling of groundwater monitoring wells.

Currently, the east and west portions of Sub-Parcel 1 have been developed with manufacturing facilities, CertainTeed (C915185) and Cobey LLC (C915202), under the BCP. The Site consists of the remaining central portion of Sub-Parcel 1.

2.3 Site Geology and Hydrogeology

2.3.1 Geology

An evaluation of the subsurface stratigraphy of the Site was completed by integrating the data collected during the Remedial Investigation (RI) with existing published information on the geology and hydrogeology of the Site. The subsurface stratigraphy of the Site can be divided into three significant units, which are described in descending order as follows:

- Fill material
- Peat layer
- Lacustrine silt and clay

Geologic cross-sections of the Site are depicted on Figure 5.

Fill Material

Industrial fill material was encountered across the project site and was observed from the ground surface to a maximum depth of 13 ft bgs. The fill material ranged in thickness from approximately 9.5 ft to 13 ft. Generally the uppermost 3 ft to 5 ft of fill material consisted of brown sand to silty sand and gravel with some brick; brown to dark red-brown fine sand; and/or cobble size slag. Brown, tan, gray, and white weathered slag was generally encountered from 3 ft to 8 ft bgs. Blue-green, white, gray, and tan weathered slag was generally encountered from 6 ft to 13 ft bgs.

Peat Layer

Beneath the fill, native soils consisted of a one to two-foot thick layer of brown silt and peat. The silt and peat layer was encountered at depths ranging from approximately 9.5 ft to 13 ft bgs. The top one to two inches of the silt and peat layer was saturated and observed to have an apparent organic sheen. The remainder of the silt and peat layer was observed to be moist to wet.

Lacustrine Silt and Clay

Beneath the peat layer, apparent native overburden was generally encountered at depths of 11 ft to 13 ft bgs and consisted of dense, gray silty clay.

2.3.2 Hydrogeology

Hydrogeologic conditions across the Site were investigated through the installation of six 2-inch diameter groundwater monitoring wells.

The uppermost water bearing zone was observed within the fill material across the Site. This water bearing zone was encountered in all test pits and test borings across the Site with the exception of TP-2. The six 2-inch monitoring wells (MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6) were screened across the apparent phreatic surface within the upper-most hydrostratigraphic unit.

Based on static water level measurements taken from the monitoring wells on June 2 and 3, 2015, the depth to groundwater measured in the wells ranged from 7.01-10.4 feet from the top of the well risers. A groundwater contour map is included as Figure 3. Review of the groundwater contour map and static water levels recorded in the monitoring wells indicates that the gradient of the groundwater potentiometric surface across the Site is generally flat. The groundwater at the Site appears to flow generally to the north with the exception of the area in the vicinity of MW-2, which appears to flow to the southwest.

3.0 SUMMARY OF REMEDIAL INVESTIGATION

This section summarizes the investigation work completed as part of the RI program and presents the Areas of Concern (AOCs) identified at the Project Site; however, the RI Report should be referenced for greater details concerning the RI results. The RI program was conducted in conformance with the NYSDEC-approved RIWP and subsequent amendments, and in general accordance with NYSDEC DER-10, *Technical Guidance for Site Investigation and Remediation.*

3.1 Remedial Investigation Fieldwork

The RI program encompassed the following major tasks:

- Collection and chemical analysis of on-site surface soil/fill samples to characterize the chemistry of these materials
- Completion of test pits and test borings to enable the classification, screening, sampling, and chemical characterization of subsurface soil/fill
- Installation, development, and sampling of groundwater monitoring wells in an effort to determine groundwater flow direction and gradient, as well as to enable the collection and chemical analysis of groundwater samples
- Survey of horizontal and vertical positions of investigation/sample points (e.g., surface soil/fill, test pits, monitoring wells, etc.).

Investigation locations from the RI are depicted on Figure 4.

3.2 Areas of Concern

As described in the RI Report, the results of this investigation identified a number of AOCs at the Site. The nature and extent of impacts for these areas have been defined and are summarized in the sections below. For discussion purposes, these impacts were compared with the Standards Criteria and Guidance values (SCGs) applicable to each medium sampled, including:

- Soil/Fill: NYSDEC's 6NYCRR Part 375 Environmental Remediation Programs: Part 375-6.8: Commercial and Industrial Use Soil Cleanup Objectives (SCOs); and
- Groundwater: NYSDEC's June 1998 Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations in the Technical and Operational Guidance Series (TOGS) 1.1.1. Ambient Water Quality Standards (AWQS)

3.2.1 AOC #1 Surface Soil/Fill

One SVOC (benzo(a)pyrene) was detected in the sample collected from TP-3 exceeding the Commercial Use and Industrial Use SCOs. TP-3 was located proximate the southeast corner of the Site. The presence of this SVOC is likely related to the past railroad operations at the Site.

Arsenic was detected in five surface soil/fill samples exceeding the Commercial and Industrial Use SCOs. The samples were collected from the northeast, southwest, and central portions of the Site. Aluminum, cadmium, calcium, copper, iron, and vanadium were detected above the Commercial Use SCOs in surface soil/fill samples collected across the Site. The presence of these metals is likely related to the placement of slag and other industrial fill materials across the Site as well as the historical railroad operations at the Site.

Based on the results of the RI, impacts in this AOC have been identified at levels exceeding SCOs. As such, remediation and/or engineering controls to address this AOC appear warranted.

3.2.2 AOC #2 Subsurface Soil/Fill – Site Wide Contaminants of Concern

Arsenic was detected in four subsurface soil/fill samples exceeding the Commercial and Industrial Use SCOs. The samples were collected from the southeast, east, and central portions of the Site. A number of other metals exceeding the Commercial Use SCOs were detected in subsurface soil/fill samples from across the Site. The analytical results appear to reflect the chemistry of the slag and other industrial fill that is present across the Site to depths ranging from 9 ft to 13 ft bgs.

Cyanide was detected in the subsurface soil/fill sample collected from TP-13 at a concentration of 27.1 mg/Kg, minimally exceeding the Commercial and Industrial Use SCOs of 27 mg/Kg. TP-13 is located on the west-central portion of the Site and the sample was collected from a depth of 8 ft bgs. The cyanide is likely related to the slag and industrial fill present at the Site.

The pH of subsurface soil/fill samples analyzed ranged from 8.78 to 11.0 standard units. Eleven of the eighteen soil/fill samples exhibited elevated pH measurements (i.e. greater than 10 standard units) and were located across the Site. The elevated pH in the subsurface soil/fill across the Site is likely related to the presence of slag and industrial fill materials at the Site.

Based on the results of the RI, impacts in this AOC have been identified at levels exceeding SCOs. As such, remediation and/or engineering controls to address this AOC appear warranted.

3.2.3 AOC #3 Groundwater – Site Wide Contaminants of Concern

The six 2-inch monitoring wells are screened in the upper-most water-bearing unit, which occurs within the fill material across the Site. With the exception of low concentrations of several VOCs and low level, unknown SVOC tentatively identified compounds (TICs) across the Site, organic contaminants were not detected in this hydrostratigraphic unit. The majority of the low level VOCs could be related to laboratory contamination. The nature and source of the unknown SVOC TICs are not currently known, but they are likely reflective of the industrial character of the Site and surrounding properties.

Metals detected above the groundwater standards in this hydrostratigraphic unit were limited to iron, selenium, and sodium. These parameters are commonly encountered in uncontaminated, natural environments and do not appear to be associated with the contaminated fill on the project site. No exceedances of the groundwater standards for arsenic, barium, cadmium, or cyanide were detected in the groundwater samples analyzed.

The pH of the groundwater samples analyzed ranged from 10.7 to 11.5 standard units. The elevated pH in the groundwater across the Site is likely related to the presence of slag and industrial fill materials in the subsurface of the Site.

Based on the results of the RI, pH is the contaminant of concern associated with this AOC. Active remediation to address the groundwater at the Site does not appear to be warranted. However, institutional controls in the form of restrictions on the use of groundwater at the Site and the implementation of a Site Management Plan to identify proper handling procedures when groundwater is encountered are appropriate and will be included in the recommended remedy.

4.0 STANDARDS, CRITERIA AND GUIDANCE

This section identifies the SCGs for the Site. The SCGs identified are used to quantify the extent of contamination at the Site requiring remedial work based on the cleanup goal. The SCGs to be utilized as part of the implementation of this SIWP are identified below:

Fill SCGs: The following SCGs for soil were used in developing this SIWP:

- United State Environmental Protection Agency (USEPA) Office of Solid Waste and Emergency Response recommended cleanup guidance level for total radium: 5 picocuries per gram (pCi/g)

Groundwater SCGs: The following SCGs for groundwater were used in developing this SIWP:

- NYSDEC Guidelines for Sampling and Analysis of Per- and Polyfluroroalkyl Substances (PFAS), January 2020. Perfluorooctanoic acid (PFOA) or Perfluorooctanesulfonic acid (PFOS) at or above 10 nanograms per liter (ng/L). Any other individual PFAS detected at or above 100 ng/L. Total concentration of PFAS at or above 500 ng/L.
- Codes, Rules and Regulations of the State of New York Title 10, Chapter I, Part 5, Subpart 5-1, Public Water Systems; Maximum Contaminant Level (MCL) for 1,4-dioxane: 1.0 microgram per liter (µg/L)

5.0 OBJECTIVES AND RATIONALE

The objective of the SI is to address the NYSDEC's request for supplemental investigation at the Site to address the potential for slag fill exhibiting elevated radiological levels and/or emerging contaminants in groundwater at the Site. The results of this SI along with the results of the RI will be utilized to determine the necessary environmental remedy for the Site.

5.1 Areas of Concern

Fill Material

During the RI, field instrumentation identified radioactive properties associated with slag fill materials encountered at the Site. The SI will further screen the slag fill materials at the Site for elevated levels of gamma radiation. Samples will be collected from each type of slag fill material and submitted for gamma spectroscopy analysis.

Groundwater

Emerging contaminants have not been identified as a concern at the Site at this time. The request for emerging contaminant sampling of Site groundwater is part of a State-wide initiative requiring the sampling and analysis of groundwater for 1,4-dioxane and PFAS for all environmental remediation sites. The SI will evaluate the Site groundwater for the presence of emerging contaminants.

6.0 SUPPLEMENTAL INVESTIGATION SCOPE

The proposed SI field activities to be completed as part of this work plan have been separated into tasks and are presented in this section. All work will be completed in general accordance with NYSDEC-approved RIWP and subsequent amendments, and NYSDEC DER-10. Prior to implementation of the SI field activities, a Dig Safely New York stakeout will be conducted at the Site to locate any subsurface utilities in the areas where subsurface activities will take place.

6.1 Supplemental Investigation Tasks

The SI Field Program is detailed below:

Task 1: Radiological Screening and Analysis of Slag Fill- This task will assess the radioactive properties of the slag fill material across the Site.

Task 2: Groundwater Emerging Contaminant Sampling- This task is proposed to sample the groundwater at the Site and evaluate for the presence of emerging contaminants PFAS and 1.4-dioxane.

6.1.1 Task 1: Radiological Screening and Analysis of Slag Fill

This task will involve the advancement of at least nine test pits across the Site to assess the radioactive properties of the slag fill materials at the Site. The test pits will be advanced to a maximum depth of approximately 13 ft bgs or until native soils are encountered to attempt to encounter all three slag fill material layers observed during the RI. If a slag fill layer is not encountered in a test pit an additional test pit will be advanced until all three slag fill layers are encountered in nine test pits. The proposed test pit locations are depicted on Figure 6. This work will be completed in general accordance with NYSDEC-approved RIWP and subsequent amendments, and NYSDEC DER-10. The following methods will be utilized during the test pit investigation.

- Test pits will be advanced utilizing an appropriately sized track mounted excavator to reach the desired depths.
- A ¾ inch steel road plate will be placed adjacent to the test pit to be utilized as the screening area for the slag fill material. The background gamma radiation level a top the steel plate will be established and recorded via a one-minute static measurement using a Ludlum Model #2221 rate meter paired with a 2x2 inch Model 44-10 sodium iodide detector. The background gamma radiation a top the steel plate will be measured at each test pit.
- Test pits will be advanced into the subsurface in one foot increments. The soil/fill removed will be placed adjacent to the test pit excavation on a known background area/or on a plastic tarp for characterization and screening. Soil/fill characterization observations and field screening measurements will be recorded on test pit logs.
- Representative slag fill material from each of the three slag fill layers will be placed on the

steel plate in separate six-inch lifts. The slag fill will be screened to measure gamma radiation levels using a Ludlum Model #2221 rate meter paired with a 2x2 inch Model 44-10 sodium iodide detector. In addition, a one-minute measurement will be collected and recorded.

