WORK PLAN

For

REMEDIAL INVESTIGATION

68 TONAWANDA STREET SITE

NYSDEC SITE #C915316
68 TONAWANDA STREET
BUFFALO, NEW YORK 14207

Prepared For:

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1.0 INTRODUCTION

This document presents details of a work plan designed to support a Remedial Investigation (RI) at the 68 Tonawanda Street Site - NYSDEC Site #C915316 located at 68 Tonawanda Street, Buffalo, New York 14207 (refer to Figure 1). 68 Tonawanda Street, LLC was the recent owner of the property. Buffalo Freight House, LLC. (Owner) recently purchased the property and will conduct a remedial investigation and remediate the site under New York's Brownfield Cleanup Program (BCP). The owner plans, upon completion of remediation, to redevelop the site. The reuse will result in repurposing an existing warehouse/manufacturing facility into apartments and light commercial space as well as parking spaces.

Environmental studies/investigations that have been completed at the site to date (refer to Section 3.0) concluded that there are impacted site soils and potential impacts to groundwater due to the sites former rail and varied commercial/industrial use.

The objectives of the RI include: further assessing the extent of impacted soils, particularly adjacent and beneath the existing structure; assess the quality/depth of fill material across the site; and assess groundwater quality through installing/sampling groundwater monitoring wells

The remaining sections of the work plan discuss:

Section 2.0 - Goals and objectives of the investigation
Section 4.0 - The need for Interim Remedial Measures (IRMs)
Section 5.0 - The investigation scope of work
Section 6.0 - Supplemental field investigations (based on the RI results)
Section 7.0 - A qualitative exposure assessment
Section 8.0 - Oversight and reporting requirements
Section 9.0 - Work plan PE certification

Appendix A - Provides a site-specific Health and Safety Plan (HASP)
Appendix B - Citizens Participation Plan
Appendix C - Quality Assurance Quality Control Plan
Appendix D - Field Sampling Plan

Appendix E - Project Schedule
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1.1 Site History and Description

The 68 Tonawanda Street property is approximately 1.74-acres and located in the Black Rock area of the City of Buffalo. The property is located within the City of Buffalo Tonawanda Street Corridor Brownfield Opportunity Area (BOA). The Tonawanda Street Corridor BOA is comprised of 514 acres of primarily under-utilized industrial brownfields in northwest Buffalo stretching from Scajaquada Creek (Creek) to just south of the Tonawanda municipal boundary, and along Chandler Street.

The area and property have a long historic commercial and industrial use. Commercial/industrial use of the general area occurred in the early 1800's situated around Black Rock. Located just north and across Tonawanda Street from the corner of West and Tonawanda Streets, the elongated subject 68 Tonawanda Street property is situated between active rail lines and Tonawanda Street. The property contains the former *New York Central Freight House and Office*. This long narrow 1½-story brick freight house structure was constructed in the early 1900s. The structure does not contain a basement. The building has been recommended as National Register Eligible for its association with the transportation and industrial history of the City of Buffalo at the local, national and international levels.

Historical information and maps suggest that by 1889 the Black Rock Passenger Station was located in the southern part of the property with some sheds and other disconnected buildings including freight platforms and separate smaller freight houses extending north where the freight house is currently. By 1916 the Freight house building was located on the property and rail tracts extended across the adjacent northern rail parcel. A review of 1916 historic maps suggest that the structure included a freight office.

The former freight house building is currently being used by EB Atlas Steel Corp. and Steel Crazy Iron Art which specialize in steel construction, architectural and ornamental metal work. The structure contains eight separate bays. Floors are cement and lighting is a combination mercury and florescent. Various materials associated with steel construction and architectural art are found throughout the

building including steel/metal, various steel working machines, welding equipment etc. Small quantities of paints and lacquers are also contained in the structure in 55-gallon drums or smaller containers. The building uses cooking grease and fry oil as a fuel for heating. This material is contained in 55-gallon drums and other size containers and fed into a heating system. North of the building contains a lay-down area where steel and other materials are stored. This lay-down area extends north onto the adjoining rail parcel. The rail parcel is vacant land beyond the lay-down section. A few 55-gallon drums were observed during the Phase I in the lay-down area and behind the building. The 55-gallon drums at this facility are reportedly associated with three different purposes including storage of the vegetable oil used for heating system or they contain primer paint or sand used in the metal work. A covered section attached to the western side of the building is located toward the northern end of the structure. This area has steel I-beams and other materials and appears to be used for both storage and manufacturing activities.

The property has been associated with rail operations since the mid-late 1800's. By the late 1800's the property contained freight platforms and separate freight depots. As a freight depot, much of the raw and manufactured products that supported the surrounding industry and residential community were probably temporarily stored at this location. Materials where on/off loaded from freight trains on the western rail side of the property and off/on loaded to vehicles on the eastern Tonawanda Street side of the property.

Rail tracts are located immediately adjacent to the west and a vacant undeveloped "triangle shaped" area is further west. Immediately south of the property is a vacant residential/restaurant structure and a vehicle repair shop towards the intersection of Niagara and Tonawanda Streets. Historically the property immediately south had a series of small store and residential structures. Tenements were indicated on the southern adjacent property during the early 1900's and by the 1950's these properties were restaurant and filling station/auto repair facilities. The area immediately north was mostly rail with an office and later a restaurant north of Parish Street at Tonawanda Street. Now mostly vacant, major manufacturing complexes including production of paint and lacquers, automotive parts, metal machining, brick and sewer pipe, and steel foundry operations were located east of the property across Tonawanda Street.

The building is currently sparsely occupied with about 4-5 employees at any one time. The building is currently being used by EB Atlas Steel Corp. and Steel Crazy Iron Art which specialize in steel construction, architectural and ornamental metal work. The structure contains eight separate bays and most of the current use is limited to only a few of these bays. Various materials associated with steel construction and architectural art are found throughout the building including steel/metal, various steel working machines, welding equipment etc.

The building reuse will result in repurposing an existing warehouse/manufacturing facility into 37 market rate apartments and 2,500 square feet of light commercial space as well as approximately 60 parking spaces.

1.2 Contemplated Use of the Site

The building reuse will result in repurposing an existing warehouse/manufacturing facility into 37 market rate apartments and 2,500 square feet of light commercial space as well as approximately 60 parking spaces.

1.3 Project Organization

The following are the lead personnel on the project team:

Project Manager - Peter J. Gorton, CHCM
Project/Remedial Engineers - John Berry, P.E., Jason Brydges, P.E.
Project Field Geologist/Technician – Kevin Williamson
Project Health and Safety - Peter J. Gorton, CHCM
Project QA/QC – Jason Brydges, PE.
Project Hydrogeologist – Michael J. Belotti

Analytical Laboratory – Paradigm Environmental or Accutest Laboratories
Asbestos/lead based paint/mold assessment subcontractor – to be determined
Drilling/Excavation subcontractors – to be determined

2.0 GOALS AND OBJECTIVES

2.1 Overall RI Objectives

In general, a remedial investigation has the following overall objectives as described in NYCRR Part 375-1.8(e):

- Delineation of the areal and vertical extent of the contamination at, and emanating from all media at the Site and the nature of that contamination;
- Characterization of the surface and subsurface characteristics of the site, including topography, surface drainage, stratigraphy, depth to groundwater, and any aquifers that have been impacted or have the potential to be impacted;
- Identification of the sources of contamination, the migration pathways and actual or potential receptors of contaminants;
- Evaluation of actual and potential threats to public health and the environment; and,
- Production of data of sufficient quality and quantity to support the necessity for, and the proposed extent of, remediation and to support the evaluation of proposed alternatives.

The scope and goals specific to this work plan are summarized below and are based on the results of investigations completed to date and those remaining to satisfy the objectives above. If necessary, the RIWP will be supplemented with additional work plans, as needed, to meet the overall objectives of the RI.

2.2 Specific RI Objectives

Specific objectives of the RI are as follows:

- Advance a series of soil borings/test trenches across the property focusing on areas where impacted soils were identified during the Phase II ESAs and to also confirm that other areas not investigated during the Phase II ESAs have not have impacted;
- Collect and analyze representative subsurface soil samples to supplement samples collected in previous investigations along with sampling the natural soil below the fill to assess environmental impacts;
- Confirm depth of fill vs natural soil;
- Install and sample overburden groundwater wells to assess groundwater impacts from off-site and on-site sources by evaluating groundwater quality entering and leaving the site;
- Conduct a vapor intrusion assessment in the on-site building;
- Conduct a building environmental condition assessment (asbestos, lead base paint, etc.); and,

- Fill any data gaps resulting from previous assessments.

The scope of work to complete these objectives is presented in Section 5.0.

2.3 Contaminates of Concern

Based on the findings related to historic use of the Site and the results of the previous Phase II Environmental Site Assessment (ESA) investigations, known contaminates of concern (COCs) in the soils are petroleum related volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs) primarily polynuclear aromatic hydrocarbons (PAHs); PCBs and heavy metals. During the Phase II Environmental Site Assessments, ten samples were analyzed for the full suite of analytes. Based upon these results, the NYSDEC has agreed that additional analyses for volatile organic compounds and pesticides are not required. However, should elevated PID readings or odors be observed during the investigation appropriate samples will be collected for VOC analysis. The redevelopment of the property will include removing at a minimum the top one foot of material across the entire property exterior to the building and covering the entire area with stone base and asphalt. The NYSDEC has agreed that because of this no surface soil samples will need to be collected.

All sub surface soil samples will be analyzed for the remaining Part 375 Brownfields constituent list including semi-volatile organic compounds (SVOCS), metals and PCBs. Tentatively Identified Compounds (TICs) will also be reported for VOCs and SVOCs. Refer to Section 5.2.1 for details of the sampling program.

3.0 ENVIRONMENTAL CONDITIONS/PAST INVESTIGATIONS

February 2013 – Phase I Environmental Site Assessment - In February 2013, PEI conducted a Phase I Environmental Site Assessment (ESA) on the subject Site. The Phase I noted several Recognized Environmental Conditions (RECs) including:

- The property has been associated with rail use and freight storage since the mid-late 1800's. In general, railroad operations have historically produced low level contamination of surrounding areas and therefore the possibility of soil contamination associated with the former railroad operations cannot be discounted. Railroad environmental issues

sometimes involve diesel fuel and other petroleum products and rail areas have also been associated with other contaminants such as heavy metals, chlorinated hydrocarbons, and PAHs above NYSDEC guidelines. In general, soils at former rail road property typically consists of fill near the surface which is typically a black cindery fill layer consistent with materials typically found at rail yards including cinder, gravel, coal and sometimes slag. The fill typically contains elevated concentrations of a few PAHs and metals which may slightly exceed the New York State Department of Environmental Conservation (NYSDEC) soil cleanup guidance values. PAH and metal compounds are common constituents of fill material found in urban environments and are typically associated with rail yards and particularly with the cindery fill used at rail yards.

- The Fedders-Quigan Corporation occupied the southern portion of the freight house by at least 1950. The main Fedders complex was located across Tonawanda Street. Indications were that the subject property was used for freight warehousing products/raw materials. It is unknown if Fedders conducted any manufacturing in the subject property.
- The property has been associated with steel fabrication in the recent past. Depending on the extent of the fabrication, various materials such as metal shavings and metallic dust are likely present. Use of metal cleaning/polishing compounds, and abrasives as well as any fuel may have contributed to environmental impacts.
- Soil mounds and a small number of drums were observed in the rear of the property. These reportedly are empty drums that previously contained either paint primer, sand or used cooking grease/vegetable oil.
- Foundry and machine shop operations were located adjacent to the subject property. Environmental impacts associated with these facilities include elevated levels of lead and other metals in soils and wastes associated with slag/foundry sands such as phenols. Other contaminants, including solvents and petroleum products were associated with these properties. The large Pratt & Lambert paint; resin and lacquer facility which included above ground and underground storage of chemicals and petroleum in numerous tanks, drums and vessels was located adjacent to the property. It is possible that releases from these facilities have impacted area surface and near-surface soils above “normal” urban background with regard to metals and polycyclic aromatic hydrocarbons (PAH) as well as other organic compounds.

- A former Manufacturing Gas Plant (MGP) was located east and nearby the property during the early 1900's until the 1950's. Another MGP plant was located southeast across the creek in the early 1900's. The distance from the subject properties and these facilities was most likely too far to have a significant environmental effect on the subject parcels
- The adjacent Fedders complex properties have a history of chemical and petroleum use and storage. Industrial wastes were reported to include solder dross, degreasing still bottoms including trichloroethylene (TCE) and tetrachloroethene compounds, petroleum-based lubricating fluids and other products and wastes. However, it is likely based on topography and groundwater flow that this facility is mostly either cross/down-gradient of the subject properties.
- A gasoline service station and auto repair facility were located adjacent/nearby to the south. However, it is likely based on topography and groundwater flow that this property is cross/down-gradient of the property.
- Due to the property use history and adjacent property uses, PEI believes potential vapor concerns exist.

March 2014 and January 2016- Phase II Environmental Site Assessments - In March 2014, PEI/BE3 conducted a limited Phase II ESA and in January 2016 conducted a second Phase II ESA that built upon the findings of the first assessment. A February Phase II ESA Report combined the findings of both assessments. The specific scope of work of both ESAs was directed at the examination of surface/subsurface conditions at the property and the collection of soil samples.

A summary or the ESAs is as follows:

- PEI/BE3 completed a field soil screening using a total organic vapor monitor (PID) and soil sampling using Geoprobe® direct push technology to investigate subsurface conditions at the property. A total of seventeen (17) Geoprobe borings were advanced in an array around the western, northern and southern perimeter of the 68 Tonawanda Street structure (refer to Figure 2). Three borings were placed along the eastern side of the building during the 2014 field investigation (Boreholes BH-6, BH-7 and BH-8). These are not associated with this property and therefore not covered

in this Phase II ESA report but are mentioned to explain why they are missing from the figures, table and discussion. The eastern perimeter of the property is the structures eastern wall. Borings were advanced to an average depth of 8 feet below ground surface.

- Elevated PID readings and minor odors were observed at two locations during the 2014 event; borehole BH-4 at a depth of 4-8 feet bgs and in borehole BH-9 at a depth of between 3-4 feet. Borehole 4 was located in the southwest corner of the property and borehole BH-9 was located in the northwest portion of the property adjacent to six 55-gallon drums which are no longer present at the property at that location. Stronger petroleum odor was observed at borehole BH-9A during the 2017 sampling event at between 6-8 feet. Borehole BH-9A is located just south of BH-4 and probably represents the same petroleum impacts observed at that borehole (refer to Figure 2).
- The concentration of PCBs at BH-4A exceeded residential/restricted residential SCOs.
- A total of ten soil samples were collected for laboratory analysis; three (3) soil samples were collected during the 2014 event and seven (7) were collected from the 2017 field event.
- The results of the Phase II ESAs indicate that SVOCs (primarily PAHs) and metal compounds were detected throughout the site at variable levels above residential and restricted residential SCOs in the soil fill that pose a potential risk to construction workers and future residents (see Table 2 and Figure 2). Additionally, results indicate that volatile compounds and PCB/Pesticides were detected in concentrations below SCOs in various locations across the property indicating potential impact from previous property operations. The potential of a petroleum impacted area in the southwest corner of the property was also identified.

4.0 INTERIM REMEDIAL MEASURES (IRM)

Following the remedial investigation, the need for and design of an IRM will be developed.

5.0 INVESTIGATION SCOPE OF WORK

5.1 Introduction

The investigation scope of work will concentrate on: subsurface soil assessment; installation and sampling of groundwater monitoring wells; building soil vapor intrusion and building environmental condition assessment (asbestos, lead base paint, etc.). The scope of work to accomplish each of these objectives is provided in the following sections.

5.2 Environmental Media Investigation

5.2.1 Subsurface Soil Assessment

PEI proposes to advance approximately 20 soil borings/test trenches throughout the site over a two-day working period. The tentative locations of borings/trenches are shown on Figure 3. One of the borings will be located within the south end of the building where there is no floor slab (first 40 or 50 feet of the building) and access by Geoprobe is available.

Based on past investigations, it is assumed that borings/test trenches will be advanced to an average depth of between 8-16 feet below ground surface (bgs) using Geoprobe direct push technology for borings and a backhoe for trenches. For soil borings continuous soil sampling will be conducted using the Geoprobe with a two-inch diameter sampler with four-foot lengths. Test trenches will vary in dimensions; however, they will roughly be 2-4 feet wide, 8-16 feet deep and 6-10 feet long. The soil boring program will be completed first to identify suspect soil conditions such as petroleum contamination that may require further assessment by test trenching. The test trenches are proposed in areas of noted impacted soils from the previous ESA. The primary reason for the test trenches is twofold: 1) to allow for a better examination of fill material and depth of fill and 2) in area where petroleum contamination was indicated.

A field geologist/technician will log all samples and perform visual and field screening of all soil samples for volatile organic compound (VOC) concentrations using a photoionization detector (PID) with an 11.7 eV lamp. Prior to any intrusive activities, subsurface utilities will be located and marked out at the boring locations. The locations of the soil borings/test trenches will be field located and are subject to accessibility and the location of underground utility lines. All soil borings/test trenches will be advanced at a minimum distance of 2.5 feet away from marked utilities, where present, to reduce the possibility of accidentally damaging an underground line. All probe holes will be filled with

indigenous soil deemed not impacted by visual, olfactory and PID screening or clean sand prior to leaving the location. Soils that are deemed impacted from probe holes will be containerized and properly disposed off-site. An asphalt patch will be placed as necessary. Each test trench will be backfilled with the material removed in the order of which it was removed and compacted prior to moving to the next test trench location. Protocols for backfilling and soil compaction are contained in Appendix D.

A record of soil stratigraphy and soil gas readings (PID) will be recorded**.** PEI/BE3 will collect a minimum of six (6) subsurface fill samples from the borings/test trenches. In addition, up to four subsurface samples will be collected from the native undisturbed underlying soil at the same locations where fill samples will be collected. The native undisturbed soil samples will be used to assess if impacted fill material has impacted native undisturbed soil. Sample locations will be based on visual/olfactory observations and on PID readings.

During the Phase II Environmental Site Assessments, metals exceedances were detected throughout the site and may likely drive remediation. Therefore, Besides the six (6) samples noted above to be collected from six of the 20 boring/test trench locations a subsurface soil sample will be collected from the remaining 14 boring/test trench locations for metals analysis to help determine the full extent of metals contamination. The Hex-Chrome parameter will not be tested for unless the Total Chrome parameter results exceed Restricted Residential SCOs.

All sampling will be in accordance with the Appendix D Field Sampling Plan. No surface samples will be collected since all surface fill is anticipated to be removed with the new development.

A PEI/BE3 geologist/technician will complete the following:

- log samples as required;
- prepare field logs based on observations;
- perform air monitoring;
- Properly label, package, and handle samples;
- supervise operations; and
- Complete trench records.

The Onsite Coordinator/Supervising Geologist will keep the Project Manager updated on daily progress and the results of the subsurface investigation. No major changes in the subsurface investigations will be carried out unless approved by the Project Manager. The Project Manager will likewise keep the Client/NYSDEC informed of project developments. No major changes in the subsurface investigations will be carried out unless approved by the Client/NYSDEC.

During the Phase II Environmental Site Assessments, ten samples were analyzed for the full suite of analytes. Based upon these results, the NYSDEC has agreed that additional analyses for volatile organic compounds and pesticides are not required. However, should elevated PID readings or odors be observed during the investigation appropriate samples will be collected for VOC analysis. All samples will be analyzed for the remaining Part 375 Brownfields constituent list including semi-volatile organic compounds (SVOCS), metals and PCBs. Tentatively Identified Compounds (TICs) will also be reported for VOCs and SVOCs. The soil samples will be analyzed by a NYSDOH ELAP certified laboratory and a full Contract Laboratory Program (CLP), NYSDEC Category B, or full CLP-type analytical data package deliverables will be provided as required by the BCP.

5.2.2 Groundwater Investigation

A total of five (5) overburden groundwater monitoring wells will be installed (see Figure 3) using a conventional truck mounted drill rig with hollow stem auger drilling techniques. Each well will consist of a 2-inch inside diameter, schedule 40 PVC casing equipped with a ten-foot screen or less depending on well depth and solid PVC riser pipe extending to the surface. Screens will be positioned to straddle the groundwater surface where water bearing zones are assumed to be between 14 and 24 feet based on investigations conducted at nearby sites and will be extended to the bottom of the boring. We have assumed for this work plan that the average depth will be 20 feet. Filter pack will be placed around the screen to a minimum of one foot above the screen. A finer grained sand pack material (100 percent passing the No. 30 sieve and less than two percent passing the No. 200 sieve) six inches thick will be placed at the top of the sand pack between the sand and the bentonite seal. Bentonite must be placed above the sand pack to form a seal at least three feet thick. A 6 to 12-inch fine grained sand

pack must be placed above the bentonite seal to minimize grout infiltration. Grout of cement/bentonite or bentonite alone must completely fill the remaining annular space to the surface seal. Auger flights or casing must be left in the hole before grouting to prevent caving.

All wells will be completed with 8-inch flush mounted protective casing and cap.

For each well soil types, rock depth, groundwater depth, etc. will be logged by BE3/PEI's geologist. Installation of wells will also adhere to the requirements provided in the Field Sampling Plan provided in Appendix D. Boring logs and well completion diagrams will be provided in the RI report.

One groundwater sample will be collected from each of the five (5) wells. Well development and sampling will be in accordance with the Appendix D Field Sampling Plan. Groundwater samples will be submitted to a New York State approved laboratory and analyzed for the complete Part 375 brownfield constituents list.

All field work will adhere to the Health and Safety Plan provided in Appendix A.

All sample analysis will be in accordance with ASP, Cat B requirements and all data will be validated by preparation of Data Usability Summary Reports (DUSRs). QA/QC requirements for all sample analysis are provided in Appendix C Quality Assurance/Quality Control Plan. Table 1 in Appendix C summarizes the number of Groundwater and soil samples to be collected.

All sampling and development water waste will be containerized and properly disposed off-site.

5.2.3 Building Environmental Condition Assessment

It is assumed for this WP that all process related equipment/materials will have been removed from the site building prior to the field investigation. As part of this RI, an inspection of all buildings and their surrounds will be undertaken to determine if any environmental impacts remain related to previous operations. Also, the Phase 1 ESA noted asbestos, lead based paint and mold as possible environmental concerns in the buildings. This section includes a description of

the environmental assessments to be conducted for the building related to the above concerns.

The former freight house brick building is approximately 40 feet wide by 750 feet in length and contains eight separate bays. A separate metal roof covered section is attached to the western side of the building toward the northern end. This area has steel I-beams and other materials and appears to be used for both storage and manufacturing activities.

The scope of services will entail renovation related services to include: an asbestos containing materials (ACM) survey; Lead based paint inspection and mold assessment.

The specific scope of work tasks are as follows:

ASBESTOS SURVEY

The asbestos inspection will be completed under current industry standards. New York State Department of Labor Certified Asbestos Inspectors will be provided to identify and quantify homogenous areas, and to collect bulk samples of each homogenous area for laboratory analysis. The samples will be sent to a laboratory approved by New York State Department of Health (NYSDOH) Environmental Laboratory Approval Program (ELAP) for subsequent analysis.

The sampling event will include a visual examination to identify the location, approximate quantities, apparent condition and friability of materials that are typically suspected to contain asbestos as identified in 12 NYCRR 56-5.1.

Bulk samples will be laboratory analyzed for the presence of asbestos, using polarized light microscopy (PLM). Samples that are determined by the laboratory to be non-friable organically bound (NOB) in nature, and determined to contain less than one percent asbestos by PLM analysis, will also be analyzed by transmission electron microscopy (TEM). TEM analysis is required by the NYSDOH to conclusively determine that NOB materials contain less than one percent asbestos.

An asbestos survey report will be completed for inclusion in the RI report.

LEAD INSPECTION

The Lead inspection will be completed under current industry standards. EPA certified LBP Risk Assessors/Environmental Technicians will be provided to perform a lead based paint (LBP) inspection of the building using X-Ray Fluorescence (XRF). Surfaces will be classified as LBP using HUD criteria which defines LBP as any paint, varnish, stain or other applied coating measuring 1.0 mg/cm^2 or 0.5 percent by weight or more of lead. All surfaces yielding inconclusive results during the XRF inspection shall be assumed positive for LBP.

A report will be developed for inclusion in the RI report.

MOLD INSPECTION

Mold assessors certified under the current New York State Department of Labor Mold Program will perform the mold assessment. An analysis of mold swab, air and settled particulate analysis in fabric, carpet and other media will be conducted in the building. Analysis will be conducted to identify the type and concentration of cultural and non-cultural molds and other microscopic substances in each sample. Laboratory reports reflect common units of analysis for spore type, and concentration by total spores and by volume. Analysis is conducted under AIHA and EMLAP accreditation.

A report will be developed for inclusion in the RI report.

5.3 Soil Vapor Assessment

A soil vapor assessment will be completed during the soil boring/sampling program and will include monitoring soil during boring and installation of each monitoring well using a PID.

In addition, since the Building is to remain on site and used in the new planned development, a building sub slab vapor assessment will be conducted. The building may be subject to volatile vapors from solvent, petroleum, etc. in the soil from historic site operations. Also, during Phase 2 ESA investigations elevated PID readings and petroleum odors were detected in borings BH-4 and BH-9A located adjacent the west building wall at the south end of the building (refer to figures 3).

This investigation will consist of sampling vapors that may exist beneath the building slab along with sampling building indoor/outdoor air. Up to five (5) air/vapor samples will be collected from five (5) locations across the facility's concrete sub-slab floor with emphasis at the south end of the building. A total of two (2) indoor samples and one (1) outdoor air sample will also be collected for background comparison. Samples will be collected over a 24-hour period. Specific sampling locations within the building will be selected after assessing the PID data from the installation of the RI external borings around the building.

To collect sub-slab air/vapor samples, the concrete floor will be drilled removing a concrete core and collecting an air (vapor) sample from beneath the floor slab using a Summa canister. Summa canisters will also be used to collect indoor/outdoor air samples. Sample collection will follow the procedures described in Appendix D - Field Sampling Plan and will be in accordance with the October 2006, New York State Department of Health *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*.

Since the building will have minimum heat, if any, during the above vapor testing, depending on the testing results, additional indoor air sampling may be required once the building is heated.

6.0 ADDITIONAL SUPPLEMENTAL FIELD INVESTIGATION

All the data generated during the RI will be evaluated to determine if additional investigation activities are needed to fill data gaps and/or assess unexpected environmental concerns resulting from the RI.

The results from the Phase II ESAs will also be included in the RI report.

7.0 QUALITATIVE EXPOSURE ASSESSMENT

A qualitative exposure assessment will be completed in accordance with DER-10 sections 3.3(c) 3 & 4. The assessment will include what impacts site contaminates may have, if any, on all media (ground/surface water, soil, soil vapor, ambient air and biota). Human health and ecological exposure impacts will be assessed as outlined in DER-10 Appendix 3B Qualitative Human Health Exposure Assessment and Appendix 3C Fish and Wildlife Resources Impact Analysis Decision Key. The

Appendix 3C Fish and Wildlife Resources Impact Analysis (FWRIA) Decision Key is provided in Appendix F. No FWRIA is needed based on the completed decision key process. This determination is based on the following:

- The Site was a commercial/industrial property located in the heart of the city of Buffalo;
- There is no habitat of an endangered, threatened or special concern species present on site; and
- There are no ecological resources present on the site.

The qualitative human health exposure assessment will evaluate the five elements (DER-10 Appendix 3B) associated with exposure pathways, and describe how each of these elements pertains to the Site. The exposure pathway elements that will be addressed include:

- A description of the contaminant source(s) including the location of the contaminant release to the environment (any waste disposal area or point of discharge) or if the original source is unknown, the contaminated environmental medium (soil, indoor or outdoor air, biota, water) at the point of exposure;
- An explanation of the contaminant release and transport mechanisms to the exposed population;
- Identification of all potential exposure point(s) where actual or potential human contact with a contaminated medium may occur;
- Description(s) of the route(s) of exposure (i.e., ingestion, inhalation, dermal absorption); and
- A characterization of the receptor populations who may be exposed to contaminants at a point of exposure.

As called for in DER-10 for volunteers in the BCP, sufficient field information and sampling data will be provided to identify the presence of contamination, if any, that maybe leaving the site to support qualitative off-site exposure assessments by others.

8.0 OVERSIGHT AND REPORTING

A Remedial Investigation report will be prepared in accordance with the

applicable requirements of DER-10 and Part 375. A schedule is provided in Appendix E. We anticipate that upon completion of the 30-day public comment period we would conduct the RI immediately and complete field activities in approximately 2-3 weeks.

9.0 WORK PLAN CERTIFICATION

I John B. Berry and Jason M. Brydges certify that we are currently NYS registered professional engineers as defined in 6 NYCRR Part 375 and that this Remedial Investigation Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

John B Berry, PE

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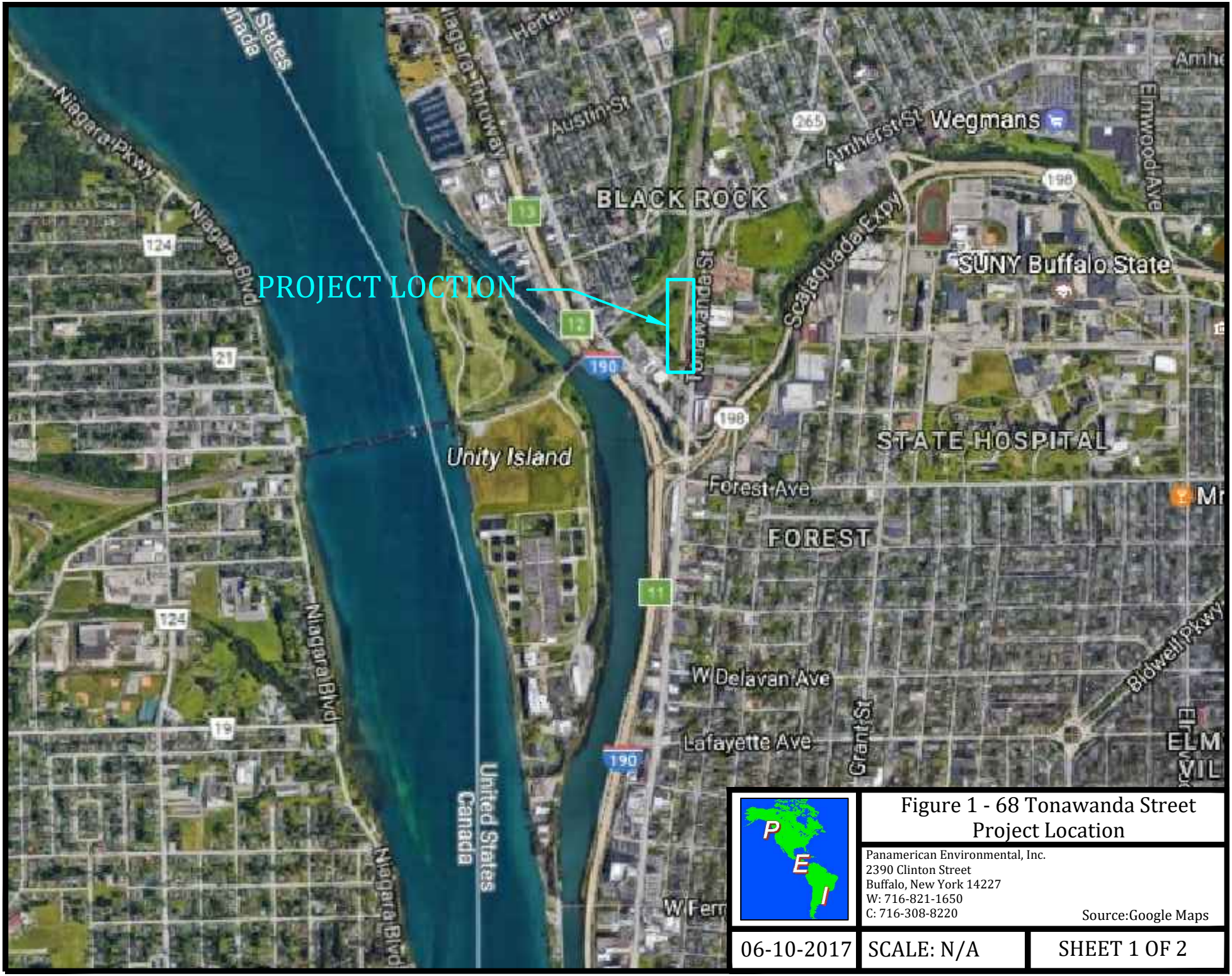


Figure 1 - 68 Tonawanda Street
Project Location

Panamerican Environmental, Inc.
2390 Clinton Street
Buffalo, New York 14227
W: 716-821-1650
C: 716-308-8220

Source:Google Maps

06-10-2017	SCALE: N/A	SHEET 1 OF 2

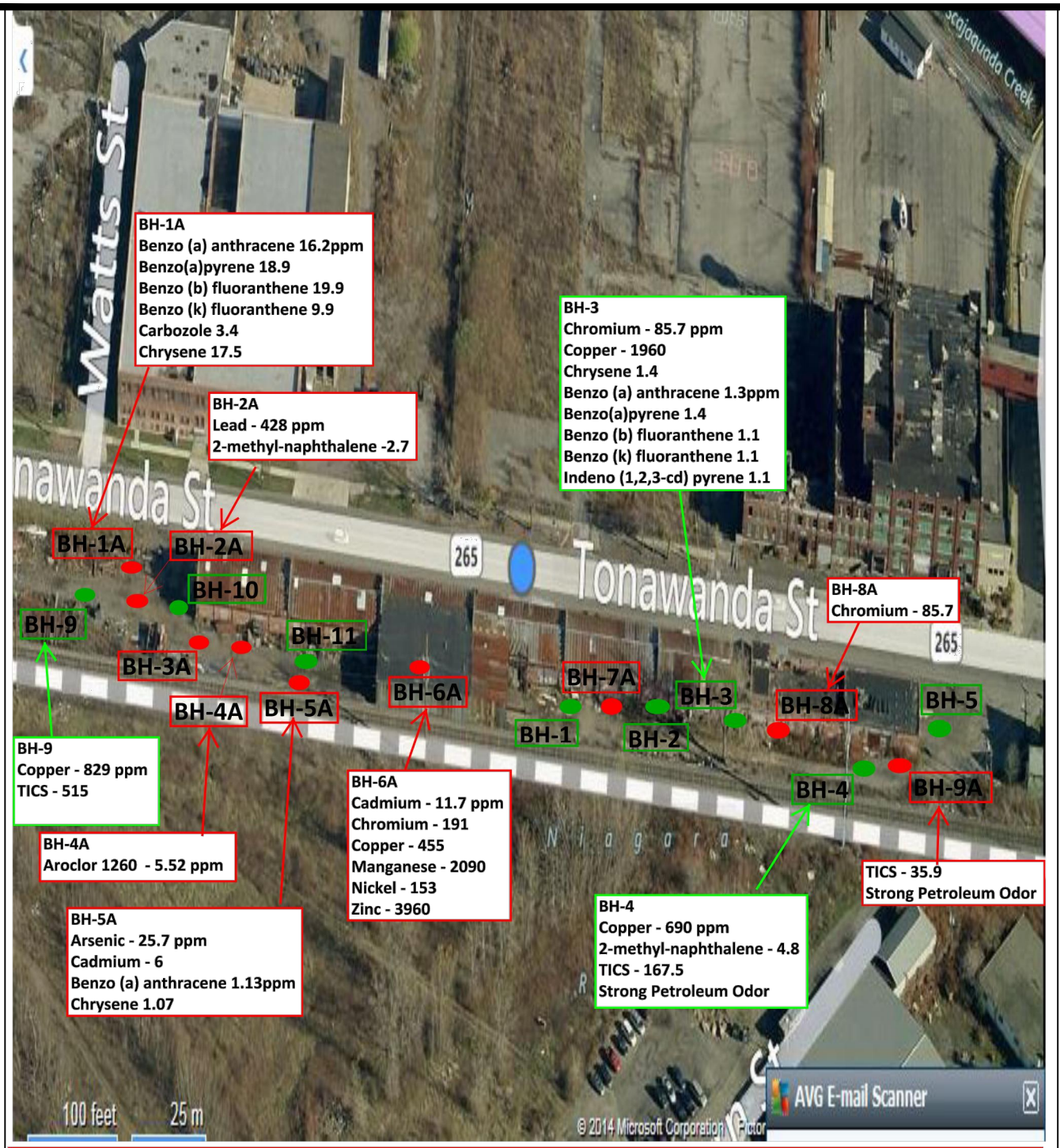


Figure 2: Approximate Location of Bore Holes With Results Above Guidance Values

Key: ● BH-1 Borehole/Sample Location - 2014 Event

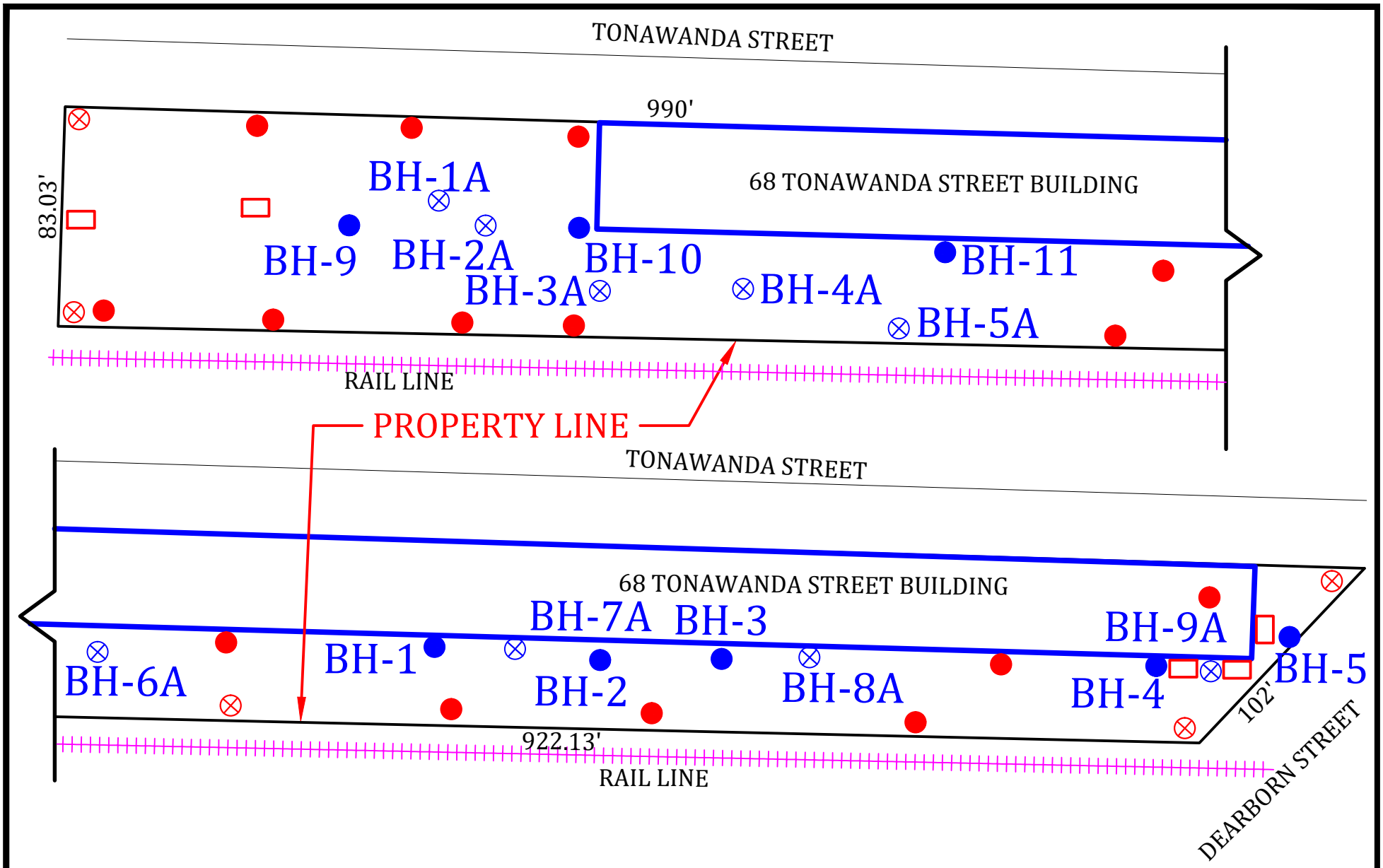
● BH-1A Borehole/Sample Location - 2017 Event

Figure 2 - 68 Tonawanda Street
Phase 2 ESA 2014 & 2017 Results

Panamerican Environmental, Inc.
2390 Clinton Street
Buffalo, New York 14227
W: 716-821-1650
C: 716-308-8220

Source: Bing Maps

06-10-2017	SCALE: N/A	SHEET 2 OF 2



LEGEND

- RI BORINGS
- TEST PITS
- RI MONITORING WELLS
- BH1 - 2014 PH2 ESA BORINGS
- BH1A - 2017 - PH2 ESA BORINGS

Figure 3 - 68 Tonawanda Street
RI LAYOUT PLAN

Panamerican Environmental, Inc.
1270 Niagara Street
Buffalo, New York 14213
W: 716-249-6880
C: 716-308-8220

11-07-2017 | SCALE: N/A | SHEET 3 OF 3

TABLE 2 - 68 TONAWANDA STREET - PHASE 2 ESA SOIL SAMPLE ANALTICAL RESULTS SUMMARY

Sampling Program	PEI - Phase 2 ESA SOIL BORING SAMPLING PROGRAM													
Sample Number	BH 3	BH 4	BH 9	BH 1A	BH 2A	BH 4A	BH 5A	BH 6A	BH 8A	BH 9A	NYSDEC	NYSDEC	NYSDEC	NYSDEC
Sample Date	3/5/2014	3/5/2014	3/5/2014	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	1/26/2017	PART 375	PART 375	CP-51	CP-51
Sample depth (bgs)	0' - 2'	5' - 6'	3' - 4'	1' - 4'	1' - 3'	1' - 6'	1' - 6'	0' - 3'	0' - 4'	6' - 8'	Residential	Restrict Res	Residential	Fuel Oil
Compounds	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	(a)	(b)	(c)	(d)
Metals														
Mercury	0.2	0.03	0.3	0.09	0.31	0.14	0.38	0.052	ND	0.207	0.81	1	NA	NA
Arsenic	6.70	3.7	13.8	4.83	10.3	6.93	**25.7 (a) (b)**	14.7	1.27	9.89	16	16	NA	NA
Barium	78.3	85	58.9	42.3	138	48.2	94.4	528	Nd	82.4	350	400	NA	NA
Beryllium	ND	ND	ND	0.26	0.57	NA	0.67	ND	ND	1.55	14	72	NA	NA
Cadmium	ND	ND	ND	0.627	1.14	1.23	**6 (a)(b)**	**11.7 (a)(b)**	0.356	1.07	2.5	4.3	NA	NA
Chromium	**85.7 (a)**	13.4	17.6	7.57	14.8	17.1	15.1	**191 (a) (b)**	**161 (a)**	12	36	180	NA	NA
Copper	**1960 (a) (b)**	**690 (a) (b)**	**829 (a)(b)**	40.2	67.4	**35.5**	**139**	**455 (a) (b)**	**161**	**224**	270	270	NA	NA
Lead (Axial)	221.0	65.7	88.6	80.8	**428 (a)(b)**	183	189	355	4.93	117	400	400	NA	NA
Magnesium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	N/A	N/A	NA	NA
Manganese	448	140	285	110	261	430	318	**2090 (a) (b)**	297	371	2000	2000	NA	NA
Nickel	**45.9**	16	14.4	8.31	15.2	9.64	27.6	**153 (a)**	71.7	9.02	140	310	NA	NA
Selenium	ND	ND	ND	2.5	3.96	5.75	6.59	26.8	ND	3.75	36	180	NA	NA
Silver	ND	ND	ND	0.66	1.1	ND	3.22	ND	ND	ND	36	180	NA	NA
Zinc	228	296	149	96	165	193	1450	**3960 (a)**	112	118	2200	10000	NA	NA
Total Cyanide	NA	NA	NA	ND	ND	0.548	ND	ND	ND	ND	27	27	NA	NA
PCBS														
PCB-1248	0.3	ND	ND	0.1	ND	ND	0.566	ND	ND	ND	1	1	NA	NA
PCB-1260	0.3	ND	ND	0.1	ND	**5.52 (a)(b)**	ND	0.698	ND	ND	1	1	NA	NA
Pesticides														
4,4-DDT	ND	ND	ND	0.016	ND	0.48	0.045	0.049	ND	ND	1.7	7.9	NA	NA
Aldrin	ND	ND	ND	0.005	ND	ND	0.004	ND	ND	ND	0.019	0.097	NA	NA
alpha-BHC	ND	ND	ND	0.003	ND	ND	ND	ND	ND	ND	0.097	0.48	NA	NA
beta BHC	ND	ND	ND	ND	ND	ND	ND	0.008	ND	ND	0.072	0.36	NA	NA
delta BHC	ND	ND	ND	0.004	ND	ND	ND	0.029	ND	ND	100	100	NA	NA
Endosulfan I	ND	ND	ND	0.004	ND	ND	ND	ND	ND	ND	4.8	24	NA	NA
Endosulfan II	ND	ND	ND	ND	ND	0.033	0.014	0.014	ND	ND	4.8	24	NA	NA
Endosulfan Sulfate	ND	ND	ND	0.019	ND	0.086	0.049	0.05	ND	0.007	4.8	24	NA	NA
Lindane	ND	ND	ND	0.014	ND	ND	ND	0.007	ND	0.01	0.28	1.3	NA	NA
Dieldrin	ND	ND	ND	0.007	ND	0.037	0.009	0.01	ND	0.004	0.039	0.2	NA	NA
Endrin	ND	ND	ND	0.009	ND	0.4	0.036	0.005	ND	ND	2.2	11	NA	NA
VOCs														
Acetone	ND	ND	ND	0.9	1.19	0.114	ND	ND	ND	ND	100	100	NA	NA
Carbon disulfide	ND	ND	ND	ND	ND	0.0069	ND	ND	ND	ND	NA	NA	100	NA
Naphthalene	ND	ND	ND	0.02	0.96	0.092	ND	ND	ND	ND	100	100	NA	12
m, p Xylene	ND	ND	ND	ND	ND	0.00766	ND	ND	ND	ND	100	100	NA	0.26
n-Butylbenzene	ND	0.5	ND	ND	ND	ND	ND	ND	ND	0.398	NA	ND	NA	12
n-propylbenzene	ND	0.2	ND	ND	ND	ND	ND	ND	ND	0.14	100	100	NA	3.9
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0526	NA	NA	100	2.3
Toluene	ND	ND	ND	ND	ND	0.0108	ND	ND	ND	ND	100	100	NA	0.7
Sec-Butylbenzene	ND	0.2	ND	ND	ND	ND	ND	ND	ND	0.19	100	100	NA	11
1,2,4 Trimethylbenzene	ND	1.7	ND	ND	ND	ND	ND	ND	ND	0.428	47	52	NA	3.6
1,3,5 Trimethylbenzene	ND	ND	0.4	ND	ND	ND	ND	ND	ND	ND	47	52	NA	8.4
TICs (Total)	0.03	66.9	128.4	ND	ND	ND	ND	ND	ND	35.9	N/A	N/A	NA	NA
SVOCs														
Anthracene	ND	ND	ND	5.3	2.00	ND	ND	ND	ND	ND	100	100	NA	NA
Benzo(a)anthracene	**1.3 (a)(b)(d)**	ND	ND	**16.2(a)(b)(d)**	ND	ND	**1.130(a)(b)(d)**	0.371	ND	0.419	1	1	NA	1
Benzo(a)pyrene	**1.4 (a)(b)(d)**	ND	ND	**18.9(a)(b)(d)**	ND	ND	0.782	0.317	ND	0.368	1	1	NA	1
Benzo(b)fluoranthene	**1.1 (a)(b)(d)**	ND	ND	**19.9(a)(b)(d)**	ND	ND	0.885	0.399	ND	0.417	1	1	NA	1
Benzo(g,h,I)perylene	1	ND	ND	**13.5**	ND	ND	0.544	0.403	ND	ND	100	100	NA	100
Benzo(k)fluoranthene	**1.1 (a)(d)**	ND	ND	**9.9(a)(b)**	ND	ND	0.555	ND	ND	ND	1	3.9	NA	0.8
Carbazole	ND	ND	ND	**3.4(a)(b)**	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA
Chrysene	**1.4 (a)(d)**	ND	ND	**17.5(a)(b)(d)**	ND	ND	**1.07 (a)(d)**	0.385	ND	0.42	1	3.9	NA	1
Bis (2-ethylhexyl) phthalate	12	ND	ND	ND	ND	ND	ND	0.475	ND	ND	NA	NA	NA	50
Dibenzofuran	ND	ND	ND	ND	1.8	ND	ND	ND	ND	ND	NA	NA	NA	NA
2-methyl-naphthalene	ND	**4.8 (c)**	ND	ND	**2.7 (c)**	ND	ND	ND	ND	ND	NA	NA	0.41	NA
Fluoranthene	2.8	ND	ND	47.4	3.34	ND	2.49	0.711	ND	0.752	100	100	NA	NA
Fluorene	ND	ND	ND	ND	2.1	ND	ND	ND	ND	ND	100	100	NA	NA
Indeno(1,2,3-cd)pyrene	**1.1 (a)(b)**	ND	ND	ND	ND	ND	0.554	0.402	ND	ND	0.5	0.5	NA	NA
Phenanthrene	1.9	4.4	ND	23.2	5.00	ND	1.2	ND	ND	0.792	100	100	NA	NA
Pyrene	2.4	ND	ND	38.4	2.5	ND	1.71	0.483	ND	0.641	100	100	NA	NA
TICs (Total)	17.9	167.5	515	ND	ND	ND	ND	ND	ND	ND	N/A	N/A	NA	NA

ND - Non-Detect NA - Not Available
Shaded Value - Exceeds Part 375 and/or CP-51 SCOs
TICs - Tentitively Identified Compounds

APPENDIX A

HEALTH & SAFETY PLAN

APPENDIX A

HEALTH AND SAFETY PLAN

SITE INVESTIGATIONS
AND
REMEDIAL OVERSIGHT

SITE #915316
68 TONAWANDA STREET SITE
BUFFALO, NEW YORK 14207

Prepared for:

Buffalo Freight House, LLC
221 Bedford Avenue
Buffalo, NY 14216

PANAMERICAN
1270 NIAGARA STREET
Buffalo, New York 14213

January 2018

Peter J. Gorton, MPH, CHCM
PEI Safety Officer

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HEALTH AND SAFETY PLAN

1.0 INTRODUCTION

The following health and safety procedures will be followed by PEI/BE3 personnel and their immediate subcontractors performing the activities described in the RI Work Plan. Please note, however, contractors are required to develop and follow their own plans meeting these requirements minimally or adopt this plan.

1.1 Purpose

Directed at protecting the health and safety of the field personnel during field activities, the following site-specific Health and Safety Plan (HASP) was prepared to provide safe procedures and practices for personnel engaged in conducting the field activities associated with this plan. The plan has been developed using the Occupational Safety and Health Administration (OSHA) 1910 and 1926 regulations and NYSDEC Brownfields DER-10 as guidance. The purpose of this HASP is to establish personnel protection standards and mandatory safety practices and procedures for this task specific effort. This plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise during the field efforts.

1.2 Applicability

The provisions of the plan are mandatory for all personnel engaged in field activities. All personnel who engage in these activities must be familiar with this plan and comply with its requirements. The plan is based on available information concerning the project area and planned tasks. If more data concerning the project area becomes available which constitute safety concerns, the plan will be modified accordingly. One crew member of each contractor will be designated Field Safety Officer and will be responsible for in-field safety. Any necessary modifications to the plan will be made by the Field Safety Officer after discussion with the PEI Project Manager and Safety Manager. All modifications will be documented in the HASP plan and field book and provided to the Project Manager and the Health and Safety Manager for approval. A copy of this plan will be available for review by all on- site personnel. In addition, a copy of the plan will be provided to all subcontractors prior to their initial entry onto the site.

Before field activities begin, all personnel will be required to read the plan. All personnel must agree to comply with the minimum requirements of the site-specific plan, be responsible for health and safety, and sign the Statement of Compliance for all on-site employees before site work begins.

1.3 Field Activities

The work includes remedial investigations including assessment of subsurface conditions to include soil and groundwater.

Field Investigations

Field investigations will be conducted which will include test trenches/soil borings, possibly monitoring well installation, groundwater sampling and soil sampling. Specific health and safety

requirements to be adhered to for these tasks are covered in this HASP.

1.4 Personnel Requirements

Key personnel are as follows:

Project Manager - Peter J. Gorton, CHCM
Project/Remedial Engineers - John Berry, P.E., Jason Brydges, P.E.
Project Field Geologist/Technician – Kevin Williamson
Project Health and Safety - Peter J. Gorton, CHCM
Project QA/QC – Jason Brydges, PE.
Project Hydrogeologist – Michael J. Belotti

Site personnel and their duties are outlined below.

The Project Manager will be responsible for all PEI/BE3 personnel and their subcontractors' on-site duties.

The Project Manager has the primary responsibility for:

1. Assuring that personnel are aware of the provisions of the HASP and are instructed in the work practices necessary to ensure safety for planned procedures and in emergencies;
2. Verifying that the provisions of this plan are implemented;
3. Assuring that appropriate personnel protective equipment (PPE), if necessary, is available for and properly utilized by all personnel;
4. Assuring that personnel are aware of the potential hazards associated with site operations;
5. Supervising the monitoring of safety performances by all personnel to ensure that required work practices are employed; and,
6. Maintaining sign-off forms and safety briefing forms.

Field Health and Safety/oversight Inspector:

1. Monitor safety hazards to determine if potential hazards are present;
2. Determine changes to work efforts or equipment needed to ensure the safety of personnel;
3. Evaluate on-site conditions and recommend to the Project Manager modifications to work plans needed to maintain personnel safety;
4. Determine that appropriate safety equipment is available on-site and monitor its proper use;
5. Monitor field personnel and potential for exposure to physical hazards, such as heat/cold stress, safety rules near heavy equipment and borings;
6. Halt site operations if unsafe conditions occur or if work is not being performed in compliance with this plan:
7. Monitor performance of all personnel to ensure that the required safety procedures are followed. If established safety rules and practices are violated, a report of the incident will be filed and sent to the Project Manager within 48 hours of the incident; and,
8. Conduct safety meetings as necessary.

Field Personnel: The responsibility of each field crew member is to follow the safe work practices of this HASP and be familiar with and comply with the Contractor's HASP and in general to:

1. Be aware of the procedures outlined in this plan;
2. Take reasonable precautions to prevent injury to him/herself and to his/her co-workers;
3. Perform only those tasks that he/she believes can be done safely and
4. Immediately report any accidents or unsafe conditions to the safety personnel and Project Manager;
5. Notify the safety personnel and Project Manager of any special medical problems (i.e., allergies or medical restrictions) and make certain that on-site personnel are aware of any such problems;
6. Think Safety First prior to and while conducting field work; and,
7. Do not eat, drink or smoke in work areas.

Each crew member has the authority to halt work should he deem conditions to be unsafe. Visitors will be required to report to the construction manager or designee and follow the requirements of this plan and the Contractor's HASP.

2.0 SITE DESCRIPTION AND HAZARDS/SAFETY CONCERNS

2.1 Site Background And Description

The 68 Tonawanda Street property is approximately 1.74-acres and located in the Black Rock area of the City of Buffalo. The property is located within the City of Buffalo Tonawanda Street Corridor Brownfield Opportunity Area (BOA). The Tonawanda Street Corridor BOA is comprised of 514 acres of primarily under-utilized industrial brownfields in northwest Buffalo stretching from Scajaquada Creek (Creek) to just south of the Tonawanda municipal boundary, and along Chandler Street.

The area and property have a long historic use and is located in what was formerly a highly industrial area. Commercial use of the general area occurred in the early 1800's situated around Black Rock. Located just north and across Tonawanda Street from the corner of West and Tonawanda Streets, the elongated subject 120 Tonawanda Street property is situated between the active rail lines and Tonawanda Street. The property contains the former *New York Central Freight House and Office*. This long narrow 1½-story brick freight house structure was constructed in the early 1900s. The structure does not contain a basement. The building has been recommended as National Register Eligible for its association with the transportation and industrial history of the City of Buffalo at the local, national and international levels.