- A representative portion of each of the three slag fill material layers will be placed in a ziplock bag and labeled with the test pit location, slag fill layer type, and gamma radiation level.
- The advancement of test pits and screening of slag fill materials will continue until nine samples of each slag fill layer have been screened.
- The three samples with the highest gamma radiation levels from each of the three slag fill layers (nine total samples) will be submitted for gamma spectroscopy analysis via USEPA Method 901.1M (full 21-day in growth period).
- Soil/fill removed during the test pit excavations will be returned to the test pit from which they originated and compacted with the excavator bucket.
- Equipment will be decontaminated prior to commencing with test pitting activities and between test pit locations through the physical removal of materials adhered to equipment surfaces.

6.1.2 Task 2: Groundwater Emerging Contaminant Sampling

This task will involve the collection of groundwater samples from existing groundwater monitoring wells and submission of samples for laboratory analysis to assess the groundwater conditions at the Site for emerging contaminants. The groundwater samples will be collected from MW-3, MW-5, and MW-6. The monitoring well locations are depicted on Figure 3. This work will be completed in accordance with NYSDEC DER-10 as well as the NYSDEC Guidelines for Sampling and Analysis of Per- and Polyfluroroalkyl Substances (PFAS), January 2020 attached to the NYSDEC letter included as Appendix 1. The following methods will be utilized during the groundwater sampling:

- Groundwater monitoring wells will be purged and groundwater samples will be collected using low-flow techniques. Prior to sampling, the following parameters will be measured and recorded at three to five minute intervals:
  - Water level drawdown (<0.3')
  - Temperature (+/- 3%)
  - pH (+/- 0.1 unit)
  - Dissolved oxygen (+/- 10%)
  - Specific conductance (+/- 3%)
  - Oxidation reduction potential (+/- 10 millivolts)
  - Turbidity (+/- 10%, <50 NTU for metals)
- Samples will be collected when the parameters have stabilized within the specified range for at least three consecutive intervals. If dry conditions are encountered during low-flow sampling, samples will be collected when the well has recharged a sufficient volume to allow for sample collection.
- Purge water will be allowed to infiltrate back into the subsurface of the Site in the vicinity of the well from which the water originated. No water will be allowed to flow off-site.
- Groundwater samples will be collected from each of the three wells and submitted under chain of custody procedures to an Environmental Laboratory Accreditation Program (ELAP)-

certified laboratory for analysis for the following parameters:

  - NYSDEC PFAS Analyte list using USEPA Method 537.1
  - 1,4-Dioxane using USEPA Method 8270
- Quality Assurance/Quality Control samples will also be collected and analyzed and include one matrix spike/ matrix spike duplicate (MS/MSD).
- The laboratory will provide a NYSDEC Analytical Services Protocol (ASP) Category B Deliverables data package and a Data Usability Summary Report (DUSR) will be completed by a third-party data validator.
- All groundwater sampling will be completed in a manner to minimize potential cross-contamination of the samples by completing all work as outlined in the NYSDEC Guidelines for Sampling and Analysis of PFAS (January 2020) document included in Appendix 1 and as identified below. Because PFAS are found in numerous everyday items, the following special precautions will be taken during all sampling activities:
  - Acceptable materials for sampling include stainless steel, high density polyethylene (HDPE), PVC, silicone, acetate and polypropylene
  - No use of Teflon®-containing materials (e.g., Teflon® tubing, bailers, tape, sample jar lid liners, plumbing paste)
  - No Tyvek® clothing will be worn onsite
  - Clothing that contains polytetrafluorethylene (PTFE, GORE-TEX®, etc.) or that have been waterproofed with PFC materials will not be worn on-site.
  - All clothing worn by sampling personnel must have been laundered multiple times. Clothing must not be laundered with fabric softener.
  - No Post-It® notes will be brought onsite.
  - No fast food wrappers, disposable cups or microwave popcorn will be brought on-site.
  - No use of chemical (blue) ice packs will be allowed.
  - No use of aluminum foil, low density polyethylene (LDPE), glass or PTFE materials will be allowed.
  - No use of Sharpies®, rather ball point pens will be utilized.
  - No use of sunscreen, insect repellants, cosmetic, lotions or moisturizers will be allowed by sampling personnel the day of sampling.
  - If any of the above items are handled by the field personnel prior to sampling activities, field personnel will wash their hands thoroughly with soap and water prior to any sampling activities.
  - Powder-free nitrile gloves will be worn during all sample collection activities.
- Well sampling will be conducted utilizing dedicated equipment appropriate for PFAS sampling.

6.2 *Health and Safety and Community Air Monitoring*

LaBella's Health and Safety Plan from the RI is included as Appendix 3. Air monitoring will not be conducted during the SI. Dust suppression measures (i.e. watering the ground surface, the excavations, or stockpiled materials) or suspension of work will be implemented if visible dust is generated and observed leaving the Site during the SI activities.

6.3 Housekeeping and Investigation Derived Waste

Good housekeeping practices will be followed to prevent leaving contaminated material on the ground surface. Waste materials anticipated to be generated during the implementation of this SIWP include soil generated from test pits, groundwater generated from purging of monitoring wells, and decontamination water generated from decontaminating field equipment. The soil/fill from test pits will be placed back into the test pits from which they originated. Decontamination water will be allowed to infiltrate back into the subsurface of the Site in the vicinity of the sample location from which the material originated. Purge water will be allowed to infiltrate back into the subsurface of the Site in the vicinity of the monitoring well from which it originated. Procedures will be implemented to prevent soils or water from leaving the Site.

7.0 SI SCHEDULE AND REPORTING – DELIVERABLES

The information and laboratory analytical data obtained during the SI will be incorporated in a revised AAR Report, completed in accordance with DER-10.

It is anticipated that implementation of the SIWP will begin within 14 days after NYSDEC approval of this work plan. The field work is anticipated to require approximately four days to complete *(Note: this timeframe does not include laboratory analysis or data validation).* The revised AAR Report will be submitted within two months of receipt of DUSRs.

The above schedule assumes that an addendum to the SIWP will not be required. If an SIWP addendum is required, it will be submitted as the need is identified and it will include a revised schedule.

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

I:\BUFFALO URBAN DEVELOPMENT CORP\2202521 - 193 SHIP CANAL PKWY SUPP INV\REPORTS\Supplemental Investigation Work Plan\Final Sup IWP_193 Ship Canal Pkwy_9.29.2020.docx

FIGURES

7.5-minute, Buffalo SE , New York quadrangle USGS Map

N

Not To Scale

FIGURE 1
SITE LOCATION MAP

193 Ship Canal Parkway
Buffalo, New York 14218

LABELLA

PROJECT NO.

2202521

LABELLA
Associates,D.P.C.
Relationships. Resources. Results.

Engineering
Architecture
Environmental
Planning

300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
F: (585) 454-3066

www.labellapc.com

BUFFALO URBAN DEVELOPMENT CORP.

Buffalo Urban Development Corporation
95 Perry Street, Suite 404
BUFFALO, NEW YORK 14203

193 Ship Canal Parkway
BCP Project

193 Ship Canal Parkway
BUFFALO, NEW YORK 14218

PROJECT NO: 2202521

REVISION

NO.	DATE	DESCRIPTION
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--

DRAWN BY: CTL

APPROVED BY: MWH

ISSUED FOR: FINAL SURVEY PLAT

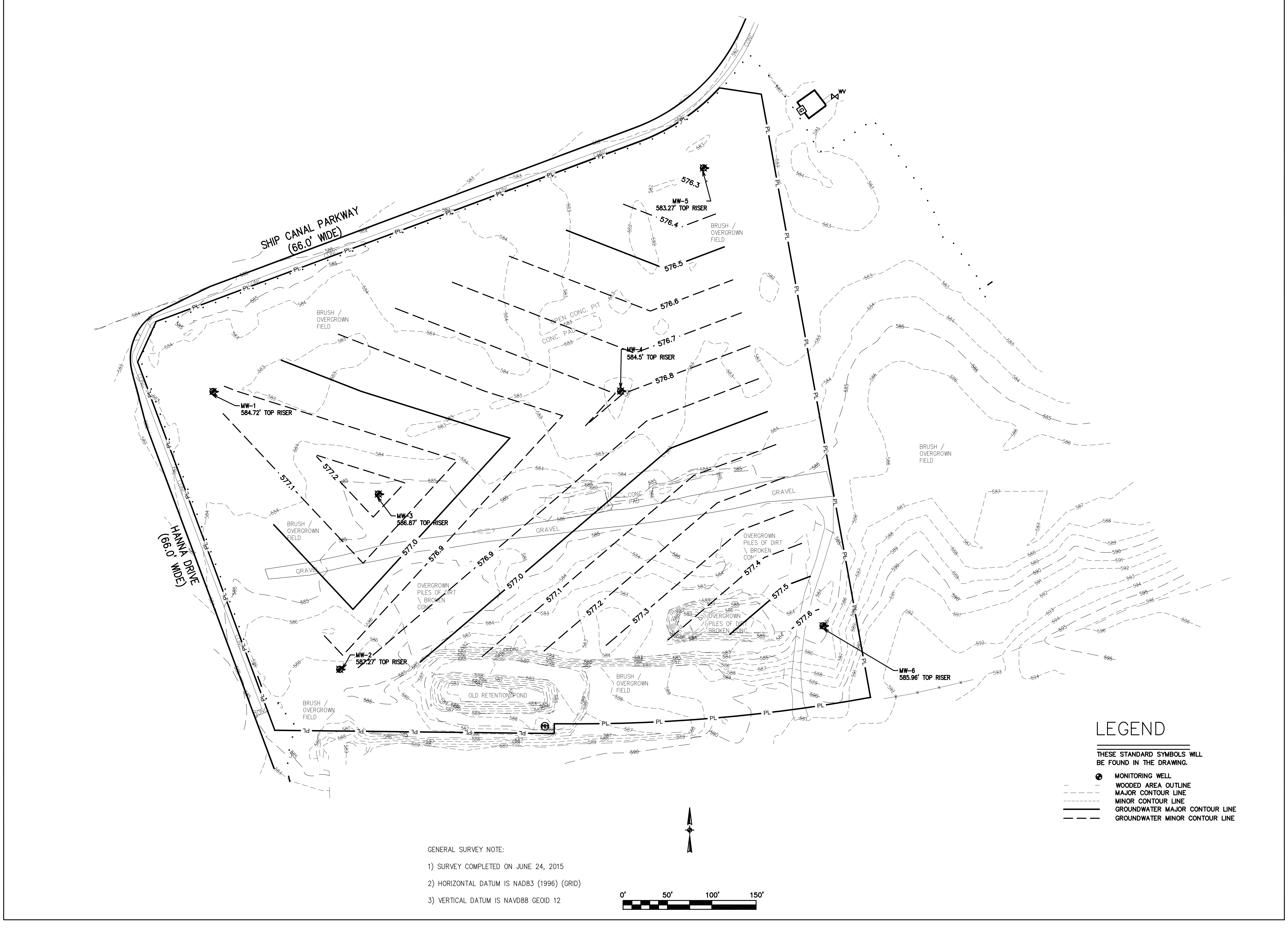
DATE: JUNE 26, 2015

DRAWING NAME:

PROJECT SITE
AERIAL MAP

DRAWING NO:

FIGURE 2



LEGEND

THESE STANDARD SYMBOLS WILL BE FOUND IN THE DRAWING.

●	MONITORING WELL
	WOODED AREA OUTLINE
	MAJOR CONTOUR LINE
	MINOR CONTOUR LINE
	GROUNDWATER MAJOR CONTOUR LINE
	GROUNDWATER MINOR CONTOUR LINE

GENERAL SURVEY NOTE:

1) SURVEY COMPLETED ON JUNE 24, 2015

2) HORIZONTAL DATUM IS NAD83 (1996) (GRID)

3) VERTICAL DATUM IS NAVD88 GEOID 12

LABELLA
Associates,D.P.C.
Relationships. Resources. Results.
Engineering
Architecture
Environmental
Planning

300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
F: (585) 454-3066
www.labellapc.com

It is a violation of New York Education Law Article 145 Sec.7209, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered; the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

**BUFFALO URBAN
DEVELOPMENT CORP.**

**Buffalo Urban Development Corporation
95 Perry Street, Suite 404
BUFFALO, NEW YORK 14203**

**193 Ship Canal Parkway
BCP Project**

**193 Ship Canal Parkway
BUFFALO, NEW YORK 14218**

PROJECT NO:
2202521

REVISION

NO.	DATE	DESCRIPTION
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--

DRAWN BY: CTL

APPROVED BY: MWH

ISSUED FOR:
FINAL SURVEY PLAT

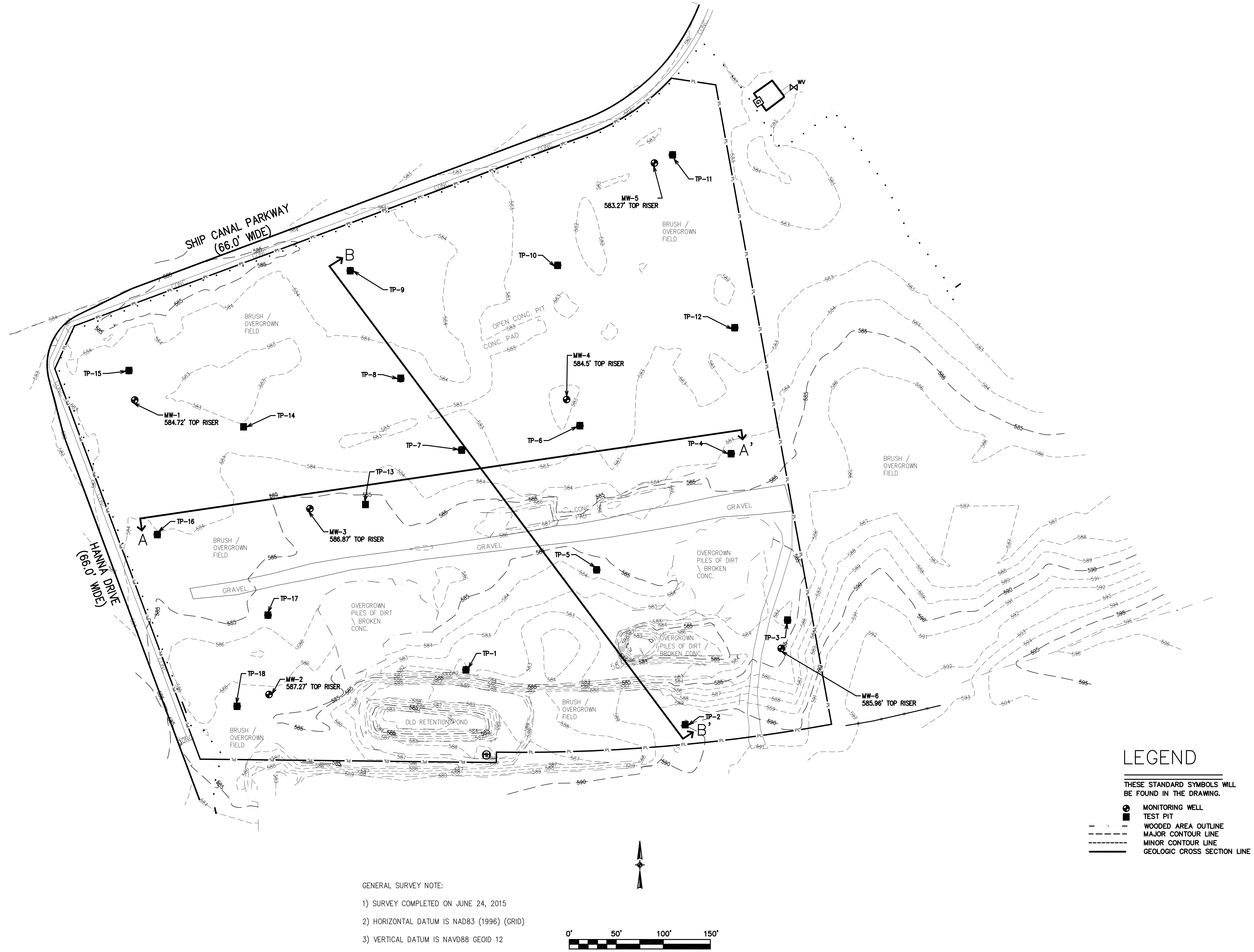
DATE:
JUNE 26, 2015

DRAWING NAME:

GROUNDWATER CONTOUR MAP

DRAWING NO:

FIGURE 3



LEGEND

THESE STANDARD SYMBOLS WILL BE FOUND IN THE DRAWING.

- ⊕ MONITORING WELL
- ■ TEST PIT
- — · — WOODED AREA OUTLINE
- — — — MAJOR CONTOUR LINE
- - - - - - MINOR CONTOUR LINE
- ——— GEOLOGIC CROSS SECTION LINE

GENERAL SURVEY NOTE:

1) SURVEY COMPLETED ON JUNE 24, 2015

2) HORIZONTAL DATUM IS NAD83 (1996) (GRID)

3) VERTICAL DATUM IS NAVD88 GEOID 12

LABELLA
Associates,D.P.C.
Relationships. Resources. Results.

Engineering
Architecture
Environmental
Planning

300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
F: (585) 454-3066

www.labellapc.com

It is a violation of New York Education Law Article 145 Sec.7209, for any person, unless acting under the direction of a licensed architect, professional engineer, or land surveyor, to alter an item in any way. If an item bearing the seal of an architect, engineer, or land surveyor is altered; the altering architect, engineer, or land surveyor shall affix to the item their seal and notation "altered by" followed by their signature and date of such alteration, and a specific description of the alteration.

BUFFALO URBAN DEVELOPMENT CORP.

Buffalo Urban Development Corporation
95 Perry Street, Suite 404
BUFFALO, NEW YORK 14203

193 Ship Canal Parkway
BCP Project

193 Ship Canal Parkway
BUFFALO, NEW YORK 14218

PROJECT NO:
2202521

REVISION

NO.	DATE	DESCRIPTION
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--

DRAWN BY: CTL

APPROVED BY: MWH

ISSUED FOR:
FINAL SURVEY PLAT

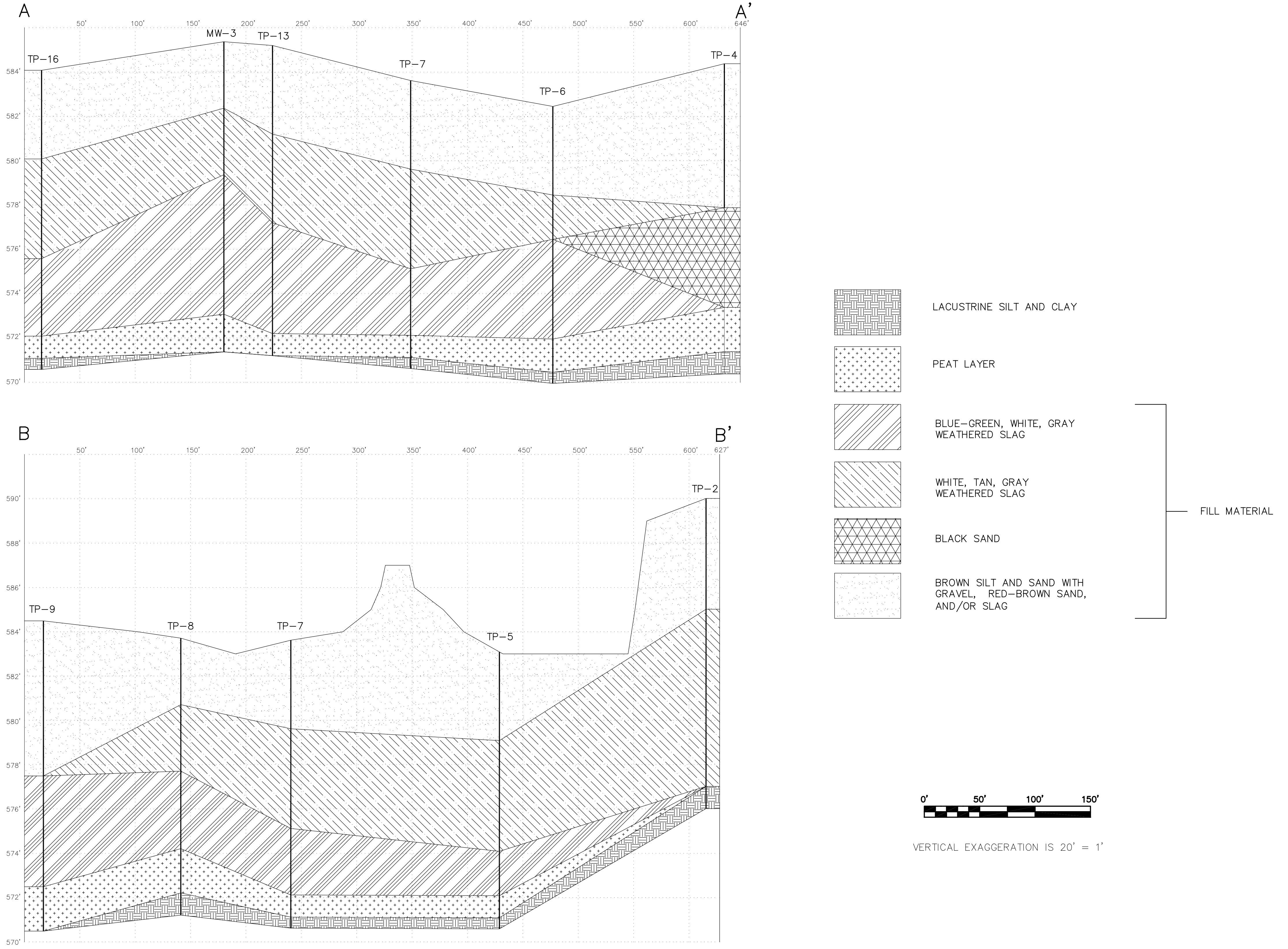
DATE:
JUNE 26, 2015

DRAWING NAME:

TEST PIT AND MONITORING WELL LOCATIONS

DRAWING NO:

FIGURE 4



LABELLA
Associates, D.P.C.
Relationships. Resources. Results.
Engineering
Architecture
Environmental
Planning

300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
F: (585) 454-3066

www.labellapc.com

BUFFALO URBAN DEVELOPMENT CORP.

Buffalo Urban Development Corporation
95 Perry Street, Suite 404
BUFFALO, NEW YORK 14203

193 Ship Canal Parkway
BCP Project

193 Ship Canal Parkway
BUFFALO, NEW YORK 14218

PROJECT NO: 2202521

REVISION

NO.	DATE	DESCRIPTION
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--

DRAWN BY: CTL

APPROVED BY: MWH

ISSUED FOR: FINAL SURVEY PLAT

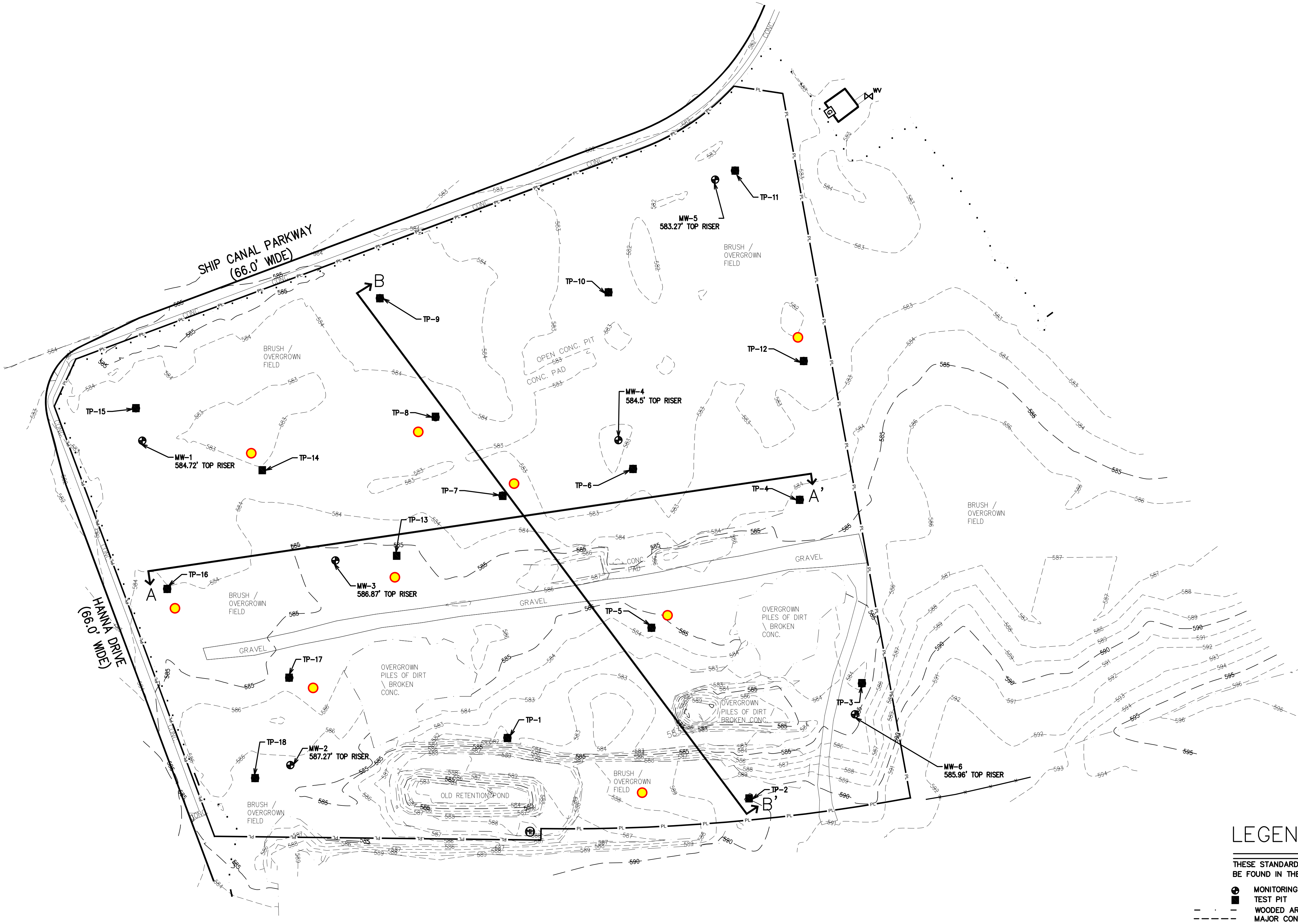
DATE: JUNE 26, 2015

DRAWING NAME:

GEOLOGIC SECTIONS

DRAWING NO:

FIGURE 5



GENERAL SURVEY NOTE:

1) SURVEY COMPLETED ON JUNE 24, 2015

2) HORIZONTAL DATUM IS NAD83 (1996) (GRID)

3) VERTICAL DATUM IS NAVD88 GEOID 12

LEGEND

THESE STANDARD SYMBOLS WILL BE FOUND IN THE DRAWING.

⊕	MONITORING WELL
■	TEST PIT
— · —	WOODED AREA OUTLINE
— — —	MAJOR CONTOUR LINE
- - - - -	MINOR CONTOUR LINE
———	GEOLOGIC CROSS SECTION LINE

●	Proposed Supplemental Test Pit Locations

LABELLA
Associates, D.P.C.
Relationships. Resources. Results.
Engineering
Architecture
Environmental
Planning
300 STATE STREET
ROCHESTER, NY 14614
P: (585) 454-6110
F: (585) 454-3066
www.labellapc.com

BUFFALO URBAN DEVELOPMENT CORP.

Buffalo Urban Development Corporation
95 Perry Street, Suite 404
BUFFALO, NEW YORK 14203

193 Ship Canal Parkway
BCP Project

193 Ship Canal Parkway
BUFFALO, NEW YORK 14218

PROJECT NO:
2150403

REVISION

NO.	DATE	DESCRIPTION
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--
--	--	--

DRAWN BY: CTL

APPROVED BY: MWH

ISSUED FOR: FINAL SURVEY PLAT

DATE: JUNE 26, 2015

DRAWING NAME:

TEST PIT AND MONITORING WELL LOCATIONS

DRAWING NO:

FIGURE 6

LaBella
Powered by partnership.

APPENDIX 1

NYSDEC Supplemental Investigation Request Letter

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Region 9
270 Michigan Avenue, Buffalo, NY 14203-2915
P: (716) 851-7220 | F: (716) 851-7226
www.dec.ny.gov

April 27, 2020

Mr. Peter Cammarata
Buffalo Urban Development Corp.
95 Perry St., Suite 404
Buffalo, NY 14203

Dear Mr. Cammarata:

Radioactive Fill and Emerging Contaminants
193 Ship Canal Parkway, Site #C915240
Buffalo, Erie County

During an April 24, 2020 telephone conversation, we discussed the steps necessary for deciding upon an environmental remedy for the subject brownfield site.

Field instrumentation used in the past Remedial Investigation found that some of the fill material on site displayed radioactive properties. In order to evaluate remedial alternatives for the site, a more accurate determination of these radioactive properties must be made; samples of the fill material will need to be collected for laboratory analysis. Please submit a work plan and schedule for this sampling and testing, for the Department's review, no later than August 25, 2020.

We also discussed the Department's State-wide initiative, requiring the sampling and testing of groundwater, at all environmental remediation sites, for the contaminants: 1,4-Dioxane and per- and polyfluoroalkyl substances (PFASs), so-called Emerging Contaminants (ECs). You might be familiar with the initiative, from other BUDC brownfield sites. Information pertaining to the sampling and testing of ECs is found in the Department's guidance document: *Guidelines for Sampling and Analysis of PFAs*, January 2020 (attached). Additional information is also available on the Department's website at https://www.dec.ny.gov/chemical/108831.html. Please include this sampling and testing in the work plan described above.

If you have any questions, please contact me by phone (716-851-7260) or email (david.locey@dec.ny.gov).

Sincerely,

David P. Locey
NYSDEC Project Manager

DPL:
ec with attachment:
David Stebbins, BUDC
Andrea Caprio, NYSDEC

NEW YORK STATE OF OPPORTUNITY. | Department of Environmental Conservation

GUIDELINES FOR SAMPLING AND ANALYSIS OF PFAS

Under NYSDEC's Part 375 Remedial Programs

January 2020

www.dec.ny.gov

Contents

ERRATA SHEET for

Guidelines for Sampling and Analysis of PFAS Under NYSDEC's Part 375 Program
Issued January 17, 2020

Citation and Page Number	Current Text	Corrected Text	Date

January 2020

Guidelines for Sampling and Analysis of Per- and Polyfluoroalkyl Substances (PFAS) Under NYSDEC's Part 375 Remedial Programs

Objective

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) performs or oversees sampling of environmental media and subsequent analysis of PFAS as part of remedial programs implemented under 6 NYCRR Part 375. To ensure consistency in sampling, analysis and reporting of PFAS, DER has developed this document to summarize procedures and update previous DER technical guidance pertaining to PFAS.

Applicability

Sampling for PFAS has already been initiated at numerous sites under DER-approved work plans, in accordance with specified procedures. All future work plans should include PFAS sampling and analysis procedures that conform to the guidelines provided herein.

As part of a site investigation or remedial action compliance program, whenever samples of potentially affected media are collected and analyzed for the standard Target Analyte List/Target Compound List (TAL/TCL), PFAS analysis should also be performed. Potentially affected media can include soil, groundwater, surface water, and sediment. Based upon the potential for biota to be affected, biota sampling and analysis for PFAS may also be warranted as determined pursuant to a Fish and Wildlife Impact Analysis. Soil vapor sampling for PFAS is not required.

Field Sampling Procedures

DER-10 specifies technical guidance applicable to DER's remedial programs. Given the prevalence and use of PFAS, DER has developed "best management practices" specific to sampling for PFAS. As specified in DER-10 Chapter 2, quality assurance procedures are to be submitted with investigation work plans. Typically, these procedures are incorporated into a work plan, or submitted as a stand-alone document (e.g., a Quality Assurance Project Plan). Quality assurance guidelines for PFAS are listed in Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS.

Field sampling for PFAS performed under DER remedial programs should follow the appropriate procedures outlined for soils, sediments or other solids (Appendix B), non-potable groundwater (Appendix C), surface water (Appendix D), public or private water supply wells (Appendix E), and fish tissue (Appendix F).

QA/QC samples (e.g. duplicates, MS/MSD) should be collected as specified in DER-10, Section 2.3(c). For sampling equipment coming in contact with aqueous samples only, rinsate or equipment blanks should be collected. Equipment blanks should be collected at a minimum frequency of one per day or one per twenty samples, whichever is more frequent.

Data Assessment and Application to Site Cleanup

Until such time as Ambient Water Quality Standards (AWQS) and Soil Cleanup Objectives (SCOs) for PFAS are published, the extent of contaminated media potentially subject to remediation should be determined on a case-by-case basis using the procedures discussed below and the criteria in DER-10.

Water Sample Results

PFAS should be further assessed and considered as a potential contaminant of concern in groundwater or surface water if PFOA or PFOS is detected in any water sample at or above 10 ng/L (ppt). In addition, further assessment of water may be warranted if either of the following screening levels are met:

a. any other individual PFAS (not PFOA or PFOS) is detected in water at or above 100 ng/L; or
b. total concentration of PFAS (including PFOA and PFOS) is detected in water at or above 500 ng/L

If PFAS are identified as a contaminant of concern for a site, they should be assessed as part of the remedy selection process in accordance with Part 375 and DER-10.

Soil Sample Results

The extent of soil contamination for purposes of delineation and remedy selection should be determined by having certain soil samples tested by Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed for PFAS. Soil exhibiting SPLP results above 70 ppt for either PFOA or PFOS (individually or combined) are to be evaluated during the cleanup phase.

Sites in the site management phase should evaluate for PFAS to determine if modification to any components of the SMP is necessary (e.g., monitoring for PFAS, upgrading treatment facilities, or performing an RSO).

Testing for Imported Soil

Soil imported to a site for use in a soil cap, soil cover, or as backfill is to be tested for PFAS in general conformance with DER-10, Section 5.4(e) for the *PFAS Analyte List* (Appendix F) using the analytical procedures discussed below and the criteria in DER-10 associated with SVOCs.

If PFOA or PFOS is detected in any sample at or above 1 µg/kg, then soil should be tested by SPLP and the leachate analyzed for PFAS. If the SPLP results exceed 10 ppt for either PFOA or PFOS (individually) then the source of backfill should be rejected, unless a site-specific exemption is provided by DER. SPLP leachate criteria is based on the Maximum Contaminant Levels proposed for drinking water by New York State's Department of Health, this value may be updated based on future Federal or State promulgated regulatory standards. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays. Category B deliverables should be submitted for backfill samples, though a DUSR is not required.

Analysis and Reporting

As of January 2020, the United States Environmental Protection Agency (EPA) does not have a validated method for analysis of PFAS for media commonly analyzed under DER remedial programs (non-potable waters, solids). DER has developed the following guidelines to ensure consistency in analysis and reporting of PFAS.

The investigation work plan should describe analysis and reporting procedures, including laboratory analytical procedures for the methods discussed below. As specified in DER-10 Section 2.2, laboratories should provide a full Category B deliverable. In addition, a Data Usability Summary Report (DUSR) should be prepared by an independent, third party data validator. Electronic data submissions should meet the requirements provided at: https://www.dec.ny.gov/chemical/62440.html.

DER has developed a *PFAS Analyte List* (Appendix F) for remedial programs to understand the nature of contamination at sites. It is expected that reported results for PFAS will include, at a minimum, all the compounds listed. If lab and/or matrix specific issues are encountered for any analytes, the DER project manager, in consultation with the DER chemist, will make case-by-case decisions as to whether certain analytes may be temporarily or permanently discontinued from analysis at each site. As with other contaminants that are analyzed for at a site, the *PFAS Analyte List* may be refined for future sampling events based on investigative findings.

Routine Analysis

Currently, New York State Department of Health's Environmental Laboratory Approval Program (ELAP) does not offer certification for PFAS in matrices other than finished drinking water. However, laboratories analyzing environmental samples for PFAS (e.g., soil, sediments, and groundwater) under DER's Part 375 remedial programs need to hold ELAP certification for PFOA and PFOS in drinking water by EPA Method 537.1 or ISO 25101. Laboratories should adhere to the guidelines and criteria set forth in the DER's laboratory guidelines for PFAS in non-potable water and solids (Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids). Data review guidelines were developed by DER to ensure data comparability and usability (Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids).

LC-MS/MS analysis for PFAS using methodologies based on EPA Method 537.1 is the procedure to use for environmental samples. Isotope dilution techniques should be utilized for the analysis of PFAS in all media. Reporting limits for PFOA and PFOS in aqueous samples should not exceed 2 ng/L. Reporting limits for PFOA and PFOS in solid samples should not exceed 0.5 µg/kg. Reporting limits for all other PFAS in aqueous and solid media should be as close to these limits as possible. If laboratories indicate that they are not able to achieve these reporting limits for the entire *PFAS Analyte List*, site-specific decisions regarding acceptance of elevated reporting limits for specific PFAS can be made by the DER project manager in consultation with the DER chemist.