Historical information and maps suggest that by 1889 the Black Rock Passenger Station was located in the southern part of the parcel with some sheds and other disconnected buildings including freight platforms and separate smaller freight houses extending north where the freight house is currently. By 1916 the Freight house building was located on the parcel and rail tracts extended across the adjacent northern rail parcel. A review of 1916 historic maps suggests that the structure included a freight office. The former freight house building is currently being used by EB Atlas Steel Corp. and Steel Crazy Iron Art which specialize in steel construction, architectural and ornamental metal work. The structure contains eight separate bays. Floors are cement and lighting is a combination mercury and florescent. Various materials associated with steel construction and architectural art are found

throughout the building including steel/metal, various steel working machines, welding equipment etc. Small quantities of paints and lacquers are also contained in the structure in 55-gallon drums or smaller containers. The building uses cooking grease and fry oil as a fuel for heating. This material is contained in 55-gallon drums and other size containers and fed into a heating system. North of the building contains a lay-down area where steel and other materials are stored. This lay-down area extends north onto the adjoining rail parcel. The rail parcel is vacant land beyond the lay-down section. A few 55-gallon drums were observed during the Phase I in the lay-down area and behind the building. The 55-gallon drums at this facility are reportedly associated with three different purposes including storage of the vegetable oil used for heating system or they contain primer paint or sand used in the metal work. A covered section attached to the western side of the building is located along the northern end. This area has steel I-beams and other materials and appears to be used for both storage and manufacturing activities.

The subject parcel has been associated with rail operations since the mid-late 1800's. By the late 1800's the property contained freight platforms and separate freight depots. As a freight depot, much of the raw and manufactured products that supported the surrounding industry and residential community were probably temporarily stored at this location. Materials where on/off loaded from freight trains on the western rail side of the property and off/on loaded to vehicles on the eastern Tonawanda Street side of the property.

Rail tracts are located immediately adjacent to the west and a vacant undeveloped "triangle shaped" area is further west. Immediately south of the property is a vacant residential/restaurant structure and a vehicle repair shop towards the intersection of Niagara and Tonawanda Streets. Historically the property immediately south had a series of small store and residential structures. Tenements were indicated on the southern adjacent property during the early 1900's and by the 1950's these properties were restaurant and filling station/auto repair facilities. The area immediately north was mostly rail with an office and later a restaurant north of Parish Street at Tonawanda Street. Now mostly vacant, major manufacturing complexes including production of paint and lacquers, automotive parts, metal machining, brick and sewer pipe, and steel foundry operations were located east of the property across Tonawanda Street.

2.2 Hazard Evaluation

Specific health and safety concerns particular to the project tasks include working around low levels of petroleum related in soils and groundwater. Physical hazards include those associated with working near open excavations, as well as working adjacent manual/mechanical operation of field equipment. Contractors will have separate detailed health and safety procedures/requirements for soil excavations and/or the removal and disposal of impacted soil which will meet or exceed requirements in this plan. Their plans will be attached to this plan.

2.2.1 Chemical Hazards

Chemical hazards at the site may include petroleum related chemical compounds.

Petroleum related compounds. Some chemicals that may be found in petroleum products include hexane, jet fuels, mineral oils, benzene, toluene, xylenes, naphthalene, and fluorine, as well as other petroleum compounds and gasoline components.

How might someone be exposed to petroleum hydrocarbons?

- Everyone is exposed to petroleum hydrocarbons from many sources.
- Breathing air at gasoline stations, using chemicals at home or work, or using certain pesticides.
- Drinking water contaminated with petroleum hydrocarbons.
- Working in occupations that use petroleum products.
- Living in an area near a spill or leak of petroleum products.
- Touching soil contaminated with petroleum hydrocarbons.

Potential routes of exposure include:

- Skin contact;
- Inhalation of vapors or particles;
- Ingestion; and,
- Entry of contaminants through cuts, abrasions or punctures.

The anticipated levels of personnel protection will include Level D personal protective equipment:

1. Long sleeve shirt and long pants (recommended),
2. Work boots,
3. Hard hats, if work is conducted around heavy equipment or overhead hazards,
4. Safety Glasses
5. Gloves to include work gloves and chemical resistant gloves when sampling potentially contaminated materials.

Modifications may include chemically resistant gloves, boots/booties, and overalls. If monitoring levels indicate levels requiring respiratory protection (sustained PID readings at or above 5 ppm above a daily established background), work will be halted pending discussions with field and office management. If any readings are recorded above background, work will proceed with caution and breathing zone monitoring will be conducted.

2.2.2 Other Physical Hazards

Depending on the time of year, weather conditions or work activity, some of the following potential physical hazards could result from project activities:

1. Noise
2. Heat Stress
3. Cold Stress
4. Slips, trips, and falls
5. Exposure to moving machinery or stored energy, particularly during Lime removal and drilling
6. Physical eye hazards
7. Lacerations and skin punctures

8 . Back strain from lifting equipment
9 . Electrical storms and high winds
1 0 . Contact with overhead or underground utilities

Slips, Trips, and Falls. Field personnel shall become familiar with the general terrain and potential physical hazards which would be associated with accidental risk of slips, trips, and/or falls. Special care shall be taken when working near demolition operations or demolition material stockpiles. Workers will observe all pedestrian and vehicle rules and regulations. Extra caution will be observed while working near roadways and while driving in reverse to ensure safety.

Noise. All personnel shall wear hearing protection devices, such as ear muffs or ear plugs, if work conditions warrant. These conditions would include difficulty hearing while speaking to one another at a normal tone within three feet. If normal speech is interfered with due to work noise, the field safety officer will initiate the mandatory use of hearing protection around the backhoe, or other noise-producing equipment or events.

Heat/Cold Stress. Heat stress work modification may be necessary during ambient temperatures of greater than 29° C (85° F) while wearing normal clothing or exceeding 21' C (70° F) while wearing personnel protective clothing. Because heat stress is one of the most common and potentially serious illnesses at work sites, regular monitoring and preventive measures will be utilized should conditions warrant. This may include additional rest periods, supplemental fluids, restricted consumption of drinks containing caffeine or alcohol, use of cooling vests, or modification of work practices.

Most of the work to be conducted during the oversight and monitoring operations is expected to consist of light manual labor and visual observation. Given the nature of the work and probable temperatures, heat stress hazards are not anticipated.

If work is to be conducted during winter conditions, cold stress may be a concern to the health and safety of personnel. Wet clothes combined with cold temperatures can lead to hypothermia. If air temperature is less than 40° F (4° C) and an employee perspires, the employee must change to dry clothes. The following summary of the signs and symptoms of cold stress are provided as a guide for field and safety personnel.

Incipient frostbite is a mild form of cold stress characterized by sudden blanching or whitening of the skin.

Chilblain is an inflammation of the hands and feet caused by exposure to cold moisture. It is characterized by a recurrent localized itching, swelling, and painful inflammation of the fingers, toes, or ears. Such a sequence produces severe spasms, accompanied by pain.

Second-degree frostbite is manifested by skin with a white, waxy appearance and the skin is firm to the touch. Individuals with this condition are generally not aware of its seriousness because the underlying nerves are frozen and unable to transmit signals to warn the body. Immediate first aid and medical treatment are required.

Third-degree frostbite will appear as blue blotchy skin. The tissue is cold, pale, and solid. Immediate medical attention is required.

Hypothermia develops when body temperature falls below a critical level. In extreme cases, cardiac failure and death may occur. Immediate medical attention is warranted when the following symptoms are observed:

1. Involuntary shivering
2. Irrational behavior
3. Slurred speech
4. Sluggishness

Fire and Explosion. These hazards will be minimal for activities associated with this project. All heavy equipment will be equipped with a fire extinguisher.

Trenching and Excavations. There are a variety of potential health and safety hazards associated with excavations. These include:

- Surface encumbrances, such as structures, fencing, stored materials, etc., may interfere with safe excavations;
- Below- and above-ground utilities, such as water and sewer lines, gas lines, power lines, telephones, and optical cable lines, etc.;
- Overhead power lines and other utilities which may be contacted by the excavation equipment;
- Vehicle and heavy equipment traffic around the excavations;
- Falling loads from lifting or digging equipment;
- Water accumulation within excavations;
- Hazardous atmospheres, such as oxygen deficiency, flammable gases or vapors, and toxic gases which may occur in excavations,
- Falling into or driving equipment or vehicles into unprotected or unmarked excavations; and,
- Cave-in of loose rocks and soil/lime at the excavation face.

OSHA requirements for trenching and excavations are contained in 29 CFR, subpart P, 1926:650 thru 1926.652.

Basic minimum excavation requirements should include:

- Personnel entry into excavations should be minimized, whenever possible and no entry will occur in pits below 4 feet in depth.
- Sloping, shoring or some other equivalent means should be utilized, as required.
  Surface encumbrances such as structures, fencing, piping, stored material etc. which may interfere with safe excavations should be avoided, removed or adequately supported prior to the start of excavations. Support systems should be inspected daily.
- Underground utility locations should be checked and determined and permits as necessary should be in place prior to initiating excavations. Local utility companies will be contacted at least two days in advance, advised of proposed work, and requested to locate underground installations. When excavations approach the estimated location of utilities, the exact location should be determined by careful probing or hand digging and when it is uncovered, proper

supports should be provided.

- A minimum safe distance of 15 feet should be maintained when working around overhead high-voltage lines or the line should be de-energized following appropriate lock-out and tag-out procedures by qualified utility personnel.
- Excavations five feet or more deep if entered will require an adequate means of exit, such as a ladder, ramp, or steps and located so as to require no more than 25 feet of lateral travel. Under no circumstances should personnel be raised using heavy equipment.
- Personnel working around heavy equipment, or who may be exposed to public vehicular traffic should wear a traffic warning vest. At night, fluorescent or other reflective material is recommended to be worn.
- Heavy equipment or other vehicles operating next to or approaching the edge of an excavation will require that the operator have a clear view of the edge of the excavation, or that warning systems such as barricades, hand or mechanical signals, or stop logs be used. If possible the surface grade should slope away from the excavation.
- Personnel should be safely located in and around the trench/excavation face and should not work underneath loads handled by lifting or digging equipment.
- Hazardous atmospheres, such as oxygen deficiency (atmospheres containing less than 19.5% oxygen), flammable gases or vapors (airborne concentrations greater than 20% of the lower explosive limit), and toxic gases or vapors (airborne concentrations above the OSHA Permissible Exposure Limit or other exposure limits) may occur in excavations. Monitoring should be conducted for hazardous atmospheres prior to entry and at regular intervals. Ventilation or respiratory protection may be provided to prevent personnel exposures to oxygen deficient or toxic atmospheres. Periodic retesting (at least each shift) of the excavation will be conducted to verify that the atmosphere is acceptable. A log or field book records should be maintained.
- Personnel should not work in excavations that have accumulated water or where water is accumulating unless adequate precautions have been taken. These precautions can include special support or shield systems, water removal systems such as pumps, or safety harnesses and lifelines. Groundwater entering the excavation should be properly directed away and down gradient from the excavation.
- Safety harnesses and lifelines should be worn by personnel entering excavations that qualify as confined spaces.
- Excavations near structures should include support systems such as shoring, bracing, or underpinning to maintain the stability of adjoining buildings, walls, sidewalks, or other structures endangered by the excavation operations.
- Loose rock, excavated or other material, and spoils should be effectively stored and retained at least two and preferably 5 feet or more from the edge of the excavation. Barriers or other effective retaining devices may be used in order to prevent spoils or other materials from falling into the excavation.
- Walkways or bridges with standard guardrails that meet OSHA specifications will be provided where employees, the public, or equipment are required to cross over excavations.
- Adequate barrier physical protection should be provided and excavations should be barricaded or covered when not in use or left unattended. Excavations should be backfilled as soon as possible when completed.
- Safety personnel should conduct inspections prior to the start of work and as needed

throughout the work shift and after occurrence that increases the hazard of collapse (i.e., heavy rain, vibration from heavy equipment, freezing and thawing, etc.).

- Personnel working in excavations should be protected from cave-ins by sloping and/or benching of excavation walls, a shoring system or some other equivalent means in accordance with OSHA regulations. Soil type is important in the determination of the angle of repose for sloping and benching, and the design of shoring systems.

2.2.3 Biological Hazards

Biological hazards can result from encounters with mammals, insects, snakes, spiders, ticks, plants, parasites, and pathogens. Mammals can bite or scratch when cornered or surprised. The bite or scratch can result in local infection with systemic pathogens or parasites. Insect and spider bites can result in severe allergic reactions in sensitive individuals. Exposure to poison ivy, poison oak or poison sumac results in skin rash. Ticks are a vector for a number of serious diseases. Dead animals, organic wastes, and contaminated soil and water can harbor parasites and pathogens. These hazards will be reduced to non-existent if work is conducted during late fall and winter months. The following are highlighted because they represent more likely concerns for the site-specific tasks and location:

Bees, Ants, Wasps and Hornets. Sensitization by the victim to the venom from repeated stings can result in anaphylactic reactions. If a stinger remains in the skin, it should be removed by teasing or scraping, rather than pulling. An ice cube placed over the sting will reduce pain. An analgesic corticosteroid lotion is often useful. People with known hypersensitivity to such stings should consult with their doctor about carrying a kit containing an antihistamine and aqueous epinephrine in a pre-filled syringe when in endemic areas. Nests and hives for bees, wasps, hornets and yellow jackets often occur in the ground, trees and brush. Before any nests or hives are disturbed, an alternate sampling location should be selected. If the sample location cannot be relocated, site personnel who may have allergic reactions shall not work in these areas.

Storm Conditions. When lightening is within 10 miles of the work site, all personnel should evacuate to a safe area.

Sun. When working in the sun, personnel should apply appropriate sun screening lotions (30 sun screen or above), and/or wear long sieve clothing and hats.
Field personnel should refrain from handling any foreign objects such as hypodermic needles, glass, etc.

2.2.4 Activity Hazard Analysis

Table 1 presents a completed activity hazard analysis for the performance of IRM and RI

Table 1. Activity Hazard Analysis

PRINCIPAL STEPS	POTENTIAL SAFETY/ HEALTH HAZARDS	RECOMMENDED CONTROLS

1. RI soil/groundwater investigation	1. Potential exposure to low levels of petroleum products, heavy metals and PAH compounds	Covers all hazards 1. Use of administrative controls (site control and general safety rules), work cloths, dust suppression 2. Use of real-time monitoring and action levels 3. Use Physical Hazards SOPs
EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Excavation and other heavy equipment, Backhoe and/or Geoprobe	1. Daily inspection of equipment 2. Continuous safety oversight	1. Safety plan review 2. Routine safety briefings

3.0 MONITORING

The purpose of air monitoring is to monitor for potential airborne contaminants and to verify that protection levels are suitable. Monitoring will be performed for dust/particulates and volatile organic compounds during excavation activities. Daily background and calibration readings will be recorded prior to the start of field activities. All monitoring equipment used during this investigation will be maintained and calibrated and records of calibration and maintenance will be kept in accordance with 29 CFR 1910.120(b)4(11)E. The Community Air Monitoring Program (CAMP) is discussed in Section 9.0.

3.1 Particulate Monitoring

PEI/BE3 will obtain real-time air monitoring readings from upwind and downwind locations in accordance with DER-10 for community air-monitoring (refer to Section 9.0).

PEI will complete daily field reports that document activities performed equipment and manpower onsite, screening and/or monitoring results, general conditions and weather conditions.

Air Monitoring for Worker Protection

Real time air monitoring will be conducted during any building demolition, UST removal and when site soils are disturbed including during, excavation and grading and other activities. A real time personal aerosol monitor (i.e., TSI SidePak AM5 10 Personal Aerosol monitor or equivalent) will be used. This monitor is a laser photometer which measures data as both real-time aerosol mass-concentration and 8-hour time weighted average (TWA). For this project the monitor will be used to measure real-time concentrations in milligrams per meter cubed (mg/m^3). Action levels are based on potential exposure to calcium carbonate and will be as follows:

- 15 mg/m^3 total dust
- 5 mg/m^3 respirable fraction for nuisance dusts

Dust suppression techniques should be employed prior to exceeding the action levels. However, if these if these levels are exceeded work will be halted and additional dust suppression techniques employed until safe levels are reached.

3.2 Total Volatile Organics Monitoring

Monitoring of volatile organic compounds will be conducted using a photo-ionization detector (PID). If a sustained reading of 5 ppm above background occurs, work will be halted and personnel will evacuate the work area. Levels will be allowed to stabilize and another reading will be taken in the breathing zone. If background levels continue to be exceeded, work will not continue at that location and the project manager will be notified of the situation. Action levels will remain the same.

4.0 SAFE WORKING PRACTICES

4.1 General Practices

The following general safe work practices apply:

- Eating, drinking, chewing gum or tobacco and smoking are prohibited within the work area as part of safe work practices.
- Contact with potentially contaminated substances should be avoided. Puddles, pools, mud, etc. should not be walked through if possible. Kneeling, leaning, or sitting on equipment or on the ground should be avoided whenever possible.
- Upon leaving the work area, hands, face and other exposed skin surfaces should be thoroughly washed.
- Unusual site conditions shall be promptly conveyed to the site manager and safety personnel as well as the project management for resolution.
- A first-aid kit shall be available at the site.
- Field personnel should use all their senses to alert themselves to potentially dangerous situations (i.e., presence of strong, irritating, or nauseating odors).
- Personal hygiene practices such as no eating, drinking or smoking will be followed.
- If severe dusty conditions hazardous to the crew are present, soils will be dampened to mitigate dust. All equipment will be cleaned before leaving the work area.
- Field personnel must attend safety briefings and should be familiar with the physical characteristics of the investigation, including:
    - Accessibility to associates, equipment, and vehicles.
    - Areas of known or suspected contamination.
    - Site access.
    - Routes and procedures to be used during emergencies.
- Personnel will perform all investigation activities with a buddy who is able to:
    - Provide his or her partner with assistance.
    - Notify management / emergency personnel if emergency help is needed.
- Excavation activities shall be terminated immediately in event of thunder and/or electrical

storm.
- The use of alcohol or drugs at the site is strictly prohibited.

5.0 PERSONAL SAFETY EQUIPMENT AND SITE CONTROL

5.1 Personal Safety Equipment

As required by OSHA in 29 CFR 1920.132, this plan constitutes a workplace hazard assessment to select personal protective equipment (PPE) to perform the site investigation.

The PPE to be donned by on-site personnel during this investigation are those associated with the industry standard of level D. Protective clothing and equipment to initiate the project will include:

- Work clothes
- Work boots
- Work gloves as necessary
- Hard hat if work is conducted in areas with overhead danger
- Hearing protection as necessary

Modifications may include chemically resistant gloves, boots/booties, and overalls. If monitoring levels indicate levels requiring respiratory protection (sustained readings at or above action levels above a daily established background), work will be halted pending discussions with field and office management.

5.2 Site Control

Site control will be established near each work zone by the Contractor. The purpose is to control access to the immediate work areas from individuals not associated with the project. Site control limits will be established by the Contractor in his HASP. All work zones will be fenced off with controlled access and appropriately designated as an exclusion area.

5.2.1 Work Zones (For excavations/drilling using heavy equipment or deeper than 3 feet)

Each excavation will be set up in work zones to include an exclusion area and support zone. Exact configuration of each zone is dependent upon location, weather conditions, wind direction and topography. The Contractor's safety manager will establish the control areas daily at each excavation.

An area of 10 feet (as practical) around each excavation will be designated as the exclusion area. This is the area where potential physical hazards are most likely to be encountered by field personnel. The size of the exclusion area may be altered to accommodate site conditions and the drilling/excavation location. If levels of protection higher than level D are used, this plan will be modified to include decontamination procedure. The Site excavation contractor will be required to have eye/face wash equipment/means available on-site.

A support area will be defined for each field activity. Support equipment will be located in this clean

area. Normal work clothes are appropriate within this area. The location of this area depends on factors such as accessibility, wind direction (upwind of the operation.), and resources (i.e., roads, shelter, utilities). The location of this zone will be established daily.

Excavation areas will be filled and or secured (fencing) to prevent access from the general public.

6.0 EMERGENCY INFORMATION

In the event of an emergency, the field team members or the site safety manager will employ emergency procedures. A copy of emergency information will be kept in the field vehicle and will be reviewed during the initial site briefing. Copies of emergency telephone numbers and directions to the nearest hospital will be prominently posted in the field vehicle.

6.1 Emergency Medical Treatment and First Aid

A first aid kit large enough to accommodate anticipated emergencies will be kept in the PEI field vehicle. If any injury should require advanced medical assistance, emergency personnel will be notified and the victim will be transported to the hospital. The Contractor will establish his own first aid station and details will be provided in his HASP.

In the event of an injury or illness, work will cease until the field safety and oversight inspector has examined the cause of the incident and taken appropriate corrective action. Any injury or illness, regardless of extent, is to be reported to the project manager.

6.2 Emergency Telephone Numbers and Hospital

Emergency telephone numbers for medical and chemical emergencies will be posted in the field vehicle are listed below:

Ambulance	911
Fire	911
Police - NYS Troopers	911
Poison Control Center	1-800-888-7655
NYSDEC Spills Hotline	1-800-457-7362

PEI/BE3 Project Manager, Mr. Peter J. Gorton: Work 716 - 821-1650 & Cellular 716-308-8220
NYSDEC Project Manager, Glenn May (716) 851-7220
NYSDOH (716) 847-4357

Sisters of Charity Hospital 2157 Main Street Buffalo, NY 14214

Site Location: 68 Tonawanda Street, Buffalo, New York 14207
Hospital Telephone: 716-862-1000

See attached map for route to the Hospital Facility.

Verbal communications between workers or use of a site vehicle horn repeated at intervals of three short beeps shall be used to signal all on-site personnel to immediately evacuate the area and report to the vehicle parking area.

6.3 Emergency Standard Operating Procedures

The following standard operating procedures are to be implemented by on-site personnel in the event of an emergency. The Contractor's field safety manager along with PEI oversight Inspector shall manage response actions.

Upon notification of injury to personnel, the designated emergency signal shall be sounded, if necessary. All personnel are to terminate their work activities and assemble in a safe location. The emergency medical service and hospital emergency room shall be notified of the situation. If the injury is minor, but requires medical attention, the field safety manager shall accompany the victim to the hospital and provide assistance in describing the circumstances of the accident to the attending physician.

Upon notification of an equipment failure or accident, the field safety manager shall determine the effect of the failure or accident on site operations. If the failure or accident affects the safety of personnel or prevents completion of the scheduled operations, all personnel are to leave the area until the situation is evaluated and appropriate actions taken.

Upon notification of a natural disaster, such as tornado, high winds, flood, thunderstorm or earthquake, on-site work activities are to be terminated and all personnel are to evacuate the area.

6.4 Emergency Response Follow-Up Actions

Following activation an Emergency Response, PEI/BE3 Oversight inspector shall notify the PEI/BE3 project manager regarding any emergency involving PEI/BE3 personnel. The Contractor's field safety manager shall submit a written report documenting the incident to PEI/BE3 and Owner's site representatives

6.5 Medical Treatment for Site Accidents/Incidents

The Contractor's field safety manager shall be informed of any site-related injury, exposure or medical condition resulting from work activities. All personnel are entitled to medical evaluation and treatment in the event of a site accident or incident.

6.6 Site Medical Supplies and Services

The Contractor's field safety manager or a trained first aid crew member shall evaluate all injuries at the site and render emergency first-aid treatment as appropriate. If an injury is minor but requires professional medical evaluation, the field safety manager shall escort the employee to the appropriate emergency room. For major injuries occurring at the site, emergency services shall be requested.

A first-aid kit shall be available, readily accessible and fully stocked. The first-aid kit shall be located within specified vehicles used for on-site operations.

6.7 Universal Precautions

Universal precautions shall be followed on-site at all times. This consists of treating all human blood and certain body fluids as being infected with Human Immune Deficiency Virus (HIV), Hepatitis B virus (HBV), and other blood borne pathogens. Clothing and first-aid materials visibly contaminated with blood or other body fluids will be collected and placed into a biohazard bag. Individuals providing first aid or cleanup of blood- or body-fluid contaminated items should wear latex gloves. If providing CPR, a one-way valve CPR device should be used. Biohazard bags, latex gloves, and CPR devices will be included in the site first-aid kits.

Work areas visibly contaminated with blood or body fluids shall be cleaned using a 1:10 dilution of household bleach. If equipment becomes contaminated with blood or body fluids, and can not be sufficiently cleaned, the equipment shall be placed in a plastic bag and sealed.

Any personnel servicing the equipment shall be made aware of the contamination, so that proper precautions can be taken.

7.0 RECORD KEEPING

The Contractor's field manager and safety manager are responsible for site record keeping. Prior to the start of work, they will review this Plan along with the Contractor's HASP.

A Site Safety Briefing will be completed prior to the initiation of investigation activities. This shall be recorded in the field log book An Accident Report should be completed by the Field Manager in the event that an accident occurs and forwarded to the office administrative manager.

8.0 PERSONNEL TRAINING REQUIREMENTS

8.1 Initial Site Entry Briefing

Prior to initial site entry, the Contractor's field safety manager shall provide all personnel (including site visitors) with site-specific health and safety training. A record of this training shall be maintained. This training shall consist of the following:

- Discussion of the elements contained within this plan
- Discussion of responsibilities and duties of key site personnel
- Discussion of physical, biological and chemical hazards present at the site
  Discussion of work assignments and responsibilities
- Discussion of the correct use and limitations of the required PPE
- Discussion of the emergency procedures to be followed at the site
- Safe work practices to minimize risk
- Communication procedures and equipment
- Emergency notification procedures

8.2 Daily Safety Briefings

The Contractor's field safety manager will determine if a daily safety briefing with all site personnel is needed. The briefing shall discuss the specific tasks scheduled for that day and the following topics:

- Specific work plans
- Physical, chemical or biological hazards anticipated
- Fire or explosion hazards
- PPE required
- Emergency procedures, including emergency escape routes, emergency medical treatment, and medical evacuation from the site
- Weather forecast for the day
- Buddy system
- Communication requirements
- Site control requirements
- Material handling requirements

9.0 COMMUNITY AIR MONITORING PROGRAM (CAMP)

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the upwind and downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities.

The generic CAMP presented in Attachment 4 from *NYSDEC DER-10* titled *Appendix 1A-New York State Department of Health Generic Community Air Monitoring Plan* will be followed and adhered to for the building demolition, IRMs and similar applicable areas.

A program for suppressing fugitive dust and particulate matter monitoring will also be conducted in accordance *NYSDEC DER-10* titled *Appendix 1B Fugitive Dust and Particulate Monitoring* which is also provided in Attachment 4. The fugitive dust suppression and particulate monitoring program will be employed at the site during building demolition, IRM site remediation and other intrusive activities which warrant its use.

Both the CAMP and the fugitive dust suppression and particulate monitoring program will be carried out be PEI the Owner's consultant. Monitoring results of the CAMP will be reported to the New York State Department of Health on a daily basis for review.

10.0 POTENTIAL HAZARDS AND OSHA STANDARDS

A table of Potential Hazards and OSHA Standards for Consideration during the building demolition and IRMs is provided in Attachment 5.

ATTACHMENT 1

Heat Stress management Program & procedures

Panamerican Environmental, Inc.
2390 Clinton Street
Buffalo, New York 14227
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PANAMERICAN

PANAMERICAN HEAT STRESS MANAGEMENT PROGRAM

INTRODUCTION

Panamerican employees engage in a variety of activities with potential exposure to excessive ambient temperatures and humidity, with the overall result being Aheat stress@. This procedure establishes the Panamerican Heat Stress Management Program. It establishes responsibilities and basic requirements for personnel who may be required to work in situations where the ambient temperature exceeds 21° C (70° F) while wearing protective equipment (e.g., hazardous waste site investigations) or when the ambient temperature exceeds 29° (85° F) while wearing normal clothing. Because heart stress is one of the most common and potentially serious illnesses at job sites and particularly hazardous waste sites, regular monitoring and other preventive measures are warranted.

There are no regulations addressing heat stress. However, it should be noted that OSHA does recognize heat stress as a potentially serious health hazard and can site employers under the Ageneral duty clause@ of the Occupational Safety Health Act if heat-related illness is occurring or likely to occur.

PROGRAM ADMINISTRATION AND RESPONSIBILITIES

The Heat Stress Management Program is administered by Panamerican Managers and Health and Safety personnel.

These Individuals:

- Oversee the implementation of the Heat Stress Management Program;
- Periodically audit and evaluate program implementation;
- Evaluate this procedure on an ongoing basis to see that it reflects current practice and regulations;
- Assist field crews in their implementation of this procedure.

Project Managers (PM) and Safety Personnel are responsible for:

- Implementing this Procedure in all field operations:
- Providing guidance to staff regarding heat stress management as described in the Procedure; and
- Providing feedback to management regarding program effectiveness.

Staff Members are responsible for:

- Complying with this Procedure as it applies to their activities; and
- Providing feed back to their supervisor regarding program effectiveness.

HEAT STRESS HAZARDS AND RISK FACTORS

Heat Stress is defined as the total net load on the body with contributions from both exposure to external sources, such as sunshine and hot surfaces, and from internal metabolic heat production. A person=s

exposure to the increased ambient temperatures and humidity produces physiological responses referred to as heat stress which are characterized by an increase in the: a) Acore@ or Adeep body temperature@. b) heart rate, c) blood flow to the skin, and d) water and salt loss due to sweating. Conditions of excessive heat stress may occur either when the physical work is too heavy or the environment is too hot in relation to the work being performed. If work is performed under hot environmental conditions, the work load effort must be reviewed and the heat exposure limit maintained at or below the levels to protect the worker from the risk of acute heat illness.