Additional Analysis

Additional laboratory methods for analysis of PFAS may be warranted at a site, such as the Synthetic Precipitation Leaching Procedure (SPLP) and Total Oxidizable Precursor Assay (TOP Assay). Commercially methods are also available for biota and air samples.

SPLP is a technique used to determine the mobility of chemicals in liquids, soils and wastes, and may be useful in determining the need for addressing PFAS-containing material as part of the remedy. SPLP by EPA Method 1312 should be used unless otherwise specified by the DER project manager in consultation with the DER chemist.

Impacted materials can be made up of PFAS that are not analyzable by routine analytical methodology. A TOP Assay can be utilized to conceptualize the amount and type of oxidizable PFAS which could be liberated in the environment, which approximates the maximum concentration of perfluoroalkyl substances that could be generated if all polyfluoroalkyl substances were oxidized. For example, some polyfluoroalkyl substances may degrade or transform to form perfluoroalkyl substances (such as PFOA or PFOS), resulting in an increase in perfluoroalkyl substance concentrations as contaminated groundwater moves away from a source. The TOP Assay converts, through oxidation, polyfluoroalkyl substances (precursors) into perfluoroalkyl substances that can be detected by routine analytical methodology.

Please note that TOP Assay analysis of highly-contaminated samples, such as those from an AFFF (aqueous film-forming foam) site, can result in incomplete oxidation of the samples and an underestimation of the total perfluoroalkyl substances.

Commercial laboratories have adopted methods which allow for the quantification of targeted PFAS in air and biota. The EPA's Office of Research and Development (ORD) is currently developing methods which allow for air emissions characterization of PFAS, including both targeted and non-targeted analysis of PFAS. Consult with the DER project manager and the DER chemist for assistance on analyzing biota/tissue and air samples.

Appendix A - Quality Assurance Project Plan (QAPP) Guidelines for PFAS

The following guidelines (general and PFAS-specific) can be used to assist with the development of a QAPP for projects within DER involving sampling and analysis of PFAS.

General Guidelines in Accordance with DER-10

- Document/work plan section title – Quality Assurance Project Plan
- Summarize project scope, goals, and objectives
- Provide project organization including names and resumes of the project manager, Quality Assurance Officer (QAO), field staff, and Data Validator
    - The QAO should not have another position on the project, such as project or task manager, that involves project productivity or profitability as a job performance criterion
- List the ELAP-approved lab(s) to be used for analysis of samples
- Include a site map showing sample locations
- Provide detailed sampling procedures for each matrix
- Include Data Quality Usability Objectives
- List equipment decontamination procedures
- Include an “Analytical Methods/Quality Assurance Summary Table” specifying:
    - Matrix type
    - Number or frequency of samples to be collected per matrix
    - Number of field and trip blanks per matrix
    - Analytical parameters to be measured per matrix
    - Analytical methods to be used per matrix with minimum reporting limits
    - Number and type of matrix spike and matrix spike duplicate samples to be collected
    - Number and type of duplicate samples to be collected
    - Sample preservation to be used per analytical method and sample matrix
    - Sample container volume and type to be used per analytical method and sample matrix
    - Sample holding time to be used per analytical method and sample matrix
- Specify Category B laboratory data deliverables and preparation of a DUSR

Specific Guidelines for PFAS

- Include in the text that sampling for PFAS will take place
- Include in the text that PFAS will be analyzed by LC-MS/MS for PFAS using methodologies based on EPA Method 537.1
- Include the list of PFAS compounds to be analyzed (*PFAS Analyte List*)
- Include the laboratory SOP for PFAS analysis
- List the minimum method-achievable Reporting Limits for PFAS
    - Reporting Limits should be less than or equal to:
        - Aqueous – 2 ng/L (ppt)
        - Solids – 0.5 µg/kg (ppb)
- Include the laboratory Method Detection Limits for the PFAS compounds to be analyzed
- Laboratory should have ELAP certification for PFOA and PFOS in drinking water by EPA Method 537.1, EPA Method 533, or ISO 25101
- Include detailed sampling procedures
    - Precautions to be taken
    - Pump and equipment types
    - Decontamination procedures
    - Approved materials only to be used
- Specify that regular ice only will be used for sample shipment
- Specify that equipment blanks should be collected at a minimum frequency of 1 per day per matrix

Appendix B - Sampling Protocols for PFAS in Soils, Sediments and Solids

General

The objective of this protocol is to give general guidelines for the collection of soil, sediment and other solid samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Containers

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in to contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel spoon
- stainless steel bowl
- steel hand auger or shovel without any coatings

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification. Previous results of "non-detect" for PFAS from the UCMR3 water supply testing program are acceptable as verification.

Sampling Techniques

Sampling is often conducted in areas where a vegetative turf has been established. In these cases, a pre-cleaned trowel or shovel should be used to carefully remove the turf so that it may be replaced at the conclusion of sampling. Surface soil samples (e.g. 0 to 6 inches below surface) should then be collected using a pre-cleaned, stainless steel spoon. Shallow subsurface soil samples (e.g. 6 to ~36 inches below surface) may be collected by digging a hole using a pre-cleaned hand auger or shovel. When the desired subsurface depth is reached, a pre-cleaned hand auger or spoon shall be used to obtain the sample.

When the sample is obtained, it should be deposited into a stainless steel bowl for mixing prior to filling the sample containers. The soil should be placed directly into the bowl and mixed thoroughly by rolling the material into the middle until the material is homogenized. At this point the material within the bowl can be placed into the laboratory provided container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A soil log or sample log shall document the location of the sample/borehole, depth of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix C - Sampling Protocols for PFAS in Monitoring Wells

General

The objective of this protocol is to give general guidelines for the collection of groundwater samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including plumbers tape and sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel inertia pump with HDPE tubing
- peristaltic pump equipped with HDPE tubing and silicone tubing
- stainless steel bailer with stainless steel ball
- bladder pump (identified as PFAS-free) with HDPE tubing

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Monitoring wells should be purged in accordance with the sampling procedure (standard/volume purge or low flow purge) identified in the site work plan, which will determine the appropriate time to collect the sample. If sampling using standard purge techniques, additional purging may be needed to reduce turbidity levels, so samples contain a limited amount of sediment within the sample containers. Sample containers that contain sediment may cause issues at the laboratory, which may result in elevated reporting limits and other issues during the sample preparation that can compromise data usability. Sampling personnel should don new nitrile gloves prior to sample collection due to the potential to contact PFAS containing items (not related to the sampling equipment) during the purging activities.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank every day that sampling is conducted and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Additional equipment blank samples may be collected to assess other equipment that is utilized at the monitoring well
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A purge log shall document the location of the sample, sampling equipment, groundwater parameters, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix D - Sampling Protocols for PFAS in Surface Water

General

The objective of this protocol is to give general guidelines for the collection of surface water samples for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Samples collected using this protocol are intended to be analyzed for PFAS using methodologies based on EPA Method 537.1.

The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation’s Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials including sample bottle cap liners with a PTFE layer.

A list of acceptable equipment is provided below, but other equipment may be considered appropriate based on sampling conditions.

- stainless steel cup

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Where conditions permit, (e.g. creek or pond) sampling devices (e.g. stainless steel cup) should be rinsed with site medium to be sampled prior to collection of the sample. At this point the sample can be collected and poured into the sample container.

If site conditions permit, samples can be collected directly into the laboratory container.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- Collect one equipment blank every day that sampling is conducted and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the sample, sampling equipment, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate. Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appropriate rain gear (PVC, polyurethane, or rubber rain gear are acceptable), bug spray, and sunscreen should be used that does not contain PFAS. Well washed cotton coveralls may be used as an alternative to bug spray and/or sunscreen.

PPE that contains PFAS is acceptable when site conditions warrant additional protection for the samplers and no other materials can be used to be protective. Documentation of such use should be provided in the field notes.

Appendix E - Sampling Protocols for PFAS in Private Water Supply Wells

General

The objective of this protocol is to give general guidelines for the collection of water samples from private water supply wells (with a functioning pump) for PFAS analysis. The sampling procedure used should be consistent with Sampling Guidelines and Protocols – Technological Background and Quality Control/Quality Assurance for NYS DEC Spill Response Program – March 1991 (http://www.dec.ny.gov/docs/remediation_hudson_pdf/sgpsect5.pdf), with the following limitations.

Laboratory Analysis and Container

Drinking water samples collected using this protocol are intended to be analyzed for PFAS by ISO Method 25101. The preferred material for containers is high density polyethylene (HDPE). Pre-cleaned sample containers, coolers, sample labels, and a chain of custody form will be provided by the laboratory.

Equipment

Acceptable materials for sampling include: stainless steel, HDPE, PVC, silicone, acetate, and polypropylene. Additional materials may be acceptable if pre-approved by New York State Department of Environmental Conservation's Division of Environmental Remediation.

No sampling equipment components or sample containers should come in contact with aluminum foil, low density polyethylene, glass, or polytetrafluoroethylene (PTFE, Teflon™) materials (e.g. plumbers tape), including sample bottle cap liners with a PTFE layer.

Equipment Decontamination

Standard two step decontamination using detergent (Alconox is acceptable) and clean, PFAS-free water will be performed for sampling equipment. All sources of water used for equipment decontamination should be verified in advance to be PFAS-free through laboratory analysis or certification.

Sampling Techniques

Locate and assess the pressure tank and determine if any filter units are present within the building. Establish the sample location as close to the well pump as possible, which is typically the spigot at the pressure tank. Ensure sampling equipment is kept clean during sampling as access to the pressure tank spigot, which is likely located close to the ground, may be obstructed and may hinder sample collection.

Prior to sampling, a faucet downstream of the pressure tank (e.g., wash room sink) should be run until the well pump comes on and a decrease in water temperature is noted which indicates that the water is coming from the well. If the homeowner is amenable, staff should run the water longer to purge the well (15+ minutes) to provide a sample representative of the water in the formation rather than standing water in the well and piping system including the pressure tank. At this point a new pair of nitrile gloves should be donned and the sample can be collected from the sample point at the pressure tank.

Sample Identification and Logging

A label shall be attached to each sample container with a unique identification. Each sample shall be included on the chain of custody (COC).

Quality Assurance/Quality Control

- Immediately place samples in a cooler maintained at 4 ± 2º Celsius using ice
- Collect one field duplicate for every sample batch, minimum 1 duplicate per 20 samples. The duplicate shall consist of an additional sample at a given location
- Collect one matrix spike / matrix spike duplicate (MS/MSD) for every sample batch, minimum 1 MS/MSD per 20 samples. The MS/MSD shall consist of an additional two samples at a given location and identified on the COC
- If equipment was used, collect one equipment blank every day that sampling is conducted and minimum 1 equipment blank per 20 samples. The equipment blank shall test the new and decontaminated sampling equipment utilized to obtain a sample for residual PFAS contamination. This sample is obtained by using laboratory provided PFAS-free water and passing the water over or through the sampling device and into laboratory provided sample containers
- Request appropriate data deliverable (Category B) and an electronic data deliverable

Documentation

A sample log shall document the location of the private well, sample point location, owner contact information, sampling equipment, purge duration, duplicate sample, visual description of the material, and any other observations or notes determined to be appropriate and available (e.g. well construction, pump type and location, yield, installation date). Additionally, care should be performed to limit contact with PFAS containing materials (e.g. waterproof field books, food packaging) during the sampling process.

Personal Protection Equipment (PPE)

For most sampling Level D PPE is anticipated to be appropriate. The sampler should wear nitrile gloves while conducting field work and handling sample containers.

Field staff shall consider the clothing to be worn during sampling activities. Clothing that contains PTFE material (including GORE-TEX®) or that have been waterproofed with PFAS materials should be avoided. All clothing worn by sampling personnel should have been laundered multiple times.

Appendix F - Sampling Protocols for PFAS in Fish

This appendix contains a copy of the latest guidelines developed by the Division of Fish and Wildlife (DFW) entitled “General Fish Handling Procedures for Contaminant Analysis” (Ver. 8).

Procedure Name: General Fish Handling Procedures for Contaminant Analysis

Number: FW-005

Purpose: This procedure describes data collection, fish processing and delivery of fish collected for contaminant monitoring. It contains the chain of custody and collection record forms that should be used for the collections.

Organization: Environmental Monitoring Section
Bureau of Ecosystem Health
Division of Fish and Wildlife (DFW)
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, New York 12233-4756

Version: 8

Previous Version Date: 21 March 2018

Summary of Changes to this Version: Updated bureau name to Bureau of Ecosystem Health. Added direction to list the names of all field crew on the collection record. Minor formatting changes on chain of custody and collection records.

Originator or Revised by: Wayne Richter, Jesse Becker

Date: 26 April 2019

Quality Assurance Officer and Approval Date: Jesse Becker, 26 April 2019

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

GENERAL FISH HANDLING PROCEDURES FOR CONTAMINANT ANALYSES

A. Original copies of all continuity of evidence (i.e., Chain of Custody) and collection record forms must accompany delivery of fish to the lab. A copy shall be directed to the Project Leader or as appropriate, Wayne Richter. All necessary forms will be supplied by the Bureau of Ecosystem Health. Because some samples may be used in legal cases, it is critical that each section is filled out completely. Each Chain of Custody form has three main sections:

1. The top box is to be filled out **and signed** by the person responsible for the fish collection (e.g., crew leader, field biologist, researcher). This person is responsible for delivery of the samples to DEC facilities or personnel (e.g., regional office or biologist).

2. The second section is to be filled out **and signed** by the person responsible for the collections while being stored at DEC, before delivery to the analytical lab. This may be the same person as in (1), but it is still required that they complete the section. Also important is the **range of identification numbers** (i.e., tag numbers) included in the sample batch.

3. Finally, the bottom box is to record any transfers between DEC personnel and facilities. Each subsequent transfer should be **identified, signed, and dated**, until laboratory personnel take possession of the fish.

B. The following data are required on each **Fish Collection Record** form:

1. Project and Site Name.

2. DEC Region.

3. All personnel (and affiliation) involved in the collection.

4. Method of collection (gill net, hook and line, etc.)

5. Preservation Method.

C. The following data are to be taken on each fish collected and recorded on the **Fish Collection Record** form:

1. Tag number - Each specimen is to be individually jaw tagged at time of collection with a unique number. Make sure the tag is turned out so that the number can be read without opening the bag. Use tags in sequential order. For small fish or composite samples place the tag inside the bag with the samples. The Bureau of Ecosystem Health can supply the tags.

2. Species identification (please be explicit enough to enable assigning genus and species). Group fish by species when processing.

3. Date collected.

4. Sample location (waterway and nearest prominent identifiable landmark).

5. Total length (nearest mm or smallest sub-unit on measuring instrument) and weight (nearest g or

smallest sub-unit of weight on weighing instrument). Take all measures as soon as possible with calibrated, protected instruments (e.g. from wind and upsets) and prior to freezing.

6. Sex - fish may be cut enough to allow sexing or other internal investigation, but do not eviscerate. Make any incision on the right side of the belly flap or exactly down the midline so that a left-side fillet can be removed.

D. General data collection recommendations:

1. It is helpful to use an ID or tag number that will be unique. It is best to use metal striped bass or other uniquely numbered metal tags. If uniquely numbered tags are unavailable, values based on the region, water body and year are likely to be unique: for example, R7CAY11001 for Region 7, Cayuga Lake, 2011, fish 1. If the fish are just numbered 1 through 20, we have to give them new numbers for our database, making it more difficult to trace your fish to their analytical results and creating an additional possibility for errors.

2. Process and record fish of the same species sequentially. Recording mistakes are less likely when all fish from a species are processed together. Starting with the bigger fish species helps avoid missing an individual.

3. If using Bureau of Ecosystem Health supplied tags or other numbered tags, use tags in sequence so that fish are recorded with sequential Tag Numbers. This makes data entry and login at the lab and use of the data in the future easier and reduces keypunch errors.

4. Record length and weight as soon as possible after collection and before freezing. Other data are recorded in the field upon collection. An age determination of each fish is optional, but if done, it is recorded in the appropriate “Age” column.

5. For composite samples of small fish, record the number of fish in the composite in the Remarks column. Record the length and weight of each individual in a composite. All fish in a composite sample should be of the same species and members of a composite should be visually matched for size.

6. Please submit photocopies of topographic maps or good quality navigation charts indicating sampling locations. GPS coordinates can be entered in the Location column of the collection record form in addition to or instead for providing a map. These records are of immense help to us (and hopefully you) in providing documented location records which are not dependent on memory and/or the same collection crew. In addition, they may be helpful for contaminant source trackdown and remediation/control efforts of the Department.

7. When recording data on fish measurements, it will help to ensure correct data recording for the data recorder to call back the numbers to the person making the measurements.

E. Each fish is to be placed in its own individual plastic bag. For small fish to be analyzed as a composite, put all of the fish for one composite in the same bag but use a separate bag for each composite. It is important to individually bag the fish to avoid difficulties or cross contamination when processing the fish for chemical analysis. Be sure to include the fish’s tag number inside the bag, preferably attached to the fish with the tag number turned out so it can be read. Tie or otherwise secure the bag closed. **The Bureau of Ecosystem Health will supply the bags.** If necessary, food grade bags may be procured from a suitable vendor (e.g., grocery store). It is preferable to redundantly label each bag with a manila tag tied between the knot and the body of the bag. This tag should be labeled with the project name, collection location, tag number, collection date, and fish species. If scales are collected, the scale envelope should be labeled with the same information.

F. Groups of fish, by species, are to be placed in one large plastic bag per sampling location. **The Bureau of Ecosystem Health will supply the larger bags.** Tie or otherwise secure the bag closed. Label the site bag with a manila tag tied between the knot and the body of the bag. The tag should contain: project, collection location, collection date, species and **tag number ranges**. Having this information on the manila tag enables lab staff to know what is in the bag without opening it.

G. Do not eviscerate, fillet or otherwise dissect the fish unless specifically asked to. If evisceration or dissection is specified, the fish must be cut along the exact midline or on the right side so that the left side fillet can be removed intact at the laboratory. If filleting is specified, the procedure for taking a standard fillet (SOP PREPLAB 4) must be followed, including removing scales.

H. Special procedures for PFAS: Unlike legacy contaminants such as PCBs, which are rarely found in day to day life, PFAS are widely used and frequently encountered. Practices that avoid sample contamination are therefore necessary. While no standard practices have been established for fish, procedures for water quality sampling can provide guidance. The following practices should be used for collections when fish are to be analyzed for PFAS:
   No materials containing Teflon.
   No Post-it notes.
   No ice packs; only water ice or dry ice.
   Any gloves worn must be powder free nitrile.
   No Gore-Tex or similar materials (Gore-Tex is a PFC with PFOA used in its manufacture).
   No stain repellent or waterproof treated clothing; these are likely to contain PFCs.
   Avoid plastic materials, other than HDPE, including clipboards and waterproof notebooks.
   Wash hands after handling any food containers or packages as these may contain PFCs. Keep pre-wrapped food containers and wrappers isolated from fish handling.
   Wear clothing washed at least six times since purchase.
   Wear clothing washed without fabric softener.
   Staff should avoid cosmetics, moisturizers, hand creams and similar products on the day of sampling as many of these products contain PFCs (Fujii et al. 2013). Sunscreen or insect repellent should not contain ingredients with "fluor" in their name. Apply any sunscreen or insect repellent well downwind from all materials. Hands must be washed after touching any of these products.

I. All fish must be kept at a temperature <45° F (<8° C) immediately following data processing. As soon as possible, freeze at -20° C ± 5° C. Due to occasional freezer failures, daily freezer temperature logs are required. The freezer should be locked or otherwise secured to maintain chain of custody.

J. In most cases, samples should be delivered to the Analytical Services Unit at the Hale Creek field station. Coordinate delivery with field station staff and send copies of the collection records, continuity of evidence forms and freezer temperature logs to the field station. For samples to be analyzed elsewhere, non-routine collections or other questions, contact Wayne Richter, Bureau of Ecosystem Health, NYSDEC, 625 Broadway, Albany, New York 12233-4756, 518-402-8974, or the project leader about sample transfer. Samples will then be directed to the analytical facility and personnel noted on specific project descriptions.

K. A recommended equipment list is at the end of this document.

page ______ of ______

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF FISH AND WILDLIFE
FISH COLLECTION RECORD

Project and Site Name ____ DEC Region ____________

Collections made by (include all crew) ____

Sampling Method: ☐Electrofishing ☐Gill netting ☐Trap netting ☐Trawling ☐Seining ☐Angling ☐Other ____________________

Preservation Method: ☐Freezing ☐Other ________________ Notes (SWFDB survey number): ____________________

FOR LAB USE ONLY- LAB ENTRY NO.	COLLECTION OR TAG NO.	SPECIES	DATE TAKEN	LOCATION	AGE	SEX &/OR REPROD. CONDIT	LENGTH ( )	WEIGHT ( )	REMARKS

richter: revised 2011, 5/7/15, 10/4/16, 3/20/17; becker: 3/23/17, 4/26/19

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
CHAIN OF CUSTODY

I, ______________________________, of ____ collected the
(Print Name) (Print Business Address)

following on ____________________, 20____ from ____
(Date) (Water Body)

in the vicinity of ____
(Landmark, Village, Road, etc.)

Town of ____, in __________________________________ County.

Item(s) ____

____

Said sample(s) were in my possession and handled according to standard procedures provided to me prior to collection. The sample(s) were placed in the custody of a representative of the New York State Department of Environmental Conservation on ____________________________________, 20______.

____ ______________________________
Signature Date

I, __________________________________, received the above mentioned sample(s) on the date specified and assigned identification number(s) ____ to the sample(s). I have recorded pertinent data for the sample(s) on the attached collection records. The sample(s) remained in my custody until subsequently transferred, prepared or shipped at times and on dates as attested to below.

______________________________________ ____________________
Signature Date

SECOND RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
THIRD RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
FOURTH RECIPIENT (Print Name)	TIME & DATE	PURPOSE OF TRANSFER
SIGNATURE	UNIT	
RECEIVED IN LABORATORY BY (Print Name)	TIME & DATE	REMARKS
SIGNATURE	UNIT	
LOGGED IN BY (Print Name)	TIME & DATE	ACCESSION NUMBERS
SIGNATURE	UNIT	

richter: revised 21 April 2014; becker: 23 March 2017, 26 April, 2019

NOTICE OF WARRANTY

By signature to the chain of custody (reverse), the signatory warrants that the information provided is truthful and accurate to the best of his/her ability. The signatory affirms that he/she is willing to testify to those facts provided and the circumstances surrounding the same. Nothing in this warranty or chain of custody negates responsibility nor liability of the signatories for the truthfulness and accuracy of the statements provided.

HANDLING INSTRUCTIONS

On day of collection, collector(s) name(s), address(es), date, geographic location of capture (attach a copy of topographic map or navigation chart), species, number kept of each species, and description of capture vicinity (proper noun, if possible) along with name of Town and County must be indicated on reverse.

Retain organisms in manila tagged plastic bags to avoid mixing capture locations. Note appropriate information on each bag tag.

Keep samples as cool as possible. Put on ice if fish cannot be frozen within 12 hours. If fish are held more than 24 hours without freezing, they will not be retained or analyzed.

Initial recipient (either DEC or designated agent) of samples from collector(s) is responsible for obtaining and recording information on the collection record forms which will accompany the chain of custody. This person will seal the container using packing tape and writing his signature, the time and the date across the tape onto the container with indelible marker. Any time a seal is broken, for whatever purpose, the incident must be recorded on the Chain of Custody (reason, time, and date) in the purpose of transfer block. Container then is resealed using new tape and rewriting signature, with time and date.

EQUIPMENT LIST

Scale or balance of appropriate capacity for the fish to be collected.

Fish measuring board.

Plastic bags of an appropriate size for the fish to be collected and for site bags.

Individually numbered metal tags for fish.

Manila tags to label bags.

Small envelops, approximately 2” x 3.5”, if fish scales are to be collected.

Knife for removing scales.

Chain of custody and fish collection forms.

Clipboard.

Pens or markers.

Paper towels.

Dish soap and brush.

Bucket.

Cooler.

Ice.

Duct tape.

Appendix G – PFAS Analyte List

Group	Chemical Name	Abbreviation	CAS Number
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid	PFBS	375-73-5
	Perfluorohexanesulfonic acid	PFHxS	355-46-4
	Perfluoroheptanesulfonic acid	PFHpS	375-92-8
	Perfluorooctanesulfonic acid	PFOS	1763-23-1
	Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluoroalkyl carboxylates	Perfluorobutanoic acid	PFBA	375-22-4
	Perfluoropentanoic acid	PFPeA	2706-90-3
	Perfluorohexanoic acid	PFHxA	307-24-4
	Perfluoroheptanoic acid	PFHpA	375-85-9
	Perfluorooctanoic acid	PFOA	335-67-1
	Perfluorononanoic acid	PFNA	375-95-1
	Perfluorodecanoic acid	PFDA	335-76-2
	Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
	Perfluorododecanoic acid	PFDoA	307-55-1
	Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
	Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
Fluorinated Telomer Sulfonates	6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
	8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluorooctane-sulfonamides	Perfluroroctanesulfonamide	FOSA	754-91-6
Perfluorooctane-sulfonamidoacetic acids	N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
	N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

Appendix H - Laboratory Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

New York State Department of Environmental Conservation's Division of Environmental Remediation (DER) developed the following guidelines for laboratories analyzing environmental samples for PFAS under DER programs. If laboratories cannot adhere to the following guidelines, they should contact DER's Quality Assurance Officer, Dana Maikels, at dana.maikels@dec.ny.gov prior to analysis of samples.