In general, there are four types of physiological disorders associated with heat stress. They include:

- Heat Rash - a skin reaction occurring as a result of obstructed sweat glands, often associated with impermeable clothing.

- Heat Cramps - painful muscle spasms of extremities and abdomen, resulting from inadequate balance of electrolytes which are lost from sweating.

- Heat Exhaustion - a mild form of heat stroke due to depletion of body fluids and electrolytes. Blood vessels dilate despite decreased volume of blood. Symptoms include weakness, dizziness, nausea, rapid pulse, and a small increase in body temperature.

- Heatstroke - a potentially fatal disorder resulting from failure of the body=s thermoregulatory system. The classical description of heatstroke includes (1) a major disruption of central nervous function (unconsciousness of convulsions), (2) a lack of sweating (3) hot, dry, red or mottled skin, and (4) a core temperature in excess of 41^{o}C (105.8^{o} F). Heatstroke is a serious medical condition which calls for emergency medical action.

Seven factors play significant roles in the development of or predisposition to, heat stress disorders. These factors include:

- Acclimatization - Heat acclimatization leads to increased and quicker sweating, cooler skin due to an increase in evaporative cooling and a lower, more stable core body temperature. Maximal sweating rates in unacclimatized persons are lower, but salt concentrations in their perspiration are higher, requiring a higher rate of salt replacement.

- Age - Older individuals are generally more susceptible to heat stress than younger individuals. However, older healthy workers are able to perform well in hot jobs if permitted to proceed at a self-regulated pace.

- Gender - The average woman has a lower aerobic capacity than a similar-sized man. Nevertheless, when working at similar proportions of their maximum aerobic capacity, women perform similarly or only slightly less well than men.

- Body Fat - The lower level of physical fitness, decreased maximum work capacity and decreased cardiovascular capacity frequently associated with obesity predispose individuals to heat disorders.

- Water and Electrolyte Balance - Sustained, effective work performance in heat requires a

replacement of body water and electrolytes lost through sweating. If this water is not replaced by drinking, continued sweating will draw on water reserves from both tissues and body cells leading to dehydration.

- Use of Alcohol and Medication - Not withstanding the potential hazards from impaired coordination and judgment, the ingestion of alcohol before or during work in the heat should not be permitted because it reduces heat tolerance and increases the risk of heat illness, Many drugs, including diuretics and antihypertensives, can interfere with the body=s thermoregulation.

- Physical Fitness - Physical conditioning enhances heat tolerance by increasing the functional capacity of the cardiovasculatory system, and reduces the time required to develop heat acclimatization by about 50% over those not physically fit.

The factors listed above are to be taken into account by all project personnel when planning or executing a project subject to heat stress conditions. The factors should be taken into consideration for:

- the development of the project schedule;
- the ordering of supplies/equipment;
- the support facilities to be made available at the site;
- the execution of work tasks; and
- the after work hours activities.

The following is a summary of signs and symptoms of heat stress:

Heat Rash may result from continuous exposure to heat or humid air .

Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:

- Muscle Spasms
- Pain in the hands, feet and abdomen.

Heat Exhaustion occurs from increased stress on various body organs, including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

- Pale, cool and moist skin
- Heavy sweating
- Dizziness, fainting and nausea

Heat stroke is the most serious form of heat stress. Temperature regulation fails, and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Competent medical help must be obtained. Signs and symptoms are:

- Red, hot and unusually dry skin
- Lack of or reduced perspiration
- Dizziness and confusion

- Strong, rapid pulse and coma.

HEAT AND STRESS PREVENTION

Preventive measures should be taken to prevent personnel from experiencing heat stress illness. Prevention of heat stress is also important because if an individual has experienced a heat illness incident, he has an increased likelihood of future occurrences. Preventive measures include: favorable work scheduling, acclimatization of workers to hot environments, drinking sufficient quantities of fluids, providing cool, sheltered work and rest areas, and utilizing cooling devices as appropriate of feasible. Heat stress monitoring/work rest regimens are discussed below.

Work Schedules and Activity

If possible, work should be scheduled during the coolest part of the day. Early morning and evening work can be considerably more effective than working midday when the additional time for breaks and heat stress monitoring are taken into account.

Employees should also be encourages to maintain a certain level of activity during the work shift. Prolonged standing in hot environments can lead to heat illness because the blood pools in the lower extremities. Workers should periodically walk about to encourage blood circulation from the feet and legs.

Acclimatization of Workers

A properly designed and applied heat acclimatization program will dramatically increase the ability of workers to work at a hot job and will decrease the risk of heat-related illnesses and unsafe acts. Heat acclimatization can usually be induced in 5 to 7 days of exposure to the hot job. For workers who have had previous experience with the job, the acclimatization regimen should be exposure for 50% on day 1, 60% on day 2, 80% on day 3 and 100% on day 4. For workers new to job the schedule should be 20% on day 1 with a 20% increase in each additional day.
Acclimatization can be induced by sustained elevations of the skin and core body temperatures above levels for the same work in cool environments for an hour or more per day. Acclimatization needs periodic reinforcement such as occurs daily during the work week. Persons may show some loss of acclimatization on the first day of the new shift after being idle for two days or over a weekend. After vacations of two weeks or longer he loss of acclimatization is substantial, several days at work will be needed before heat tolerance is fully restored.

Drinking Sufficient Quantities of Fluids

Under hot conditions where sweat production may reach 6 to 8 liters per day, voluntary replacement of the water lost is usually incomplete. The normal thirst mechanism is not sensitive enough to urge us to drink enough water to prevent dehydration. Individuals are seldom aware of the exact amount of seat they produce of how much water is needed to replace that lost in sweat; 1 liter/hour is not an uncommon rate of water loss. Every effort should be made to encourage individuals to drink water, low-sodium noncarbonated beverages or electrolyte replacement fluids (e.g., Gatorade). Lightly salted water (1 gram/liter of water (0.1%) or one level teaspoon per 15 quarts of water), should be provided to unacclimated workers. The salt should be dissolved completely and the water kept cool. Salt tablets as dietary supplements are not generally recommended.

Workers should drink at least 500 ml (one pint) of water before beginning work. The fluid should be maintained at temperatures of 10° to 15° (50 to 59° F). If possible, small quantities of fluids should be consumed at frequent intervals (e.g., 150 to 250 milliliters (ml), or at least a quarter pint, every 20 minutes) rather than the intake of 750 ml (3 cups) or more once per hour. Individuals vary, but water intake should total 4 to 8 liters (quarts) per day. When heat stress is considered a potential problem, a minimum of 1 liter/hour/person of water are to be maintained onsite. Individual paper or plastic cups will be provided in order to prevent the spread of communicable disease.

Alcohol and diuretics such as caffeine (contained in coffee, tea and soft drinks) can increase dehydration. Therefore employees with potential exposure to heat stress should be discouraged from the consumption of these types of fluids during and after working hours.

Cool, sheltered Work and Rest Areas

Exposure to direct sunlight significantly increases the overall thermal loading of the body, thereby increasing an individuals susceptibility to heat stress illnesses. Whenever possible work should be conducted under suspended tarps, in shady areas or in other sheltered areas in order to reduce thermal loading caused by the sun. Cool sheltered areas should be provided also for rest breaks. A rest area should be situated so that part of it is in the contamination reduction area so that workers can take breaks without being required to undertake a full decontamination procedure. Canopies or tarps and open air tents, are types of cool shelters which can provide shaded rest areas.

Cooling Devices

Auxiliary cooling devices can be successfully used to provide body cooling, especially to workers wearing protective garments at hazardous waste sites. Vortex coolers utilize high velocity air which is directed inside the protective clothing. Vortex coolers have been used successfully in some operations. Cooling vests utilizing Ablue ice@ type packs can provide some cooling to the torso, but add weight for the wearer and can inhibit body movements.

Newer, more sophisticated tube and refrigerant systems woven into undergarments are also available. However, some of these systems ,,may not be effective in situations where the work involves considerable motion, since bending and lifting can crimp the tubes, impending the flow of refrigerant.

Heat Stress Monitoring

Several heat stress monitoring systems have been devised to help manage heat stress in hot work environments. Panamerican performs heat stress monitoring when: 1) employees are wearing normal work clothing in ambient temperatures exceeding 29° C, (85° F) and 2) employees wearing chemical protective clothing (including paper coveralls) working in ambient temperatures exceeding 21° C (70° F). The temperature differential is related to the reduced ability of a person to maintain a core temperature of $\pm$ 37° C (98.6° F) when wearing chemical protective clothing.

It should be noted by personnel that there are no Afast and true@ methods of heat stress monitoring; likewise there are no regulations concerning heat stress monitoring. Individual susceptibility to heat stress is highly variable. Some individuals are highly susceptible to any increase in their internal body temperature while other individuals can work very well with internal body temperatures of 39°C (102.2° F) or higher.

The heat stress monitoring systems should be used by Site Safety Officers as guidelines and not necessarily as hard, fast rules. Individuals working in elevated temperatures should be queried on a regular basis regarding their perceived state of heat stress. If the calculated heat stress index value indicates that work can continue but a person states that they believe they are experiencing heat stress, the work effect should be discontinued and a rest break taken.

Likewise, if the calculated heat stress index value indicates that a rest break should be taken but the workers believe they can work longer, they should be permitted to work longer providing that their heart rates do not exceed 110 beats per minute. If the individual's heart rate rates exceed 110 beats per minute a rest break will be taken. In all cases, individual workers should not be permitted or expected to perform excessive work which could result in heat stress. If a SSO has any concerns that an individual may be pushing himself/herself past the Abreaking point@ the calculated work/rest regimen will be followed.

For strenuous field activities that are part of ongoing site work activities in hot weather, the following procedures shall be used to monitor the body=s physiological response to heat, and to monitor the work cycle of each site worker. There are two phases to this monitoring: the initial work/rest cycle is used to estimate how long the first work shifts of the day should be. Heart rate monitoring of each worker will establish the length of the successive work periods. Both phases are to be used are to be used for heat stress monitoring. Failure to use either one could place workers at risk of heat-related disorders.

Phase 1 - Determination of the Initial Work - Rest Regimen

The determination of the initial work - rest regimen can be performed using either of two methods:

-The Modified Dry Bulb Index; or
-The Wet Bulb Globe Thermometer (WBGT) Index

After the initial work - rest regimen has been determined, environmental conditions must be monitored for changes which would require a modification to the work - rest regimen. This, coupled with the heart rate monitoring, determines the work cycles to be followed on a site.

The Modified Dry Bulb Index accounts for the effects caused by solar, load, air temperature, and chemical protective clothing, under a light work load (walking at approximately 3 mph). A mercury thermometer, shielded from direct sunlight, is used to measure ambient temperature. The percentages of (of time) of sunlight and cloud cover are then estimated to determine a sunshine quality factor (e.g., 100% sunshine - no cloud cover = 1.0; 50% sunshine - 50% cloud cover = 0.5; 0% sunshine - 100% cloud cover = 0.0). When these two sets of values have been obtained, they are inserted into the following equation to calculate the adjusted temperature:

$$T\,(^{o}C, \text{adjusted}) = T\,(^{o}C, \text{actual}) + (7.2 \times \text{sunshine quality factor})$$

-OR-

$$T\,(^{o}F, \text{adjusted}) = T\,(^{o}F, \text{actual}) + (13 \times \text{sunshine quality factor})$$

After the adjusted temperature has been calculated, the length of the first work shift can be determined using the following table:

Initial Break and Physiological Monitoring Cycles

ADJUSTED TEMPERATURE	NORMAL WORK CLOTHES	PROTECTIVE CLOTHING
90^0F (32.2^0 C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5^0-90^0 F (30.8^0-32.2^0 C)	After each 60 minutes of work	After each 30 minutes of work
82.5^0-87.5^0 F (28.1^0-30.8^0 C)	After each 90 minutes of work	After each 60 minutes of work
77.5^0-82.5^0 F (25.3^0-28.1^0 C)	After each 120 minutes of work	After each 90 minutes of work
72.5^0-77.5^0 F (22.5^0-25.3^0 C)	After each 150 minutes of work	After each 120 minutes of work

NOTE: The standard rest period is 15 minutes

WET BULB GLOBE THERMOMETER INDEX

The Wet Bulb Globe Thermometer (WBGT) Index was developed by the U.S. Army in the 1950s to prevent heat stress in army recruits. The WBGT Index accounts for the effects caused by humidity, air movement, evaporation, air temperature and work rate. It does not, however, account for the effects of chemical protective clothing, non-acclimatized workers, age, or other factors which may affect the likelihood of heat stress. Because of this, it is necessary to make adjustments to the index and conduct Heart Rate Monitoring.

WBGT measurements are usually obtained through the use of are-contained electronic devices. Such devices are easy to set up and can provide the user with the capabilities to store data and download to print out a hard copy.

Heat produced by the body and the environmental heat together determine the total heat load. Therefore, after the WBGT Index has been obtained, the anticipated work load category of each job shall be determined and the initial-rest regimen established using the table below.

The work load category may be determined by ranking each job into light, medium and heavy categories on the basis of type of operation. Examples of each category are:

Light work:	sitting or standing to control machines, performing light hand work
Moderate work:	walking about with moderate lifting and pushing; and
Heavy work:	pick and shovel work.

PERMISSIBLE HEAT EXPOSURE			
WORK-REST REGIMEN	WORK LOAD		
	LIGHT	MODERATE	HEAVY
	30.0^0 C/86^0 F	26.7^0 C/80.1^0 F	25^0C/77^0F
75% Work-25% Rest Each Hour	30.6^0 C/87.1^0 F	28^0 C/82.4^0 F	25.9^0 C/78.6^0 F
50% Work-50% Rest Each Hour	31.4^0 C/88.5^0 F	29.4^0 C/85.0^0 F	27.9^0 C/82.2^0 F
25%Work-75 % Rest Each Hour	32.2^0 C/90.0^0 F	31.1^0 C/88.0^0 F	30.0^0 C/86.0^0 F

The table reads as follows:

Light, continuous work is possible at any WBGT reading up to 30^0 C (86^0F) but above that limit work breaks

are needed to recover from the heat; light work at temperatures of between 30.0 and 30.6^{0}C (86 to 87^{0}F) can be conducted, but 15 minute breaks must be taken every hour, etc. It is important to note that this table is applicable primarily to healthy, acclimatized personnel; wearing standard work clothing.

NOTE: An additional 6 to 11^{0}C (42.8 to 51.8^{0}F) must be added to the calculated WBGT temperature for personnel wearing chemical protective clothing prior to determining the initial work - rest regimen from this table. Because the WBGT Index does not take into account unacclimatized workers, or individual susceptibilities, the addition to the WBGT value does not eliminate the requirement for Heart Rate Monitoring after work has begun.

Phase 2 - Heart Rate Monitoring

An increase in the heart rate is a significant indication of stress, whether induced by exposure to heat or through physical labor. Although baseline heart rates can vary significantly between individuals and during the day for an individual, a heart rate of 110 beats per minute or greater is an indication of physiological stress. To prevent heat stress illnesses, the heart rate (HR) should be measured by radial (wrist) or carotid (neck) pulse for 30 seconds as early as possible in the rest period. The HR at the beginning of the rest period should not exceed 110 beats/minute. If the HR is higher, the next work period should be shortened by 33 percent while the length of the rest period stays the same. If the pulse rate still exceeds 110 beats/minute at the beginning of the next rest period, the following work period should be further shortened by 33 percent while the length of the rest period stays the same.

ATTACHMENT 2

Trenching & Excavating H & S Requirements

Panamerican Environmental, Inc.
2390 Clinton Street
Buffalo, New York 14227
Tel: (716) 821-1650
Fax: (716) 821-1607

PANAMERICAN

PANAMERICAN TRENCHING AND EXCAVATION HEALTH AND SAFETY REQUIREMENTS

The following will apply to all activities associated with excavations:

REGULATORY AUTHORITY

Excavations will be performed in accordance with OSHA 29 CFR, subpart P, 1926:650-1926.652 and USACOE EM 385-1-1 section 25 requirements as they apply to project activities.

GENERAL

- **At all times the need for personnel to enter excavations will be minimized. Inspections or sample removal will be done from above the excavation, whenever possible.**
- **Personnel will only enter excavations after the requirements of this plan have been met.**
- **Personnel protective equipment including hard hat, safety glasses and steel-toe work boots may be required.**

SURFACE ENCUMBRANCES

Surface encumbrances such as structures, fencing, piping, stored material etc. which may interfere with safe excavations will be avoided, removed or adequately supported prior to the start of excavations. Support systems will be inspected daily.

UNDERGROUND UTILITIES

Underground utility locations will be checked and determined and permits as necessary will be in place prior to initiating excavations. Local utility companies will be contacted at least two days in advance, advised of proposed work, and requested to locate underground installations. When excavations approach the estimated location of utilities, the exact location will be determined by careful probing or hand digging and when it is uncovered, proper supports will be provided.

OVERHEAD OBSTACLES

A minimum safe distance of 20 feet will be maintained when working around overhead high-voltage lines or the line will be de-energized following appropriate lock-out and tag-out procedures by qualified utility personnel.

ENTRY/EXIT ROUTES

Excavations five feet or more deep will require an adequate means of exit, such as a ladder, ramp, or steps and located so as to require no more than 25 feet of lateral travel. Under no circumstances will

personnel be raised.

VEHICLE CONTROL/SAFETY

Personnel working around heavy equipment, or who may be exposed to public vehicular traffic will wear a traffic warning vest consisting of at least 400 square inches of red or orange material. At night, at least 400 square inches of florescent or other reflective material will be worn.

For excavation work on or adjacent to highways or streets, signs, signals, and barricades tat conform to the requirements of the current American National Standards Institute (ANSI) D6.1, Manual on Uniform Traffic Control Devices for Streets and Highways will be used to protect work areas. Signs, signals, and barricades will be adequately lighted at night. Flagmen will be provided when signs, signals and barricades do not provide adequate protection. Flagmen will use signals and procedures contained in the current issue of ANSI D6.1. At night, flagmen will be clearly illuminated so as to be easily seen by approaching traffic.

For mobile equipment operating next to or approaching the edge of an excavation, the operator will have a clear view of the edge of the excavation, or a warning system such as barricades, hand or mechanical signals, or stop logs will be used. If possible the surface grade will slope away from the excavation.

Personnel will be safely located in and around the trench and will not be permitted to work underneath loads handled by lifting or digging equipment. Personnel are required to stand away from vehicles being loaded and unloaded. Operators can remain in the cabs of vehicles being loaded or unloaded provided the vehicles are equipped to provide adequate protection to the operator.

HAZARDOUS ATMOSPHERES

Hazardous atmospheres, such as oxygen deficiency (atmospheres containing less than 19.5% oxygen), flammable gases or vapors (airborne concentrations greater than 20% of the lower explosive limit), and toxic gases or vapors (airborne concentrations above the OSHA Permissible Exposure Limit or other exposure limits) may occur in excavations, especially around landfills and hazardous waste sites.

In locations where oxygen deficiency or hazardous gaseous conditions are possible, the air in the excavation will be tested before personnel are permitted to enter an excavation deeper than 4 feet. When flammable gases are present, adequate ventilation will be provided and sources of ignition will be eliminated. Ventilation or respiratory protection will be provided to prevent personnel exposures to oxygen deficient or toxic atmospheres. Periodic retesting (at least each shift) of the excavation will be conducted to verify that the atmosphere is acceptable. A log or field book records will be maintained of all test results.

WATER ACCUMULATION HAZARDS

Personnel will not work in excavations that have accumulated water or where water is accumulating unless adequate precautions have been taken. These precautions can include special support or shield systems, water removal systems such as pumps, or safety harnesses and lifelines. Water removal systems will be operated and monitored by experienced personnel. Diversion ditches or dikes will be used to prevent surface water from entering the excavation and to provide adequate drainage of the area around the excavation. Adequate precautions, as described above, will be taken for excavating

subject to heavy rains.

STABILITY OF ADJACENT STRUCTURES

Support systems such as shoring, bracing, or underpinning will be provided to maintain the stability of adjoining buildings, walls, or other structures endangered by the excavation operations. Excavations below a foundation or retaining wall that could be reasonably expected to pose a hazard to personnel will not be permitted unless:

- **a support system is provided**
- **The excavation is in stable rock; or**
- **A Registered Professional Engineer has determined that the structure will not be effected by the excavation activity or that the excavation work will pose a hazard to employees. The Professional Engineer is required to demonstrate how the above determination was made on the basis of appropriate calculations.**

Sidewalks will not be undermined unless shored to protect from possible collapse.

PROTECTION FROM LOOSE ROCK, MATERIALS OR SPOILS

In excavations and trenches that personnel may be required to enter, loose rock, excavated or other material, and spoils will be effectively stored and retained at least two feet or more from the edge of the excavation.

As an alternative to the clearance prescribed above, barriers or other effective retaining devices may be used in order to prevent spoils or other materials from falling into the excavation.

Walkways, runways, and sidewalks will be kept clear of excavated material from other obstructions.

Scaling operations may be used to remove loose material and will be performed only by experienced crews under the direct supervision of a competent supervisor. The scalers will be provided with scaler=s lifelines, safety belts, boatswain chair, and other safety equipment necessary for their protection.

FALL PROTECTION

Walkways or bridges with standard guardrails that meet OSHA specifications will be provided where employees, the public, or equipment are required to cross over excavations.

Adequate barrier physical protection will be provided at all remotely located excavations. All excavations will be barricaded or covered.

EMERGENCY RESCUE

In the event of a cave-in, the Emergency Rescue Squad will be immediately notified. The caller should provide his name, location, nature of the accident (an excavation collapse), the dimensions of the excavation, and number of people trapped in the excavation. Personnel are not to enter a collapsed trench to attempt rescue. This may cause a further collapse of the trench. Under no circumstance is heavy equipment to be used to attempt rescue of personnel in a collapsed excavation; injury or decapitation could be the result. All heavy equipment and traffic in the area is to be shut down and

stopped to reduce vibration. Pumps should be started if water ensues.

INSPECTION PROGRAM

Safety personnel will conduct daily inspections of the excavation, the adjacent areas, and protective systems. Inspections will be conducted prior to the start of work and as needed throughout the work shift. Inspections will also be made after every rainstorm or other occurrence that increases the hazard of collapse (i.e., vibration from heavy equipment, freezing and thawing, etc.).

The excavation inspection will include a check for the following:

- **Evidence if situations that could result in possible cave-in (i.e. soil crumbling or sloughing, water saturated soils, freezing and thawing, unusual vibrations such as from heavy equipment, heavy rains, surface run off entering trench, etc.);**
- **Indications of failure of protective systems;**
- **Hazardous atmosphere (oxygen deficiency, flammable and toxic gases and vapors);**
- **Condition and support of exposed underground installations;**
- **Adequate means of egress;**
- **Signs, signals, and barricades for work area protection;**
- **Precautionary measures to control water accumulation;**
- **Stability and support of adjacent structures; and**
- **Adequate protection from loose rock and soil.**

PROTECTIVE SYSTEMS

Personnel working in excavations will be protected from cave-ins by sloping and/or benching of excavation walls, a shoring system or some other equivalent means except when:

- **The excavation is made entirely in stable rock; or**
- **Excavations are less than five feet deep and safety personnel have determined that there is no indication of potential cave-in. Depending on site and soil conditions protective measures may be taken for the excavations less than five feet in depth.**

The most important factor influencing the choice of protective systems is the soil type classification. Once the soil type has been classified, selection of the protective system, the determination of the angle of repose for sloping and benching, and the design of shoring systems will be made. Decisions will be based on careful evaluation of pertinent factors such as depth of cut; possible variation in water content of the material while the excavation is open; anticipated changes in materials from exposure to air, sun, water, or freezing; loading imposed structures equipment, overlying material, or stored material; and vibration from equipment, blasting traffic or other sources.

Soil Classification

Appendix A of the OSHA Excavation Standard describes a methjod to classify soils into four types:

1. Stable Rock - Solid mineral matter that can be excavated with vertical sides.

2. Type A - cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) or greater. Examples include: clay; silty clay; sandy clay; clayey loam; and cemented soils such as caliche and hardpan. No soil is considered to be Type A if it is fissured, subject to vibration, previously disturbed, or part of a sloped, layered system.

3. Type B - cohesive soils with an unconfined compressive strength of greater than 0.5 tsf but less than 1.5 tsf. Examples include: angular gravel similar to crushed rock; silt; silty loam; and sandy loam; Type B soils also include : previously disturbed soils that are not type C; Type A soils that are fissured or subject to vibration; and dry rock that is not stable.

4. Type C - cohesive soils with an unconfined compressive strength of 0.5 tsf or less. Examples include: gravel; sand; loamy sand; submerged soil or soil from which water is seeping; submerged rock that is not stable.

The engineer, geologist, or safety personnel will conduct at least one visual and at least one manual test as described in the OSHA excavation standard in order to classify soils. Visual tests include looking for : particle size and soil cohesiveness (clumping); cracking in the excavation sides which suggests fissured material; underground installations ans previously disturbed soils; layered soil systems that slope toward the excavation; evidence of surface water and water seeping from the sides of the excavation; and sources of vibration that may affect the excavation stability. Manual tests include: plascticity; dry strength; tumb penetration; drying test; and strength tests using a pocket penetrometer or hand-operated shearvane.

<u>Sloping and Benching</u>

One of the following options for sloping and benching systems described in section 1926.652(b) of the OSHA Excavation Standard will be used in excavations of .5 foot or deeper or at the discretion of the safety personnel:

- **The walls of excavation will be sloped at an angle not steeper than 0ne-and one-half horizontal to one vertical. Sloping configurations will follow the slopes shown for Type C soils in Appendix B of the OSHA Excavation Standard.**

- **Maximum allowable slopes and sloping and benching configurations will be determined according to soil type as described in Appendices A and B of the OSHA Excavation Standard.**

- **Use of other written tabulated data and designs, such as tables and charts, to design sloping and benching systems. A copy of the tabulated data must be approved by a registered Professional Engineer. A copy of the tabulated data must be kept at the job site.**

Personnel are not allowed to work on the faces of sloped or benched excavations above other workers unless the workers at the lower levels are protected from falling material or equipment. Similar protection will be provided for personnel working in excavations below other workers.

<u>Support Systems, Shield Systems, and Other Protective Devices</u>

One of the following options described in OSHA (1926.652 (c)) will be followed.

- **Timber shoring, designed according to the conditions and requirements of Appendix C of the OSHA Excavation Standard or aluminum hydraulic shoring designed according to manufacturers tabulated data or Appendix D of the OSHA Excavation Standard. In order to use the information in Appendices C or D, the soil type must first be determined using the classification system in Appendix A. For each soil type the size and spacing of the cross braces, uprights, and walls that comprise the shoring system are then selected based on the depth and width of the trench.**

- **Use of the manufacturer=s written tabulated to design support systems, shielded systems, and other protective devices. Any deviation from this tabulated data must be approved by the manufacturer. A copy of the tabulated data as well as any approvals to deviate from the tabulated data must be kept at the job site.**

- **Use of other written tabulated data to design support systems, shield systems, and other protective devices. The tabulated data must be approved by a Registered Professional Engineer. A copy of the tabulated data must be kept at the job site.**

- **Use of a written support system, shield system, and other protective device design that has been approved by a Registered Professional Engineer. A copy of the written design must be kept at the job site.**

<u>Installation and Removal of Support</u>

Cross braces or trench jacks, uprights, and walls will be secured together to prevent sliding, falling or kickouts.

Additional precautions by way of shoring and bracing will be taken to prevent slides or cave-ins when excavations or trenches are made in locations adjacent to backfilled excavations, or where excavations are subjected to vibrations from railroad or highway traffic, the operation of machinery, or any other source.

If it is necessary to place or operate power shovels, derricks, trucks, materials, or other heavy objects on a level above or near any excavation, the side of the excavation will be sheetpiled, shored, and braced as necessary to resist the extra pressure due to such superimposed loads.

Backfilling and removal of trench supports will progress together from the bottom of the trench. Jacks or braces will be released slowly and , in unstable soil, ropes will be used to pull out the jacks or braces from above after employees have cleared the trench.

<u>Shield Systems</u>

Portable trench boxes or sliding trench shields may be used for protection of personnel in lieu of a shoring system or sloping. Where such trench boxes or shields are used, they will be designed, constructed and maintained in a manner which will provide protection equal to or greater than the sheeting or shoring required for the trench. Shields will be installed so as to restrict lateral or other hazardous movement. Personnel are not allowed inside shields when shields are being moved.

EXCAVATION SAFETY LIST

To be completed prior to each work shift, or prior to personnel entering a new trench for the first time, by the Site Safety Officer/Competent Person:

Project_____Location_____

Job Number_____

Competent Person(CP)*_____Date_____

		Yes	No	N/A
1.	**Has the site been cleared for utilities and other underground obstructions?**	____	____	____
2.	**If on public property, has the regional utility locating service been notified?**	____	____	____
3.	**Has the excavation equipment been safety checked by the operator?**	____	____	____
4.	**Are copies of relevant OSHA excavation regulations available on site?**	____	____	____
5.	**Will the excavation be 5 feet or more in depth?**	____	____	____
6.	**If 4 is yes, will personnel enter the excavation at any time?**	____	____	____
7.	**If 4a is yes, have provisions been made for shoring, sloping, or benching the excavation? Describe:** _____ _____ _____	____	____	____
8.	**Has an inspection of the site and excavation been conducted by the SSO?**	____	____	____
9.	**Has the Competent Person conducted visual and manual tests to classify the soil?**	____	____	____

*** According to Federal OSHA, A Competent Person is a person who is capable of identifying existing and predictable hazards in the surroundings; or working conditions which are unsanitary, hazardous, or dangerous to employees; and who has the authority to take prompt corrective measures to eliminate them.**

10.	**G**	**Visual Test _____(type)**			
	G	**Manual Test_____(type)**			
	G	**Soil Classification_____(type)**			
11.		**Are there any conditions that might expose employees to injury from possible moving ground?**	____	_____	____
12.		**Is excavated material being placed at least 2 feet from the edge of the excavation?**	____	____	____
13.		**Is work in the excavation at all times under the immediate supervision of the SSO or other competent person?**	____	____	____
14.		**Is there a stairway, ladder, or ramp securely fastened in place to provide ingress and egress from the excavation?**	____	____	____
15.		**If the excavation is 4 feet or more in depth, are safe means of access (see 8) provided so as to require no more than 25 feet of lateral travel to reach them?**	____	____	____
16.		**If structural ramps are installed that are used for access/egress: were they designed by a qualified engineer?**	____	____	____
17.		**Do the structural ramps have appropriate means to prevent slipping and are the ramps uniform in thickness?**	____	____	____
18.		**Are walkways or bridges provided across the excavation to safe crossing?**	____	____	____
19.		**If excavations are 71/2 or more feet in depth, do the walkways have guardrails and toeboards?**	____	____	____
20.		**Are undermined structures adequately supported to safely carry all anticipated loads and protect workers?**	____	____	____
21.		**Are there adequate means provided to prevent mobile equipment from inadvertently entering the excavation?**	____	____	____
22.		**Is the excavation well marked and barricaded to prevent personnel from falling IN?**	____	____	____
23.		**Are means available to prevent surface water from entering the excavation and to provide**	____	____	____

	adequate drainage of the area adjacent to the trench?			
24.	**Where it is reasonable to expect hazardous atmospheres, including oxygen deficiency, to exist in the excavation, is appropriate atmosphere testing equipment available.**	____	____	____
25.	**Has the testing equipment been calibrated, and the calibrations recorded, today?**	____	____	____
26.	**Are employees trained in proper use of this equipment?**	____	____	____
27.	**Has a harness and lifeline been provided whenever an employee is required to enter a confined footing excavation?**	____	____	____
28.	**Is appropriate personal protective equipment (hardhat, safety boots, eye protection, etc.) available and in use?**	____	____	____

Notes:_____

_____

_____

_____

_____ _____

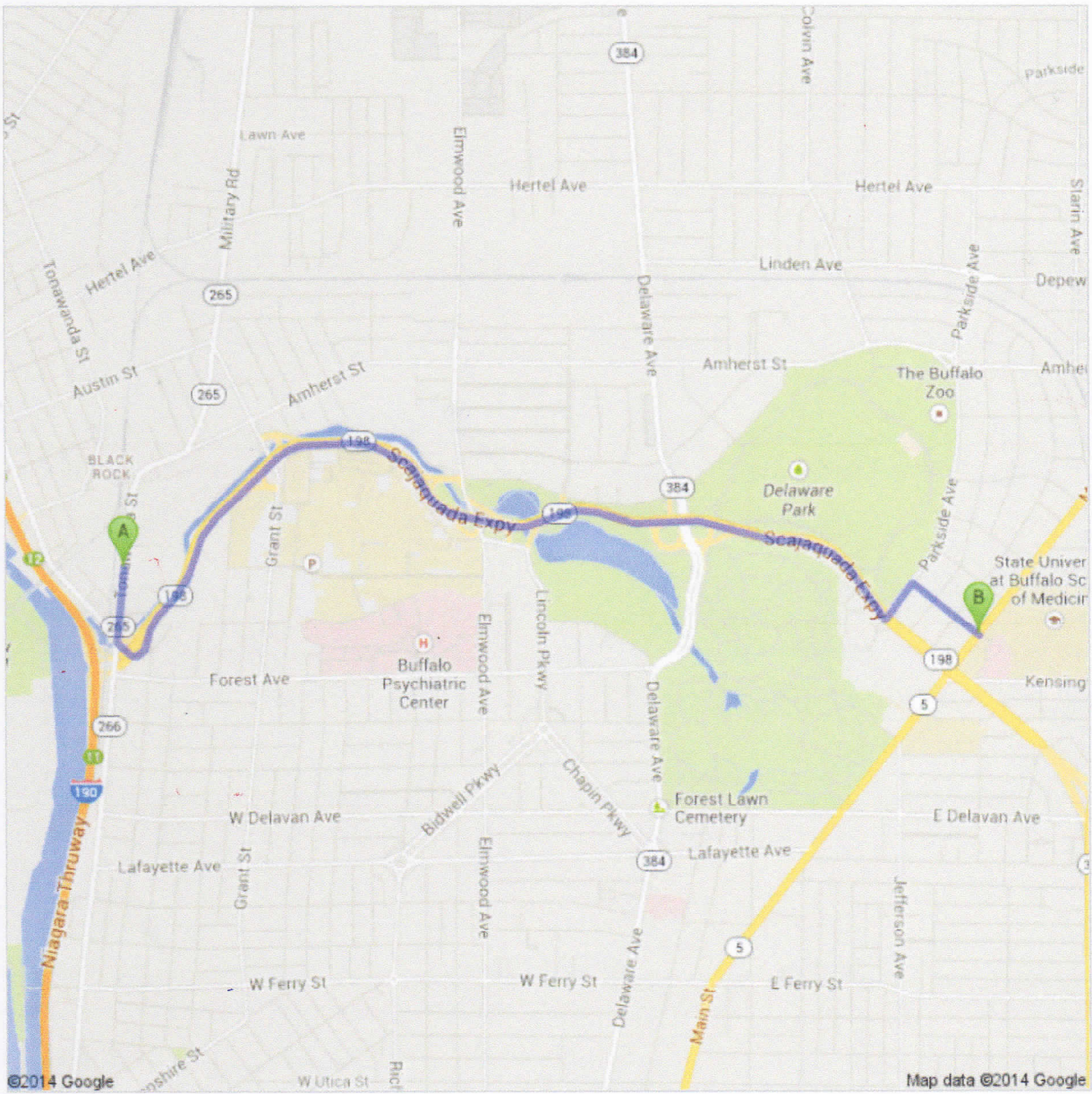
CPs Name (Print) **Signature**

ATTA CHMENT 3

Map to Hospital

Google

Directions to Sisters of Charity Hospital
2157 Main St, Buffalo, NY 14214
3.3 mi – about **6 mins**



A 68 Tonawanda St, Buffalo, NY 14207

1	Head **south** on **Tonawanda St** toward **West Ave** About 51 secs	go 0.2 mi total 0.2 mi
2.	Turn left onto the **New York 198** ramp	go 0.2 mi total 0.4 mi
198	3. Merge onto **NY-198 E** About 3 mins	go 2.5 mi total 2.9 mi
4.	Turn left onto **Parkside Ave**	go 0.1 mi total 3.0 mi
5.	Take the 1st right onto **Robie St** About 54 secs	go 0.2 mi total 3.3 mi
6.	Take the 3rd right onto **Main St** Destination will be on the left	go 13 ft total 3.3 mi

B **Sisters of Charity Hospital**
2157 Main St, Buffalo, NY 14214

ATTACHMENT 4

NYSDEC DER-10
Appendix 1A & Appendix 1B

Appendix 1A
New York State Department of Health
Generic Community Air Monitoring Plan

Overview

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

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

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

Community Air Monitoring Plan

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

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

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or

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

VOC Monitoring, Response Levels, and Actions

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

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

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

December 2009

Appendix 1B
Fugitive Dust and Particulate Monitoring

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

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

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

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

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

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

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

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

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

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

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

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

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

ATTACHMENT 5

Table of Potential Hazards & OSHA Standards

Potential Hazards and OSHA Standards for Consideration during IRMs

Site Exposure/Control	Potentially Applicable OSHA Standard*	
	1910 General Industry	1926 Construction
Hazard Assessmen & Employee Training	29 CFR 1910.132(d)	29 CFR 1926.21(b)
Chemical Exposure	29 CFR 1910.1000	29 CFR 1926.55
Noise Exposure	29 CFR 1910.95	29 CFR 1926.52
Sanitation	29 CFR 1910.141	29 CFR 1926.51
Wiring Methods (temporary wiring)	29 CFR 1910.305(a)(2) 29 CFR 1910.333	29 CFR 1926.405(a)(2)
Electrical Hazards		29 CFR 1926.416
Emergency Action Planning	29 CFR 1910.38	29 CFR 1926.35
Excavation	covered by 1926	29 CFR 1926 Subpart P
Confined Space Entry	29 CFR 1910.146	29 CFR 1926.21(b)(6)29 CFR 1926.353(b)
Material Handling	29 CFR Subpart N	29 CFR Subpart N29 CFR 1926.600-60229 CFR 1926.604
Building Demolition	covered by 1926	29 CFR 1926 Subpart T
Site ContaminantAbatement	29 CFR 1910.1000-1029 29 CFR 1910.1043-1052	29 CFR 1926.5529 CFR 1926.6229 CFR 1926.1101-1152
Elevated Work Surfaces	29 CFR 1910 Subpart D 29 CFR 1910 Subpart F	29 CFR 1926 Subpart L29 CFR 1926 Subpart M29 CFR 1926.552
Chemical Storage	29 CFR 1910 Subpart H29 CFR 1910.1200	29 CFR 1926.5929 CFR 1926 Subpart F
Personal Protective Equipment	29 CFR 1910 Subpart I	29 CFR 1926 Subpart E
Heavy Equipment Operation	29 CFR 1910.9529 CFR 1910 Subpart N	29 CFR 1926.5229 CFR 1926 Subpart O
Tasks-Long Duration	29 CFR 1910.141-142	29 CFR 1926.51

The Federal General Industry and Construction citations are provided above

APPENDIX B

CITIZEN PARTICIPATION PLAN

New York State Department of Environmental Conservation

Brownfield Cleanup Program

Citizen Participation Plan
For
68 Tonawanda Street Site

Site #915316
68 Tonawanda Street
Buffalo, New York 14207

January 2018

Table of Contents

* * * * *

Note: The information presented in this Citizen Participation Plan was current as of the date of its approval by the New York State Department of Environmental Conservation. Portions of this Citizen Participation Plan may be revised during the site s investigation and cleanup process.

Applicant: **Buffalo Freight House, LLC.**
Site Name: **68 Tonawanda Street Site ("site")**
Site Address: **68 Tonawanda Street, Buffalo, NY 14207**
Site County: **Erie County**
Site Number: **#915316**

1. What is New York's Brownfield Cleanup Program?

New York's Brownfield Cleanup Program (BCP) works with private developers to encourage the voluntary cleanup of contaminated properties known as "brownfields" so that they can be reused and developed. These uses include recreation, housing, and business.

A *brownfield* is any real property that is difficult to reuse or redevelop because of the presence or potential presence of contamination. A brownfield typically is a former industrial or commercial property where operations may have resulted in environmental contamination. A brownfield can pose environmental, legal, and financial burdens on a community. If a brownfield is not addressed, it can reduce property values in the area and affect economic development of nearby properties.

The BCP is administered by the New York State Department of Environmental Conservation (NYSDEC) which oversees Applicants that conduct brownfield site investigation and cleanup activities. An Applicant is a person who has requested to participate in the BCP and has been accepted by NYSDEC. The BCP contains investigation and cleanup requirements, ensuring that cleanups protect public health and the environment. When NYSDEC certifies that these requirements have been met, the property can be reused or redeveloped for the intended use.

For more information about the BCP, go online at:
http://www.dec.ny.gov/chemical/8450.html.

2. Citizen Participation Activities *Why NYSDEC?*

Involves the Public and Why It Is Important

NYSDEC involves the public to improve the process of investigating and cleaning up contaminated sites, and to enable citizens to participate more fully in decisions that affect their health, environment, and social wellbeing. NYSDEC provides opportunities for citizen involvement and encourages early two-way communication with citizens before decision makers form or adopt final positions.

Involving citizens affected and interest in site investigation and cleanup programs is important for many reasons. These include:

- Promoting the development of timely, effective site investigation and cleanup programs that protect public health and the environment

- Improving public access to, and understanding of, issues and information related to a particular site and that site's investigation and cleanup process
- Providing citizens with early and continuing opportunities to participate in NYSDEC's site investigation and cleanup process
- Ensuring that NYSDEC makes site investigation and cleanup decisions that benefit from input that reflects the interests and perspectives found within the affected community
- Encouraging dialogue to promote the exchange of information among the affected/interested public, State agencies, and other interested parties that strengthens trust among the parties, increases understanding of site and community issues and concerns, and improves decision making.

This Citizen Participation (CP) Plan provides information about how NYSDEC will inform and involve the public during the investigation and cleanup of the site identified above. The public information and involvement program will be carried out with assistance, as appropriate, from the Applicant.

Project Contacts

Appendix A identifies NYSDEC project contact(s) to which the public should address questions or request information about the sites investigation and cleanup program. The publics suggestions about this CP Plan and the CP program for the site are always welcome. Interested people are encouraged to share their ideas and suggestions with the project contacts at any time.

Locations of Reports and Information

The locations of the reports and information related to the sites investigation and cleanup program also are identified in Appendix A. These locations provide convenient access to important project documents for public review and comment. Some documents may be placed on the NYSDEC web site. If this occurs, NYSDEC will inform the public in fact sheets distributed about the site and by other means, as appropriate.

Site Contact List

Appendix B contains the site contact list. This list has been developed to keep the community informed about, and involved in, the site's investigation and cleanup process. The site contact list will be used periodically to distribute fact sheets that provide updates about the status of the project. These will include notifications of upcoming activities at the site (such as fieldwork), as well as availability of project documents and announcements about public comment periods.
The site contact list includes, at a minimum:

- chief executive officer and planning board chairperson of each county, city, town and village in

which the site is located;

- residents, owners, and occupants of the site and properties adjacent to the site;
- the public water supplier which services the area in which the site is located;
- any person who has requested to be placed on the site contact list;
- the administrator of any school or day care facility located on or near the site for purposes of posting and/or dissemination of information at the facility;
- Location (s) of reports and information.

The site contact list will be reviewed periodically and updated as appropriate. Individuals and organizations will be added to the site contact list upon request. Such requests should be submitted to the NYSDEC project contact(s) identified in Appendix A. Other additions to the site contact list may be made at the discretion of the NYSDEC project manager, in consultation with other NYSDEC staff as appropriate.

CF Activities

The table at the end of this section identifies the CP activities, at a minimum, that have been and will be conducted during the sites investigation and cleanup program. The flowchart in Appendix D shows how these CP activities integrate with the site investigation and cleanup process. The public is informed about these CP activities through fact sheets and notices distributed at significant points during the program. Elements of the investigation and cleanup process that match up with the CP activities are explained briefly in Section 5.

- **Notices and fact sheets** help the interested and affected public to understand contamination issues related to a site, and the nature and progress of efforts to investigate and clean up a site.

- **Public forums, comment periods and contact with project managers** provide opportunities for the public to contribute information, opinions and perspectives that have potential to influence decisions about a sites investigation and cleanup. The site developer has established a website (www.eastmancommons.org/resources/links.php) that describes the planned development activities at the site.

The public is encouraged to contact project staff at any time during the sites investigation and cleanup process with questions, comments, or requests for information.

This CP Plan maybe revised due to changes in major issues of public concern identified in Section 3 or in the nature and scope of investigation and cleanup activities.

Technical Assistance Grant

NYSDEC must determine if the site poses a significant threat to public health or the environment. This determination generally is made using information developed during the investigation of the site, as described in Section 5.

If the site is determined to be a significant threat, a qualifying community group may apply for a Technical Assistance Grant (TAG). The purpose of a TAG is to provide funds to the qualifying group to obtain independent technical assistance. This assistance helps the TAG recipient to interpret and understand existing environmental information about the nature and extent of contamination related to the site and the development/implementation of a remedy.

An eligible community group must certify that its membership represents the interests of the community affected by the site, and that its members' health, economic well-being or enjoyment of the environment may be affected by a release or threatened release of contamination at the site.

For more information about TAGs, go online at http://www.dec.ny.gov/regulations/2590.html

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

Note: The table identifying the citizen participation activities related to the site's investigation and cleanup program follows on the next page:

Citizen Participation Requirements (Activities)	Timing of CP Activity(ies)
Application	**Process:**
• Prepare site contact list • Establish document repositories • Publish notice in Environmental Notice Bulletin (ENB) announcing receipt of application and 30-day public comment period • Publish above ENB content in local newspaper • Mail above ENB content to site contact list • Conduct 30-day public comment period	At time of preparation of application to participate in the BCP. When NYSDEC determines that BCP application is complete. The 30-day public comment period begins on date of publication of notice in ENB. End date of public comment period is as stated in ENB notice. Therefore, ENB notice, newspaper notice, and notice to the site contact list should be provided to the public at the same time.
After Execution of Brownfield Site Cleanup Agreement:	
• Prepare Citizen Participation (CP) Plan	Before start of Remedial Investigation
Before NYSDEC Approves Remedial	**Investigation (RI) Work Plan:**
• Distribute fact sheet to site contact list about proposed RI activities and announcing 30-day public comment period about draft RI Work Plan • Conduct 30-day public comment period	Before NYSDEC approves RI Work Plan. If RI Work Plan is submitted with application, public comment periods will be combined and public notice will include fact sheet. Thirty-day public comment period begins/ends as per dates identified in fact sheet.
After Applicant Completes	**Remedial Investigation:**
• Distribute fact sheet to site contact list that describes RI results	Before NYSDEC approves RI Report
Before NYSDEC Approves	**Remedial Work Plan (RWP):**
• Distribute fact sheet to site contact list about proposed RWP and announcing 45-day public comment period • Public meeting by NYSDEC about proposed RWP (if requested by affected community or at discretion of NYSDEC project manager) • Conduct 45-day public comment period	Before NYSDEC approves RWP. Forty-five day public comment period begins/ends as per dates identified in fact sheet. Public meeting would be held within the 45-day public comment period.
Before Applicant Starts	**Cleanup Action:**
• Distribute fact sheet to site contact list that	Before the start of cleanup action.
After Applicant Completes	**Cleanup Action:**
• Distribute fact sheet to site contact list that announces that cleanup action has been completed and that summarizes the Final Engineering Report • Distribute fact sheet to site contact list announcing issuance of Certificate of Completion (COC)	At the time NYSDEC approves Final Engineering Report. These two fact sheets are combined if possible if there is not a delay in issuing the COC.

3. Major Issues of Public Concern

This section of the CP Plan identifies major issues of public concern as they relate to the site Additional major issues of public concern may be identified during the site's remedial process.

At this juncture the public has not identified major concerns with the project. In the event major concerns are expressed, future communication addressing those concerns will be issued to stakeholders.

4. Site Information

Site Description

The 68 Tonawanda Street property is approximately 1.74-acres and located in the Black Rock area of the City of Buffalo. The property is located within the City of Buffalo Tonawanda Street Corridor Brownfield Opportunity Area (BOA). The Tonawanda Street Corridor BOA is comprised of 514 acres of primarily under-utilized industrial brownfields in northwest Buffalo stretching from Scajaquada Creek (Creek) to just south of the Tonawanda municipal boundary, and along Chandler Street. Located just north and across Tonawanda Street from the corner of West and Tonawanda Streets, the elongated subject 68 Tonawanda Street property is situated between the active rail lines and Tonawanda Street stretching north from Dearborn Street towards Amherst Street. The 120 Tonawanda Street parcel contains the former *New York Central Freight House and Office*. This long narrow 1½-story brick freight house structure was constructed in the early 1900s. The structure does not contain a basement. The building has been recommended as National Register Eligible for its association with the transportation and industrial history of the City of Buffalo at the local, national and international levels. The adjacent subject rail property to the north is vacant and formerly contained rail lines.

Contemplated Use of the Site

The BCP application and agreement identifies the future use as repurposing an existing warehouse/manufacturing facility into apartments and light commercial space as well as parking spaces.

History of Site Use

Historical information and maps suggest that by 1889 the Black Rock Passenger Station was located in the southern part of the parcel with some sheds and other disconnected buildings including freight platforms and separate smaller freight houses extending north where the freight house is currently. By 1916 the Freight house building was located on the parcel and rail tracts extended across the adjacent northern rail parcel. A review of 1916 historic maps suggests that the structure included a freight office. The former freight house building is

currently being used by EB Atlas Steel Corp. and Steel Crazy Iron Art which specialize in steel construction, architectural and ornamental metal work. The structure contains eight separate bays. Floors are cement and lighting is a combination mercury and florescent. Various materials associated with steel construction and architectural art are found throughout the building including steel/metal, various steel working machines, welding equipment etc. Small quantities of paints and lacquers are also contained in the structure in 55-gallon drums or smaller containers. The building uses cooking grease and fry oil as a fuel for heating. This material is contained in 55-gallon drums and other size containers and fed into a heating system. North of the building contains a lay-down area where steel and other materials are stored. This lay-down area extends north onto the adjoining rail parcel. The rail parcel is vacant land beyond the lay-down section. A few 55-gallon drums were observed during the Phase I in the lay-down area and behind the building. The 55-gallon drums at this facility are reportedly associated with three different purposes including storage of the vegetable oil used for heating system or they contain primer paint or sand used in the metal work. A covered section attached to the western side of the building is located along the northern end. This area has steel I-beams and other materials and appears to be used for both storage and manufacturing activities.

The subject parcel has been associated with rail operations since the mid-late 1800's. By the late 1800's the property contained freight platforms and separate freight depots. As a freight depot, much of the raw and manufactured products that supported the surrounding industry and residential community were probably temporarily stored at this location. Materials where on/off loaded from freight trains on the western rail side of the property and off/on loaded to vehicles on the eastern Tonawanda Street side of the property.

Rail tracts are located immediately adjacent to the west and a vacant undeveloped "triangle shaped" area is further west. Immediately south of the property is a vacant residential/restaurant structure and a vehicle repair shop towards the intersection of Niagara and Tonawanda Streets. Historically the property immediately south had a series of small store and residential structures. Tenements were indicated on the southern adjacent property during the early 1900's and by the 1950's these properties were restaurant and filling station/auto repair facilities. The area immediately north was mostly rail with an office and later a restaurant north of Parish Street at Tonawanda Street. Now mostly vacant, major manufacturing complexes including production of paint and lacquers, automotive parts, metal machining, brick and sewer pipe, and steel foundry operations were located east of the property across Tonawanda Street.

Environmental History

Historical information indicates the following previous investigations/remedial activities have been completed on the property:

February 2013 – Phase I Environmental Site Assessment - In February 2013, PEI conducted a Phase I Environmental Site Assessment (ESA) on the subject Site. The Phase I noted several Recognized Environmental Conditions (RECs) including:

- The property has been associated with rail use and freight storage since the mid-late 1800's. In general, railroad operations have historically produced low level

contamination of surrounding areas and therefore the possibility of soil contamination associated with the former railroad operations cannot be discounted. Railroad environmental issues sometimes involve diesel fuel and other petroleum products and rail areas have also been associated with other contaminants such as heavy metals, chlorinated hydrocarbons, and PAHs above NYSDEC guidelines. In general, soils at former rail road property typically consists of fill near the surface which is typically a black cindery fill layer consistent with materials typically found at rail yards including cinder, gravel, coal and sometimes slag. The fill typically contains elevated concentrations of a few PAHs and metals which may slightly exceed the New York State Department of Environmental Conservation (NYSDEC) soil cleanup guidance values. PAH and metal compounds are common constituents of fill material found in urban environments and are typically associated with rail yards and particularly with the cindery fill used at rail yards.

- The Fedders-Quigan Corporation occupied the southern portion of the freight house by at least 1950. The main Fedders complex was located across Tonawanda Street. Indications were that the subject property was used for freight warehousing products/raw materials. It is unknown if Fedders conducted any manufacturing in the subject property.
- The property has been associated with steel fabrication in the recent past. Depending on the extent of the fabrication, various materials such as metal shavings and metallic dust are likely present. Use of metal cleaning/polishing compounds, and abrasives as well as any fuel may have contributed to environmental impacts.
- Soil mounds and a small number of drums were observed in the rear of the property. These reportedly are empty drums that previously contained either paint primer, sand or used cooking grease/vegetable oil.
- Foundry and machine shop operations were located adjacent to the subject property. Environmental impacts associated with these facilities include elevated levels of lead and other metals in soils and wastes associated with slag/foundry sands such as phenols. Other contaminants, including solvents and petroleum products were associated with these properties. The large Pratt & Lambert paint; resin and lacquer facility which included above ground and underground storage of chemicals and petroleum in numerous tanks, drums and vessels was located adjacent to the property. It is possible that releases from these facilities have impacted area surface and near-surface soils above "normal" urban background with regard to metals and polycyclic aromatic hydrocarbons (PAH) as well as other organic compounds.
- A former Manufacturing Gas Plant (MGP) was located east and nearby the property during the early 1900's until the 1950's. Another MGP plant was located southeast across the creek in the early 1900's. The distance from the subject properties and these facility was most likely too far to have a significant environmental effect on the subject parcels
- The adjacent Fedders complex properties have a history of chemical and petroleum use and storage. Industrial wastes were reported to include solder dross, degreasing still bottoms including trichloroethylene (TCE) and tetrachloroethene compounds, petroleum-based lubricating fluids and other products and wastes. However, it is likely based on topography and groundwater flow that this facility is mostly either cross/down-

gradient of the subject properties.

- A gasoline service station and auto repair facility was located adjacent/nearby to the south. However, it is likely based on topography and groundwater flow that this property is cross/down-gradient of the property.
- Due to the property use history and adjacent property uses, PEI believes potential vapor concerns exist.

March 2014 and January 2016- Phase II Environmental Site Assessments - In March 2014, PEI/BE3 conducted a limited Phase II ESA and in January 2016 conducted a second Phase II ESA that built upon the findings of the first assessment. A February Phase II ESA Report combined the findings of both assessments. The specific scope of work of both ESAs was directed at the examination of surface/subsurface conditions at the property and the collection of soil samples.

A summary or the ESAs is as follows:

- PEI/BE3 completed a field soil screening using a total organic vapor monitor (PID) and soil sampling using Geoprobe® direct push technology to investigate subsurface conditions at the property. A total of seventeen (17) Geoprobe borings were advanced in an array around the western, northern and southern perimeter of the 68 Tonawanda Street structure (refer to Figure 2). Three borings were placed along the eastern side of the building during the 2014 field investigation (Boreholes BH-6, BH-7 and BH-8). These are not associated with this property and therefore not covered in this Phase II ESA report but are mentioned to explain why they are missing from the figures, table and discussion. The eastern perimeter of the property is the structures eastern wall. Borings were advanced to an average depth of 8 feet below ground surface.

- Elevated PID readings and minor odors were observed at two locations during the 2014 event; borehole BH-4 at a depth of 4-8 feet bgs and in borehole BH-9 at a depth of between 3-4 feet. Borehole 4 was located in the southwest corner of the property and borehole BH-9 was located in the northwest portion of the property adjacent to six 55-gallon drums which are no longer present at the property at that location. Stronger petroleum odor was observed at borehole BH-9A during the 2017 sampling event at between 6-8 feet. Borehole BH-9A is located just south of BH-4 and probably represents the same petroleum impacts observed at that borehole.

- A total of ten soil samples were collected for laboratory analysis; three (3) soil samples were collected during the 2014 event and seven (7) were collected from the 2017 field event.