Isotope Dilution

Isotope dilution techniques should be utilized for the analysis of PFAS in all media.

Extraction

For water samples, the entire sample bottle should be extracted, and the sample bottle rinsed with appropriate solvent to remove any residual PFAS.

For samples with high particulates, the samples should be handled in one of the following ways:

1. Spike the entire sample bottle with isotope dilution analytes (IDAs) prior to any sample manipulation. The sample can be passed through the SPE and if it clogs, record the volume that passed through.
2. If the sample contains too much sediment to attempt passing it through the SPE cartridge, the sample should be spiked with isotope dilution analytes, centrifuged and decanted.
3. If higher reporting limits are acceptable for the project, the sample can be diluted by taking a representative aliquot of the sample. If isotope dilution analytes will be diluted out of the sample, they can be added after the dilution. The sample should be homogenized prior to taking an aliquot.

If alternate sample extraction procedures are used, please contact the DER remedial program chemist prior to employing. Any deviations in sample preparation procedures should be clearly noted in the case narrative.

Signal to Noise Ratio

For all target analyte ions used for quantification, signal to noise ratio should be 3:1 or greater.

Blanks

There should be no detections in the method blanks above the reporting limits.

Ion Transitions

The ion transitions listed below should be used for the following PFAS:

PFOA	413 > 369
PFOS	499 > 80
PFHxS	399 > 80
PFBS	299 > 80
6:2 FTS	427 > 407
8:2 FTS	527 > 507
N-EtFOSAA	584 > 419
N-MeFOSAA	570 > 419

Branched and Linear Isomers

Standards containing both branched and linear isomers should be used when standards are commercially available. Currently, quantitative standards are available for PFHxS, PFOS, NMeFOSAA, and NEtFOSAA. As more standards become available, they should be incorporated in to the method. All isomer peaks present in the standard should be integrated and the areas summed. Samples should be integrated in the same manner as the standards.

Since a quantitative standard does not exist for branched isomers of PFOA, the instrument should be calibrated using just the linear isomer and a technical (qualitative) PFOA standard should be used to identify the retention time of the branched PFOA isomers in the sample. The total response of PFOA branched and linear isomers should be integrated in the samples and quantitated using the calibration curve of the linear standard.

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated for each target analyte and the ratio compared to standards. Lab derived criteria should be used to determine if the ratios are acceptable.

Reporting

Detections below the reporting limit should be reported and qualified with a J qualifier.

The acid form of PFAS analytes should be reported. If the salt form of the PFAS was used as a stock standard, the measured mass should be corrected to report the acid form of the analyte.

Appendix H - Data Review Guidelines for Analysis of PFAS in Non-Potable Water and Solids

General

These guidelines are intended to be used for the validation of PFAS analytical results for projects within the Division of Environmental Remediation (DER) as well as aid in the preparation of a data usability summary report. Data reviewers should understand the methodology and techniques utilized in the analysis. Consultation with the end user of the data may be necessary to assist in determining data usability based on the data quality objectives in the Quality Assurance Project Plan. A familiarity with the laboratory's Standard Operating Procedure may also be needed to fully evaluate the data. If you have any questions, please contact DER's Quality Assurance Officer, Dana Maikels, at dana.maikels@dec.ny.gov.

Preservation and Holding Time

Samples should be preserved with ice to a temperature of less than 6°C upon arrival at the lab. The holding time is 14 days to extraction for aqueous and solid samples. The time from extraction to analysis for aqueous samples is 28 days and 40 days for solids.

Temperature greatly exceeds 6ºC upon arrival at the lab*	Use professional judgement to qualify detects and non-detects as estimated or rejected
Holding time exceeding 28 days to extraction	Use professional judgement to qualify detects and non-detects as estimated or rejected if holding time is grossly exceeded

*Samples that are delivered to the lab immediately after sampling may not meet the thermal preservation guidelines. Samples are considered acceptable if they arrive on ice or an attempt to chill the samples is observed.

Initial Calibration

The initial calibration should contain a minimum of five standards for linear fit and six standards for a quadratic fit. The relative standard deviation (RSD) for a quadratic fit calibration should be less than 20%. Linear fit calibration curves should have an R^2 value greater than 0.990.

The low-level calibration standard should be within 50% - 150% of the true value, and the mid-level calibration standard within 70% - 130% of the true value.

%RSD >20%	J flag detects and UJ non detects
R^2 >0.990	J flag detects and UJ non detects
Low-level calibration check <50% or >150%	J flag detects and UJ non detects
Mid-level calibration check <70% or >130%	J flag detects and UJ non detects

Initial Calibration Verification

An initial calibration verification (ICV) standard should be from a second source (if available). The ICV should be at the same concentration as the mid-level standard of the calibration curve.

ICV recovery <70% or >130%	J flag detects and non-detects

Continuing Calibration Verification

Continuing calibration verification (CCV) checks should be analyzed at a frequency of one per ten field samples. If CCV recovery is very low, where detection of the analyte could be in question, ensure a low level CCV was analyzed and use to determine data quality.

CCV recovery <70 or >130%	J flag results

Blanks

There should be no detections in the method blanks above the reporting limits. Equipment blanks, field blanks, rinse blanks etc. should be evaluated in the same manner as method blanks. Use the most contaminated blank to evaluate the sample results.

Blank Result	Sample Result	Qualification
Any detection	<Reporting limit	Qualify as ND at reporting limit
Any detection	>Reporting Limit and >10x the blank result	No qualification
>Reporting limit	>Reporting limit and <10x blank result	J+ biased high

Field Duplicates

A blind field duplicate should be collected at rate of one per twenty samples. The relative percent difference (RPD) should be less than 30% for analyte concentrations greater than two times the reporting limit. Use the higher result for final reporting.

RPD >30%	Apply J qualifier to parent sample

Lab Control Spike

Lab control spikes should be analyzed with each extraction batch or one for every twenty samples. In the absence of lab derived criteria, use 70% - 130% recovery criteria to evaluate the data.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects

Matrix Spike/Matrix Spike Duplicate

One matrix spike and matrix spike duplicate should be collected at a rate of one per twenty samples. Use professional judgement to reject results based on out of control MS/MSD recoveries.

Recovery <70% or >130% (lab derived criteria can also be used)	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only
RPD >30%	Apply J qualifier to detects and UJ qualifier to non detects of parent sample only

Extracted Internal Standards (Isotope Dilution Analytes)

Problematic analytes (e.g. PFBA, PFPeA, fluorotelomer sulfonates) can have wider recoveries without qualification. Qualify corresponding native compounds with a J flag if outside of the range.

Recovery <50% or >150%	Apply J qualifier
Recovery <25% or >150% for poor responding analytes	Apply J qualifier
Isotope Dilution Analyte (IDA) Recovery <10%	Reject results

Secondary Ion Transition Monitoring

Quantifier and qualifier ions should be monitored for all target analytes (PFBA and PFPeA are exceptions). The ratio of quantifier ion response to qualifier ion response should be calculated from the standards for each target analyte. Lab derived criteria should be used to determine if the ratios are acceptable. If the ratios fall outside of the laboratory criteria, qualify results as an estimated maximum concentration.

Signal to Noise Ratio

The signal to noise ratio for the quantifier ion should be at least 3:1. If the ratio is less than 3:1, the peak is discernable from the baseline noise and symmetrical, the result can be reported. If the peak appears to be baseline noise and/or the shape is irregular, qualify the result as tentatively identified.

Branched and Linear Isomers

Observed branched isomers in the sample that do not have a qualitative or quantitative standard should be noted and the analyte should be qualified as biased low in the final data review summary report. Note: The branched isomer peak should also be present in the secondary ion transition.

Reporting Limits

If project-specific reporting limits were not met, please indicate that in the report along with the reason (e.g. over dilution, dilution for non-target analytes, high sediment in aqueous samples).

Peak Integrations

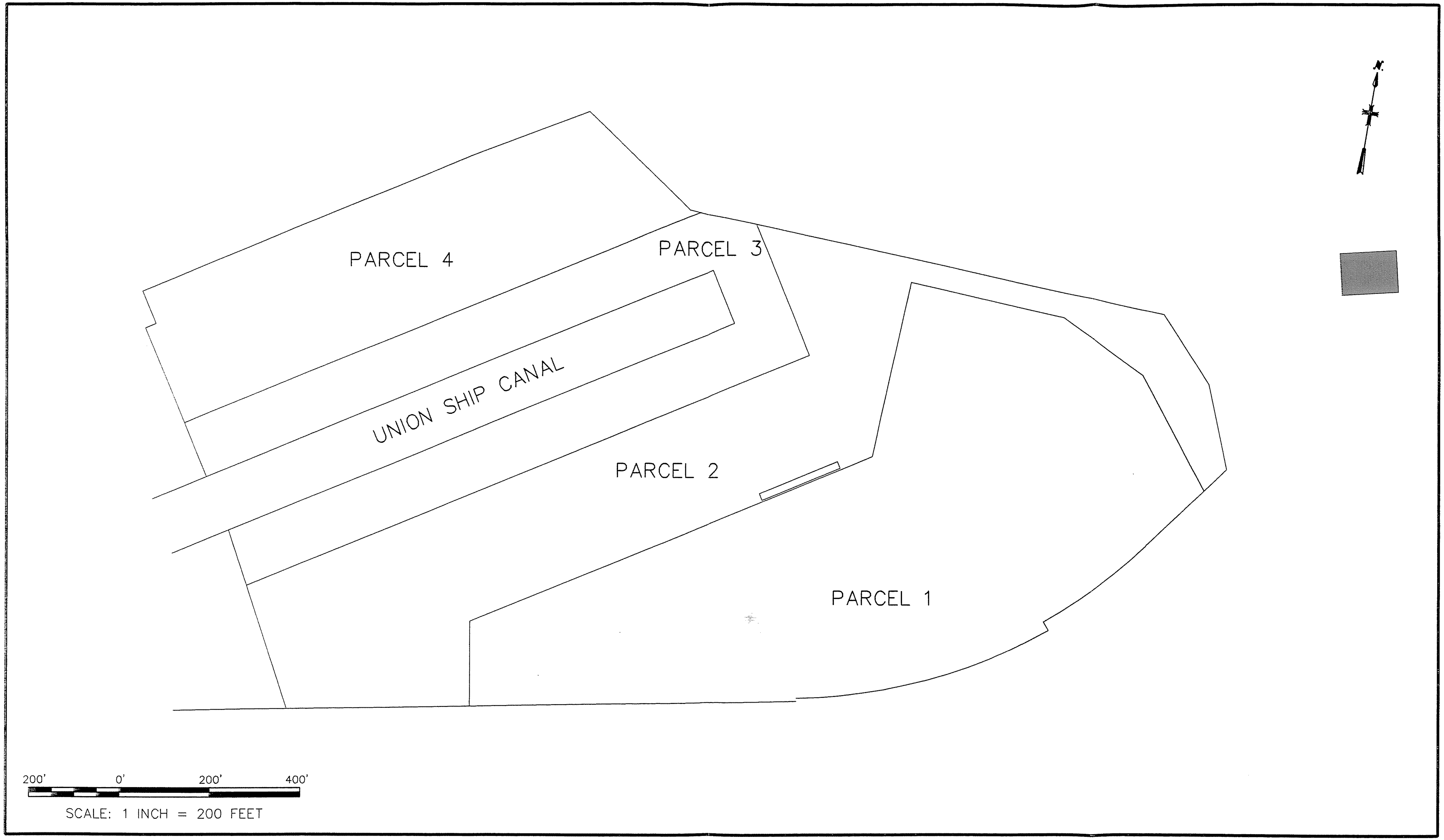
Target analyte peaks should be integrated properly and consistently when compared to standards. Ensure branched isomer peaks are included for PFAS where standards are available. Inconsistencies should be brought to the attention of the laboratory or identified in the data review summary report.

LaBella
Powered by partnership.