- The results of the Phase II ESAs indicate that SVOCs (primarily PAHs) and metal compounds were detected throughout the site at variable levels above residential and restricted residential SCOs in the soil fill that pose a potential risk to construction workers and future residents (see Table 1). Additionally, results indicate that volatile compounds and PCB/Pesticides were detected in concentrations below SCOs in various

locations across the property indicating potential impact from previous property operations. The potential of a petroleum impacted area in the southwest corner of the property was also identified.

5 Remedial Cleanup Process

Application

The Applicant is applying for acceptance into New York's Brownfield Cleanup Program as a Volunteer. This means that the Applicant is not responsible for the disposal or discharge of the contaminants or whose ownership or operation of the site took place after the discharge or disposal of contaminants. The Volunteer must fully characterize the nature and extent of contamination onsite, and must conduct a qualitative exposure assessment, a process that characterizes the actual or potential exposures of people, fish and wildlife to contaminants on the site and to contamination that has migrated from the site.

The Applicant in its Application proposes that the site will be used for restricted purposes.

To achieve this goal, the Applicant will conduct investigation and/or cleanup activities at the site with oversight provided by NYSDEC. The Brownfield Cleanup Agreement to be executed by NYSDEC and the Applicant sets forth the responsibilities of each party in conducting these activities at the site.

Investigation

The Applicant will complete a RI as part of the BCP. NYSDEC will use the information in the investigation report to determine if the site poses a significant threat to public health or the environment. If the site is a significant threat, it must be cleaned up using a remedy selected by NYSDEC from an analysis of alternatives prepared by the Applicant and approved by NYSDEC. If the site does not pose a significant threat, the Applicant may select the remedy from the approved analysis of alternatives.

Remedy Selection

The Applicant will recommend in its application that action needs to be taken to address site contamination. Pending approval of the investigation report by the NYSDEC, the Applicant has proposed a remediation of impacted soil to meet at least restricted residential use.

The RI results will help develop a remedial approach which may include an IRM. When the Applicant submits the proposed Remedial (IRM) Work Plan for approval, NYSDEC will announce the availability of the proposed plan for public review during a 45-day public comment period.

Cleanup Action

NYSDEC will consider public comments, and revise the draft Remedial (IRM) Work Plan if necessary, before approving the proposed remedy. The New York State Department of

Health (NYSDOH) must concur with the proposed remedy. After approval, the proposed remedy becomes the selected remedy.

The Applicant may then design and perform the cleanup action to address the site contamination. NYSDEC and NYSDOH will oversee the activities. When the Applicant completes cleanup activities, it will prepare a final engineering report that certifies that cleanup requirements have been achieved or will be achieved within a specific time frame. NYSDEC will review the report to be certain that the cleanup is protective of public health and the environment for the intended use of the site.

Certificate of Completion

When NYSDEC is satisfied that cleanup requirements have been achieved or will be achieved for the site, it will approve the final engineering report. NYSDEC then will issue a Certificate of Completion (COC) to the Applicant. The COC states that cleanup goals have been achieved, and relieves the Applicant from future liability for site-related contamination, subject to certain conditions. The Applicant would be eligible to redevelop the site after it receives a COC.

Site Management

Site management is the last phase of the site cleanup program. This phase begins when the COC is issued. Site management may be conducted by the Applicant under NYSDEC oversight, if contamination will remain in place. Site management incorporates any institutional and engineering controls required to ensure that the remedy implemented for the site remains protective of public health and the environment. All significant activities are detailed in a Site Management Plan.

An institutional control is a non-physical restriction on use of the site, such as a deed restriction that would prevent or restrict certain uses of the property. An institutional control may be used when the cleanup action leaves some contamination that makes the site suitable for some, but not all uses.

An engineering control is a physical barrier or method to manage contamination. Examples include: caps, covers, barriers, fences, and treatment of water supplies.

Site management also may include the operation and maintenance of a component of the remedy, such as a system that is pumping and treating groundwater. Site management continues until NYSDEC determines that it is no longer needed.

Appendix A
Project Contacts and Locations of Reports and Information

Project Contacts

For information about the site's investigation and cleanup program, the public may contact any of the following project staff:

New York State Department of Environmental Conservation (NYSDEC):

Mr. Glenn May
Project Manager
270 Michigan Avenue
Buffalo, New York 14203-2999
716-851-7220
Glenn.may@dec.ny.gov
Region 9 Email: region9@dec.ny.gov

Kristen Davidson
Citizen Participation Specialist
Division of Public Affairs
New York State Department of
Environmental Conservation
Region 9 (716)-851-7220
Kristen.davidson@dec.ny.gov

New York State Department of Health (NYSDOH):

Arunesh Ghosh
New York State Department of Health
Empire State Plaza, Corning Tower, Room 1787
Albany, NY 12237
Phone: (518) 486-1443
Email: [Arunesh.Ghosh@health.ny.gov]

Public Repository for Reports and Information:

Ms. Patti Foley
Library Manager
Riverside Branch Library
820 Tonawanda St
Buffalo, NY 14207

Appendix B Site Contact List

1. The chief executive officer and planning board/dept. chair of each county, city, town and village in which the property is located.

Erie County
County Executive Mark C. Poloncarz
Edward A. Rath County Office Building
95 Franklin Street, 16th Floor
Buffalo, New York 14202
Phone: (716) 858-8500
Fax: (716) 858-6679

City of Buffalo
Mayor – Byron W. Brown
201 City Hall,
Buffalo, NY 14202
Mayor's Office Telephone: 716-851-4841

Planning Board Chairman
James K. Morrell
901 City of Hall
Buffalo NY 14202
716-851-5082

2. Residents, owners, and occupants of the property and properties adjacent to the property. **Refer To Figure 8.**
City of Buffalo (1490 and 1485 West Street – 88.50-1-7)
323 City Hall
Buffalo, New York 14202

Black Rock Trade Center, Inc. and 120 Tonawanda Street Incorporated – (57 & 71Tonawanda – 88.50-1-8.21 and 88.50-1-8.11)

Mr. Edward Hogle
Black Rock Trade Center
495 Niagara Street
Tonawanda, New York 14150
&
Mr. Brian Hogel
Black Rock Trade Center
33 East Girard Street
Kenmore, NY 14150

Niagara Mohawk Power Corporation (**Niagara Mohawk Property - 1626 Niagara – 88.58-4-10)**
Real Estate Tax Dept
300 Erie Blvd West
Syracuse, NY 13202

TLC Properties (2 Tonawanda St. – 88.58-4-7)
TLC Properties, Inc.
289 Exchange St.
Buffalo, NY 14204
Note property is for sale/vacant

Golf and Recreation Facilities, Inc. (69 Dearborn Street – 88.49-2-1.2 and 189 Tonawanda Street-88.42-1-2.13.)
P.O. Box 869
Warren MI 48090
Note, these properties are vacant land

31 Tonawanda Street LLC (31 Tonawanda Street – 88.58-1-1)
148 Middlesex Road
Buffalo, New York 14216
Note, this property is vacant/under re-development

105 Tonawanda Street (105 Tonawanda Street – 88.50-1-11 and
0 Tonawanda Street (88.50-2-1.12 and 88.42-2-4.2)
Black Rock Rail, LLC
148 Middlesex Road
Buffalo, New York 14216
Note these properties are vacant lands.

Pratt & Lambert, Inc. (73 Tonawanda Street – 88.50-1-10 and 1409 West Street – 88.58-2-2)

C/O Tax Department
P.O. Box 6027
Cleveland, OH 44115
Note, this property is vacant land

William David Lyons (117Tonawanda Street – 88.50-1-1.1)
Buffalo Business Interiors
111-117 Tonawanda Street
Buffalo, New York 14207

Clinton Holcomb (1675 Niagara Street - 88.58-4-1.1)
Free Will Rental
1675 Niagara Street
Buffalo, New York 14207
And
Ministry Body of Christ
Pastor Timothy Gakodi
1675 Niagara Street
Buffalo, New York 14207

CSX Trans. Inc (100 & 174 Tonawanda – 88.50-2-1.11 & 88.42-2-4.1)
Unit C-910
500 Water Street
Jacksonville, FL 19103
Note, this property is rail

Ed Hogel (32 Tonawanda Street – 88.58-4-4)
120 Tonawanda Street
Buffalo, New York 14207

Lewmar Properties, LLC (1701 Niagara and 69 Wayne – 88.49-2-5.1 and 88.49-2-14)
1721 Niagara Street
Buffalo, New York 14207
Note, 1701 Niagara St. is occupied by Dival Safety below and 69 Wayne Street is vacant land

Dival Safety (1701 Niagara Street – 88.49-2-5.1)
1701 Niagara Street
Buffalo New York 14207

Fred C Rumsey (1679 Niagara – 88.49-2.6)

Hudson Rumsey Company, Inc.
1679 Niagara Street
Buffalo, New York 14207

Romelo M Inc (18 &22 Tonawanda Street - 88.58-4-6 and 88.58-4-5)
15 Skillen Street Buffalo New York 14207
700 Military Road Buffalo, New York 14207

Buffalo State Ventures, LLC (80 Forest Street – 88.58-2-8)
6225 Carmel Road
Charlotte, NC 28277

3. Local news media from which the community typically obtains information.
1) News Papers

The Buffalo News
One News Plaza
PO Box 100
Buffalo, NY 14240
Phone: Niagara County Bureau - 849-4601

2) TV
The following is a directory of television stations in the Buffalo, NY area.

WGRZ-TV 2NBC 259 Delaware Ave, Buffalo, NY 14202. 716-849-2222.
WIVB-TV 4, WNLO-TV. 2077 Elmwood Avenue, Buffalo, NY 14207. 716-874-4410
WKBW-TV 7 Broadcast Plaza, Buffalo, NY 14202. 716-845-6100. Fax: 716-842-1855.
WNED-TV 17 PBS. 140 Lower Terrace Street, Buffalo, NY 14202. 716-845-7000
YNN Buffalo , 355 Chicago St., Buffalo, NY 14204 716) 558-8999 Option 2

4. The public water supplier which services the area in which the property is located.
Public Water Supplier:

Buffalo Water Department
120 Delaware Ave,
Buffalo, New York 14202
Erie County Water Department
295 Main St Rm 350

Buffalo, New York, 14202

5. Any person who has requested to be placed on the contact list.
None

6. The administrator of any school or day care facility located on or near the property.
There are no day care facilities on the property

Nearby Day care

Grow With US Day Care
1800 Niagara St,
Buffalo, NY 14207
(716) 332-2838
Administrators Name – Debra Sutton

7. The location of a document repository for the project (e.g., local library).

Ms. Patti Foley
Library Manager
Riverside Branch Library
820 Tonawanda St
Buffalo, NY 14207

APPENDIX C

Figure 1 – Site Location Plan

Figure 3 – Remediation/Investigation Area Plan

APPENDIX C

Figure 1 – Site Location Plan

Figure 3 – Remediation/Investigation Area Plan

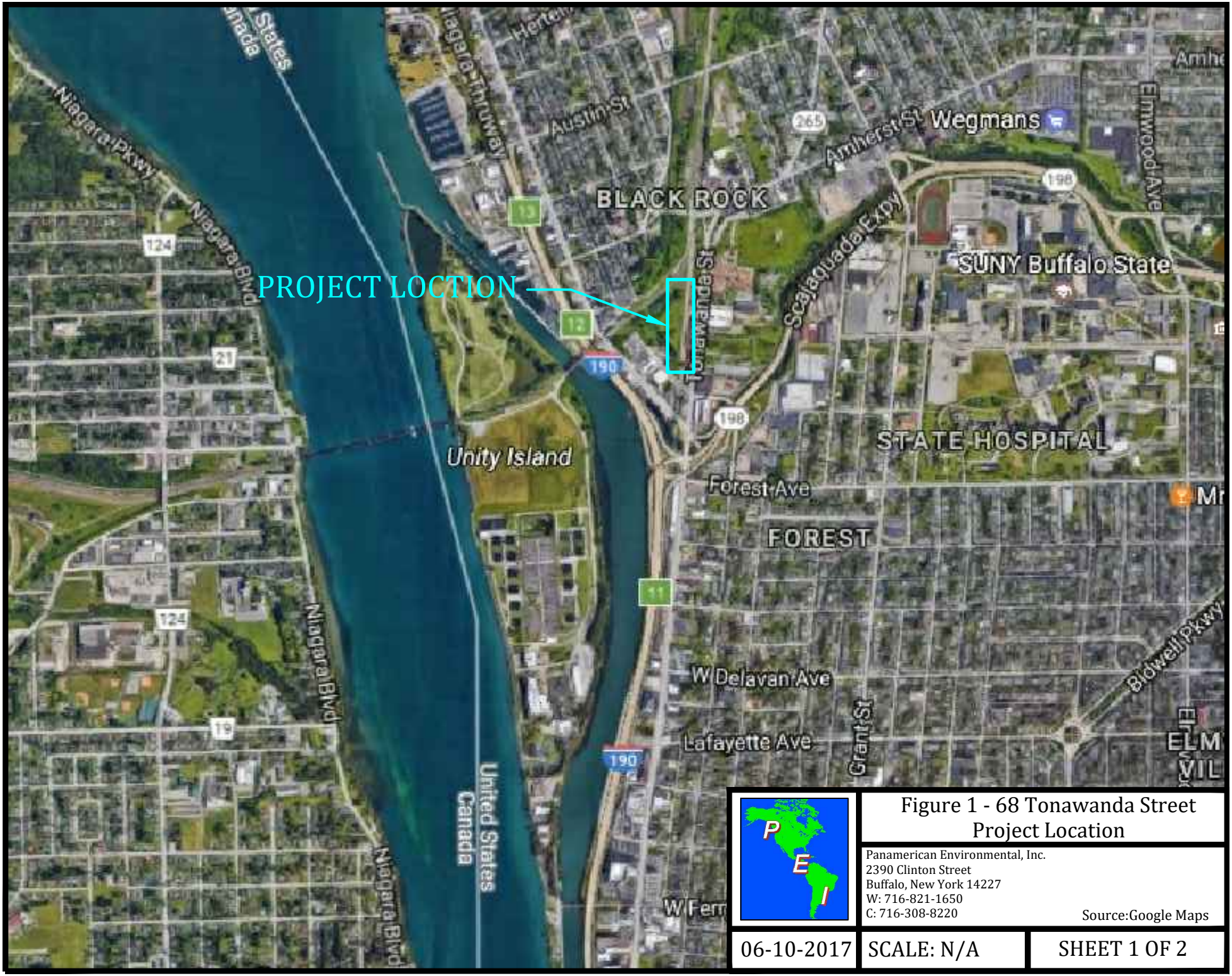
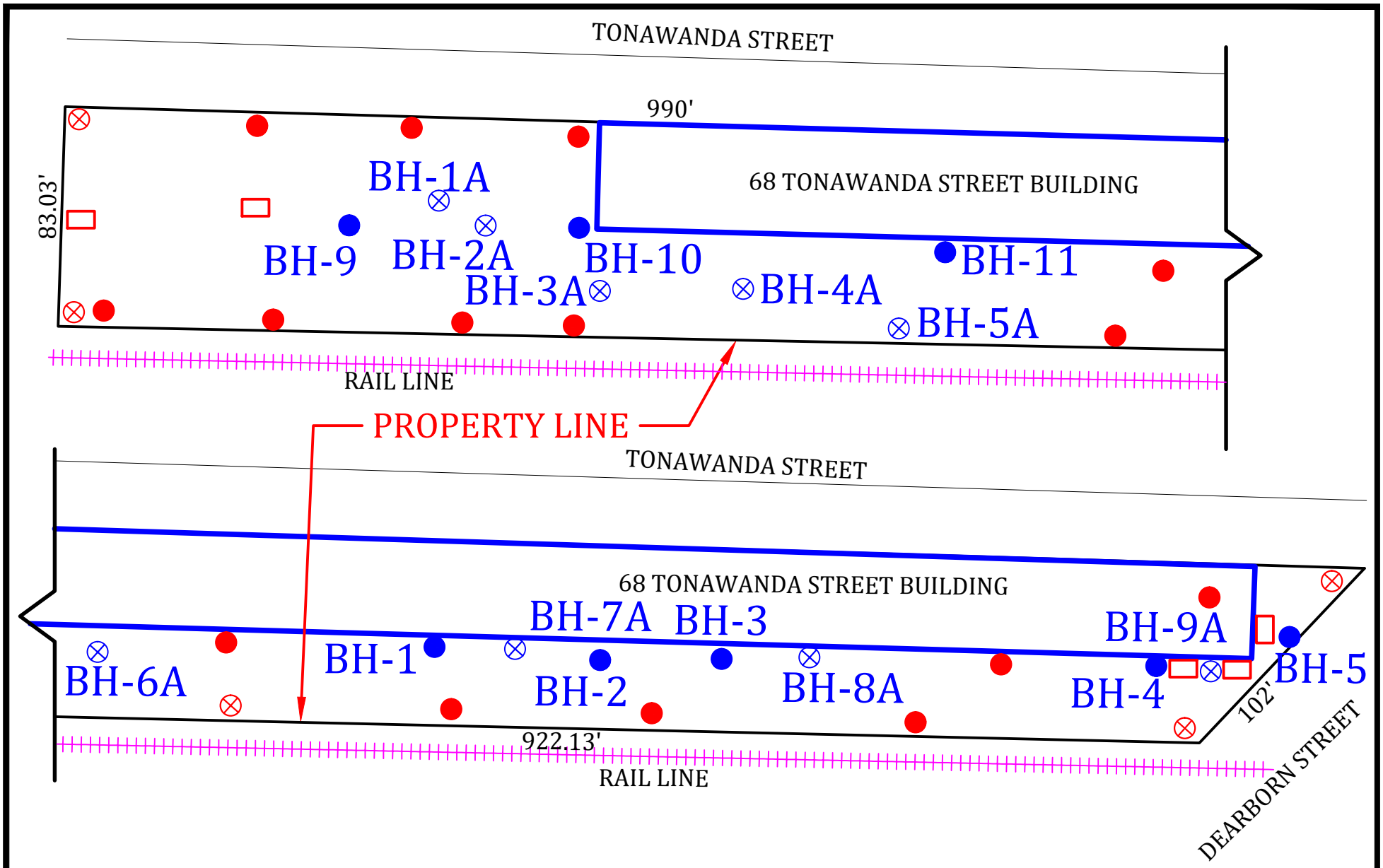


Figure 1 - 68 Tonawanda Street
Project Location

Panamerican Environmental, Inc.
2390 Clinton Street
Buffalo, New York 14227
W: 716-821-1650
C: 716-308-8220

Source:Google Maps

06-10-2017	SCALE: N/A	SHEET 1 OF 2



LEGEND

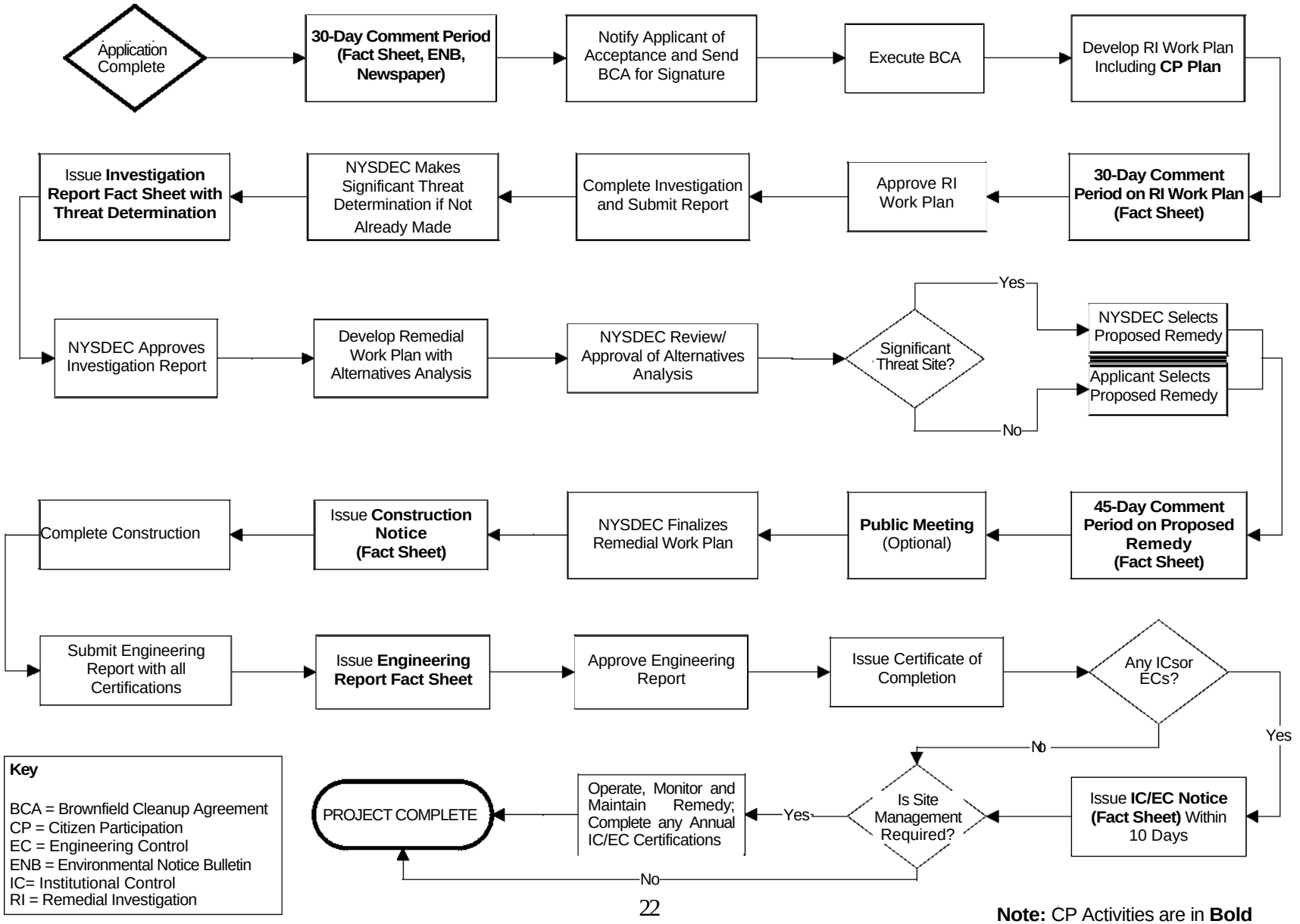
- RI BORINGS
- TEST PITS
- RI MONITORING WELLS
- BH1 - 2014 PH2 ESA BORINGS
- BH1A - 2017 - PH2 ESA BORINGS

Figure 3 - 68 Tonawanda Street
RI LAYOUT PLAN

Panamerican Environmental, Inc.
1270 Niagara Street
Buffalo, New York 14213
W: 716-249-6880
C: 716-308-8220

11-07-2017 | SCALE: N/A | SHEET 3 OF 3

Appendix D– Brownfield Cleanup Program Process



Note: CP Activities are in **Bold**

APPENDIX C

QUALITY ASSURANCE/ QUALITY CONTROL PLAN

TABLE OF CONTENTS

QUALITY ASSURANCE/QUALITY CONTROL PLAN

1.0 INTRODUCTION

This Quality Assurance/Quality Control Plan is designed to provide an overview of QA/QC procedures. It will give specific methods and QA/QC procedures for chemical testing of environmental samples obtained from the site. In addition, it will ensure the quality of the data produced.

The organizational structure for this project is presented in the Work Plan. It identifies the names of key project personnel. The project manager will be responsible for verifying that QA procedures are followed in the field. This will provide for the valid collection of representative samples. The Project Manger will be in direct contact with the analytical laboratory to monitor laboratory activities so that holding times and other QA/QC requirements are met. The numbers of soil/water samples that may be collected and analytical parameters/methods are provided in Table-1 below.

The Project Field Inspector will be responsible for coordinating the activities of all personnel involved with implementing the project in the field, and will be in daily communication with the Project Manager. This person will verify that all field investigation sampling work is carried out in accordance with the approved project Field Sampling Plan (Appendix D). In addition to overall project coordination, the Project Manager will be responsible for overseeing both the analytical and field QA/QC activities. The ultimate responsibility for maintaining quality throughout the project rests with the Project Manager.

TABLE-1
ANALYTICAL SUMMARY TABLE – SOIL/WATER/AIR

REMEDIAL INVESTIGATION PROGRAM SAMPLING:

PARAMETER	EPA METHOD	WATER(1)	Soil (2)	Air
TCL VOCs	8260	6	0	
TCL SVOCs	8270	6	11	
TICs VOC/SVOC		6	11	
TAL Metals	6010/7470	6	24	
PCBs	8082	6	11	
TO-15 Air				9

See Table 2 for Analyte List

Technical Holding Times: 8270C - 7 days till extraction, 40 days till analysis
8260C -14 days till analysis.

(1) – One MS/MSD and one trip blank (2) One MS/MSD

The analytical laboratory proposed for use for the analysis of samples will be a certified NYSDOH ELAP laboratory for the appropriate categories. The QA Manager of the laboratory will be responsible for performing project-specific audits and for overseeing the quality control data generated.

2.0 DATA QUALITY OBJECTIVES

2.1 Background

Data quality objectives (DQOs) are qualitative and quantitative statements, which specify the quality of data required supporting the investigation for the site. DQOs focus on the identification of the end use of the data to be collected. The project DQOs will be achieved utilizing the definitive data category, as outlined in *Guidance for the Data Quality Objectives Process,* EPA QA/G-4 (September 1994). All sample analyses will provide definitive data, which are generated using rigorous analytical methods, such as reference methods approved by the United States Environmental Protection Agency (USEPA). The purpose of this investigation is to determine the nature and extent of contamination at the site.

Within the context of the purpose stated above, the project DQOs for data collected during this investigation are:

- To assess the nature/extent of contamination in surface and subsurface soil, and groundwater.
- To maintain the highest possible scientific/professional standards for each procedure.
- To develop enough information to assess if the levels of contaminates identified in the media sampled exceed regulatory guidelines.

2.2 QA Objectives for Chemical Data Measurement

Sample analytical methodology for the media sampled and data deliverables will meet the requirements in NYSDEC Analytical Services Protocol, July 2005 edition. Laboratories will be instructed that completed **Sample Preparation and Analysis Summary forms** are to be submitted with the analytical data packages. The laboratory also will be instructed that matrix interferences must be cleaned up, to the extent practicable. Data usability summary reports (DUSRs) will be generated. In order to achieve the definitive data category described above, the data quality indicators of precision, accuracy, representativeness, comparability, and completeness will be measured during offsite chemical analysis.

2.2.1 Precision

Precision examines the distribution of the reported values about their mean. The distribution of reported values refers to how different the individual reported values are from the average reported value. Precision may be affected by the natural variation of the matrix or contamination within that matrix, as well as by errors made in field and/or laboratory handling procedures. Precision is evaluated using analyses of a laboratory matrix spike/matrix spike duplicate (for organics) and matrix duplicates (for inorganics), which not only exhibit sampling and analytical

precision, but indicate analytical precision through the reproducibility of the analytical results. Relative Percent Difference (RPD) is used to evaluate precision. RPD criteria must meet the method requirements identified in the attached table.

2.2.2 Accuracy

Accuracy measures the analytical bias in a measurement system. Sources of error are the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analysis techniques. These data help to assess the potential concentration contribution from various outside sources. The laboratory objective for accuracy is to equal or exceeds the accuracy demonstrated for the applied analytical methods on samples of the same matrix. The percent recovery criterion is used to estimate accuracy based on recovery in the matrix spike/matrix spike duplicate and matrix spike blank samples. The spike and spike duplicate, which will give an indication of matrix effects that may be affecting target compounds is also a good gauge of method efficiency.

2.2.3 Representativeness

Representativeness expresses the degree to which the sample data accurately and precisely represent the characteristics of a population of samples, parameter variations at a sampling point, or environmental conditions. Representativeness is a qualitative parameter, which is most concerned with the proper design of the sampling program or sub-sampling of a given sample. Objectives for representativeness are defined for sampling and analysis tasks and are a function of the investigative objectives. The sampling procedures, as described in the Field Sampling Plan (Appendix D), have been selected with the goal of obtaining representative samples for the media of concern.

2.2.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. A DQO for this program is to produce data with the greatest possible degree of comparability. This goal is achieved through using standard techniques to collect and analyze representative samples and reporting analytical results in appropriate units. Complete field documentation will support the assessment of comparability. Comparability is limited by the other parameters (e.g., precision, accuracy, representative-ness, completeness, comparability), because only when precision and accuracy are known can data sets be compared with confidence. In order for data sets may be comparable, it is imperative that contract-required methods and procedures be explicitly followed.

2.2.5 Completeness

Completeness is defined as a measure of the amount of valid data obtainable from a measurement system compared to the amount that was expected to be obtained under normal conditions. It is important that appropriate QA procedures be maintained to verify that valid data are obtained in order to meet project needs. For the data generated, a goal of 90% is required for completeness (or usability) of the analytical data. If this goal is not met, then NYSDEC and PEI project personnel will determine whether the deviations might cause the data to be rejected.

3.0 SAMPLING LOCATIONS, CUSTODY, HOLDING TIMES, & ANALYSIS

Sampling locations and procedures are discussed in Work Plan. Procedures addressing field and laboratory sample chain-of-custody and holding times are presented in the Appendix D - Field Sampling Plan. All holding times begin with validated time of sample receipt (VTSR) at the laboratory. The laboratory must meet the method required detection limits which are referenced within the methods.

4.0 CALIBRATION PROCEDURES AND FREQUENCY

In order to obtain a high level of precision and accuracy during sample processing procedures, laboratory instruments must be calibrated properly. Several analytical support areas must be considered so the integrity of standards and reagents is upheld prior to instrument calibration. The following sections describe the analytical support areas and laboratory instrument calibration procedures.

4.1 Analytical Support Areas

Prior to generating quality data, several analytical support areas must be considered; these are detailed in the following paragraphs.

Standard/Reagent Preparation - Primary reference standards and secondary standard solutions shall be obtained from National Institute of Standards and Technology (NIST), or other reliable commercial sources to verify the highest purity possible. The preparation and maintenance of standards and reagents will be accomplished according to the methods referenced. All standards and standard solutions are to be formally documented (i.e., in a logbook) and should identify the supplier, lot number, purity/concentration, receipt/preparation date, preparers name, method of preparation, expiration date, and any other pertinent information. All standard solutions shall be validated prior to use. Care shall be exercised in the proper storage and handling of standard solutions (e.g., separating volatile standards from nonvolatile standards). The laboratory shall continually monitor the quality of the standards and reagents through well documented procedures.

Balances - The analytical balances shall be calibrated and maintained in accordance with manufacturer specifications. Calibration is conducted with two Class AS" weights that bracket the expected balance use range. The laboratory shall check the accuracy of the balances daily and they must be properly documented in permanently bound logbooks.

Refrigerators/Freezers - The temperature of the refrigerators and freezers within the laboratory shall be monitored and recorded daily. This will verify that the quality of the standards and reagents is not compromised and the integrity of the analytical samples is upheld. Appropriate acceptance ranges (2 to 6°C for refrigerators) shall be clearly posted on each unit in service.

Water Supply System - The laboratory must maintain a sufficient water supply for all project needs. The grade of the water must be of the highest quality (analyte-free) in order to eliminate

false-positives from the analytical results. Ultraviolet cartridges or carbon absorption treatments are recommended for organic analyses and ion-exchange treatment is recommended for inorganic tests. Appropriate documentation of the quality of the water supply system(s) will be performed on a regular basis.

4.2 Laboratory Instruments

Calibration of instruments is required to verify that the analytical system is operating properly and at the sensitivity necessary to meet established quantitation limits. Each instrument for organic and inorganic analyses shall be calibrated with standards appropriate to the type of instrument and linear range established within the analytical method(s). Calibration of laboratory instruments will be performed according to specified methods.

In addition to the requirements stated within the analytical methods, the contract laboratory will be required to analyze an additional low level standard at or near the detection limits. In general, standards will be used that bracket the expected concentration of the samples. This will require the use of different concentration levels, which are used to demonstrate the instrument's linear range of calibration.

Calibration of an instrument must be performed prior to the analysis of any samples and then at periodic intervals (continuing calibration) during the sample analysis to verify that the instrument is still calibrated. If the contract laboratory cannot meet the method required calibration requirements, corrective action shall be taken as discussed in Section 7.0. All corrective action procedures taken by the contract laboratory are to be documented, summarized within the case narrative, and submitted with the analytical results.

5.0 INTERNAL QUALITY CONTROL CHECKS

Internal QC checks are used to determine if analytical operations at the laboratory are in control, as well as determining the effect sample matrix may have on data being generated. Two types of internal checks are performed and are described as batch QC and matrix-specific QC procedures. The type and frequency of specific QC samples performed by the contract laboratory will be according to the specified analytical method and project specific requirements. Acceptable criteria and/or target ranges for these QC samples are presented within the referenced analytical methods.

QC results which vary from acceptable ranges shall result in the implementation of appropriate corrective measures, potential application of qualifiers, and/or an assessment of the impact these corrective measures have on the established data quality objectives. Quality control samples including any project-specific QC will be analyzed are discussed below.

5.1 Batch QC

Method Blanks - A method blank is defined as laboratory-distilled or deionized water that is carried through the entire analytical procedure. The method blank is used to determine the level

of laboratory background contamination. Method blanks are analyzed at a frequency of one per analytical batch.

Matrix Spike Blank Samples - A matrix spike blank (MSB) sample is an aliquot of water spiked (fortified) with all the elements being analyzed for calculation of precision and accuracy to verify that the analysis that is being performed is in control. A MSB will be performed for each matrix and organic parameter only.

5.2 Matrix-Specific QC

Matrix Spike Samples - An aliquot of a matrix is spiked with known concentrations of specific compounds as stipulated by the methodology. The matrix spike (MS) and matrix spike duplicate (MSD) are subjected to the entire analytical procedure in order to assess both accuracy and precision of the method for the matrix by measuring the percent recovery and relative percent difference of the two spiked samples. The samples are used to assess matrix interference effects on the method, as well as to evaluate instrument performance. MS/MSDs are analyzed at a frequency of one each per 20 samples per matrix.

Matrix Duplicates - The matrix duplicate (MD) is two representative aliquots of the same sample which are prepared and analyzed identically. Collection of duplicate samples provides for the evaluation of precision both in the field and at the laboratory by comparing the analytical results of two samples taken from the same location. Obtaining duplicate samples from a soil matrix requires homogenization (except for volatile organic compounds) of the sample aliquot prior to filling sample containers, in order to best achieve representative samples. Every effort will be made to obtain replicate samples; however, due to interferences, lack of homogeneity, and the nature of the soil samples, the analytical results are not always reproducible.

Rinsate (Equipment) Blanks - A rinsate blank is a sample of laboratory demonstrated analyte-free water passed through and over the cleaned sampling equipment. A rinsate blank is used to indicate potential contamination from ambient air and from sample instruments used to collect and transfer samples. This water must originate from one common source within the laboratory and must be the same water used by the laboratory performing the analysis. The rinsate blank should be collected, transported, and analyzed in the same manner as the samples acquired that day. Rinsate blanks for nonaqueous matrices should be performed at a rate of 10 percent of the total number of samples collected throughout the sampling event. Rinse blanks will not be performed on samples (i.e., groundwater) where dedicated disposable equipment is used.

Trip Blanks - Trip blanks are not required for nonaqueous matrices. Trip blanks are required for aqueous sampling events. They consist of a set of sample bottles filled at the laboratory with laboratory demonstrated analyte free water. These samples then accompany the bottles that are prepared at the lab into the field and back to the laboratory, along with the collected samples for analysis. These bottles are never opened in the field. Trip blanks must return to the lab with the same set of bottles they accompanied to the field. Trip blanks will be analyzed for volatile organic parameters. Trip blanks must be included at a rate of one per volatile sample shipment.

6.0 CALCULATION OF DATA QUALITY INDICATORS

6.1 Precision

Precision is evaluated using analyses of a field duplicate and/or a laboratory MS/MSD which not only exhibit sampling and analytical precision, but indicate analytical precision through the reproducibility of the analytical results. RPD is used to evaluate precision by the following formula:

$$RPD = \frac{(X_1 - X_2)}{[(X_1 + X_2)/2]} \times 100\%$$

where:

X_1 = Measured value of sample or matrix spike
X_2 = Measured value of duplicate or matrix spike duplicate

Precision will be determined through the use of MS/MSD (for organics) and matrix duplicates (for inorganics) analyses.

6.2 Accuracy

Accuracy is defined as the degree of difference between the measured or calculated value and the true value. The closer the numerical value of the measurement comes to the true value or actual concentration, the more accurate the measurement is. Analytical accuracy is expressed as the percent recovery of a compound or element that has been added to the environmental sample at known concentrations before analysis. Analytical accuracy may be assessed through the use of known and unknown QC samples and spiked samples. It is presented as percent recovery. Accuracy will be determined from matrix spike, matrix spike duplicate, and matrix spike blank samples, as well as from surrogate compounds added to organic fractions (i.e., volatiles, semivolatiles, PCB), and is calculated as follows:

$$Accuracy\ (\%R) = \frac{(X_s - X_u)}{K} \times 100\%$$

where:

X_s - Measured value of the spike sample
X_u - Measured value of the unspiked sample
K - Known amount of spike in the sample

6.3 Completeness

Completeness is calculated on a per matrix basis for the project and is calculated as follows:

$$Completeness\ (\%C) = \frac{(X_v - X_n)}{N} \times 100\%$$

where:

X_v - Number of valid measurements
X_n - Number of invalid measurements

N - Number of valid measurements expected to be obtained

7.0 CORRECTIVE ACTIONS

Laboratory corrective actions shall be implemented to resolve problems and restore proper functioning to the analytical system when errors, deficiencies, or out-of-control situations exist at the laboratory. Full documentation of the corrective action procedure needed to resolve the problem shall be filed in the project records, and the information summarized in the case narrative. A discussion of the corrective actions to be taken is presented in the following sections.

7.1 Incoming Samples

Problems noted during sample receipt shall be documented by the laboratory. The PEI/BE3 Project Manager shall be contacted immediately for problem resolution. All corrective actions shall be documented thoroughly.

7.2 Sample Holding Times

If any sample extraction and/or analyses exceed method holding time requirements, the PEI/BE3 Project Manager shall be notified immediately for problem resolution. All corrective actions shall be documented thoroughly.

7.3 Instrument Calibration

Sample analysis shall not be allowed until all initial calibrations meet the appropriate requirements. All laboratory instrumentation must be calibrated in accordance with method requirements. If any initial/continuing calibration standards exceed method QC limits, recalibration must be performed and, if necessary, reanalysis of all samples affected back to the previous acceptable calibration check.

7.4 Reporting Limits

The laboratory must meet the method required detection limits listed in NYSDEC ASP, 10/95 criteria. If difficulties arise in achieving these limits due to a particular sample matrix, the laboratory must notify PEI project personnel for problem resolution. In order to achieve those detection limits, the laboratory must utilize all appropriate cleanup procedures in an attempt to retain the project required detection limits. When any sample requires a secondary dilution due to high levels of target analytes, the laboratory must document all initial analyses and secondary dilution results. Secondary dilution will be permitted only to bring target analytes within the linear range of calibration. If samples are analyzed at a secondary dilution with no target analytes detected, the PEI Project Manager will be immediately notified so that appropriate corrective actions can be initiated.

7.5 Method QC

All QC method-specified QC samples, shall meet the method requirements referenced in the analytical methods. Failure of method-required QC will result in the review and possible qualification of all affected data. If the laboratory cannot find any errors, the affected sample(s) shall be reanalyzed and/or re-extracted/redigested, then reanalyzed within method-required holding times to verify the presence or absence of matrix effects. If matrix effect is confirmed, the corresponding data shall be flagged accordingly using the flagging symbols and criteria. If matrix effect is not confirmed, then the entire batch of samples may have to be reanalyzed and/or re-extracted/redigested, then reanalyzed at no cost to the PEI/BE3. PEI/BE3 shall be notified as soon as possible to discuss possible corrective actions should unusually difficult sample matrices be encountered.

7.6 Calculation Errors

All analytical results must be reviewed systematically for accuracy prior to submittal. If upon data review calculation and/or reporting errors exist, the laboratory will be required to reissue the analytical data report with the corrective actions appropriately documented in the case narrative.

8.0 DATA REDUCTION, VALIDATION, AND USABILITY

8.1 Data Reduction

Laboratory analytical data are first generated in raw form at the instrument. These data may be either in a graphic or printed tabular format. Specific data generation procedures and calculations are found in each of the referenced methods. Analytical results must be reported consistently. Identification of all analytes must be accomplished with an authentic standard of the analyte traceable to NIST or USEPA sources. Individuals experienced with a particular analysis and knowledgeable of requirements will perform data reduction.

8.2 Data Validation

Data validation is a systematic procedure of reviewing a body of data against a set of established criteria to provide a specified level of assurance of validity prior to its intended use. All analytical results from soil and initial and final rounds of groundwater samples will have ASP Category B deliverables and DUSRs. The data validation will be in accordance with DER-10 Section 2.2 with ASP- Cat B data deliverables provided by the laboratory and a Data Usability Summary Report provided for validation.

- Technical holding times will be in accordance with NYSDEC ASP, 7/2005 edition.

- Organic calibration and QC criteria will be in accordance with NYSDEC ASP, 7/2005 edition. Data will be qualified if it does not meet NYSDEC ASP, 7/2005 criteria.

Where possible, discrepancies will be resolved by the PEI project manager (i.e., no letters will be written to laboratories).

9.0 REFERENCES

Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Quality Assurance Manual, Final Copy , Revision I, October 1989.
National Enforcement Investigations Center of USEPA Office of Enforcement. *NEIC Policies and Procedures.* Washington: USEPA.

New York State Department of Environmental Conservation (NYSDEC) 2005. *Analytical Services Protocol*, (ASP) 7/2005 Edition. Albany: NYSDEC.

NYSDEC "DER-10 Technical Guidance for Site Investigation and Remediation (DER-10)," dated May 3, 2010, Appendix 2B

TABLE 2
ANALYTE LIST

Part 375 Metals (ICP)
EPA 6010C

Analyte

Arsenic
Barium
Beryllium
Cadmium
Chromium
Copper
Lead
Manganese
Nickel
Selenium
Silver
Zinc
Mercury EPA 7471B
Cyanide, Total EPA 9014

PCBs **EPA 7471B**
PCB-1016
PCB-1221
PCB-1232
PCB-1242
PCB-1248

Chlorinated Pesticides
EPA 8081B

4,4-DDD
4,4-DDE
4,4-DDT
Aldrin
alpha-BHC
beta-BHC
cis-Chlordane
delta-BHC
Dieldrin
Endosulfan I
Endosulfan II
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Endrin Ketone
gamma-BHC (Lindane)
Heptachlor
Heptachlor Epoxide
Methoxychlor
Toxaphene
trans-Chlordane

Semi-Volatile Organics (Acid/Base Neutrals)
EPA 8270D

1,1-Biphenyl
1,2,4,5-Tetrachlorobenzene
1,2,4-Trichlorobenzene
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
2,2-Oxybis (1-chloropropane)
2,3,4,6-Tetrachlorophenol
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
2,4-Dichlorophenol
2,4-Dimethylphenol
2,4-Dinitrophenol
2,4-Dinitrotoluene
2,6-Dinitrotoluene
2-Chloronaphthalene
2-Chlorophenol
2-Methylnapthalene
2-Methylphenol
2-Nitroaniline
2-Nitrophenol
3&4-Methylphenol
3,3'-Dichlorobenzidine
3-Nitroaniline
4,6-Dinitro-2-methylphenol
4-Bromophenyl phenyl
4-Chloro-3-methylphenol
4-Chloroaniline
4-Chlorophenyl phenyl ether
4-Nitroaniline
4-Nitrophenol
Acenaphthene
Acenaphthylene
Acetophenone
Anthracene
Atrazine
Benzaldehyde
Benzo (a) anthracene
Benzo (a) pyrene
Benzo (b) fluoranthene
Benzo (g,h,i) perylene
Benzo (k) fluoranthene
Bis (2-chloroethoxy) methane
Bis (2-chloroethyl) ether
Bis (2-ethylhexyl) phthalate
Butylbenzylphthalate
Caprolactam
Carbazole
Chrysene
Dibenz (a,h) anthracene
Dibenzofuran
Diethyl phthalate
Dimethyl phthalate
Di-n-butyl phthalate
Di-n-octylphthalate
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Indeno (1,2,3-cd) pyrene
Isophorone
Naphthalene
Nitrobenzene
N-Nitroso-di-n-propylamine
N-Nitrosodiphenylamine
Pentachlorophenol
Phenanthrene
Phenol
Pyrene

Volatile Organics
EPA 8260C

1,1,1-Trichloroethane
1,1,2,2-Tetrachloroethane
1,1,2-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethene
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,2-Dibromo-3-Chloropropane
1,2-Dibromoethane
1,2-Dichlorobenzene
1,2-Dichloroethane
1,2-Dichloropropane
1,3,5-Trimethylbenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,4-dioxane
2-Butanone
2-Hexanone
4-Methyl-2-pentanone
Acetone
Benzene
Bromochloromethane
Bromodichloromethane

TABLE 2 (Continued)

Volatile Organics
(Continued)

Bromomethane
Carbon disulfide
Carbon Tetrachloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane
cis-1,2-Dichloroethene
cis-1,3-Dichloropropene
Cyclohexane
Dibromochloromethane
Dichlorodifluoromethane
Ethylbenzene
Freon 113
Isopropylbenzene
m,p-Xylene
Methyl acetate
Methyl tert-butyl Ether
Methylcyclohexane
Methylene chloride
Naphthalene
n-Butylbenzene
n-Propylbenzene
o-Xylene
p-Isopropyltoluene
sec-Butylbenzene
Styrene
tert-Butylbenzene
Tetrachloroethene
Toluene
trans-1,2-Dichloroethene
trans-1,3-Dichloropropene
Trichloroethene
Trichlorofluoromethane
Vinyl chloride

Volatiles-Air - TO-15

Acetone
Benzene
Carbon disulfide
Chloromethane
Dichlorodifluoromethane
Ethanol
Ethylbenzene
Ethyl Acetate
4-Ethyltoluene
Heptane
Hexane
Isopropyl Alcohol
Methylene chloride
Methyl ethyl ketone
Propylene
1,1,1-Trichloroethane
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
2,2,4-Trimethylpentane
Tertiary Butyl Alcohol
Tetrachloroethylene
Toluene
Trichloroethylene
Trichlorofluoromethane
m,p-Xylene
o-Xylene
Xylenes (total)
Acetone
Benzene
Carbon disulfide
Chloromethane
Dichlorodifluoromethane
Ethanol
Ethylbenzene
Ethyl Acetate
4-Ethyltoluene
Heptane
Hexane
Isopropyl Alcohol
Methylene
Methyl ethyl ketone
Propylene
1,1,1-Trichloroethane

APPENDIX D

FIELD SAMPLING PLAN
SOIL, WATER & AIR

Page No.

FIELD SAMPLING PLAN

FIELD SAMPLING PLAN (SOIL, WATER & AIR)

1.0 INTRODUCTION

This Field Sampling Plan (FSP) is designed to provide procedures for the field activities outlined in the Work Plan where soil and groundwater investigation/sampling may be required at the 68 Tonawanda Street Site under the BCP. It will serve as the field procedures manual to be strictly followed by all personnel. Adherence to these procedures will ensure the quality and usability of the field data collected. In addition to the field procedures outlined in this document, all personnel performing field activities must comply with:

- The appropriate Health and Safety guidelines found in the Health and Safety Plan (HASP) Appendix A;
- The Quality Assurance/Quality Control measures outlined in Appendix C; and
- The scope of work outlined in the Work Plan.

2.0 SOIL SAMPLING/INVESTIGATIONS

2.1 Soil Sampling

This section discusses the procedures for collecting an aliquot of sample for chemical analysis. Soil samples will be obtained as outlined in the Work Plan. The detailed procedure is outlined below:

1. Inspect test pit and/or boring core stratigraphy, sample soil and records depth interval. Record any physical characteristics (e.g., obvious contamination, odor, or discoloration) in the field logbook. Simultaneously place the probe of a calibrated PID into the exposed soil. Record the instrument readings in the field logbook.
2. Samples are to be collected at locations and frequency as discussed in the Work Plan and the Appendix C QA/QC Plan.
3. If not dedicated, decontaminate sampling implements after use and between sample locations (in most cases dedicated sampling equipment will be used).
4. Record field sampling information in the field logbook. Label each sample container with the appropriate sample identification data and place sample in a cooler (cooled to 4 degrees C.) for shipment to the laboratory.
5. Initiate chain-of-custody procedures.

2.1.1 Test Pit/Trench Procedures

Summary

Test pit sampling is a standard method of soil sampling to obtain representative samples for identification as well as to serve as a means of obtaining a large amount of information about the subsurface.

The following steps describe the procedures for test pit operations.

Field Preparation

1. Verify underground utilities have been found.
2. Review scope of work, safety procedures and communication signals with all site personnel. Identify local suppliers of sampling expendable and overnight delivery services. Pre-clean the sampling equipment prior to use, as necessary.
3. Mark/review trench locations. The specific locations will be determined in the field. Trench locations will be selected based on several factors, including areas of visible potential surface contamination/debris, pre-determined locations to examine representative areas across the site, and vegetative obstructions.
4. After completing each trench and sampling (as described above), subsurface soil will be backfilled. Backfilling will occur in the order in which the soil was removed. The backhoe will then be decontaminated over the test pit. The pit will then be filled in with clean overburden/topsoil and/or the fill that was previously on the surface, as available.

Excavation and Sample Collection

1. Maneuver the backhoe into position
2. Commence excavation with the backhoe positioned upwind of the excavation. Conduct continuous air monitoring with appropriate air monitoring equipment. Screen the soil for volatile organic compounds as it is placed on the soil pile.
3. Test trenching will be carried out in the following manner and as directed by PEI's site representative:
    - For each test trench, topsoil and/or cover soil (if any) will be excavated and placed on plastic sheeting.
    - Soil/fill below the topsoil will be excavated to the depth directed by PEI's site representative and placed on plastic sheeting separate from the topsoil/cover soil.
    - At completion of excavation all equipment in contact with the soil/fill will be steam cleaned over the trench after backfilling.
    - All trenches will be backfilled with indigenous soil in the order in which the material was removed with the topsoil/cover soil placed last to cover the trench.
4. A geologic log will be recorded as each trench is excavated. Upon completing the excavation of the pit, visually inspect the horizons of the soil for discoloration or staining and photo document the pit. The following information will be recorded for each test pit on the Test Pit Log:
    - The total depth, length, and width of the excavation.
    - The depth and thickness of distinct soil or lithologic units.
    - A lithologic description of each unit.
    - A description of any man-made materials or apparent contamination.
    - Elevation of incoming water, if encountered.
    - Depth to groundwater and/or bedrock.
    - Using dedicated stainless steel spoons collect soil samples as detailed in Section 2.1. Soil samples will be collected directly from the bucket of the backhoe.

The backhoe will collect a sample from a specific soil horizon and bring the sample back to the ground surface. **No personnel shall enter the excavation to collect samples unless a confined permit has been obtained.** Each soil sample will be placed directly into appropriate sample bottles/jars.

5. Carefully and clearly label the sample bottles and jars with the appropriate bottle label.
6. Place each jar in an ice-filled cooler.
7. Use the chain-of-custody form to document the types and numbers of test pit samples collected and logged.
8. Record the time and date of sample collection as well as a description of the sample and any associated air monitoring measurements in the field logbook.
9. All excavated soil will be returned to the trench following completion of excavation activities at each individual trench location. Each test pit will be backfilled and compacted prior to moving to the next. During the test pit operations an attempt will be made to segregate clean from dirty soil using visual observations and PID screening. When the test pit is being filled, if dirty soil was encountered, it will be placed in the bottom of the pit and covered with clean soil.
10. Decontamination sampling equipment-Decontaminate backhoe bucket prior to commencing and between locations.

Post Operations

1. Organize field notes. All relevant information recorded in the field logbook and the Test Pit Log.
2. All samples should be shipped to the laboratory as soon as possible, but no more than 24 hours after being collected.

2.1.2 Geoprobe Drilling Program

Soil sampling may also be conducted using Geoprobe drilling methods.

Macro Core Drilling Procedures:

Summary

Geoprobe Macro Core direct push sampling is a standard method of soil sampling to obtain representative samples for identification as well as to serve as a means of obtaining a specific amount of information about the subsurface.

The following steps describe the procedures for Macro Core direct push drilling operations.

Field Preparation

1. Verify underground utilities have been found.

2. Review scope of work, safety procedures and communication signals with all site personnel. Identify local suppliers of sampling expendable and overnight delivery services. Pre-clean the sampling equipment prior to use, as necessary.

3. Mark/review boring locations. The specific locations will be determined in the field. Boring locations will be selected based on several factors, including areas of visible potential surface contamination, pre-determined locations to examine representative areas across the site, and vegetative obstructions.
4. After completing each boring hole, subsurface soil will be backfilled. The boring hole will then be filled in with spoils and/or clean sand, if any available.

Excavation and Sample Collection

1. Maneuver the Geoprobe rig into position.
2. Commence drilling with the Geoprobe rig positioned upwind of the excavation. Conduct continuous air monitoring with appropriate air monitoring equipment. Screen the soil for volatile organic compounds as it is placed in a staged area.
3. Geoprobe borings will be carried out in the following manor and as directed by PEI's site representative:
    1. Start up drill rig and raise mast.
    2. If there is pavement use star bit with rig in rotary setting to penetrate pavement.
    3. If you are setting a road box excavate a hole large enough to set the road box before you advance the borehole.
    4. Unthread the bottom of the sample tube and inset a new sample liner. Thread the shoe on the bottom of the sample tube.
    5. Thread the drive cap on the top of the sample tube.
    6. Align the sample tube so it is plumb in both directions. The will assure you drill a straight borehole. It is important to drill a straight borehole.
    7. Drive the top of the sample tube to ground surface.
    8. Unthread the drive cap and thread on the pull cap.
    9. Pull the sample tube from the ground. Use caution so as not to pinch your hand between the drill rods, pull cap or rig during any of these steps.
    10. With the sample tube from the ground unthread the cutting shoe and pull the sample liner from the sample tube. You may need to use needle nose pliers to reach in the sample tube and grab the liner. Cut the sample liner lengthwise in two places and take it to the client.
    11. Insert a new liner and thread on the cutting shoe.
    12. Align the sample tube so it is plumb in both directions. The will assure you drill a straight borehole. It is important to drill a straight borehole.
    13. Push the sample tube to ground surface and thread a four-foot long drill rod onto the top of the sample tube. Thread on the drive cap and drive the top of the drill rod to ground surface.
    14. Unthread the drive cap and thread on the pull cap.
    15. Pull the drill rod from the ground.

16. Remove the pull cap from the drill rod and thread it on the sample tube
17. Pull the sample tube from the ground.
18. Repeat step 14, 15, 16 and 17.
19. After completing 17 add a second drill rod and drive it to ground surface. The borehole should now be 12 feet deep.
20. This procedure is repeated until the desired depth or refusal is reached.
21. For each Geoprobe boring, the sleeve/core will be placed on plastic sheeting.
22. The soil stratigraphy will be excavated to the depth directed by PEI's site representative and placed on plastic sheeting.
23. At completion of probe excavation all equipment in contact with the soil/fill will be cleaned in a decontamination area using Alconox and water.
24. All probe holes will be backfilled with indigenous soil in the order in which the material was removed with the topsoil/sand/cover soil placed last to cover the hole.

4. A geologic log will be recorded as each borehole is excavated. Upon completing the excavation of the borehole, visually inspect the horizons of the soil for discoloration or staining and photo document the pit. The following information will be recorded for each boring on the Geoprobe Log:
   -The total depth, length, and width of the excavation.
   -The depth and thickness of distinct soil or lithologic units.
   -A lithologic description of each unit.
   -A description of any man-made materials or apparent contamination.
   -Elevation of incoming water, if encountered.
   -Depth to groundwater and/or bedrock.
5. Using dedicated stainless steel spoons, collect soil samples as detailed in Section 2.1. Soil samples will be collected directly from the plastic sleeve of the probe core. Each soil sample will be placed directly into appropriate sample bottles/jars.
6. Carefully and clearly label the sample bottles and jars with the appropriate bottle label. Place each jar in an ice-filled cooler.
7. Use the chain-of-custody form to document the types and numbers of borehole samples collected and logged.
8. Record the time and date of sample collection as well as a description of the sample and any associated air monitoring measurements in the field logbook.
9. All excavated soil will be returned to the probe hole following completion of excavation activities at each individual trench location. Each probe hole will be backfilled and compacted prior to moving to the next.
10. Decontamination sampling equipment - Decontaminate all rods, shoes, and other geoprobe tools prior to commencing and between locations.

<u>Post Operations</u>

1. Organize field notes. All relevant information recorded in the field logbook and the Boring Log.
2. All samples should be shipped to the laboratory as soon as possible, but no more than 24 hours after being collected.

Reference: American Society for Testing Material (ASTM), 1992, ASTM D1586-84, Standard Method for Penetration Test and Split Barrel Sampling of Soils.