APPENDIX 2

Hanna Furnace Sub-Parcel Figure

FIGURE 1–2



MALCOLM PIRNIE

3587F006

HANNA FURNACE–FORMER RAILYARD SITE
REMEDIAL ACTION WORK PLAN

SITE MAP

HANNA FURNACE

FEBRUARY 2002

LaBella
Powered by partnership.

APPENDIX 3

Health & Safety Plan

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

Olympic Towers, 300 Pearl Street, Suite 130 | Buffalo, NY 14202 | p 716.551.6281 | f 716.551.6282 | www.labellapc.com

Site Health and Safety Plan

Location:
193 Ship Canal Parkway
Buffalo, New York

Prepared For:

Mr. Peter M. Cammarata, President
Buffalo Urban Development Corporation
95 Perry Street, Suite 404
Buffalo, New York 14203

LaBella Project No. 2150403

April 30, 2015

Table of Contents

Page

SITE HEALTH AND SAFETY PLAN

Project Title: 193 Ship Canal Parkway Site–Remedial Investigation

Project Number: 2150403

Project Location (Site): 193 Ship Canal Parkway, Buffalo, New York

Environmental Director: Gregory Senecal, CHMM

Project Manager: Robert Napieralski, CPG

Plan Review Date: April 30, 2015

Plan Approval Date: April 30, 2015

Plan Approved By: R Rote

Mr. Richard Rote, CIH

Site Safety Supervisor: Andrew Benkleman

Site Contact: Peter M. Cammarata, BUDC

Safety Director: Rick Rote, CIH

Proposed Date(s) of Field Activities: May, 2015

Site Conditions: Slight variable topography, vacant/fallow (commercial/industrial) land, encompassing approximately 9.65 acres

Site Environmental Information Provided By: Remedial Investigation Work Plan (RIWP), Arcadis US

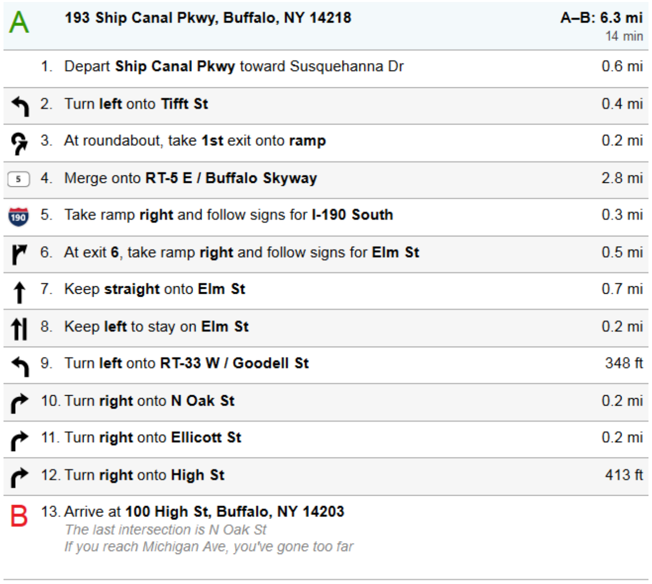
Air Monitoring Provided By: LaBella Associates, D.P.C.

Site Control Provided By: Contractor(s)

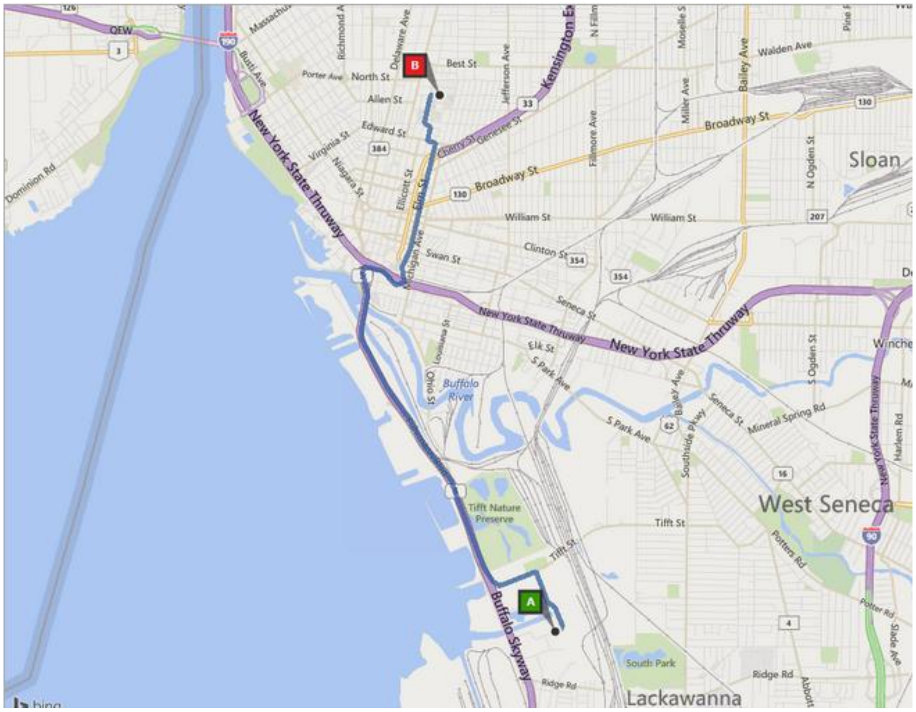
EMERGENCY CONTACTS

	Name	**Phone Number**
Ambulance:	As Per Emergency Service	911
Hospital Emergency:	Buffalo General Medical Center	716-859-5600
Poison Control Center:	National Poison Control Center (serving Buffalo Area)	800-222-1222
Police (local, state):	Lackawanna Police Department	716-822-4900
Fire Department:	West Seneca Fire District No. 1	716-824-5922
Site Contact:	Peter M. Cammarata (BUDC)	Direct: 716-856-6525 Cell: 716-362-8361
Agency Contact:	David Locey (NYSDEC)	716-851-7220
Environmental Director:	Greg Senecal, CHMM (LaBella)	Direct: 585-295-6243 Cell: 585-752-6480
Project Manager:	Rob Napieralski, CPG (LaBella)	Direct: 716-551-6283 Cell: 716-253-0444
Site Safety Supervisor:	Andrew Benkleman (LaBella)	Direct: 716-768-3184 Cell: 716-200-8885
Safety Director	Rick Rote, CIH (LaBella)	Direct: 585-295-6241

MAP AND DIRECTIONS TO THE MEDICAL FACILITY: BUFFALO GENERAL MEDICAL CENTER



A	**193 Ship Canal Pkwy, Buffalo, NY 14218**	**A–B: 6.3 mi** 14 min
1.	Depart **Ship Canal Pkwy** toward Susquehanna Dr	0.6 mi
2.	Turn **left** onto **Tifft St**	0.4 mi
3.	At roundabout, take **1st** exit onto **ramp**	0.2 mi
4.	Merge onto **RT-5 E / Buffalo Skyway**	2.8 mi
5.	Take ramp **right** and follow signs for **I-190 South**	0.3 mi
6.	At exit **6**, take ramp **right** and follow signs for **Elm St**	0.5 mi
7.	Keep **straight** onto **Elm St**	0.7 mi
8.	Keep **left** to stay on **Elm St**	0.2 mi
9.	Turn **left** onto **RT-33 W / Goodell St**	348 ft
10.	Turn **right** onto **N Oak St**	0.2 mi
11.	Turn **right** onto **Ellicott St**	0.2 mi
12.	Turn **right** onto **High St**	413 ft
B 13.	Arrive at **100 High St, Buffalo, NY 14203** *The last intersection is N Oak St* *If you reach Michigan Ave, you've gone too far*	



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 field activities relating to the implementation of the Remedial Investigation (RI) at the Site located at 139 Ship Canal Parkway, City of Buffalo, Erie County, New York. This HASP exclusively reflects the policies of LaBella Associates, D.P.C. (LaBella). The requirements of this HASP are applicable to all approved LaBella personnel at the work site. This document’s project specifications are to be consulted for guidance in preventing and quickly abating any threat to human safety or the environment. The provisions of the HASP were developed in general accordance with 29 CFR 1910 and 29 CFR 1926 and do not replace or supersede any regulatory requirements of the USEPA, NYSDEC, OSHA or and other regulatory body.

2.0 Responsibilities

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

3.0 Activities Covered

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

- ☐ Management of environmental investigation activities
- ☐ Environmental monitoring
- ☐ Collection of soil, fill and groundwater samples
- ☐ Management of investigation derived soil and fill
- ☐ Management of groundwater monitoring well development/purging fluids

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, drill rigs, backhoes, etc will be in operation at the site. The presence of such equipment presents the danger of being struck or crushed. Use caution when working near heavy machinery.

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

5.2 Excavation Hazards

Potential Hazard:
Excavations and trenches can collapse, causing injury or death. Edges of excavations can be unstable and collapse. Toxic and asphyxiant gases can accumulate in confined spaces and trenches. Excavations that require working within the excavation will require air monitoring in the breathing zone (refer to Section 5.4).

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. The contractor will be responsible to ensure that all excavations are left in a safe condition.

Excavations shall be backfilled immediately following completion. If this is not possible, fencing and/or barriers accompanied by "no trespassing" signs should be placed around all excavations when left open for any period of time when work is not being conducted.

5.3 Cuts, Punctures and Other Injuries

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

Protective Action:
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:
Investigations of the site have provided documentation of soil/fill and groundwater impacts from previous industrial activities. Soil/fill on the site is known to contain elevated concentrations of PCBs and metals, including cyanide, arsenic, chromium and lead. Groundwater with elevated pH levels has also been documented at the site. Therefore, dermal contact and inhalation of contaminated dust particles are the most likely exposure pathways. In addition to these known chemical hazards, there is the potential to encounter other contaminants including petroleum products, chlorinated solvents or other chemicals during subsurface drilling and/or excavating activities at the project site. Inhalation of high concentrations of organic vapors can cause headache, stupor, drowsiness, confusion and other health effects. Skin contact can cause irritation, chemical burn, or dermatitis.

Protective Action:
The use of properly selected Personal Protective Equipment (PPE), adherence to standard health and safety pre-cautions (e.g., no smoking or eating within work area or prior to personal decontamination), and implementation of routine dust suppression methods will effectively minimize exposure to the known contaminants on-site. For example, the use of chemical resistant gloves and face shields during groundwater sampling should provide adequate protection from caustic groundwater.

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 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 5.4), the following work zones should be established:

Exclusion Zone (EZ):
The EZ will be established in the immediate vicinity and adjacent downwind direction of site activities that elevate breathing zone VOC concentrations to unacceptable levels based on field screening. These site activities include subsurface drilling and excavating, as well as sampling activities. If access to the site is required to accommodate non-project related personnel, 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 place all used PPE in garbage bags for proper disposal by the contractor.

8.0 Personal Protective Equipment

Generally, site conditions at this work site require modified Level D Personal Protective Equipment (PPE). However, air monitoring will be conducted to determine if up-grading to Level C PPE is required (refer to Section 5.4). Descriptions of the typical safety equipment associated with modified Level D and Level C are provided below:

Modified Level D:
Hard hat, safety glasses, steel toe construction grade boots, tyvek suit, rubber nitrile sampling gloves, safety glasses, full-face shield for groundwater sampling, rubber nitrile sampling gloves.

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.

The Air Monitor will utilize a Photo-Ionization Detector (PID) to screen the ambient air in the work areas for total Volatile Organic Compounds (VOCs). Work area ambient air will generally be monitored downwind of the work area. Continuous air monitoring of the work area will be performed using the PID.

If sustained PID readings of greater than 25 ppm are recorded in the breathing zone, personnel are to either 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 hours of use or more frequently, if necessary. If PID readings are sustained in the work area at levels above 25 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).

10.0 Emergency Action Plan

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

C:\USERS\CKIBLER\DESKTOP\193 SHIP CANAL PKWY HASP.DOC

LABELLA
LaBella Associates, D.P.C.
300 Pearl Street, Suite 130
Buffalo, New York 14202

Attachment 1
Reference Exposure Limits

Exposure Limits and Recognition Qualities

Compound	PEL-TWA (ppm)(b)(d)	TLV-TWA (ppm)(c)(d)	STEL	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	0.2	0.2	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	0.096	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
Ethylbenzene	100	100	NA	1	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
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
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	Almond	NA	NA
Cadmium	0.2	0.5	NA	NA	NA	NA	NA	NA	NA
Chromium	1	0.5	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	Odorless	NA	NA
Selenium	0.2	0.02	NA	NA	NA	Unknown	NA	NA	NA
Other									
Asbestos	0.1 (f/cc)	NA	1.0 (f/cc)	NA	NA	NA	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.