3.0 GROUNDWATER INVESTIGATION

3.1 Monitoring Well Installation Procedures

Summary

The following procedure outlines a NYSDEC-approved method of constructing groundwater monitoring wells within unconsolidated material which enables monitoring of groundwater elevation and acquiring groundwater samples for laboratory testing. Monitoring wells will be installed through hollow stem augers. Stick-up or road box will be installed at completion. The following is a step-by-step method for installing a monitoring well. A typical well construction diagram is provided at the end of this FSP.

Procedure

Monitoring wells will be installed with hollow stem auger drilling techniques. Each well will consist of a 2-inch inside diameter, schedule 40 PVC casing equipped with a ten-foot screen or less depending on well depth and solid PVC riser pipe extending to the surface. Screens will be positioned to straddle the groundwater surface where water bearing zones are assumed to be and will be extended to the bottom of the boring. Filter pack will be placed around the screen to a minimum of one foot above the screen. A finer grained sand pack material (100 percent passing the No. 30 sieve and less than two percent passing the No. 200 sieve) six inches thick will be placed at the top of the sand pack between the sand and the bentonite seal. Bentonite must be placed above the sand pack to form a seal at least three feet thick. A 6 to 12-inch fine grained sand pack must be placed above the bentonite seal to minimize grout infiltration. Grout of cement/bentonite or bentonite alone must completely fill the remaining annular space to the surface seal. Auger flights or casing must be left in the hole before grouting to prevent caving.

3.2 Well Development Procedures

Summary

Following completion of drilling and well installation, and no sooner than 24 hours after installation, each well will be developed by a surge block method followed by pumping or bailing until the discharged water is relatively sediment free and the indicator parameters (pH, temperature, and specific conductivity) have reached steady-state. Developing the well not only removes any sediment, but may improve the hydraulic properties of the sand pack. Well development water will be placed on the ground surface downgradient of the well.

The effectiveness of the development measures will be closely monitored in order to keep the volume of discharged waters to the minimum necessary to obtain sediment-free samples. Steady-state pH, temperature, and specific conductivity readings will be used as a guide for discontinuing well development.

Procedure

1) An appropriate well development method should be selected, depending on water level depth, well productivity, and sediment content of the water. Well development options include: (a) bailing; (b) manual pumping; and (c) submersible pumps. Any of these options may be exercised in concert with surging of the well screen using an appropriately sized surge block.

2) Equipment should be assembled, decontaminated, if necessary, and installed in the monitoring well. Care should be taken not to introduce contaminants to the equipment during installation.

3) Well development should proceed by repeated removal of water from the well until the discharged water is relatively sediment-free. Volume of water removed, pH and conductivity measurements, are recorded on the Well Development/Purging Logs.

4) Well development will occur no sooner than 24 hours after installation. Well development will continue until readings of <50 NTUs are obtained.

3.3 Groundwater Well Purging/Sampling

Summary

To collect representative groundwater samples, groundwater wells must be adequately purged to sampling. Purging will require removing three to five volumes of standing water in rapidly recharging wells and at least one volume from wells with slow recharge rates. Sampling should commence as soon as adequate recharge has occurred.

The wells will be sampled following procedures found in Section 3.5. The samples will be labeled and shipped following procedures outlined in Sections 6.0 and 7.0 and analyzed according to the program outlined in the QA/QC Plan (Appendix C).

3.4 Well Purging Procedures

Procedure

1) The well cover will be carefully removed to avoid any foreign material enter the well. The interior of the riser pipe will be monitored for organic vapors using a PID. If reading of greater than 5 ppm is recorded, the well will be vented until levels are below 5 ppm before pumping is started.

2) Using an electronic water level indicator, the water level below top of casing will be measured. Knowing the total depth of the well, it will be possible to determine the volume of water in the well. The end of the probe will be washed with soap and rinsed with deionized-water between wells.

3) Dedicated new polyethylene discharge and intake tubing (½ inch diameter HDPE) will be used for each well. Evacuation of the well will be accomplished using bailers. Bailing will continue until the required volumes are removed. If the well purges to dryness and recharges rapidly (within 15 minutes), water will continue to be removed as it recharges until the required volumes are removed. If the well purges to dryness and is slow recharge (greater than 15 minutes), evacuation will be terminated.

4) Purging will continue until three volumes of water have been removed. Well volumes will be calculated. Measurements for pH, temperature, turbidity, and conductivity will be recorded during the purging along with physical observations.

5) Well purging data are to be recorded in the field notebook and on the Well Development/Purging Log.

3.5 Groundwater Sampling Procedures

Procedure

1) Well sampling may be performed on the same date as purging at any time after the well has recovered sufficiently to sample, or within 24 hours after evacuation, if the well recharges slowly. If a well does not contain or yield sufficient volume for all required laboratory analytical testing, then a decision will be made to prioritize analyses. If a well takes longer than 24 hours to recharge, then a decision will be made after consultation with NYSDEC whether the sample will be considered valid.

2) After well purging is complete and the well has recharged sufficiently per the previous item, a sample will be collected by use of bailers into appropriate containers.

3) All sample bottles will be labeled in the field using a waterproof permanent marker. Procedures outlined in Section 6.0 will be followed.

4) Samples will be collected into verifiably clean sample bottles (containing required preservatives) and placed on ice in coolers for transport to the analytical laboratory. Chain-of-custody will be initiated. The analytical laboratory will certify that the sample bottles are analyte-free.

5) A separate sample will be collected into a 120 milliliter (mL) plastic specimen cup to measure pH, conductivity, turbidity, and temperature off the well in the field.

6) Well sampling data are to be recorded in the field notebook and on the Well Development/Purging Log.

4.0 SAMPLE DOCUMENTATION-SOIL/WATER

Summary

Each subsurface test pit and boring core will be logged in a bound field notebook during drilling by the supervising geologist. Field notes will include descriptions of subsurface material encountered during test pit and drilling, sample numbers and types of samples recovered from the test pits and wells. Additionally, the geologist will note time and material expenditures for later verification of contractor invoices.

Upon completion of daily drilling activities, the geologist will complete the Daily Drilling Record and initiate chain-of-custody on any samples recovered for geotechnical or chemical testing. Following completion of the drilling program, the geologist will transfer field logs onto standard boring log forms and well completion logs for the site investigation report.

5.0 SAMPLING CONTAINER SELECTION-SOIL/WATER

The selection of sample containers is based on both the media being sampled and the analysis of interest.

6.0 SAMPLE LABELING-SOIL/WATER

Summary

In order to prevent misidentification and to aid in the handling of environmental samples collected during the field investigation, the procedures listed below will be followed:

Procedure: Affixed to each sample container will be a non-removable (when wet) label. The sample bottle will be wrapped with 2-inch cellophane tape. Apply label and wrap with tape to cover label. The following information will be written with permanent marker:

1. Site name
2. Sample identification
3. Project number
4. Date/time
5. Sampler's initials
6. Sample preservation
7. Analysis required
8. Site name
9. Sample identification
10. Project number
11. Date/time
12. Sampler's initials
13. Sample preservation
14. Analysis required

Each sample of each matrix will be assigned a unique identification alpha-numeric code. An example of this code and a description of its components is presented below:

Examples:

1. PEI-BI-ss1
   Where: PEI= Panamerican Environmental, Inc.
   RR = River Road
   SS-1 = surface soil sample 1

2. PEI-RR-TP1-2-3
   Where: TP1 = Test Pit 1
   2-3 = Sample Depth in feet

List of Abbreviations

Sample Type

TP	=	Test Pit
BH	=	Geoprobe Borehole
SW	=	Surface Water
SED	=	Sediment
SB	=	Soil Boring
SS	=	Surface Soil (0-2" depth)
MSB	=	Matrix Spike Blank
NSS	=	Near Surface Soil (1' - 2' depth)
EB	=	Equipment Rinse Blank
HW	=	Hydrant Water (Decon/Drilling Water)
GW	=	Groundwater
TB	=	Trip Blank
RB	=	Rinse Blank
MS/MSD	=	Matrix Spike/Matrix Spike Duplicate

7.0 SAMPLE SHIPPING-SOIL/WATER

Summary

Proper documentation of sample collection and the methods used to control these documents are

referred to as chain-of-custody procedures.

Chain-of-custody procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The procedures used in the pre-design field activities follow the chain-of-custody guidelines outlined in *NEIC Policies and Procedures*, prepared by the National Enforcement Investigations

Center (NEIC) of the USEPA Office of Enforcement,

Procedure:

1) The chain-of-custody record should be completely filled out with all relevant information.
2) The white original travels with the samples and should be placed in a Ziplock bag and taped inside the sample cooler.
3) Place about 3 inches of inert cushioning material (such as vermiculite or zonolite) in bottom of cooler.
4) Place bottles in cooler so they do not touch (use cardboard dividers).
5) Put VOA vials in Ziplock bags and place them in the center of the cooler.
6) Pack bottles, especially VOA vials, in ice in plastic bags.
7) Pack cooler with ice in Ziplock plastic bags.
8) Pack cooler with cushioning material.
9) Put paperwork in plastic bags and tape with masking tape to inside lid of cooler.
10) Tape drain shut.
11) Wrap cooler completely with strapping tape at two locations. Secure lid by taping. Do not cover any labels.
12) Place lab address on top of cooler.
13) Ship samples via overnight carrier the same day that they are collected.
14) Put "This side up" labels on all four sides and "Fragile" labels on at least two sides.
15) Affix numbered custody seals on front right and left of cooler. Cover seals with wide, clear tape.

8.0 SOIL VAPOR INTRUSION INVESTIGATIONS

This investigation will consist of sampling vapors that may exist beneath the building slabs along with sampling building indoor air.

Sample collection will follow the procedures discussed below and will be in accordance with the October 2006, New York State Department of Health *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. The samples will be analyzed for the parameters indicated in Tables C-1 and C- 2.

8.1 Sub-Slab Air Sampling Procedures

Sub-slab sampling procedures are summarized below:

Sampling Locations

Select the sub-slab sample collection points by observing the condition of the building floor slab for apparent penetrations such as concrete floor cracks, floor drains, or sump holes. The floor conditions will be noted and potential locations of subsurface probes will be selected. The locations will ideally be away from the foundation walls, apparent penetrations and buried pipes.

Sampling Probes

- Construct a sampling probe using a ¼-inch Swagelok union connected to a short length of ¼-inch diameter stainless steel tubing. Select a length of stainless steel tubing so that the bottom of the probe is close to but does not extend below the bottom of the slab (typically a 4-inch probe for a 6-inch thick slab).
- Attach a 2 ft. length of Teflon or polyethylene tubing to the other end of the union using a ¼-inch swagelok nut and ferruls. Plug up the other end of the tubing with a small piece of modeling clay to seal the system and prevent air flow in or out of the sub slab while the probe and tubing sits idle.

Installation of the Sampling Probe

- Drill through and about 1 inch below the concrete slab using a portable coring drill and 2-inch diameter core drill bit. Record the thickness of the concrete slab.
- When installing the probe, first put a few inches of driller's sand at the bottom of the cored hole so that the grout will sit on top of the sand and not go all the way to the bottom of the hole and plug the probe inlet.
- Install the probe into the hole, with the tubing already attached. Use the tubing to hold the union at the correct height in the hole (just below the top). Mix hydraulic cement and water is a ziplok bag. Cut a hole in one corner of the bag and use it like a pastry chef's bag to grout the probe in place. Use a small rod to push/tap in the grout. Leave the top 1-inch or so of the hole unfilled, being sure that the threaded top of the union (where the tubing attaches) is above the cement.
- Allow the probe to sit in place for at least one hour to allow the cement to set. If possible, install the probe one day and allow it to sit overnight.

Helium Tracer Gas Testing

- Place a 2-quart (or similar size) bucket over the sample probe after threading the Teflon sample tube through a hole in the top of the bucket. Seal the tube to the bucket with clay. The bucket should also have another hole drilled in the top for the injection of helium, and a hole in the side near the floor for the measurement of helium gas concentrations.
- Connect helium (99.999% pure) cylinder tubing to the top port of bucket enclosure and seal with clay or other sealing material. Insert a helium detector probe in the bottom port of the bucket.
- Release enough helium to displace any ambient air in the bucket until the concentration of
- helium reaches a minimum of 90%. Maintain this minimum concentration by testing with a helium detector. The Helium cylinder should be open during the purge time to cause a slight positive pressure within the enclosure.
- Connect the sample tubing to a GilAir vacuum pump or equivalent using 3/8-inch O.D. silicone tubing. Connect a 1-liter Tedlar bag to the outlet of the pump using silicone

- tubing and collect a 1-liter sample. Purging flow rates must not exceed 0.2 liters per minute (L/min). Analyze the Tedlar bag for helium using a helium detector, and record the results on the Summa Canister Data Sheet. A concentration of helium 10% or greater indicates a poor seal of the sample probe and it must be reinstalled and retested. After purging, remove the bucket enclosure from over the sample probe.

Sample Collection

- Assign sample identification to the Summa canister sample identification tag and record on chain of custody (COC), and the Summa Canister Data Sheet. Also record the Summa canister and flow controller (regulator) serial numbers on the COC and Summa Canister Data Sheet.
- Attach a pre-calibrated/certified 2-hour flow controller, and particulate filter to the Summa canister
- Attach the sample tube to the Summa canister using a ¼-inch Swagelok nut with appropriate ferrules, to the end of the flow controller/particulate filter assembly.
- Open canister valve to initiate sample collection and record sample start time, date and initial canister vacuum on the canister identification tag and on the Summa Canister Data Sheet. If the canister does not show sufficient vacuum (generally less than 25 " Hg"), do not use. Take a digital photograph of canister setup and surrounding area. Include in the photograph a dry erase board or similar display which presents sample ID, location and date.
- After 2 hours, record sample end time and canister pressure on the Summa Canister Data Sheet, and close valve. Disconnect the Teflon tubing and remove flow controller/particulate filter assembly from canister. Seal canister with laboratory supplied brass plug.
- Ship the samples, with COCs, overnight, to the selected laboratory for standard TO-15 analysis.

Remove The Sample Probe

- If the probe is to be reused, remove the ¼-inch tubing and place a Swagelok cap on the exposed part of the union. The cap should be flush or below the level of the floor. If the probe is not to be reused, remove the probe by drilling around the probe with a hammer drill and a ¼ or 3/8 inch drill bit until loose. Keep the tubing attached to the implant to aid in its removal. Fill the core hole with hydraulic cement.

8.2 Indoor/Outdoor Air Sampling Procedures

The indoor air and outdoor air sampling procedures are summarized below:

- Place the indoor air Summa canister/flow controller inlet at breathing height in the approximate center of the space being sampled, or, for the outdoor air sample, elevated on a table or other object in a location upwind of the building being sampled. The breathing

height is defined as four to six feet above the floor or ground. As an option, a length of Teflon tubing can be attached to the Summa canister/flow controller inlet and raised to breathing zone height.

- Record the canister and flow controller serial numbers on the canister identification tag, COC and the Summa Canister Data Sheet
- Assign sample identification to the canister identification tag, and record on the COC and the Summa Canister Data Sheet.
- Remove brass plug from canister fitting and save.
- Attach a pre-calibrated/certified 8-hour flow controller and particulate filter to the Summa canister. For the outside air sample, also connect the laboratory supplied "candy cane" fitting to the flow controller.
- Open canister valve to initiate sample collection and record start time, date and gauge vacuum reading on the canister identification tag and on the Summa Canister Data Sheet.
- Take a photograph of canister setup and surrounding area.
- After 8 hours, record the gauge vacuum reading, close the Summa canister valve completely and record the end time on the Summa Canister Data Sheet. There should still be a slight vacuum in the Summa canister. If no vacuum remains in the canister, or the canister does not show a significant net loss in vacuum after sampling, the sample should be re-collected using a new Summa canister and flow controller.
- Disconnect any tubing and candy cane fittings from the Summa canister and remove the flow controller.
- Replace the brass plug on the canister.
- Ship canister, with COCs, overnight, to the selected laboratory

8.3 Quality Control

The number of Quality Control samples (duplicates) to be taken during sub-slab sampling may be found on Table 1 of Appendix C. The duplicate sample rate is usually 10 percent.

Field duplicates for sub-slab, indoor air and outdoor air samples will be collected by attaching the T-fitting supplied by the laboratory to two Summa canisters with attached regulators. For sub-slab samples, the inlet of the T-fitting will then be attached to the sub-slab sample tubing using a Swagelok fitting. For indoor and outdoor air samples, any tubing used to raise the sampling

height will also be attached to the inlet of the T fitting. For sampling, both Summa canister valves are opened and closed simultaneously.

8.4 Sample Labeling

Summary: In order to prevent misidentification and to aid in the handling of environmental samples collected during the field investigation, the following procedures will be used:

Procedure: Each sub-slab sample will have the following information placed on the laboratory supplied sample label:

- Site name
- Sample identification – see below
- Date/time
- Sampler's initials
- Analysis required – **TO-15**

The serial number of the canister and regulator used during sampling will also be noted on the Summa canister identification tag and on the COC.

Each sub-slab, indoor air and outdoor air sample will be assigned a unique alpha-numeric code. An example of this code and a description of its components are presented below.

Field duplicate samples will be assigned a unique identification alphanumeric code that specifies the date of collection, the letters FD (for field duplicate) and an ascending number that records the number of duplicate samples collected that day. For example, the first field duplicate collected on February 22, 2009 would be assigned the following sample number using the code shown below:

YYYYMMDD-FD-1 = 20090222-FD-1

Subsequent duplicates collected on the same day will be assigned FD-2, FD-3 etc. Field sampling crew will record the duplicate sample information on the Summa Canister Data Sheets and also in the field book.

8.5 Field Documentation

Field notebooks will be used during all on-site work. A dedicated field notebook will be maintained by the field technician overseeing the site activities. Sub-slab sampling procedures should be photo-documented.

The field sampling team will maintain sampling records that include the following data:

- Sample Identification
- Date and time of sample collection
- Identity of samplers
- Sampling methods and devices
- Purge volumes (soil vapor)
- Volume of soil vapor sample extracted
- The Summa canister vacuum before and after samples collected
- Chain of Custody and shipping information

The proper completion of the following forms/logs will be considered correct procedure for documentation during the indoor air-sampling program:

1. Field Log Book - weather-proof hand-bound field book
2. Summa Canister Data Sheet
3. Chain of Custody Form

8.6 Sample Shipping

Summary: Proper documentation of sample collection and the methods used to control these documents are referred to as chain-of-custody procedures. Chain-of-custody procedures are essential for presentation of sample analytical chemistry results as evidence in litigation or at administrative hearings held by regulatory agencies. Chain-of-custody procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples.

The procedures used in this off-site vapor intrusion study follow the chain-of-custody guidelines outlined in NEIC Policies and Procedures, prepared by the National Enforcement Investigations Center (NEIC) of the U.S. Environmental Protection Agency Office of Enforcement.

Procedure:

- The chain-of-custody (COC) record should be completely filled out, with all relevant information.
- The original COC goes with the samples. It should be placed in a Ziplock bag and placed inside the box containing a Summa canister. The sampler should retain a copy of the COC.
- Summa canisters are shipped in the same boxes the laboratory used for shipping.
- Place the lab address on top of sample box/cooler. Affix numbered custody seals across box lid flaps and cooler lid. Cover seals with wide, clear tape.
- Ship samples via overnight carrier within three days of sample collection if possible.

DRILLING SUMMARY

Geologist:

Drilling Company:

Driller:

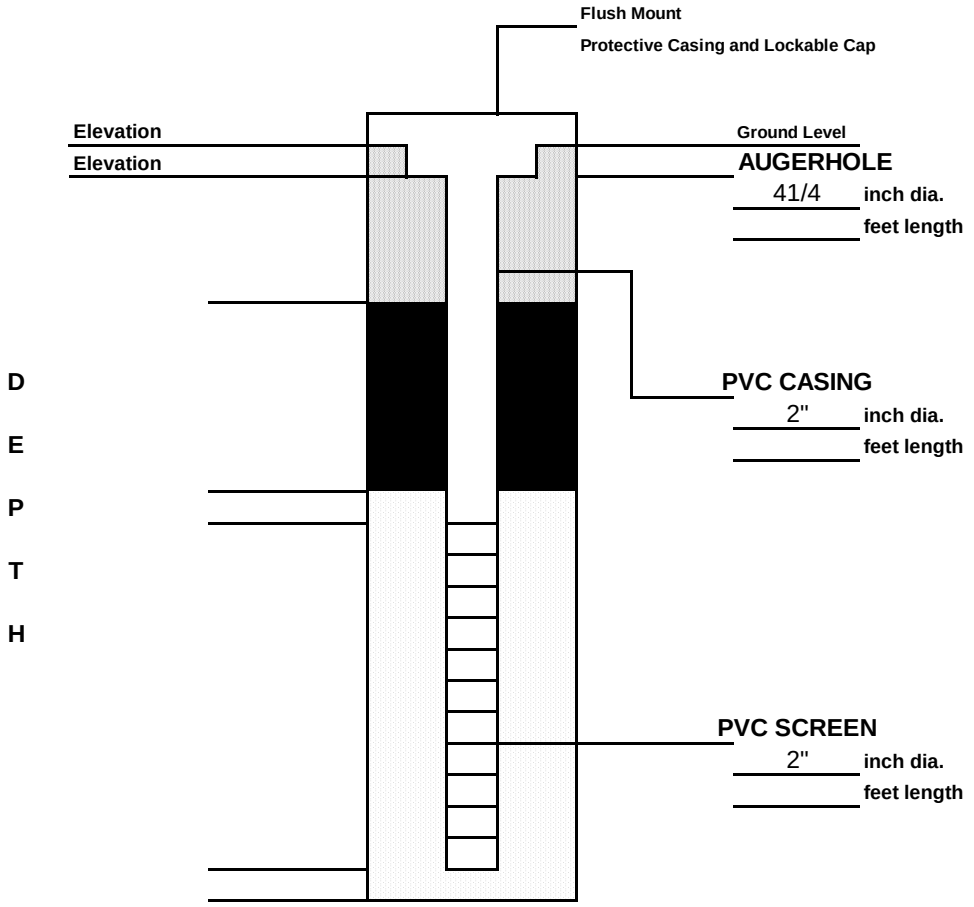
Rig Make/Model:

Date:

GEOLOGIC LOG

Depth(ft.)	Description

WELL DESIGN



CASING MATERIAL	*SCREEN MATERIAL*	*FILTER MATERIAL*
Surface: Steel grade box	**Type:** 2" PVC	**Type:** #2 Sand **Setting:**
Monitor: 2" PVC	**Slot Size:** .020"	***SEAL MATERIAL***
		Type: Bentonite **Setting:**

COMMENTS:

LEGEND

- Cement/Bentonite Grout
- Bentonite Seal
- Silica Sandpack

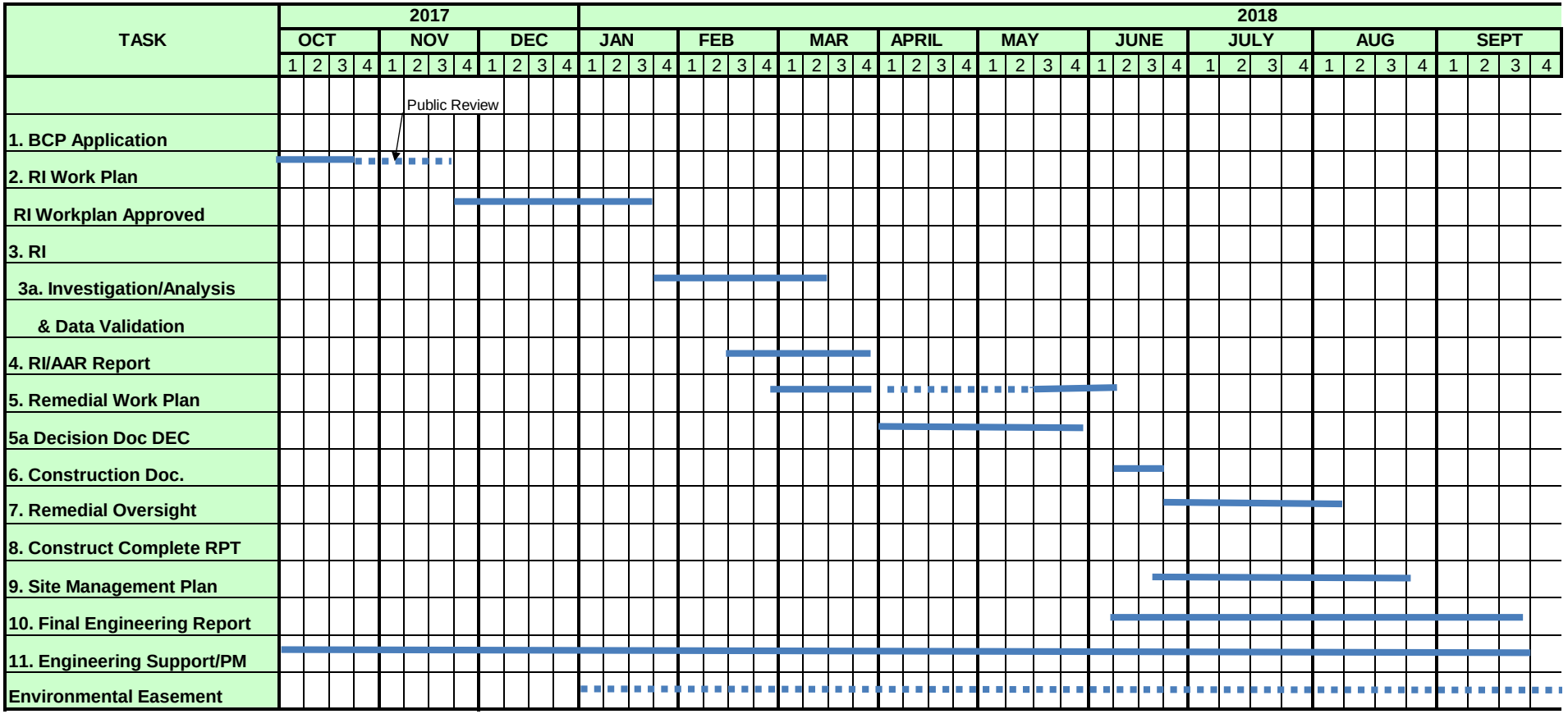
Client:	**Location:**	**Project No.:**
BE3/Panamerican	**MONITORING WELL CONSTRUCTION DETAILS**	**Well Number:**

APPENDIX E

PROJECT SCHEDULE

UPDATED PROJECT/PAYMENT SCHEDULE DECEMBER 2017

68 Tonawanda Street Site



APPENDIX F

DER-10 APPENDIX 3C
FISH & WILDLIFE DECISION KEY

68 Tonawanda Street Site

Appendix 3C Fish and Wildlife Resources Impact Analysis Decision Key		If YES Go to:	If NO Go to:
1	Is the site or area of concern a discharge or spill event?	13	2
2.	Is the site or area of concern a point source of contamination to the groundwater which will be prevented from discharging to surface water? Soil contamination is not widespread, or if widespread, is confined under buildings and paved areas.	13	3
3.	Is the site and all adjacent property a developed area with buildings, paved surfaces and little or no vegetation?	4	9
4.	Does the site contain habitat of an endangered, threatened or special concern species?	Section 3.10.1	5
5.	Has the contamination gone off-site?	6	14
6.	Is there any discharge or erosion of contamination to surface water or the potential for discharge or erosion of contamination?	7	14
7.	Are the site contaminants PCBs, pesticides or other persistent, bioaccumulable substances?	Section 3.10.1	8
8.	Does contamination exist at concentrations that could exceed ecological impact SCGs or be toxic to aquatic life if discharged to surface water?	Section 3.10.1	14
9.	Does the site or any adjacent or downgradient property contain any of the following resources? i. Any endangered, threatened or special concern species or rare plants or their habitat ii. Any DEC designated significant habitats or rare NYS Ecological Communities iii. Tidal or freshwater wetlands iv Stream, creek or river v Pond, lake, lagoon vi. Drainage ditch or channel vii. Other surface water feature viii. Other marine or freshwater habitat ix. Forest x. Grassland or grassy field xi. Parkland or woodland xii. Shrubby area xiii. Urban wildlife habitat xiv Other terrestrial habitat	11	10
10.	Is the lack of resources due to the contamination?	3.10.1	14
11.	Is the contamination a localized source which has not migrated and will not migrate from the source to impact any on-site or off-site resources?	14	12
12.	Does the site have widespread surface soil contamination that is not confined under and around buildings or paved areas?	Section 3.10.1	12
13.	Does the contamination at the site or area of concern have the potential to migrate to, erode into or otherwise impact any on-site or off-site habitat of endangered, threatened or special concern species or other fish and wildlife resource? (See #9 for list of potential resources. Contact DEC for information regarding endangered species.)	Section 3.10.1	14
14.	No Fish and Wildlife Resources Impact Analysis needed.		✓